

Operator Manual



an ARBOS Company



SUMMARY

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3	TECHNICAL CHARACTERISTICS
4	CONTROLS AND INSTRUMENTS
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1: General information

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1.1 Introduction

Keep this "Use and maintenance manual" with care and remember to refer to it regularly.

Due to the considerable diversity possible in operating conditions, the documentation produced by the manufacturer cannot take every possible variable into account regarding the performance and operation of the vehicles it manufactures. It therefore cannot be held responsible for loss or damage deriving from the content of these publications or due to any errors or omissions. If the vehicle is be used in particularly heavy-duty and unusual conditions (e.g. in deep water or very muddy soil), we recommend contacting your dealer beforehand for specific instructions to prevent voiding the warranty.

The manufacturer of the tractor cannot be held liable for any damage or injury caused by improper use of the vehicle, the risks of which are solely the user's responsibility.

Compliance with and strict observance of the conditions of use, servicing and repair specified by the manufacturer are also an essential part of intended use.

To use, service and repair this tractor, you must be fully aware of all of its specific characteristics and be informed about the relative safety standards and regulations (accident prevention).

We recommend contacting an official dealer for any queries concerning servicing or settings.

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1.2 Note for owner

This manual contains the information necessary to ensure that the machine is serviced correctly. This machine is inherently reliable. However, the performance and durability of the machine depend on proper maintenance and correct operation. This manual must be read by all persons operating the machine and must be kept close at hand at all times.

Upon delivery of the new machine, the dealer will provide the owner with general instructions for operation. Our service personnel will be happy to answer any queries regarding the operation of the machine.

The dealer has a comprehensive range of genuine spare parts. These spare parts are manufactured and inspected with care to ensure the necessary superior quality and reliability. When ordering spare parts, provide the dealer with the product identification number and the model code. Copy these numbers into the relative spaces below as soon as you take delivery of the new product. See the section "General information" in this manual for the location of the product identification number and the model code.

Contact an authorised dealer for information on and ordering any additional equipment available. Use the identification information of you vehicle, copied manually onto this page from the identification plates.



Note

Using only original spare parts will protect the tractor and keep it in good working order. Using non-original spare parts or installing spare parts incorrectly will void the warranty.

COPY THE FOLLOWING DETAILS IN THE SPACE BELOW

Model:	
Tractor identification number:	
Engine identification number:	
Date of purchase:	
Name of authorised dealer:	
Telephone number of authorised dealer:	



A number of safety warning decals are applied to the machine, which may or may not also include a caution message, to warn the user of potential hazards which could lead to personal injury. Observe all safety messages to prevent the risk of injury or death

The machine has been designed and constructed in compliance with the quality standards required by current safety legislation. In spite of this, the risk of accidents can never be eliminated completely. This is why it is imperative to follow the basic safety rules and precautions given. To prevent the risk of injury when using or repairing the machine, before you start work, read this manual thoroughly and, in particular, the instructions concerning safety, operation and maintenance.

Only use this machine for the tasks and applications indicated in this manual. In the case of tasks requiring the machine to be used together with special implements, contact your dealer to be certain that the modifications necessary are compatible with the technical specifications of the machine itself and compliant with applicable safety regulations.

Modifications made to the machine without the approval of the manufacturer may render the machine no longer compliant with safety requirements.

The instruction manual must always be kept on board the machine. Make sure that the manual is complete and in good condition. Contact your dealer to request additional copies of the manual or versions in languages other than the language of the country of use.

The manufacturer is dedicated to continuously improving its products. The manufacturer therefore reserves the right to implement improvements or modifications as it deems necessary, without extending these modifications or improvements to any machine sold beforehand

The machine must be inspected periodically at intervals determined by the usage of the machine itself. Contact an authorised dealer for more information.



Warning

The contents of this manual are based on the information available at the time of writing. Settings, procedures, part numbers, software and other elements may be subject to change, with possible ramifications for the maintenance procedures for the machine. Before operating the machine for the first time, contact your dealer to make sure that you have the latest and most complete version of the manual. All the contents of this manual may be subject to modification to reflect changes in production.



Caution

The injection system and the engine installed on this machine are compliant with governmental emissions standards. Any tampering with the machine is strictly prohibited by law. Non observance of this directive may:

- render you liable to fines;
- render you liable for repair costs;
- void the warranty;
- render you liable to legal action and lead to the vehicle being confiscated until it is restored to its original state.



Caution

Maintenance and/or repair work on the engine must only be performed by specialised technicians!



1.3 Correct and incorrect use of tractor

1.3.1 Intended use



Note

The machine has been designed and constructed in conformity with EU directives for the prevention of risks to health and safety. This manual must be read in full in order to minimise risks and avoid exposing the operator and other persons to risk or danger. The operator must understand and comply with all the instructions and warnings indicated on decals, plates and labels applied to the machine. Contact you dealer for any queries on this matter.



Note

The tractor is approved for use on public road provided that it is registered correctly and carries a legal license plate.

To operate this tractor in accordance with its intended use, it is necessary to follow the instructions in this manual, along with the routine maintenance and repair rules stipulated by the manufacturer.

The persons who use, maintain and repair the tractor must have a good knowledge of the tractor and the associated risks, and must be suitably trained and informed with regards the correct way to drive the tractor, the contents of this manual and the rules stipulated by the manufacturer.

The persons who use, maintain and repair the tractor must always comply with the rules regarding workplace health and safety, occupational health and road traffic legislation in order to avoid accidents that could cause personal injury or death.

Any usage not complying with the conditions stated above will be deemed improper and incorrect use and will automatically relieve the manufacturer of any responsibility in the event of an accident. In this situation, the user will be entirely responsible and liable.

All persons using the machine must be in possession of locally valid authorisation to drive the vehicle or observe applicable local regulations.

Read and observe the following instructions with particular care:

- Only use the machine for the usage intended by the manufacturer and indicated in this manual.
- Use the tractor safely.
- Connect implements correctly. Using non-approved or incorrectly installed implements and accessories may result in overturning caused when the implement or accessory detaches from the tractor.
- Ensure that the three point linkage meets the requirements of ISO 730 standards.
- Check that the speed and dimensions of the power take off on the tractor are correct for the connected implement
- Read the specific instruction manual provided with the implement thoroughly before operating an implement connected to the tractor. The tractor is a tool that may be used in a variety of different configurations. It would not be possible to provide comprehensive safety information in this manual encompassing ever possible configuration of the machine.
- Before using the tractor for towing or stump-pulling, check carefully that the draft force setting is correct. When using the machine for pulling stumps in particular, the machine may overturn if the stump fails to yield from the soil.
- When lifting weights with a front loader or with the rear three point linkage, the centre of gravity of the tractor may raise. In these conditions, the risk of sudden overturning is increased.
- Only leave the driver seat and alight from the tractor after doing the following:
 - Set the gear lever to neutral.
 - Engage the parking brake and, if present, the park lock.
 - Disengage the PTO (unless the specific implement connected requires the PTO to remain running).
 - Lower any implements connected to the machine to the ground.



- Especially when in restricted spaces, make sure that there are no persons in the vicinity of the machine when manoeuvring.
- Inform all persons in the vicinity that they must leave and keep out of the work area before starting work. When working, there is a risk of being hit by objects expelled by the implement connected to the tractor (rotary mowers, rotary harrows etc.).
- Take particular care when working near roads or pathways. Objects may be projected out of the work area and hit passers-by. Stop and wait for the area to clear before continuing work.
- Nobody other than the operator is allowed on the tractor. Do not allow other persons to climb onto the cab access ladder while the tractor is moving. In addition to limiting the driver's field of view, there is also a risk of the person carried falling off the tractor.
- Keep at a safe distance from the work area of implements. Keep out of the space between the machine and the implement or towed vehicle when using the external lift controls. Ensure that there are no unauthorised persons in the work area.
- The tractor is equipped with software which controls a number of its safety functions. Never tamper with these functions for any reason or load software onto the system that is not certified by the constructor. Non certified software may compromise the functions of the tractor. Non certified software may cause abnormal tractor behaviour, reducing both performance and safety. Any procedure concerning the software must only be performed by your dealer.
- Certain safety functions are controlled by sensors. These sensors must be in proper working order for the safety functions to be effective.
- The tractor is equipped with a single driver seat only and is therefore only intended to be operated by one user at a time.

1.3.2 Improper and incorrect use

Any use other than those specifically intended by the constructor is deemed improper and incorrect. The constructor cannot be held liable in the event of any accident caused by improper use. The user is responsible for all risks deriving from improper use.

The following is a list of examples of improper usage of this tractor which will put the life of the operator at risk.

- Allowing the tractor to be operated by persons who have not received adequate training.
- Using the tractor in terrain conditions and spaces not classifiable as agricultural working areas or maintenance areas
- Carrying persons on the tractor without a passenger seat. Transporting persons not seated correctly in the passenger seat (on tractors equipped with a passenger seat). Carrying a passenger while driving in the field, even if seated in the passenger seat.
- Using the tractor for competitions or sports events.
- Using the vehicle to herd animals.
- Starting and operating the tractor from outside the cab.
- Exceeding the maximum permissible load.
- Non-observance of the warnings given on the tractor and in this manual.
- Performing repairs and maintenance on the tractor while it is running and/or moving.
- Performing maintenance, cleaning and adjustment without observing the safety rules given in this manual.
- Modifying the tractor without obtaining prior authorisation from the dealer or constructor.
- Connecting implements/equipment to the tractor that are incompatible with each other and/or with the tractor, or connecting unauthorised implements/equipment to the tractor.
- Using non-original spare parts.



1.3.3 **Electromagnetic compatibility (EMC)**

This machine is compliant with EU regulations concerning electromagnetic radiation. However, interference may be caused by the use of auxiliary equipment. This may occur if the auxiliary equipment used does not comply with the standards defined by the aforementioned regulations.

This interference may cause severe malfunctions and compromise the safety of the machine.

Follow the instructions given below to avoid problems caused by interference:

- check that all third party equipment installed on the machine bears the CE mark;
- the maximum power of transmitting devices must not exceed the limits set by law in the country of use of the
- the electromagnetic field generated by auxiliary equipment must never exceed 24 V/m in any position near electronic components.

Non observance of these rules will render the manufacturer's warranty of the machine null and void.

1.4 General information and required training

1.4.1 Using the manual

This manual contains comprehensive information relative to servicing and using the machine and the describes the procedures necessary to keep the machine in good working order.

Some of the procedures described may only be performed by the specialised personnel of the dealer as they may require special tools and equipment not included with the machine itself.

All persons using this tractor must read this manual thoroughly to allow them to:

- identify all hazards associated with using the tractor;
- identify the components of the tractor and understand their functions, and identify all controls and instruments correctly in order to operate the tractor safely;
- be aware of the correct regular maintenance intervals and procedures to ensure that the machine is used safelv and correctly:
- quickly identify and localise any faults and take the correct action necessary in an emergency.

The manual must always be kept in the specific document holder on board the tractor for the entire lifespan of the tractor itself.



If the tractor changes hands, the manual must always be passed on to the new owner. If the tractor is handed over to the new owner without the operator manual, this may put the new owner at risk as they will have no way of knowing the safety rules for usage and the functions and features of the tractor itself.

The following documents are provided together with the user manual:

- Warranty certificate: containing the details of the dealer and customer and spaces for service stamps.
- Warranty conditions: describing in detail all the components covered by the warranty, all components and faults not covered by the warranty and the conditions which will render the warranty null and void.



1.4.2 Unified indicator symbols

Symbol	Description	Symbol	Description	Symbol	Description
	Fault indicator	0	Horn		Alarm indicator
	High beam headlights indicator		Dipped headlights indicator		Work light indicator
÷ <u>}</u>	Rotating beacon indicator	<u>=0 0=</u>	Running lights indicator		Read the instruction manual
4	Turn signal indicator	- +	Battery state of charge indicator		Rear screen washer/wiper indicator
$ \nabla$	Windscreen wiper indicator		Windscreen wiper/washer indicator		Engine oil pressure indicator
	Engine water temperature indicator	Z	Engine speed indicator	00	Engine preheat indicator
	Engine fault indicator	$\sum_{i=1}^{\infty}$	Engine air filter clogged indicator		Fuel level indicator
	Fuel system fault indicator	€5-0	Four wheel drive indicator		Differential lock indicator
F	Forward drive selected indicator	N	Neutral indicator	R	Reverse drive selected indicator
	Hydraulic fluid level indicator		Brake fluid warning indicator	(P)	Parking brake indicator



⇒ () (Transmission oil pressure indicator	4	Service indicator; see the technical manual	€© (\$)	Rear PTO indicator
₽ - 0	Front PTO indicator	750	Rear PTO 750 rpm mode indicator	540	Rear PTO 540 rpm mode indicator
Ы	Fluid level indicator	(1)	Braking system, first trailer or first auxiliary circuit	(2)	Braking system, second trailer or second auxiliary circuit
	Lift descent indicator		Upper lift limit reached indicator	$\sqrt[]{\underline{\downarrow}}$	Lower lift limit reached indicator
	Hydraulic oil filter indicator	⇔	Pressure indicator	===:3>	Diesel particulate filter sensor (emissions control system)



1.4.3 Units of measurement used in this manual

The units of measurement used in this manual are listed as follows:

Symbol	Description
°C	Degrees centigrade
Α	Amperes
cm	Centimetres
cm3	Cubic centimetres
dB(A)	Decibels
g	Grammes
rpm	rpm
h	Hour
kg	Kilogrammes
km/h	Kilometres per hour
kW	Kilowatts
I	Litres
m	Metres
m3	Cubic metres
min	Minutes
mm	Millimetres
N	Newtons
Nm	Newton metres
Pa	Pascals
s	Seconds
V	Volts
W	Watts

1.4.4 Terms used to denote direction

The following terms are used in this manual to denote directions and parts of the tractor as viewed from the driver seat:

- 1 Front
- 2- Right
- 3 Rear
- 4- Left

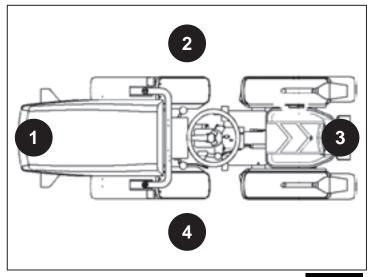


Fig. 1.1



1.4.5 Tractor delivery procedure

When the tractor is consigned, the dealer must:

- Check the tractor in accordance with the procedure defined by the constructor to ensure that it is immediately and safely operable.
- Explain the main safety rules and the controls and instruments of the tractor, and illustrate the positions of all components subject to maintenance to the user and to all operators which will be using the tractor. The description of the commands must include: indicators (including the display), settings, starting, stopping and the emergency stop procedure for the tractor and its components.
- Illustrate the different sections of the manual and inform the customer and operators that they are required to read the chapters on safety and on their responsibilities.
- Remind all operators who will be using the tractor and the owner that they are required to observe applicable national road traffic regulations if the machine is driven on public roads. Particular emphasis must be placed on the observance of speed limits and of regulations concerning towing and transporting implements.

When the tractor is consigned, the owner must:

- Receive the instruction and information necessary for themselves and for the designated operators of the tractor.
- Receive all the documentation accompanying the tractor, including the warranty conditions booklet

When the tractor is consigned, the operators must:

- Receive the necessary instruction from the dealer regarding safety rules, the controls and instruments of the tractor and the locations of components subject to regular maintenance.
- Receive an explanation from the dealer of the contents of this manual, as they are of fundamental importance for operating the tractor safely and correctly and performing all regular maintenance procedures correctly.

1.4.6 Responsibilities of the owner of the tractor

The tractor owner must:

- Read the chapter on safety in order to understand the possible risks to which operators are exposed.
- Order replacement decals if damaged to ensure the safety of operators.
- Notify the dealer immediately of any unclear information in the manual or of any inconsistencies between the manual and the tractor.
- Provide adequate training on using the tractor and the associated dangers for all persons who will be using the tractor.
- Ensure that the tractor operators read the manual and understand its contents. This applies in particular to the chapter on safety.
- When necessary, contact the dealer/importer to request a copy of the manual translated into a language understood by the operators.



1.4.7 Responsibilities of operators



The term "tractor operators" denotes all persons using the tractor, even in the case of rental or loan of the tractor.

Read this manual thoroughly in order to:

- Read all safety related messages
- Know the functions of the tractor and how to operate the tractor correctly.
- Understand the possible risks associated with using the tractor incorrectly.
- Know how to perform maintenance correctly on the different components of the tractor.
- Understand which implements are suitable for different tasks and compatible with the tractor itself.
- Know the positions of the different controls and their respective functions.
- Know the positions in significance of the indicator lamps on board the tractor.
- Recognise and report faults which could compromise the functions of the tractor.
- Perform periodical inspections correctly as indicated in the manual.
- Perform regular maintenance procedures correctly. Unscheduled maintenance and repairs must be performed
 by an authorised service centre. The constructor cannot be held responsible for any damage due to repairs or
 maintenance work done privately or outside the authorised service network.
- Report or replace damaged components which could pose a risk of injury, damage to the vehicle or environmental damage.
- Use original spare parts only.
- Use the tractor only for its intended use. The constructor cannot be held responsible for any personal injury or damage to property caused by using the tractor for any purpose other those specified.

1.4.8 Warranty

The warranty offered for Goldoni products covers material and manufacturing defects subject to certain conditions. Note that this manual is published for worldwide circulation. As a result, the terms and conditions applicable for products sold in each different individual country cannot be described in detail. Contact the dealer from which you purchased the tractor for comprehensive, detailed information concerning the terms and conditions of the warranty.

The warranty covering the tractor is subject to the terms and conditions stipulated in the warranty certificate.

The specialised personnel of our technical support service is trained and authorised to work on our products. No other service provider is authorised to work on products covered by a valid warranty.

The retailer or dealer is required to provide certain services when delivering a new tractor to a customer. These services include a thorough preliminary inspection at the time of delivery to ensure that the vehicle can be used immediately, as well as an explanation of all of the instructions on the main principles of use and maintenance. These instructions concern instruments and controls, periodic maintenance and safety precautions. This training course must be provided to anyone in charge of using and servicing the tractor.

Before delivery of a new tractor, the retailer or dealer must perform a pre-delivery inspection to ensure that the vehicle can be used immediately. The dealer must also illustrate the essential principles concerning the correct usage and maintenance of the tractor. These instructions concern instruments and controls, periodic maintenance and safety precautions. The owner of the tractor must undertake to convey this information to all personnel assigned to using and servicing the tractor.

Any unauthorised modification, alteration or installation of components, or the use of non-approved tools will release the constructor of all liability in the event of accident, injury or damage.



1.5 Identification plates

1.5.1 Location of machine identification data

The machine consists of a number of different main components, identified by the following:

- 1 Data punched onto chassis
- 2 Metal identification plate
- 3 Engine identification plate

Identification data must be cited to the dealer whenever requesting spare parts or technical support. This data is also needed in the event of theft of the tractor.

Keep these plates and punched areas clean and legible. In the event of damage or loss, order new identification plates from your dealer and apply them in the original locations on the tractor.

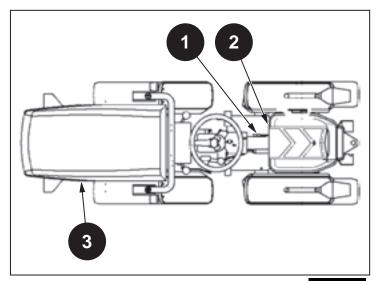


Fig. 1.2

1.5.2 Engine information

Metal plate fastened to the crankcase on the left hand side.

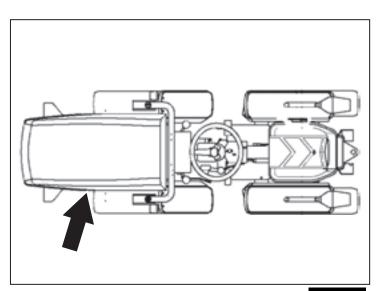


Fig. 1.3



- A Engine Type
- B rpm
- C Engine serial number
- D Client code
- E 97/68/EC homologation
- F DGM homologation

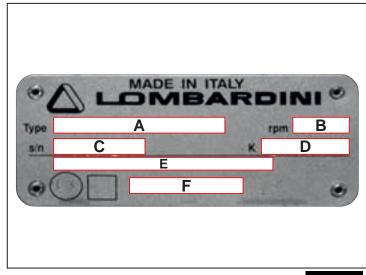


Fig. 1.4

1.5.3 Chassis

The identification data is punched onto the right hand side of the chassis.

- 1 Constructor brand code
- 2 Production series
- 3 Variant
- Y1/Y2- Engine power
- Y3- Protective structure
- 4 Version
- Y4- Speed
- Y5- Engine emissions compliance stage
- Y6- Brand
- 5 Chassis number (serial number)

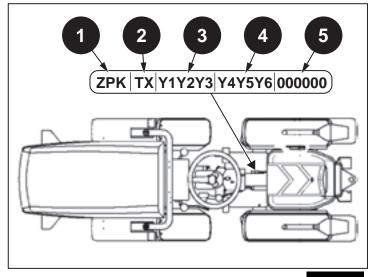


Fig. 1.5



1.5.4 Tractor identification plate

The plate is situated on the platform, below and to the right of the operator seat.

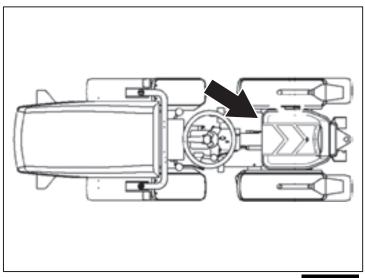


Fig. 1.6

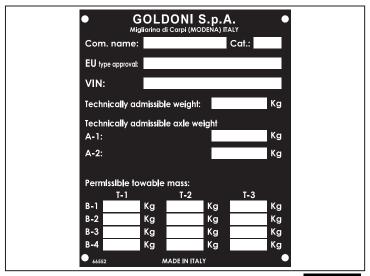


Fig. 1.7



1.5.5 Label with type of protective structure

Roll bar

The label is situated on the right hand pillar of the protective structure.

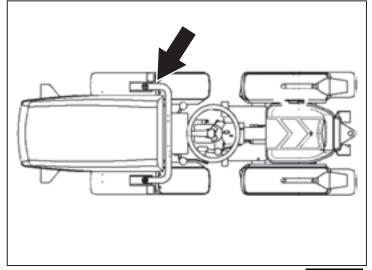


Fig. 1.8

- 1 Manufacturer of protective structure
- 2 Name of protective structure
- 3 EEC approval code
- 4 OCSE / OECD approval code
- 5 Chassis number (serial number)
- 6 Tractor brand
- 7 Variant/Version

Meaning of OCSE/OECD codes:

- OECD/OCSE 6: The protective structure has passed front mounted Roll Over Protection Structure (ROPS) testing; the driver is protected in the event of overturning.
- OECD/OCSE 7: The protective structure has passed rear mounted Roll Over Protection Structure (ROPS) testing; the driver is protected in the event of overturning.
- OECD/OCSE 10: The protective structure has passed FOPS (Fall Over Protection Structure) testing; the structure is capable of withstanding impact from falling objects with an energy of 1365 Joules.

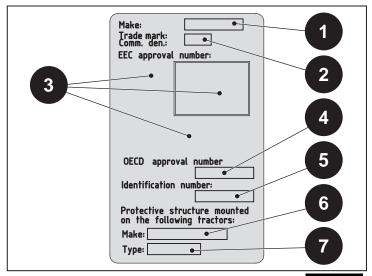


Fig. 1.9

1.6 Type approval types

Commercial name	Туре	Variant	Version	Main features
E20 SN	YB	C01	2AG	15 kW engine



an ARBOS Company	

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2: General safety rules

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GENERAL SAFETY RULES



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2.1 General safety rules

2.1.1 Important safety instructions

Read the safety rules contained herein thoroughly and follow the precautions given to prevent risk and safeguard your health and safety.

This machine has been designed for agricultural usage only. Any other usage will be deemed incorrect and improper and will relieve the constructor of any liability in the event of any resulting damage to property, damage to the machine or personal injury.

This machine may only be used, serviced and repaired by persons authorised to work with the machine itself who have received adequate prior instruction on working with the machine and the relative safety rules.

Bear in mind that the user will be solely responsible for any consequences in the event of improper use of the machine.

Observing the instructions for using, servicing and repairing the machine given in this manual are essential requisites for what the constructor deems proper use.

Users must receive instruction on working with the machine and the relative safety rules before they are allowed to work with the machine.

Any modifications made to this machine without prior authorisation from the constructor will relieve the constructor of all liability in the event of damage or injury.

The constructor and all parties in its commercial network of cannot be held responsible for any damage caused by the abnormal behaviour of any parts and/or components that are not approved by the constructor itself.



2.1.2 General safety notices

This tractor has been designed to make your work as safe as possible. However, there is no substitute for prudence, which is crucial for preventing accidents. It's too late to remember what you should have done once the accident has already happened. Never try to start or manoeuvre the tractor from anywhere other than the driver seat.

Read this manual thoroughly before starting, using, fuelling the tractor or performing any other work on the tractor. The time spent reading this manual will provide you with an adequate understanding of your machine, which will save you time and trouble in future. It will also help you avoid accidents.

Read all the safety decals on the machine and follow all the instructions and rules given in this manual before operating, fuelling or servicing the machine. Replace any damaged, lost or illegible decals promptly. Clean any safety decals covered with mud or debris.

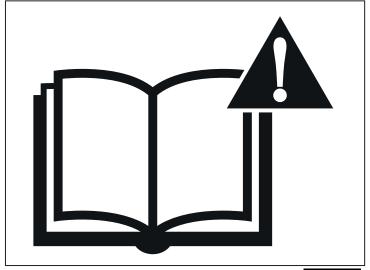


Fig. 2.1

Learn the characteristics of your tractor and how to use all of equipment on your vehicle and the implements and hitches used on it. Learn how to use each control, indicator and instrument, and learn their functions.

To prevent accidents and ensure that the tractor is used correctly, it is vital for you to know how to use all the controls and interpret all the indicators and instruments. You must be familiar with the rated load capacity of the tractor, the usable speed ranges, the characteristics of the braking system, the turning radius of the tractor and its working spaces.

Do not use the tractor if the cab or ROPS safety roll bar are not in good working order and fitted correctly on the tractor. Periodically check that the relative fasteners have not loosened and that the structural elements have not been damaged or bent by accidental impact. Do not modify structural elements by welding, drilling etc., as this will compromise the stiffness of the roll-over protection structure.

Keep a first aid kit at hand at all times in order to be able to respond to an emergency as quickly as possible. Make sure you know how to use this equipment.

Do not wear loose garments or jewellery which could tangle easily in moving parts or snag on the controls of the tractor. Tie back long hair.

Check that all rotating parts connected to the PTO shaft are suitably protected.



2.1.3 Safety symbols

The signal words DANGER, WARNING and CAUTION are used in this manual followed by specific precautionary statements. These precautionary statements and instructions are given to protect the safety of the operator and any other workers.

Read all the safety statements in the manual thoroughly before performing any repair or maintenance work.

Contact your authorised dealer to determine if any additional equipment is needed and to order this equipment if necessary. The spare parts catalogue is only available from the authorised dealer. Use the identification information of you vehicle, copied manually onto this page from the identification plates.



Symbol used to warn the operator of potentially hazardous situations which, if not avoided, could result in injury. Observe all the safety statements preceded by this symbol to prevent the risk of injury or death



These messages identify potentially hazardous situations which, if not avoided, could result in minor or moderate injury



These messages identify potentially hazardous situations which, if not avoided, could result in minor injury



These messages identify potentially hazardous situations which, if not avoided, could result in serious injury or death.



2.1.4 Identification of dangerous parts of the machine

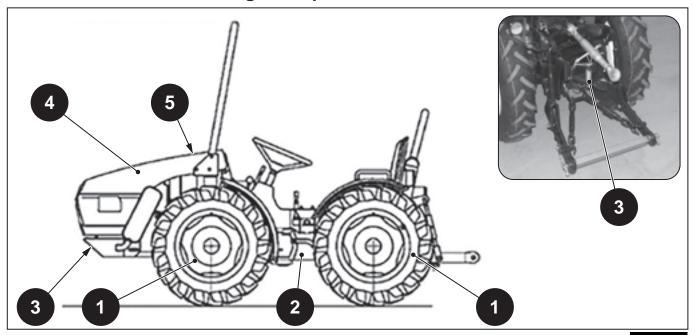


Fig. 2.2

1- Front/rear wheels	Risk of being run over by parts of moving vehicle.
	Risk of crushing by tyre.
	Tyre explosion.
2- Access to driver seat	Fall hazard.
	Avoid contact with hot parts.
3- Front/rear implement hitch	Rotating parts hazard (PTO).
	Risk of crushing caused by implements connected to PTO.
	Risk of falling suspended loads.
	High pressure oil leak hazard.
4- Engine cowl	Avoid contact with hot parts.
	Caution, possible contact with live parts.
	Avoid contact with sharp parts.
	Rotating parts hazard (e.g. fan).
5 - Refuelling	Avoid fuel spillage.
	Risk of fire.
	Avoid contact with hot parts.



2.1.5 Safety warning decals

Safety signs are applied to the machine to prevent the risk of injury to the operator and other workers.

Note the positions and take notice of the contents of these safety signs before using the machine.

The operator must read, understand and comply with the directions and warnings given on all safety decals and all the information given in the operator manual.

Never remove or cover safety and instructions decals.

Keep all safety signs clean, wiping with a soft cloth moistened with water and a mild detergent.

Replace any illegible or missing safety or instruction labels. These are available from your dealer.

If lost or damaged, replacement decals may be requested from an authorised dealer. When purchasing a pre-owned tractor, check that all the decals and instructions are complete, legible and in the correct locations on the vehicle. See the section describing the significance and illustrating the positions of these decals as reference.



2.1.6 Positions of safety decals

The following safety decals must never be removed from their original positions on the tractor. If, due to maintenance or wear, the safety decals must be removed or become illegible, they must be replaced with new decals, applied correctly in the original positions as indicated in this paragraph.

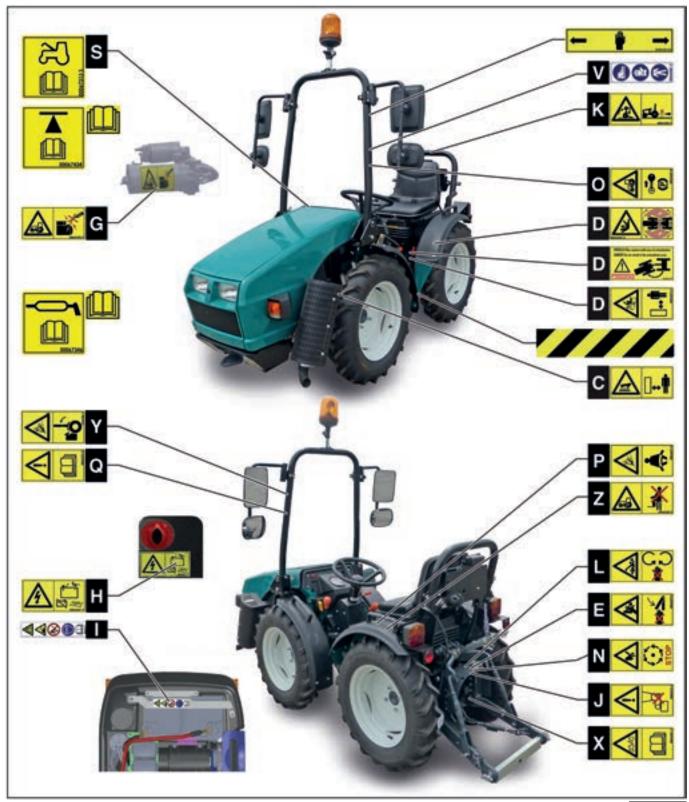


Fig. 2.3



(A) 00065368 - Moving belt hazard

Not currently used

WARNING: Risk of entanglement in belt drive components. Keep your hands away from rotating parts and belts while the engine is running. Turn the ignition switch off and remove the key before working on the tractor. Read the technical manual for more information.

POSITION: Radiator, right and left hand sides.



Fig. 2.4

(B) 00065374 - Shear hazard

Not currently used

WARNING: Shear hazard - engine fan. Keep your hands away from the fan and belts when the engine is running. Do not remove the safety guards. Stop the engine and remove the key from the ignition switch before performing maintenance or repairs.

POSITION: Water radiator, right and left hand sides



Fig. 2.5

(C) 00065372 - Burn hazard - hot surfaces

WARNING: Burn hazard - hot surfaces. Keep away from hot parts of the engine when the engine is running. Stop the engine, remove the key from the ignition switch and wait for the system to cool before performing maintenance or repairs.

POSITION: Engine exhaust system, hot surfaces



Fig. 2.6



(D) 00065407 - Articulated joint zone

Articulated version only

DANGER: Keep clear of the articulation area while the engine is running.

POSITION: Articulated machine: Rear mudguards, right and left hand sides. Machine's articulation area.



Fig. 2.7

(D) FEM51201101 - Articulated joint zone

Articulated version only

DANGER: Keep clear of the articulation area while the engine is running.

POSITION: Articulated machine: Front mudguards right and left hand sides. Machine's articulation area.



Fig. 2.8

(D) FEM51201103 - Articulated joint zone

Articulated version only

DANGER: Keep clear of the articulation area while the engine is running.

POSITION: Articulated machine: Centre tunnel protecting hydraulic steering unit



Fig. 2.9



(E) 00065379 - Pinch point hazard

WARNING: Pinch point hazard due to moving parts. Keep the hands away from pivoted linkage levers. Never access zones subject to crush or pinch hazards while any parts can still move.

POSITION: Rear lift area



Fig. 2.10

(F) 00065402 - Scald hazard

Not currently used

CAUTION: Scald hazard - High pressure steam and hot water. Stop the engine, remove the key from the ignition switch and wait for the system to cool before removing the radiator cap. Remove the radiator filler cap with extreme caution. Read the technical manual for more information.

POSITION: Water radiator, right and left hand sides / Water radiator expansion tank.



Fig. 2.11

(G) 00065378 - Uncontrolled machine, run-over hazard

DANGER: Run-over hazard. Only start the engine when seated in the driver seat, with the PTO disengaged and the transmission in neutral. NEVER start the engine by short-circuiting the starter motor terminals.

POSITION: Starter motor



Fig. 2.12



(H) 00065367 - Electric shock hazard

WARNING: Electric shock hazard - risk of personal injury and damage to components. Disconnect the battery before performing maintenance on the electrical system. Read the technical manual for more information.

POSITION: Battery master switch area.



Fig. 2.13

(I) 00065377 - Battery hazards

DANGER: Hazards associated with lead used in battery, explosive gas, or corrosive liquid (sulphuric acid); Keep away from naked flame and sparks. Wear eye protection when working over or in the vicinity of the battery. Read the Safety and Operating instructions in the Operator Instruction Manual for more information.

POSITION: Battery mount area

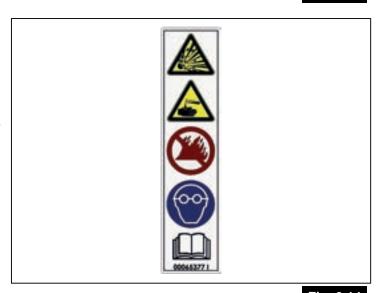


Fig. 2.14

(J) 00065413 - Risk of personal injury

DANGER: Do not climb or stand on any parts where this decal is applied.

POSITION: Towing hitch, any tool box installed at platform height, any fuel tank at platform height



Fig. 2.15



(D) 00065405 - Backward overturn hazard

DANGER: Risk of backward overturn, which may cause severe personal injury or death. Only pull from the approved drawbar or from the 3-point linkage with the arms lowered to the horizontal position or lower. Never pull with a draft force above the centre line of the rear axle.

POSITION (roll bar version): upper outer part of rear roll bar



Fig. 2.16

(L) 00065376 - Entanglement hazard – PTO, Rotating shafts

DANGER: Entanglement hazard – PTO transmission. Keep at a safe distance from rotating shafts. Keep all guards for the PTO and rotating shafts in place when working.

POSITION: PTO guards



Fig. 2.17

(N) 00065403 - Entanglement and shear hazard - PTO.

DANGER: Entanglement hazard – PTO transmission. Wait until all components of the machine have stopped completely before touching them.

POSITION: PTO guards



Fig. 2.18



(O) 00065369 - Uncontrolled machine, run-over hazard

WARNING: Uncontrolled machine. Run-over hazard. Stop the engine, remove the key from the ignition switch and engage the parking brake before leaving the tractor.

POSITION (Cab Version): left hand pillar POSITION (roll bar version): left hand pillar



Fig. 2.19

(P) 00065371 - Machine overturn hazard

WARNING: Machine overturn hazard. Risk of falling or crushing if tractor overturns. Keep the seat belt securely fastened during use. Do not attempt to jump off the tractor if it starts to overturn. Do not use the tractor on gradients or in conditions exceeding the operating limits of the tractor for safety and stability.

POSITION (Cab Version): left hand pillar

POSITION (roll bar version): left hand mudguard



Fig. 2.20

(Q) 00065370 - Read the Operator Instruction Manual

WARNING: To prevent the risk of personal injury, read the Operator Instruction Manual and the safety instructions before using the tractor.

POSITION (Cab Version): right hand centre pillar

POSITION (roll bar version): right hand pillar

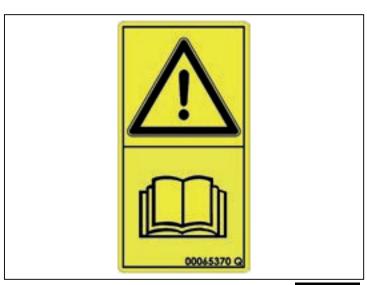


Fig. 2.21



(S) 00067313 - Opening the engine bonnet

WARNING: Opening the engine cowl: Switch off the engine and read the instructions in the operator manual before opening the engine cowl.

POSITION: Engine cowl release area

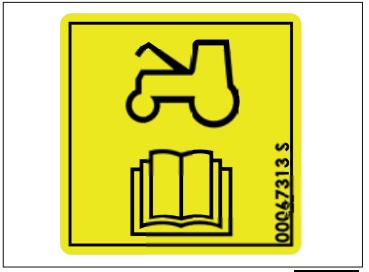


Fig. 2.22

(V) 00065387 - Personal Protective Equipment (PPE)

WARNING: Use appropriate personal protective equipment (PPE) for the specific task, e.g. safety footwear, protective eyewear, face protection, hard hat, work gloves, respirators and hearing protection.

POSITION (roll bar version): left hand side
POSITION (Cab Version):left hand side



Fig. 2.23

A - category one

B - category two

C - category three



Fig. 2.24



(X) 00065381 - Towing hitch - Read the Operator Manual

CAUTION: Towing hitch - Read the specific instructions in the Operator Instruction Manual thoroughly before towing the tractor.

POSITION: Towing hitch

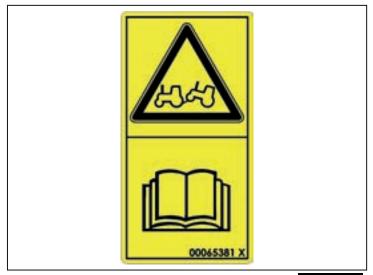


Fig. 2.25

(G) 00065386 - Always keep the roll bar locked

DANGER: Risk of overturn and personal injury. Always keep the roll bar protective structure in the raised working position. Always keep the roll bar locked in the raised position unless it is strictly necessary to fold the roll bar in order to work under trees or bushes.

POSITION (roll bar version): roll bar, right hand part



Fig. 2.26

(Z) 00065385 - Run-over hazard

WARNING: Run-over hazard. Do not sit on the mudguards while the tractor is moving and do not transport persons on the tractor. Passengers must sit on a passenger seat, and are only permitted on the tractor if they do not obstruct the vision of the driver.

POSITION (roll bar version): Left hand rear mudguard



Fig. 2.27



00067434 - Lift point

WARNING: Used to identify the positions on the machine/implement in which a lift jack or support device may be used. Lift only at the front or at the rear. Never lift both sides simultaneously. Always place chocks under the wheels of the axle that is not lifted. Read the instructions in the Operator Manual.

POSITION: Centre of front and rear axles, front zone of machine.

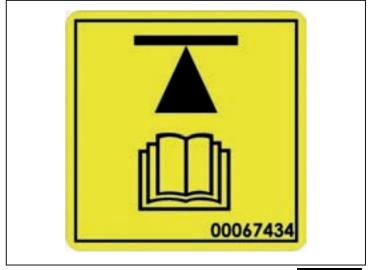


Fig. 2.28

00067346 - Lubricant grease

CAUTION: The decals identify grease nipple points. Apply grease in the indicated positions. Read the instructions in the Operator Manual.

POSITION: Grease nipple area.

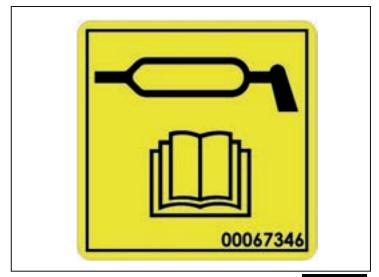


Fig. 2.29

00070020 - Torque limiter

WARNING: Apply the male connector with torque

limiter set to 300 Nm max.

POSITION: PTO guards

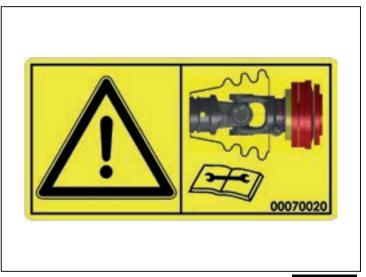


Fig. 2.30



FDM51201104 - Roll-bar grip point

WARNING: -

POSITION: Roll-bar left pillar with central height of

1500 mm from the ground.

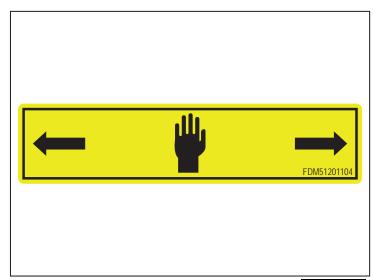


Fig. 2.31

FEM51201102 - Step present

WARNING: -

POSITION: Lefthand footboard

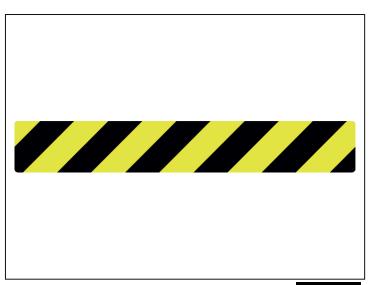


Fig. 2.32



2.1.7 Using the tractor

Choose the most appropriate track widths for the task in hand that will ensure the greatest stability possible.

Engage the clutch gradually. Engaging the clutch suddenly, especially when driving the tractor out of ditches or muddy terrain or when negotiating a steep gradient, may cause the tractor to rear dangerously. Disengage the clutch immediately if the front wheels lift from the ground.

Keep the tractor in gear when negotiating a downhill gradient. Do not disengage the clutch and never put the transmission in neutral.

Use extreme caution when working with the wheels close to ditches or embankments. If it is necessary to work with tractor in an inclined position, such as on hillsides for example, drive at reduced speed and avoid sudden or excessively tight steering manoeuvres.

The driver must always remain correctly seated in the driver seat when the tractor is moving.

Do not climb onto or off the tractor while it is moving.

If it is necessary to use the brake, press the pedal progressively.

Do not approach bends at high speed.

When driving on the road, observe the rules of the highway code.

Do not rest your feet on the brake and clutch pedals while driving.

Never carry passengers, even inside the cab, unless the tractor is equipped with a homologated additional seat. Passengers must remain seated correctly in the passenger seat with the seat belt fastened.

When driving on the road, the brake pedals must always be latched together with the specific plate. Braking with unlatched brake pedals may cause the tractor to skid and lose control. Do not overuse the brakes, and use the engine brake effect where possible.

2.1.8 Towing and transporting

Towing

Follow the instructions given below to ensure the stability of the tractor when driving:

- Stopping distances increase with speed and with the weight of the towed weight. Drive slowly and allow more time and distance to stop safely.
- Set the towing device appropriately for vehicle or implement towed.
- Drive slowly when towing very heavy loads.
- For you own safety, never tow a trailer without its own independent braking system.
- Do not negotiate bends with the differential lock engaged when towing, as it may not be possible to steer the tractor.
- Never carry persons or allow children in or on the towed implement.
- Use only homologated towing hitches.
- Only tow with a machine with a suitable towing hitch. Towed implements must only be hitched to the approved hitching point.
- Never negotiate a downhill gradient with the machine in neutral.
- Keep out of the area between the tractor and the towed vehicle.
- Do not make sudden turns. Work with particular caution when turning or working on poor surfaces. Take extreme care when reversing.
- Towing an excessive load may cause loss of traction and loss of control on slopes. Reduce the weight towed by the tractor when working on slopes.
- The total towed weight must not exceed the combined weight of the tractor, the ballast and the operator. Apply counterweights or ballast weights to the wheels as described in the operator manual of the implement or of the tractor.

Transporting

- The tractor may only be towed for short distances and never on public roads.
- An operator must remain in the driver seat while the tractor is towed.
- Do not exceed 10 km/h when towing the tractor.



2.1.9 Carrying passengers

Only the operator is permitted on board the machine. Do not carry passengers. Passengers carried on the machine or implement may be struck by foreign objects or thrown off the machine, which may cause serious or even fatal injury.

Passengers not seated correctly in a passenger seat will be subject to violent impact in the event of an accident. DO NOT carry passengers unless a passenger seat has been installed on the tractor by the manufacturer.

Passengers obstruct the field of view of the operator. As a result, the machine is not considered safe to work with when carrying a passenger.

The passenger seat (if fitted) may only be used to carry a passenger when the tractor is driven on the road. Do not carry passengers when working the field.

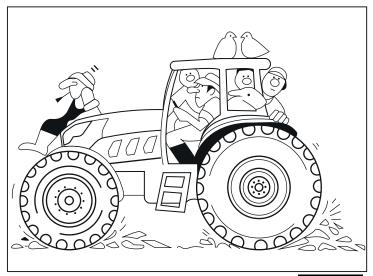


Fig. 2.33



Where permitted by local law, the a folding passenger seat is available in certain markets for certain models.



2.1.10 Lift points

Observe the following guidelines if it is necessary to lift the machine to work on it:

- Park the machine on a flat, level surface.
- Immobilise the wheels.
- Check that there are no persons in the vicinity before lifting the machine.
- Check that the equipment used is suitable for the load and for the job before starting.
- Use only tools and equipment capable of supporting the weight of the machine or the components lifted.
- Never work under the machine while is supported only by hydraulic jacks.
- Support the weight of the machine with safety stands.
- Use only the lift points indicated in the figure to lift the machine.
- Only lift the machine from the front or from the rear. Never lift both sides simultaneously.
- Always place chocks in front of or behind the wheels of the axle that is not lifted.

Hydraulic jacks: Please refer to the operation and maintenance manual in your possession for details on how to carry out maintenance.



Danger

Before using the hydraulic jack, make sure that the devices are properly secured.



Danger

Do not use the towing hitch as a lifting point.

The recommended lifting points are:

- Front axle Wheel hubs
- Rear part of tractor Brakes



Danger

When lifting the tractor from the front, place fixed support stands under the rear lateral half-axles to prevent the tractor from tilting.

When lifting the tractor from the rear, place fixed support stands under the front lateral half-axles to prevent the tractor from tilting.

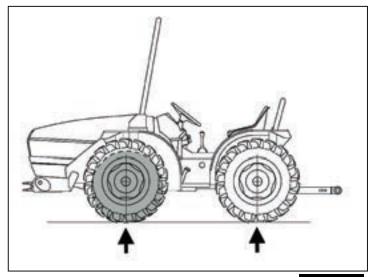


Fig. 2.34



2.1.11 Using agricultural implements and machines

Do not couple implements or machinery with power demands greater than the rated power of the tractor.

Do not negotiate tight bends while the PTO is under significant load; this is to avoid damage to the universal joints of the drive shaft connected to the PTO itself.

When working with implements requiring the tractor to remain stationary with the engine running, keep both the gearbox and creeper gear levers in neutral and engage the parking brake. Fitting chocks under the wheels is also recommended.

Before using the PTO when connected to an implement, always check that there are no persons in the working radius of the implement itself. Also check that all rotating parts connected to the PTO shaft are suitably protected with guards.



Fig. 2.35

2.1.12 Do not stand between the tractor and the implement

The tractor may move unexpectedly and the implement may start unexpectedly.

To avoid the risk of severe or fatal injury, never stand between the tractor and the implement or between the tractor and the trailer to assist the driver in connecting to the implement/trailer while the tractor is reversing.

- Always switch the engine off before carrying out any work in the space between the tractor and the connected implement.
- When it is necessary to operate the lift, make sure that there are no persons in the area involved.

The majority of accidents are caused by carelessness when working with or in the vicinity of moving machines.

2.1.13 Fire prevention

Remove grass and debris from the engine compartment and from the area surrounding the exhaust pipe before and after using the machine.

Always close the fuel cut-off valve (if present) when parking or transporting the machine.

Do not park the vehicle near naked flame or near sources of ignition, such as a water heater or boiler.

Frequently check that the fuel lines, tank, cap and connections show no signs of cracking or leakage. Replace damaged components if necessary.

Never store the machine with fuel in the tank in an enclosed space in which fuel vapours may come into contact with naked flame or sparks.

Leave the engine to cool before storing the vehicle in any enclosed space.



Fig. 2.36



2.1.14 Safety measures for tyre maintenance

The explosive separation of parts of the tyre and wheel may cause severe injury or death.

Never attempt to mount a tyre with inadequate tools and experience for the job.

Always maintain the correct tyre pressure.

Never inflate a tyre to above the recommended pressure.

Do not use the tyre at inflation pressures lower than the specified value. This will cause the tyre to overheat and may lead to:

- tvre failure:
- bead separation;
- internal tyre damage;
- uneven, premature wear.

Do not perform welds on or heat a wheel / tyre assembly. Heat may cause the air pressure to increase and lead to a tyre explosion. Welding may structurally weaken or warp the wheel.

When checking tyre pressure, do not stand in the possible path that the valve mechanism or cap could be ejected in.

When inflating tyres, use a suitably long inflation nozzle and extension hose to permit the operator to stand next to the tyre and NOT in front of or over the tyre.

Check tyres to ensure that they are inflated to the correct pressure and show no signs of cuts or bulges, check that the wheels are undamaged and check that there are no missing or loosened nuts or bolts.

Never exceed the speed indicated on the tyre. As well causing the tyre to overheat, this will also lead to premature tyre wear.

Do not park with the tyres on petroleum based substances such as oil, diesel fuel, grease etc.

After fitting the tyres, check that the nuts are tightened correctly after 100 Km or 3 operating hours. Afterwards, check the tightness at regular intervals.

If any problems are noted, have the tyre checked by a specialist.

Tyres fitted on a tractor left parked for prolonged periods of time tend to deteriorate faster than tyres used more frequently. If the tractor is out of use for prolonged periods, raise it from the ground and protect the tyres from direct sunlight.



Tyres may only be changed by skilled personnel with the necessary equipment and technical knowledge. Tyre replacement performed by unskilled persons may cause severe personal injury, damage to the tyre and damage to the wheel.

2.1.15 Checking wheel fasteners

Insufficiently tightened wheel fasteners may cause a serious accident and severe injury.

Check the tightness of the wheel fasteners frequently during the first 100 hours of use.

The wheel fasteners must be tightened to the specified torque and with the correct procedure each time these components are loosened.



2.1.16 Maintenance and long-term storage

Keep nuts, bolts and screws correctly tightened to ensure that the machine is always safe to operate.

Never store the machine with fuel in the tank in an enclosed space in which fuel vapours may come into contact with naked flame or sparks.

Leave the engine to cool before storing the vehicle in any enclosed space.

To reduce the risk of fire, keep the engine, silencer, battery and refuelling area clean and free of grass, leaves and excess grease.

For safety, replace all worn or damaged parts.

If it is necessary to empty the fuel tank, this must be done outdoors.

When the machine is parked, put into storage or left unattended, lower the implement if it is not secured by a positive action mechanical locking device.

Never leave the machine unattended while it is running.

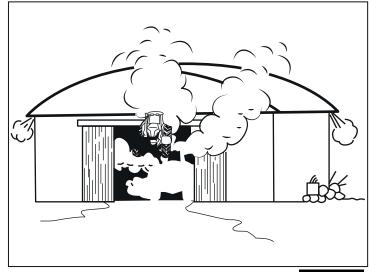


Fig. 2.37

2.1.17 Returning to service after long-term storage

Before using the machine for the first time or after a prolonged period with the machine not in use:

- check that the machine is undamaged;
- check that all mechanical components are in good condition and free of rust;
- grease all moving parts thoroughly;
- check that there are no oil leaks;
- check the engine oil level;
- check the transmission oil level;
- check that all protective devices and guards are correctly in place.

2.1.18 Safety measures when parking

Before leaving the machine:

- stop the machine on a flat, level surface;
- disengage the PTO and stop the implements;
- lower the implement to the ground;
- engage the parking brake;
- switch off the engine;
- remove the key from the ignition switch;
- wait for the engine and all moving parts to stop completely before leaving the driver seat;
- close the fuel cut-off valve if present.



2.1.19 Work garments

Always wear appropriate garments and personal protective equipment for the working conditions. The following items are necessary:

- safety glasses or safety glasses with side shields:
- a helmet when working with the machine;
- protective gloves (in neoprene for chemical substances, in leather for heavy jobs);
- ear defenders or ear plugs;
- respirator of filtering face mask;
- waterproof, close-fitting garments;
- reflective garments;
- safety footwear.

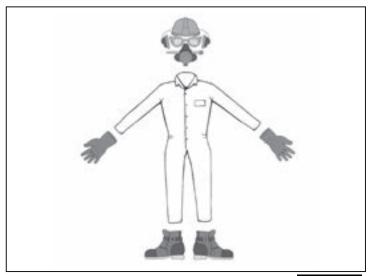


Fig. 2.38

2.1.20 Safety measures for maintenance

Only the procedures listed in the chapter MAINTENANCE are permitted. All other procedures must be performed by service centres authorised by the constructor. Contact your dealer for the details of authorised service centres.

Routing maintenance of the machine may only be performed by qualified, expert personnel. A thorough understanding of the procedure is necessary before starting any maintenance work.

Read the following instructions before starting any maintenance work on the vehicle, and observe them while working:

- never start the engine of the machine in an enclosed environment in which dangerous levels of carbon monoxide may accumulate;
- keep nuts, bolts and screws correctly tightened to ensure that the machine is always safe to operate:
- do not allow debris of any type to accumulate on or in the machine. Collect all spilt oil or fuel. Remove all debris contaminated with fuel. Wait for the machine to cool before putting into storage;
- Never perform any adjustment or repair work while the engine is running. Wait for all moving parts of the machine to come to a complete stop before starting any adjustment, cleaning or repair work;
- Frequently check that the brakes are working correctly. Have the necessary adjustment and maintenance work performed on the braking system by an authorised service centre;
- replace any damaged safety instruction labels;
- keep all parts of the body and clothing away from moving parts and control levers to prevent the risk of entanglement and snagging;
- always lower any connected implements to the ground before starting any cleaning or maintenance work on the machine:
- disconnect all electrical power connections and switch off the engine;
- Engage the parking brake and remove the key from the ignition switch. Wait for the machine to cool;
- support all parts of the machine which must be lifted for maintenance with suitable, safe support measures;
- use stands or lock the service latch mechanisms to support components if necessary;
- Disconnect the battery before starting any repairs. Disconnect the negative terminal first and then the positive terminal. Reconnect the positive terminal first and then the negative terminal;
- before starting any maintenance work on the machine or on implements, release the pressure or tension completely from all energy accumulating elements such as hydraulic components or springs;
- release the hydraulic pressure by lowering the implement or cutting attachment to the ground or to the mechanical stop, and then moving the hydraulic control levers forwards and backwards;
- keep all parts in good condition and correctly installed. Repair any damage immediately. Replace broken or worn parts;
- charge the battery in an open, well-ventilated space away from sparks. Disconnect the battery charger from mains power before connecting to and disconnecting from the battery. Wear protective garments and use insulated tools.



2.1.21 Take care when working with systems containing high pressure fluids

Hydraulic lines and hoses may fail due to mechanical damage, age and weathering. Check hoses and lines regularly. Follow the safety instructions given below:

- hydraulic connections may work loose as a result of mechanical damage or vibration.
 Check connections regularly. Retighten any loosened connections;
- escaping high pressure fluid may penetrate the skin and cause severe injury;
- release the pressure in the system before disconnecting hydraulic lines or other connections. Tighten all connections securely before re-pressurising the system;
- Use a piece of cardboard to locate leaks. Protect the hands and body appropriately against contact with high pressure fluids;
- seek medical assistance immediately in the event of an accident;
- any fluid injected through the skin must be removed surgically within the space of a few hours to prevent the risk of gangrene. Physicians who are not familiar with this type of injury must refer to a specialised medical source for information on how to treat the victim.

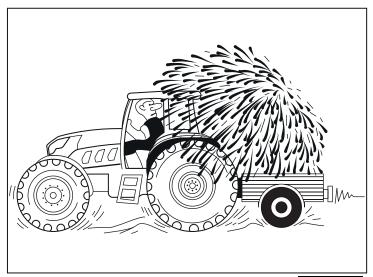


Fig. 2.39



2.1.22 Safety measures for handling fuel

Fuel is highly flammable and fuel vapour is explosive. To prevent the risk of personal injury and damage to property, use extreme caution and observe the following safety precautions when handling fuel:

- NEVER approach a flammable substance with a cigarette, cigar, pipe or any other source of ignition.
- use only portable, non-metallic containers for fuel. Any funnels used must be made from plastic and contain no mesh or filter;
- NEVER remove the fuel cap or add fuel while the engine is running. Wait for the engine to cool before refuelling;



Fig. 2.40

- NEVER add fuel to or drain fuel from the machine in an enclosed space. Take the machine outdoors and ensure adequate ventilation;
- Clean up any fuel spillage immediately. If fuel is spilt onto your garments, change them immediately. If fuel is spilt near the machine, push the machine out of the area without starting the engine. Avoid sources of ignition in the area until all the fuel vapour has dissipated;
- never keep the machine or the fuel container in the vicinity of open flames, sparks or pilot light flames, as used on a water heater or other similar appliances;
- prevent fire and explosion caused by static electric discharge. A static electric discharge may ignite the vapour in an unearthed fuel container;
- never fill fuel containers in a vehicle, on a trailer or on a trailer bed with plastic lining. Always place containers on the ground and at a safe distance from the vehicle before filling with fuel;
- consumable fluids are harmful to the health. Keep out of the reach of children.
- In the event of swallowing of a fluid, seek immediate medical attention to prevent severe damage to the health.
- All consumable fluids and the containers and materials coming into contact with them must be disposed of correctly in accordance with applicable legislation. Authorised service centres have the equipment and facilities necessary to dispose of used fluids and contaminated materials correctly without endangering the environment.
- The use of additives may void the warranty. Do not use additives for lubricants.

2.1.23 Operations necessary before refuelling

Observe the following instructions in order to refuel the vehicle in complete safety:

- remove any fuel powered equipment from the trailer and refuel them on the ground. If this is not possible, refuel the equipment with a portable container instead of a fuel pump;
- keep the nozzle of the pump in constant contact with the edge of the tank filler neck or against the aperture of the container until refuelling is complete. Do not use a device to hold the nozzle in the open position;
- Do not overfill the tank. Refit the cap on the tank filler and tighten completely;
- after use, refit and tighten all fuel container caps;
- Do not use fuel containing methanol for petrol powered engines. Methanol is harmful for the health and for the environment.



2.1.24 Safety rules concerning electrical system

The electrical system has been designed and constructed in compliance with applicable safety standards and regulations.

The following is a list of precautions and warnings to ensure that the electrical system is used and functions correctly:

- Do not use boosters or quick starters to start the engine.
- Never disconnect the electrical power supply while the engine is running.



Caution

After switching off the engine, wait at least 2 minutes before disconnecting the electrical power supply to allow the electronic control unit to complete the "after-run" procedure.



Caution

ALWAYS remove the electronic control unit and protect all electrically connected devices situated near the negative terminal (ground) before performing any arc welding on the chassis in which the engine is installed.

2.1.25 Battery safety rules

Observe the following instructions in order to perform maintenance on vehicle batteries in safety:

- Always wear eye protection;
- Avoid sparks in the vicinity of the battery and keep naked flame away from the battery.
- Ensure adequate ventilation when charging or using the battery in a confined space.
- Always disconnect the negative terminal (-) first and reconnect last.
- Do not weld, grind metal or smoke in the vicinity of a battery.
- Follow the procedure illustrated in the instruction manual to start the engine with an auxiliary battery or jump leads.
- Never short-circuit the terminals. Follow the instructions given by the manufacturer for storing and handling batteries. The battery terminals and correlated accessories contain lead or lead compounds. Wash your hands after working with the battery.
- Keep batteries out of the reach of children and other unauthorised persons.
- Battery acid may cause burn injuries. Batteries contain sulphuric acid. Avoid contact with the skin, eyes or clothes.
- First aid (in case of external contact):
 - in case of contact with eyes:
 - rinse eyes with water for at least 15 minutes;
 - seek immediate medical assistance.
 - - In case of swallowing:
 - drink plenty of water or milk;
 - do not induce vomiting;
 - seek immediate medical assistance.



Caution

If using a booster or external battery to power the electrical system of the tractor, do not remove the tractor battery.

Only remove the battery with the engine switched off. Removing the battery while the engine is running will damage the engine control unit.



2.1.26 Safety rules for PTO

Implements powered by the PTO may cause severe injury or death. Before working on or in the vicinity of the PTO shaft, and before performing any maintenance or cleaning work on the implement powered by the PTO, disengage the PTO, stop the engine and remove the key from the ignition switch.

Always observe the following safety instructions:

- NEVER remove the protective devices and guards of the PTO. Removing the protective devices or guards exposes the operator and any persons in the vicinity of the work area to the risk of severe injury or death.
- Do not wear loose-fitting garments when using implements powered by the PTO. Failure to comply with this safety rule may lead to severe injury or death;
- When using the PTO and, in particular, when changing the speed mode of the PTO, always ensure that the end coupling installed on the tractor is of the correct type for the selected speed.
- Ensure that there are no persons or objects in the work area before using the PTO.



Fig. 2.41

2.1.27 Seat belts

Inspection and maintenance of seat belts:

- wear seat belts to minimise the risk of injury in the event an accident such as a rollover;
- check that the seat belts are undamaged;
- keep objects with sharp edges away from seat belts, as they may damage the belts and compromise their safety function;
- periodically check that the fastener bolts are tightened correctly.

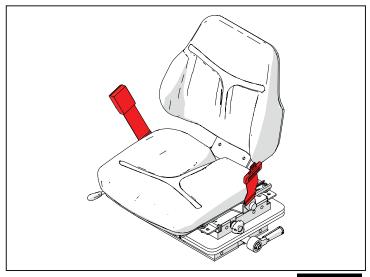


Fig. 2.42



2.1.28 Safety rules - Lifting and suspended loads

Raised loads may fall. Hydraulically raised implements or tractor components may fall accidentally, injuring or killing any persons below.

Observe the instructions given below to prevent the risk of serious or even fatal crushing injury:

- identify the manoeuvring area of the machine and the implement and keep all any other persons out of this area:
- keep out of the area beneath loads lifted by hydraulic means. Lower the lifted load to the ground before approaching;
- do not leave the implement raised from the ground while the machine is parked or during maintenance. If it is necessary keep the hydraulic cylinders in the raised position for maintenance or for access, support them appropriately or lock them mechanically in place;
- do not raise loads beyond the height strictly necessary. Lower loads for transporting. Remember to maintain a safe distance between the load and the ground or other obstacles.



Note

The manufacturer cannot be held responsible for any damage or injury resulting from the incorrect use of the loader shovel or any other implement posing a safety hazard for the occupants of the cab.

On versions with front loader:

- only use a front loader if the driver is adequately protected by a safety structure (FOPS), or if retainer devices are fitted on the loader;
- buckets, forks and other loader accessories, or other lifting, handling or digging equipment and the relative loads carried will alter the centre of gravity of the machine. This may cause the machine to overturn on slopes or poor terrain;
- suspended loads may fall from the loader bucket or from the lift equipment and crush the operator. Use extreme caution when lifting a load. Use the correct lifting equipment.

2.1.29 Roll over protection structure

The machine is equipped with a roll over protection frame or a cab. The structure protects the operator in the event of a roll over. For greater safety, observe the following instructions.

Observe the instructions and precautions given below to avoid the risk of severe or fatal personal injury:

- do not use the tractor on gradients or in conditions exceeding the operating limits of the tractor for safety and stability. The tractor may roll or tip over if these limits are exceeded. Follow these safety rules;
- use particular caution when driving on steep gradients with the machine loaded;
- do not use the protective structure as a towing point;
- do not modify the roll over protection frame by welding, drilling, bending, grinding etc. Modifications such as these will alter the original characteristics of the structure and cause it to no longer meet the requisites for homologation;
- keep the seat belt fastened at all times when using the machine. The structure only offers adequate protection if the driver is restrained correctly in the seat;
- in the event of wear or damage caused by an accident or roll over, the original protective characteristics of the structure must be restored before the machine may be used again. The structure may only be repaired or replaced by qualified personnel;
- the roll over protection frame must always be raised and locked in position. Keep the seat belt fastened at all times:
- only fold the roll over protection frame down when strictly necessary. When the roll over protection frame is in the folded position, use extreme caution and keep the seat belts fastened at all times. As soon as the task is complete, raise the roll over protection frame and lock it in position before continuing to use the machine;
- do not use a machine equipped with only the roll over protection frame to apply plant protection products;
- do not use the machine for draft or pulling jobs where the effective draft force involved is unknown (e.g. stump pulling). The tractor may overturn if the stump fails to yield from the soil.



2.1.30 Falling object protective structure (FOPS)



Danger

These tractor models are not equipped with an FOPS certified cab.

Additional protective measures are necessary for applications with specific protection rating requirements.

The cab is constructed to avoid or limit the risks for the operator caused by objects falling from above during normal use only. A cab without FOPS certification offers insufficient protection against falling rocks, bricks or cement blocks.

Use an FOPS structure when working with a front loader or for forestry applications.

2.1.31 Operator protective structure (OPS)



Danger

On machines equipped with this cab type, there are no fastener points for OPS operator protective structures as defined by the standard ISO 8084:2003. As this machine cannot be equipped with a protective structure capable of protecting the operator against the aforementioned hazards, it may not be used for forestry applications.

Additional protective measures are necessary for applications with specific protection rating requirements.

The OPS operator protective structure is installed on the tractor to limit the possibility of operator injury caused by objects intruding into the driver zone.

The air filtration and ventilation system of the cab cannot not offer complete protection against dust or gas when working with plant protection products. Employ the following precautionary measures to ensure increased protection and safety:

- always use personal protective equipment (PPE) and protective garments;
- keep the doors, windows and roof hatch closed when spraying;
- keep the interior of the cab clean;
- do not enter the cab with contaminated footwear and/or garments;
- keep all personal protective equipment (PPE) used outside the cab;
- bring the cable with the remote sprayer control button panel into the cab;
- use only original replacement filters and make sure that the filter is installed correctly;
- check the condition of seals and filters and replace if damaged.



2.1.32 Front loader (if present)

Objects may fall from the front loader and cause serious or fatal injury. Observe the following instructions and precautions to prevent the risk of injury caused by falling objects:

- never install a front loader on a tractor not equipped with an FOPS protective structure;
- fit accessory retainer devices to the loader;
- do not raise the front loader to a height from which objects could fall onto the operator;
- keep all unauthorised persons out of the working or manoeuvring area of the tractor with front loader. Do not allow any persons near or underneath the raised bucket of a front loader;
- never use the front loader to lift persons;
- make sure that there are no overhead electric power lines in the working area of the front loader. If it is necessary to work in an area with overhead power lines, maintain a suitable safe distance from the lines at all times;
- Only use the front loader to handle hay bales, pallets, etc. if equipped with the necessary accessories;
- Before driving on the road, lock the front loader in the transport position. Do not exceed the maximum front overhang limits. If the overall width of the vehicle with the implement attached exceeds 3.5 m, additional road safety measures must be adopted. Transporting equipment and material on public roads with the front loader is prohibited;
- risk of front loader unintentionally lowering. For safety, lock the valves at the end of the job. Lower the front loader to the ground before leaving the tractor;
- for safety, the front loader may only be attached and detached by a single person the driver of the machine;
- the front loader may only be detached with an accessory fitted (shovel or fork) and only on firm, flat ground;
- all the hydraulic lines, including the hydraulic return line, must be coupled when attaching the front loader;
- maintenance procedures (greasing) must only be performed with the loader attached to the vehicle with the loader itself in the lowered position;
- risk of accident due to increased height of vehicle with lift raised in case of limited headroom (e.g. driving through underpasses, under bridges etc.).
- always drive at an appropriate speed for the conditions;
- carrying persons is strictly forbidden. Set the front loader down on the ground and secure it so that unauthorised persons or children cannot accidentally overturn it.



2.1.33 Safety rules for air conditioning system

The air conditioning system is under high pressure. Do not disconnect lines. The sudden release of high pressure gas may cause severe injury.

The air conditioning system contains a gas that is harmful to the environment if released into the atmosphere. Do not attempt to service or repair the system yourself.

The air conditioning system must only be serviced, repaired and recharged by specialised personnel.

2.1.34 Personal protective equipment

Personal protective equipment (PPE) consists of devices worn by workers to protect themselves against one or more risks existing during work processes, maintenance and repair which could pose a threat to health and safety at work.

Even if the risk of accident has been minimised, the required PPE must always be used during work processes and maintenance in order to avoid risks that cannot be eliminated, denominated residual risks.

Use the appropriate PPE for each specific procedure. The personal protective equipment which may be required includes safety footwear, protective glasses and/or face protection, hard hats, work gloves, respirators and ear defenders.



Fig. 2.43

2.1.35 Safety rules - "Do not use" sign

Before performing any maintenance on the machine, place a warning sign with the wording "Do not use" in a clearly visible area of the machine and remove the key from the ignition switch.



2.1.36 Dangerous chemical substances

Dangerous chemical substances may cause severe injury and harm to the health. The fluids, lubricants, paints, adhesives, coolants etc. necessary to operate and service the machine may be harmful.

The material safety data sheets (MSDS) provide information on the chemical substances contained in each specific product, on how to use the product itself safety and on what to do in the event of accidental spillage. The MSDS sheets are available from the dealer.

Before starting any maintenance work, read the material safety data sheets of the products used with the machine.

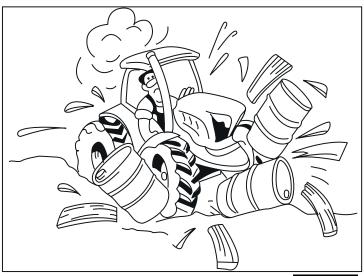


Fig. 2.44

The information given in these sheets allow operators to work safely on the machine.

Also observe the manufacturer's instructions regarding product containers and the indications contained in this manual.

Fluids, filters and containers must be disposed of correctly in accordance with applicable environmental regulations and law. Contact your local differentiated waste collection centre or your dealer for information on correct disposal.

Fluids and filters must be kept in accordance with the regulations applicable in the country of use. Chemical and petrochemical substances must only be stored in appropriate containers.

2.1.37 Safety information for the use of plant protection products (PPP)

The cab of this tractor is categorised as Class 1 in accordance with the standard EN 15695-1:2009 and does not offer protection against dangerous substances.

Tractors equipped with this cab cannot be used in conditions requiring protection against dangerous substances. The cab only offers partial protection against chemical substances and dust.

Observe the following instructions and precautions when treating crops with plant protection products:

- during treatment, wear specific PPE devices protecting against chemical mist and vapour even when seated in the cab;
- read and observe all the instructions and indications provided by the manufacturer of the dangerous substance given on the labels of the product containers:
- read all the user instructions provided by the constructor of the crop sprayer;
- as the ventilation and air filtration system does not offer complete protection, adequate additional protection measures must be used to increase operator safety;
- both towed and carried crop sprayers may be used with the tractor, but require the mandatory use of personal protective equipment (PPE) to reduce the risk of poisoning;
- appropriate personal protective equipment (PPE) must always be used, irrespective of the type of plant protection product used.



2.1.38 Climbing onto and off the machine

Climb onto and off the machine only from the side indicated by the constructor and using the specific handrails, steps or ladders.

Never jump off the tractor, especially when moving.

The steps, ladders and platform must be kept clear of debris.

Do not stand on the steps or ladders while the tractor is moving.

Do not hold onto the steering wheel or other controls when climbing off and onto the tractor.

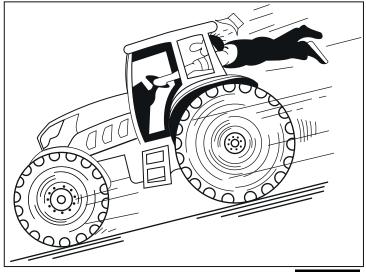


Fig. 2.45

2.1.39 Forestry use

This machine is not designed for heavy duty usage in forestry applications. Usage for these applications is therefore prohibited, unless the dealer has confirmed that the machine may be equipped with a suitable protective structure and such a structure is used. Protection against heavy objects falling from above can only be ensured with specific safety measures.

2.1.40 Vibration levels



Caution

Vibration resulting from incorrect maintenance may be harmful to the health of the operator. To prevent damage to the health, ensure that the machine is in good condition and is maintained correctly in accordance with the indications given in this manual.

The vibration to which the operator is exposed depends on a number of factors:

- terrain or road conditions;
- maintenance;
- tyre pressure;
- type of seat and state of wear of the seat;
- ground speed;
- steering and brake system malfunctions;

The vibration transmitted from the machine to the operator may be detrimental to the operator.

In certain cases, prolonged exposure to vibration may cause health and safety problems.



2.1.41 Safety information regarding contact with overhead electrical power lines

There is a risk of the tractor coming into contact with overhead electric power lines when extending, retracting and using foldable implements, and as a result of aerials mounted on the tractor itself.

To avoid the risk of fatal electric shock or fire caused by contact with electrical power lines:

- keep at a safe distance from high voltage power lines when extending and retracting implements;
- do not extend or retract implements in the vicinity of high voltage power poles, pylons or lines:
- when working with an extended implement, keep at suitable distance from high voltage power lines to allow manoeuvring in safety;
- to avoid the risk of electric arcing, never leave the tractor under overhead electric power lines;
- electric arcing phenomena may occur accidentally when in the vicinity of high voltage overhead power lines. These arcing phenomena produce very high voltages in the exterior structure of the tractor, resulting in large differences in electric potential between the tractor and the surrounding terrain.

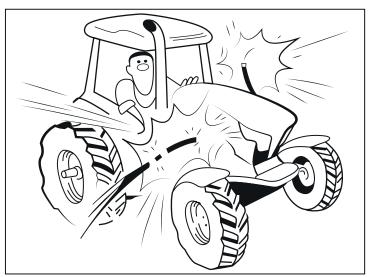


Fig. 2.46

To avoid serious or fatal injury due to high voltage:

- do not walk with long strides, do not lie down on the ground and do not touch the ground with your hands;
- do not touch any metal parts;
- do not create contact between the tractor and the ground:
- warn all persons in the area: DO NOT approach the machine. The voltage in the ground may cause powerful electric discharges;
- wait for the response of specialised emergency services. The overhead electric power line must be deactivated.

If you are forced to abandon the cab in spite of the electric arcing hazard to escape a situation of imminent peril of death due to fire:

- jump as far away from the tractor as possible to a safe position;
- avoid all contact with the exterior of the tractor and evacuate the danger area.

2.1.42 Tractor electrical system

Some parts of the tractor may be live.

Avoid contact with these parts to prevent the risk of electric shock.

To avoid the risk of serious injury or death, only specialised personnel may work on these parts.



2.1.43 Machine stability

The front/rear weight distribution is altered when implements are connected to the front and rear of the tractor.

Add or remove ballast weights to or from the tractor to attain the correct weight distribution for the implement in use.

Never exceed the maximum permissible axle and tyre loads.

A correct static weight distribution will maximise tractor performance and productivity, and extend the lifespan of the components of the tractor itself.

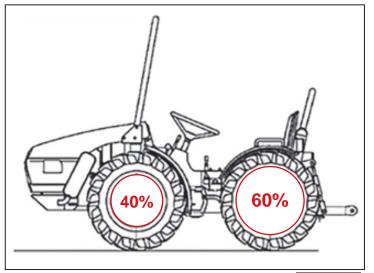


Fig. 2.47



Note

The percentage values given in the figure for 4WD models are indicative only. These values refer to the tractor with all fluids, a full fuel tank and complete with ballast weights.

2.1.44 Environmental rules

Protecting the environment is extremely important. Disposing incorrectly of fluids may cause harm to the environment.

All fluids (lubricants, fuels, coolants etc.) must be disposed of correctly without contaminating the environment. These must disposed of in accordance with the regulations applicable in the country of use.

Contact an authorised waste collection centre or your dealer for information on disposing correctly of used products.

When performing any maintenance job requiring lubricants to be drained from the machine, always place a suitable container for collecting the lubricant under the relative component.

The containers used to collect drained fluids must be easily recognisable. Never use used food containers to collect these fluids as this may lead to accidental ingestion.



2.1.45 Decommissioning and scrapping

Certain materials and parts used in the construction of the tractor are subject to regulations and legislation regarding waste disposal. As a result, at the end its service life, the tractor must be scrapped by an authorised centre.

Do not dispose of the end-of-life tractor or its components in the environment.



Warning

When scrapping the tractor, the engine must be handed over to a specialised waste treatment centre in accordance with applicable legislation.

Before scrapping the tractor, separate all plastic and rubber components from the rest of the components.

Parts consisting solely of plastic, aluminium and steel may be recycled by specialised centres.

All used oils and filters must be handed over to the local Mandatory Used Oil Treatment Centre.

Used oil must be collected properly and must not be disposed of in the environment, as it is classified as hazardous waste according to current legislation and must be handed over to a specialised collection centre.



3: Technical characteristics

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3.1 Technical data

3.1.1 Engine

Tractor		E20 SN
Manufacturer		LOMBARDINI
Model		12LD477/2 B1
Homologation code		e3-24R-036033
Fuel system		Direct diesel injection
Emissions compliance		3A
Cylinders		2
Rated speed	rpm	3000
Rated power (N 80/1269/EEC-ISO 1585)	kW (HP)	15 (20,5)
	@ rpm	@ 3000
Cooling		Air
Displacement	cm³	954
Specific fuel consumption (at max. torque engine speed)	g/kWh	236
Maximum torque	Nm	53
maximum torque speed	rpm	2300
Torque rise		6%
Tank capacity		14,5
Air filter		Oiled filter
Dry weight kg		78
Engine cowl		Pressed steel

3.1.2 Transmission

Transmission type		Mechanical transmission, four wheel drive
Gearbox type		6+3 with easy-shift system
Shift control system		Mechanical with frontal levers
		PUSH & START device on clutch pedal and interlock on gear lever
Clutch		Single plate dry clutch, diameter 7.3" (182.5 mm)
Clutch control		Mechanical with pedal
Front wheel drive engagement control		Permanent 4WD
Rear differential lock		Mechanical
Front differential lock		Mechanical
Front axle swing angle	Degrees	8° right + 8° left
Minimum speed	km/h	2,45
Maximum speed	km/h	18,36



3.1.3 Brakes

Туре	Mechanical drum brakes on rear axle
Operation	Mechanical, single pedal
Emergency and parking brake	Independently and mechanically controlled. Braking action on rear wheels
Trailer braking system	In addition to an inertial braking system, the tractor may also be equipped with a manual mechanical braking device for towed agricultural implements, constructed and installed in conformity with the CUNA NC 441-00 table

3.1.4 Steering wheel

Steering type		Hydrostatic
Articulation angle	Degrees	30° (right); 30° (left)

3.1.5 Rear power take off

Туре		Single shaft, independent and synchronised
PTO speed independent of ground speed	rpm	540 - 750 (540E)
Ground speed synchronised		Yes
Direction of rotation (looking at PTO)		Clockwise
Profile		1-3/8" with 6 splines
Clutch		Mechanical dry plate clutch (same clutch as transmission)
Clutch control		Mechanical
Safety		Interlock on Independent/Groundspeed selector lever

3.1.6 Rear lift

Туре		Hydraulic, up / down
Lifting capacity	kg	500
3-point linkage category		Category 1N
Mechanical top link arm		Category 1N
Lower link arm type		Fixed
Right and left hand tie-rod type		Mechanical adjustable tie-rod

3.1.7 Hydraulic System

Туре		Open centre
Pump delivery rate with engine at maximum operating speed	l/min.	10,7
Pump displacement	cm ³	4

3.1.8 Electrical system

Battery		12 V 360A 44 Ah
Safety		Battery master switch
Instrument		Digital / analogue
7 pole socket	Volts	12
Rotating beacon		Orange (optional)



3.1.9 Driver zone

Platform	/
Front mudguards	Integrated in bodywork
Rear mudguard protection	Rubber profile
Front mudguard protection	Rubber profile
ROPS	Central fully foldable
Standard cab	/
Low profile cab	/
Left and right hand rear view mirrors	Adjustable
Seat	With elastic suspension, seat belts and OPS (operator seated sensor)
Seat adjustment	Fore/aft, up/down and driver weight
Toolbox	Yes
Use and maintenance manual	Yes

3.1.10 Vehicle's maximum operating inclination

Forward	Degrees	25°
Reversing	Degrees	25°
Left	Degrees	25°
Right	Degrees	25°

3.1.11 Towing devices

Rear towing hitch	Category EEC-X adjustable hitch with pins
SLIDER rear towing hitch	1
Front towing hitch	Fixed
Drawbar	/

Vertical loads

	Maximum permitted vertical load on hitch (Kg)	Maximum hitch height (mm) declared
Type EEC-X hitch	500	330-495

Towable mass

Tractor weight with fluids and lubricants (minimum value)	730 kg
Maximum requested and verified towable weight	1500 kg
Maximum permissible gross weight of tractor-trailer combination	2230 kg
Maximum towable weight when towing unbraked agricultural implements	725 kg
Maximum towable weight when towing BRAKED agricultural implements	1500 kg

3.1.12 Ballast weights

Front	1
Water ballast in tyre	With air / water valve
Wheel	Set of 30x2 Kg (total 60 Kg) wheel ballast weights



3.2 Weights and dimensions

Dimensions

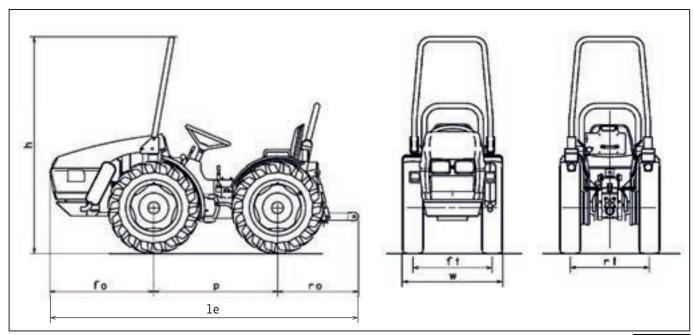


Fig. 3.1

fo	Front overhang	mm	880
р	Wheelbase	mm	990
ro	Rear overhang	mm	650
h	Maximum height	mm	1740
ft	Front track	mm	646 (max)
rt	Rear track	mm	632 (max)
w	Maximum permissible width for use on public roads	mm	815
le	Maximum length	mm	2520

Unladen weight

Unladen weight with fluids and lubricants	730 kg
Front axle weight with fluids and lubricants	435 kg
Rear axle weight with fluids and lubricants	295 kg

Maximum permitted axle weights (for use on public roads)

Maximum permitted front axle load	460 kg
Maximum permitted rear axle load	730 kg
Total maximum permitted axle weights	1190 kg



3.3 Lubricants, fuels and coolants

Assembly	Lubricants, fuels and coolants	Capacity	Recommended products	Туре	Specifications	
Engine	Engine oil	3.15	ARBOS ONYX - ENGINE OIL E7 10W/40	SAE 10W-40	API CI-4 ACEA E7	
	Fuel (1)	15	\	\	ASTM D-975 - 1D or 2D, EN590	
Transmission	Front axle oil - Front differential	6.3	ARBOS ZIRCON TRANSMISSION OIL GL5 80W/90	TRW 90	API GL-5	
	Transmission Oil - Rear Differential	6.5	ARBOS AMBER STOU GL4 15W/40	UNIVERSAL 15W- 40	API GL 4	
Other	Grease	\	ARBOS CORAL - MULTIPURPOSE EP 2	MULTIPURPOSE E.P.	NLGI 2	

(1) - In very cold ambient conditions (-10° C or lower), add specific additives to the fuel to prevent the formation of paraffin wax.

3.3.1 Fuel



Caution

Do not use fuels with characteristics differing from those indicated.

Using fuels with a high sulphur content will cause accelerated engine wear.

The use of non-recommended fuel may damage the engine. Do not use contaminated fuel or diesel fuel mixed with water as this may cause serious engine malfunctions.

The warranty does not cover any malfunctions caused by the use of fuels other than those of the recommended type.



△ Warning

Using correctly filtered fuel will prevent damage to the injection system.

Do not fill the fuel tank completely. Fill to approximately 1 cm below the max. level indicated to allow some freedom of movement for the fuel.

Clean any fuel spilt when refuelling immediately. Clean any spilt fuel before starting the engine.

Do not keep fuel in galvanised (zinc plated) containers. Fuel reacts chemically with the zinc coating of the container, producing compounds which will quickly clog the filters or cause injection pump and/or injector malfunction.

For optimum performance, use only new clean fuel purchased from a renowned supplier/brand. Diesel fuels meeting the specifications ASTM D-975 - 1D or 2D, EN590, or other equivalent specifications are suitable for use with this engine.



3.3.1.1 Fuel for low temperatures

When operating the engine at temperatures below, 0°C use the specific low temperature fuels commercialised normally by fuel manufacturers for cold weather usage and conforming with the specifications given in the fuel compatibility table.

These fuels limit the formation of paraffin wax at low temperatures.

In very cold ambient conditions (-10° C or lower), add specific additives to the fuel to prevent the formation of paraffin wax.

When paraffin wax forms in fuel, it clogs the fuel filter and stops the flow of fuel to the engine.

3.3.1.2 Biodiesel

This engine is compatible with fuels containing less than 20% methyl ester (B20). The manufacturer recommends using biodiesel fuels compliant with the specifications of BQ-9000, EN 14214 or other equivalent standards. DO NOT USE vegetable oils as biofuels for this engine. The warranty does not cover any malfunctions caused by the use of fuels other than those of the recommended type.

3.3.2 Engine oil



Warning

Operating the engine with too high or too low an oil level may cause damage to the engine itself.

Never fill to beyond the MAX level, as excess oil combusting in the cylinder may cause a sudden increase in engine speed.

Use only the specified oil type to ensure that the engine is protected adequately and maximise the performance and durability of the engine itself.

Using oils of lower quality than indicated by the specifications will significantly shorten the lifespan of the engine.

The viscosity of the oil must meet the requirements specified at the normal engine operating temperature.



Danger

Prolonged skin contact with used engine oil may cause skin cancer.

If contact with oil cannot be avoided, wash your hands thoroughly with soap and water as soon as possible.

For guidelines on disposing correctly of used oil, see the section "Decommissioning and scrapping" in the chapter "General safety rules".

3.3.2.1 SAE oil classification

This system classifies oils on the basis of viscosity only and does not take any other characteristic into account.

The classification code consists of two numbers separated by the letter "W", where the first number indicates the viscosity grade in cold conditions and the second number indicates the grade in high temperature conditions.



3.4 Speed table

Tractor variant/model	All
Crankshaft speed	3000 rpm
Speed radius index	345 mm

Range	Gear	Code	Ratio	Speed (km/h)
	1	FW1	328,89	1,19
Forward-Slow	2	FW2	153,16	2,55
	3	FW3	100,39	3,88
	1	FW4	69,57	5,61
Forward-Fast	2	FW5	32,40	12,04
	3	FW6	21,24 *	18,36 *
	1	RW1	446,35	0,87
Reverse	2	RW2	207,86	1,88
	3	RW3	136,25	2,86

^{* -} Maximum speed



3.5 Noise levels

External noise levels: 77.8 dB(A)

Maximum noise level table

Model		Maximum noise level at driver seat dB (A)	Noise level with tractor in motion dB
		Capo II	
E20 SN	YBC01	85	77

Information about noise



Pursuant to the provisions of Italian Law Decree 81 / 2008 and Directive 77/311/EEC concerning noise levels measured at the ears of the driver of wheeled agricultural tractors, the values relating to the noise produced by the tractors covered by this Maintenance and Operation Manual are given as follows.



Bearing in mind the impossibility of the manufacturer to foresee the normal working conditions in which the agricultural tractor will be operated, the noise levels have been determined in accordance with the methods and conditions described in Attachment 8 of Italian Presidential Decree no. 212 of 10/02/1981 transposing Directive 77/311/EEC (repealed by 2009/76/EEC) relating to the driver-perceived noise level of wheeled agricultural or forestry tractors.

Annex 6 to Directive 2009/63/EC concerning the noise made by tractors in motion.

Warnings to users





Remember that the agricultural tractor may be employed in different ways, and may be connected to an infinite number of implements. In order to ensure that drivers are protected against risks deriving from exposure to noise, the entire tractor-implement group must be considered.





In consideration of the aforementioned noise levels and the consequent health risks, the user must implement appropriate precautionary and safety measures as indicated in Chapter IV of Italian Law Decree 81 / 2008.



3.6 Rear

3.6.1 General information on tyres

Marking

The individual tyres have markings that indicate the dimensions, structure and characteristics.

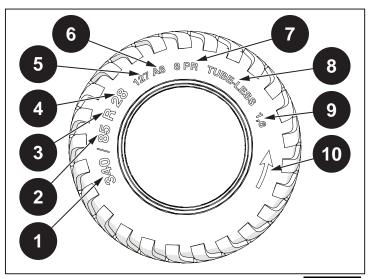


Fig. 3.2

	Example	Description
1	340	Nominal section width (in mm)
2	85	Nominal aspect ratio (in the example, the height is 85% of the width)
3	R	Radial tyre; "-" if conventional structure
4	28	Rim diameter (in inches)
5	127	Load capacity index
6	A8	Speed code
7	8 PR	Ply rating or number of layers of rubber on the tyre (this is not normally indicated on radial tyres)
8	TUBELESS	Only if tyres do not have an inner tube; if they have an inner tube, "TUBE TYPE" or no marking
9	1.6	Reference pressure (in bar)
10		The drive direction is indicated by the arrow.



Load index

The load index indicates the maximum load the tyre is designed to carry.

Index	kg	Index	kg	Index	kg	Index	kg	Index	kg
80	450	100	800	120	1400	140	2500	160	4500
81	462	101	825	121	1450	141	2575	161	4625
82	475	102	850	122	1500	142	2650	162	4750
83	487	103	875	123	1550	143	2725	163	4875
84	500	104	900	124	1600	144	2800	164	5000
85	515	105	925	125	1650	145	2900	165	5150
86	530	106	950	126	1700	146	3000	166	5300
87	545	107	975	127	1750	147	3075	167	5450
88	560	108	1000	128	1800	148	3150	168	5600
89	580	109	1030	129	1850	149	3250	169	5800
90	600	110	1060	130	1900	150	3350	170	6000
91	615	111	1090	131	1950	151	3450	171	6150
92	630	112	1120	132	2000	152	3550	172	6300
93	650	113	1150	133	2060	153	3650	173	6500
94	670	114	1180	134	2120	154	3750	174	6700
95	690	115	1215	135	2180	155	3875	175	6900
96	710	116	1250	136	2240	156	4000	176	7100
97	730	117	1285	137	2300	157	4125	177	7300
98	750	118	1320	168	2360	158	4250	178	7500
99	775	119	1360	139	2430	159	4375	179	7750

Speed code

The speed code indicates the maximum speed a tyre can be subjected to in the load conditions specified by the manufacturer.

p/n	km/h	mph
A1	5	3.10
A2	10	6.21
A3	15	9.32
A4	20	12.42
A5	25	15.53
A6	30	18.64
A7	35	21.74
A8	40	24.85
В	50	31.06
С	60	37.28
D	65	40.38



3.6.2 Available tyres

The correct tyre pressure values and respective load indexes are given as follows for the different tyre types usable.

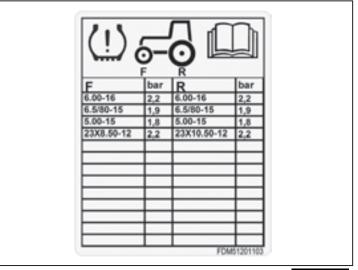


Fig. 3.3

Set	Axle	Tyre	Speed radius index (mm)	Tyre classification	Maximum tyre load per axle (kg)	Maximum permitted vehicle load per axle (kg)	Pressure (bar)
1	Front	6.00-16	350	6 PR	1118	460	2.2
1	Rear	6.00-16	350	6 PR	1118	730	2.2
2	Front	6.5/80-15	320	4 PR	970	460	1.9
	Rear	6.5/80-15	320	4 PR	970	730	1.9
3	Front	5.00-15	310	6 PR	880	460	1,8
	Rear	5.00-15	310	6 PR	880	730	1,8
4	Front	23x8.5-12	280	4 PR	962	460	2.2
	Rear	23x10.50-12	280	4 PR	1128	730	2.2



4: Controls and instruments

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4.1 General list of controls

4.1.1 Dashboard controls

- 1 Hazard warning light switch
- 2 Beacon light switch
- 3 Multifunction instrument
- 4 Lights and horn selector
- 5 PTO enable switch
- 6 Turn indicator / flash high beams selector
- 7 Ignition switch

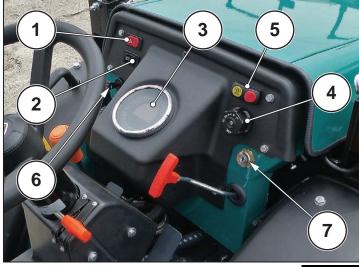


Fig. 4.1

4.1.2 Front-end controls

- 1 Range lever
- 2 Rear PTO speed selector lever
- 3 Rear lift control lever
- 4 Hand throttle lever
- 5 Gear lever
- 6 Front differential lock lever

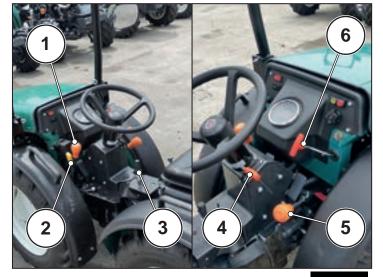


Fig. 4.2



- 7 Clutch pedal
- 8 Service brakes pedal

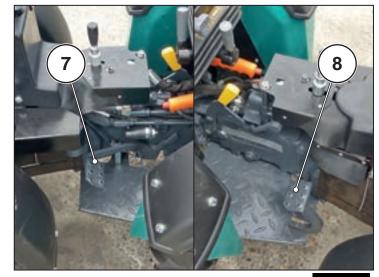


Fig. 4.3

4.1.3 Controls in rear zone

- 1 Rear PTO independent or ground speed mode selector lever
- 2 Rear differential lock lever
- 3 Parking brake lever

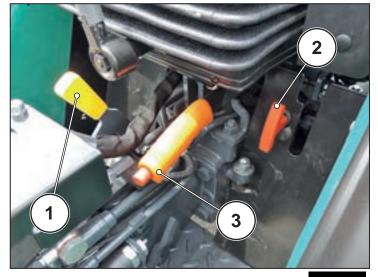


Fig. 4.4



4.2 Controls

4.2.1 Seat



A Danger

Do not climb onto or off seat while the machine is moving.



Danger

All adjustments to the seat must be made with the machine stopped, the engine switched off and the parking brake engaged.

Seat controls:

- 1 Seat longitudinal adjustment
- 2 Seat height adjustment
- 3 Seat spring adjustment lever (for adjusting to driver weight)
- 4 Seat belt

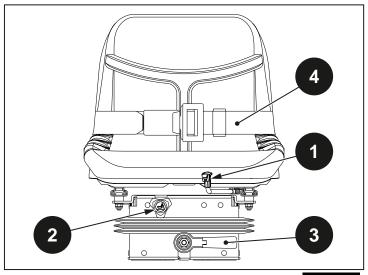


Fig. 4.5

Manufacturer	COBO
Туре	GT62-M91
Approval no.	e13 00015 W2
Category	A
Class	I, II
Position	Centre



Weight adjustment



Continuous adjustment for driver weight from 50 to 120 kg.

Turn the lever at the front of the seat suspension system clockwise or anticlockwise. The seat is adjusted correctly when it stabilises, with the load of the driver, at the mid point of the suspension travel.

If the seat is equipped with a window with a driver weight indicator, set to the weight of the driver.

If the seat is equipped with a gauge window with a pointer (M99 suspension), the seat is adjusted correctly when the pointer is in the centre of the green zone.

Certain suspension systems have a ratchet adjustment lever. Set the position of the lever to allow the lever to be rotated in the direction required. Pull the lever outward and rotate by 180° until it locks in place.

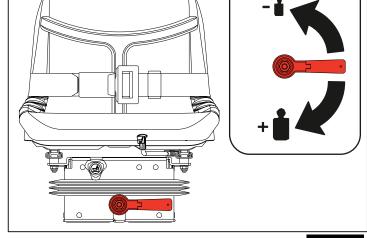


Fig. 4.6



Note

The driver must be seated when adjusting the seat, so that the seat suspension system is loaded.

Height adjustment (limiter)

The limiter limits the maximum upward excursion of the seat suspension.

The limit may be set at any position desired within the suspension travel, and must be set with the operator seated, so that the seat suspension system is loaded. The seat height may be increased or decreased by turning the height adjustment dial.

Adjust the seat suspension again for the weight of the driver after each adjustment to the height setting.



Note

The driver must be seated when adjusting the seat, so that the seat suspension system is loaded.

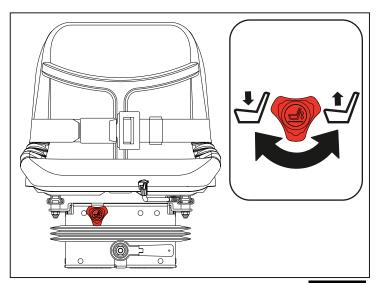


Fig. 4.7



Longitudinal adjustment

Push the adjuster lever to the right to unlock the seat guide rails; this lever may be situated on the left hand seat guide rail. Make sure that the lever snaps back into place once the adjustment has been made, locking the guide rails. Check that the seat cannot move longitudinally.

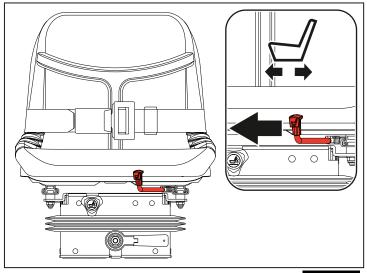


Fig. 4.8

Document holder (if available)

Туре	Instructions for use
Rigid holder with rear lid	To open the holder, move the cover towards the rear of the seat after detaching the two lateral tabs from their slots
Flexible pocket with press-stud fastener	Detach the press stud and lift the flap to open the pocket

4.2.1.1 Lap seat belt

Static seat belt: adjust the length of the belt to fit snugly around the abdomen of the driver, seated correctly with the back against the backrest and with the belt passing over the lowest part of the abdomen, near the thighs. Hold the tongue at a right angle to the belt and shorten the belt by pulling the free end (A) or lengthen by pulling the part (B).

Belt with retractor. Belts with retractors are automatically adjusting.

Check that, when worn, the belt is not twisted and does not pass over sharp or fragile objects against the clothing.

Fasten the seat belt by pushing the tongue into the slot in the buckle until it clicks audibly into place, and check that it is fastened correctly by pulling the belt.

Release the seat belt, pressing the red button (C) on the buckle until it clicks and releases the tongue.

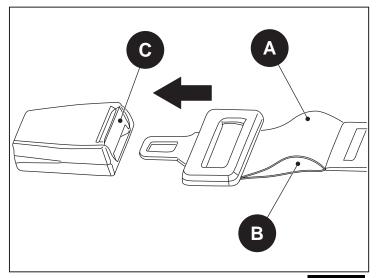


Fig. 4.9



Belt retractor functions

The belt retractor performs two functions:

- Lock the belt when the seat belt is buckled. While wearing the seat belt, check that the retractor does not lock the belt when the belt is pulled slowly out from the retractor.
- It locks the seat belt when the belt is pulled suddenly out of the retractor.

While wearing the seat belt, try to pull the belt sharply out of the retractor and check that the belt locks.

4.2.1.2 Looking after the seat

Any work on the seat, including maintenance, must be performed by specialised personnel using suitable personal protective devices.

Dirt may cause the seat to malfunction. Always keep the seat clean!

When cleaning, do not detach the padding from the seat frame.



Dot clean the seat with steam cleaning or pressure wash equipment!

When cleaning the surfaces of the seat upholstery, do not allow liquid to soak through the upholstery and into the padding.

Before use, check that the cleaning product is compatible with the upholstery or commonly used man-made textiles by testing on a small, concealed area.

4.2.2 Rear view mirrors

The rear view mirrors are adjustable in all directions to ensure that driver has a clear view from the driver seat.

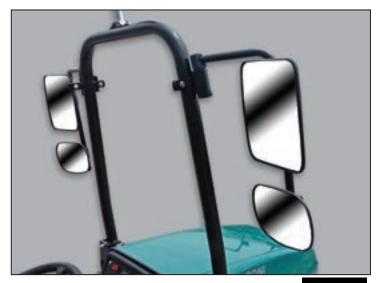


Fig. 4.10



4.2.3 Horn

Press the light selector on the dashboardto sound the horn.

Use the horn to warn pedestrians and other road users of the tractor when driving.



The horn works in any lights selector stalk position.



Fig. 4.11

4.2.4 ROPS

The machine is equipped with a folding safety frame (ROPS).



Danger

During work, always keep the ROPS mounted in the correct vertical position.

When in the horizontal position, the roll bar will provide no protection in case of overturning.

Make sure that the roll bar is positioned correctly before starting the engine.



Danger

Do not modify the structural components of the ROPS for any reason whatsoever by welding on additional parts, drilling holes, grinding, etc. Failure to observe this instruction may compromise the stiffness of the ROPS, reducing the level of protection ensured by the original equipment.



Danger

In the event of tractor overturning or damage to the ROPS or cab (e.g., due to impact), all deformed structural components must be replaced to ensure original safety.



- 1 Safety lock pin
- 2 ROPS
- 3 Safety lock pin

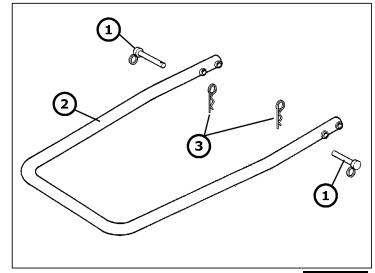


Fig. 4.12

To lower the ROPS, on both sides:

- Remove the safety lock pin (3).
- Remove the pin (1).
- Fold down the ROPS (2).
- Fit the safety lock pin (1) in the second position.
- Refit the safety lock pin (3).

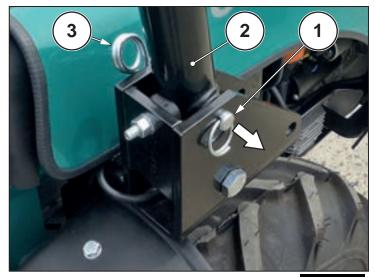


Fig. 4.13

4.2.5 Grab handles

The grab handles on the mudguards allow easier and safer access to the driver seat.



Fig. 4.14



4.3 Multifunction instrument

This chapter lists and describes the information provided by the indicator lamps, analogue gauges and digital information screen of the multifunction instrument.

Turn the ignition switch clockwise to ON to turn the display on.

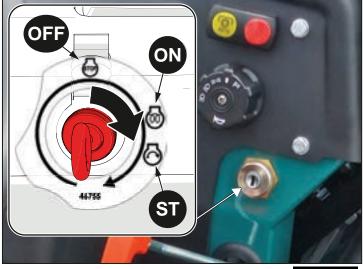


Fig. 4.15

4.3.1 Digital instrument panel

- 1 Dial
- 2 Hour meter
- 3 Tachometer

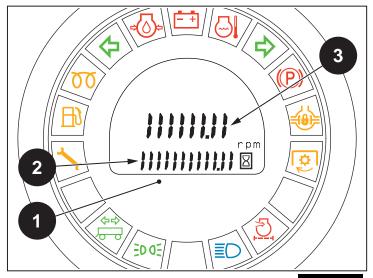


Fig. 4.16



LCD display digital indicators

Initial check

When the ignition switch is turned on, all the segments on the display must appear for 1 second.

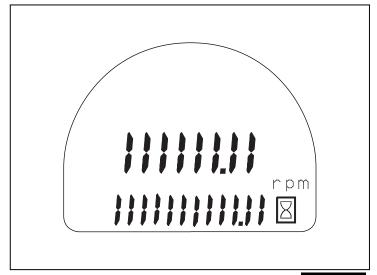


Fig. 4.17

Tachometer

Engine speed is indicated by the numbers in the centre of the display.

The following light up:

- The acronym RPM (revolutions per minute).
- Revolutions per minute.

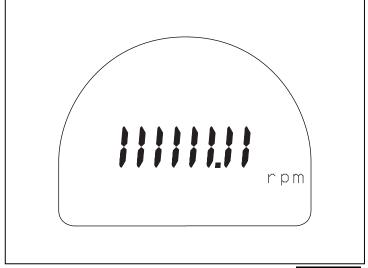


Fig. 4.18

Total hour meter

The hour meter is located in the lower part of the display. The total operating hours of the machine are displayed for 7 seconds after the number of operating hours remaining until the next service.

The following light up:

- Hourglass symbol.
- Number of hours.

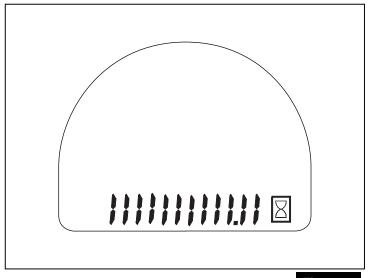


Fig. 4.19



Service indicator

To facilitate maintenance, the following are included in the dashboard:

- 1 Service interval hour meter.
- 2 Service indicator lamp, yellow

The Service indicator (2) and the number of hours remaining until the next engine service are displayed for 3 seconds when the ignition switch key is turned to ON.

When the machine is started the first time, the scheduled maintenance hour meter will show the value of 50 hours (first scheduled maintenance); when the hour meter reaches zero, the new maintenance interval will be automatically set to 150 hours, and the countdown to zero will resume.

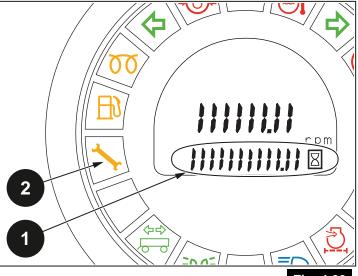


Fig. 4.20

For maintenance, contact the authorised service centre.

To perform adjustment and calibration operations, contact the authorised service centre.

4.3.2 Indicator lamps

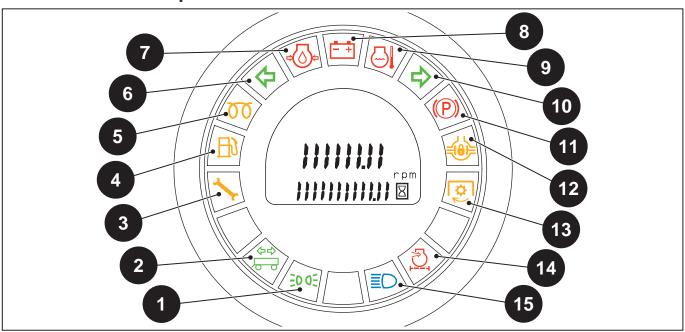


Fig. 4.21

- Position lights indicator lamp, green
- 2 Trailer turn signal indicator lamp, green
- 3 Service indicator lamp, yellow
- 4 Reserve fuel warning lamp, yellow
- 5 Engine preheat indicator lamp, vellow
- 6 Left turn signal indicator lamp, green

- 7 Low engine oil pressure warning lamp, red
- 8 Low battery charge warning lamp, red
- 9 Not used
- 10 Right turn signal indicator lamp, green
- 11 Parking brake engaged warning lamp, red
- 12 Differential lock engaged indicator lamp, yellow
- 13 PTO engaged indicator lamp, yellow
- 14 Engine air filter clogged warning lamp, red
- 15 High beam headlights indicator lamp, blue



4.4 Lights

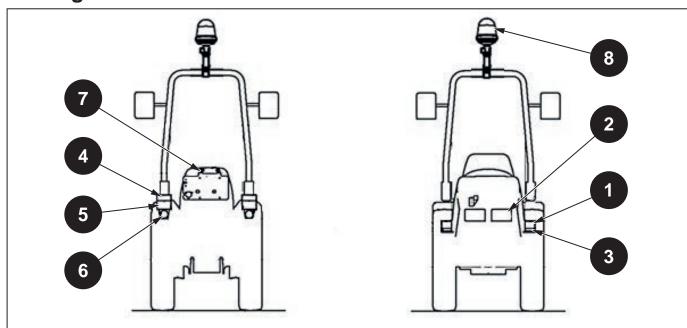


Fig. 4.22

- 1 Front turn indicator
- 2 High beam/low beam headlight
- 3 Front sidelight
- 4 Rear turn indicator
- 5 Rear sidelight
- Rear brake light
- 6 Rear reflector
- 7 Number plate light
- 8 Rotating beacon

4.4.1 Light switch

Set the lights selector stalk to position (1) to switch on the running lights.

Set the lights selector stalk to position (2) to switch on the low beam headlights.

Set the lights selector dial to position (3) to switch on the high beam headlights. The relative high beam headlights indicator lamp illuminates on the dashboard.

Set the light selector stalk to position (0) to switch all the lights off.

Set the light selector stalk to position (P) to switch on the parking lights.

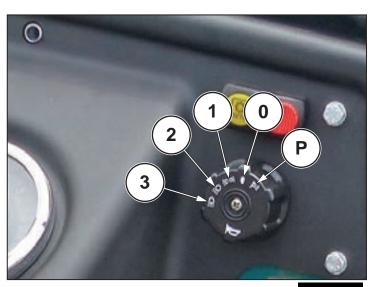


Fig. 4.23



4.4.2 Turn indicator

Push the switch (1) to the right to turn on the right hand turn signals.

Push the switch (1) to the left to turn on the left hand turn signals.

The following light up:

- Tractor turn signal indicator lamp, green.
- Buzzer.

At the end of the change of direction, return the switch to the centre.

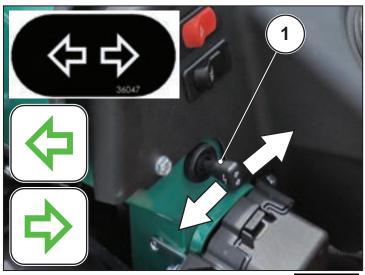


Fig. 4.24

4.4.3 Flash high beams

Push the switch (1) down to flash the high beam headlights.

The following light up:

- High beam headlights indicator lamp, blue.

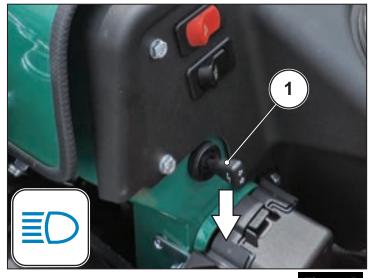


Fig. 4.25



4.4.4 Hazard warning lights

The hazard warning light button is used to turn the hazard warning lights on and off. Pressing the switch in position (1) the turn indicators flash simultaneously. Pressing the switch in position (0) the turn indicators will stop flashing.

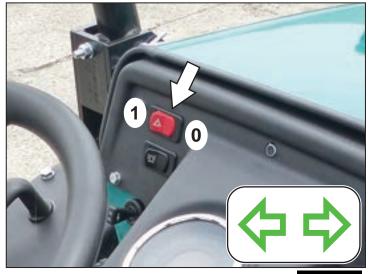


Fig. 4.26

4.4.5 Rotating beacon

The rotating beacon indicator lamp illuminates when the rotating beacon is on. Press the switch into position (1) to turn on the rotating beacon; press the switch into position (0) to turn it off.



Fig. 4.27



CONTROLS AND INSTRUMENTS



5: Operating instructions

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OPERATING INSTRUCTIONS



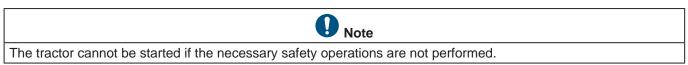
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5.1 Starting and stopping the engine

5.1.1 Engine start safety systems

This chapter lists and describes the safety measures implemented on the tractor to ensure that the minimum safety requirements for starting are met.



Function	Icon	Description of icon	Tractor behaviour	Solution
Operator seated detector switch		The icon indicates that the operator must be seated when the tractor is started	An audible warning signal sounds if the system does not detect a driver in the seat. It will not be possible to start the tractor	l .
Gear lever position sensor	N	The icon indicates that the gear lever must be in neutral (N)	An audible warning signal sounds if the system does not detect the gear lever in neutral (N). It will not be possible to start the tractor	Move the gear lever into neutral (N).
Rear PTO disengaged sensor	(A)	The icon indicates that the rear PTO must not be engaged	An audible warning signal sounds if the system if the system detects that the rear PTO is engaged or of the "PTO Auto" switch has been pressed. It will not be possible to start the tractor	release the "PTO
Parking brake engaged sensor	(P)	The icon indicates that the parking brake must be engaged	If the system detects that the parking brake is not engaged, the relative icon is shown on the display followed by an audible warning signal. It will not be possible to start the tractor	Engage the parking brake
Clutch pedal depressed sensor	W	The icon indicates that the clutch pedal must be depressed	An audible warning signal sounds if the system detects that the clutch pedal is not depressed. It will not be possible to start the tractor	Depress the clutch pedal



5.1.2 Access to driver seat

Follow the instructions given below to access the driver seat correctly and safely:

- Grip the handrails (1) securely and then climb on board the tractor with caution.



Danger

The footboard (2) can be slippery, grip the handrails (1) firmly during the whole ascent.

- Sit in the seat.
- Adjust the mirrors and driver seal position, as described in the previous chapter.
- Familiarise yourself with the location of all the tractor controls.
- fasten the seat belt.

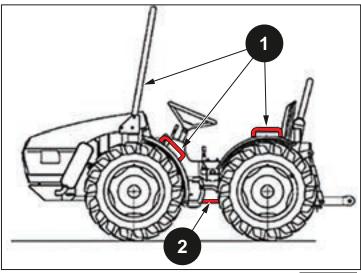


Fig. 5.1

5.1.3 Starting the engine

In order to start the engine, the operator must be correctly seated in the driver seat and following the instructions given below:

- engage the hand brake;
- depress the clutch pedal fully and then shift all control levers into neutral;
- turn the ignition switch into the ignition on position and wait for the preheat indicator to extinguish;
- turn the ignition switch into the start position.

Before setting off, run the engine for a few minutes at idle speed to warm up, as indicated in the table.

Ambient temperature	Warming up time
-20°C or lower	5 minutes
-20°C to -10°C	2 minutes
-10°C to -5°C	1 minute
5°C or above	20 seconds



Warning

Check that there is fuel in the tank before attempting to start the engine.



Insert the ignition key into the ignition switch. The ignition switch has 3 positions:

- OFF: in this position, the engine is off and the ignition key may be inserted into and removed from the ignition switch.
- -ON: in this position, the electrical circuits of the tractor are powered and the display switches on. (the preheat system is activated automatically at external temperatures below -8 °C.)
- ST: This position starts the engine. Release the key as soon as the engine starts. The switch returns automatically to the ON position.

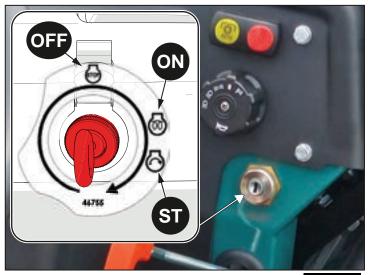


Fig. 5.2

To start the engine, depress the clutch pedal (1) completely and turn the ignition switch to ON. Check that no fault warning indicators are shown on the display.

As soon as the preheat indicator lamp extinguishes, the engine may be started by turning the ignition switch to ST. Wait for the engine to start and then release the key.

Warning

Release the ignition key and let the ignition switch return to ON as soon as the engine starts. Continuing to hold the key may damage the engine.



Warning

Do not run the starter motor for more than 20 consecutive seconds. If the engine does not start, wait 1 minute before attempting to start again. If the engine does not start after two consecutive attempts, see the chapter "Troubleshooting" to identify and resolve the problem.

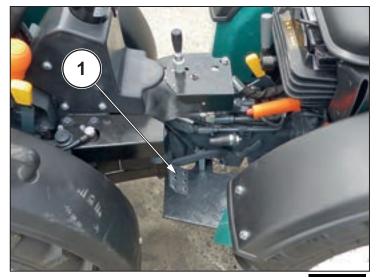


Fig. 5.3



Fig. 5.4



5.1.3.1 Starting the engine at low external temperatures



Caution

DO NOT use ether based products or other starter aid fluids to start the engine at low temperatures, as this could lead to serious injury and damage to the vehicle.



∆ Warning

DO NOT attempt to start the engine before it has preheated correctly by running the starter motor for longer than necessary, as this may drain the battery.



Warning

At temperatures below 8°C, wait until the preheat stage finishes before turning the ignition switch to ST.

To maximise the durability of the engine and prevent loss of performance, the engine must be warmed up correctly in both cold and hot weather conditions.

In low ambient temperature conditions, after starting, run the engine at idle speed for the time indicated in the table.

Ambient temperature	Warming up time
-20°C or lower	5 minutes
-20°C to -10°C	2 minutes
-10°C to -5°C	1 minute
5°C or above	20 seconds

At temperatures below 0°C, add the recommended antifreeze product to the coolant and pour anti-gelling additive into the tank before filling with fuel.



Warning

See "Lubricants, fuels and coolants" for the correct quantity and type of fluid.



5.1.4 Stopping the engine



Warning

Never switch the engine when under load and running at high engine speeds.



Warning

Before turning the ignition switch to OFF, leave the engine to idle in zero load conditions for a few minutes to ensure that all components are lubricated uniformly and prevent possible damage caused by high temperatures and insufficient lubrication.

Stop the tractor, select a gear and engage the parking brake.

Always lower any mounted implements to ground level.

Turn the ignition switch to OFF.

Remove the ignition key from the ignition switch to prevent unauthorised persons from starting the engine.



Warning

On machines with a battery master switch, never use the switch to disconnect the electrical power supply while the engine is running to stop the engine.

After switching off the engine, wait at least 2 minutes before disconnecting the electrical power supply to allow the electronic control unit to complete the "after-run" procedure. Failure to do so may result in damage to the electronic engine control unit.

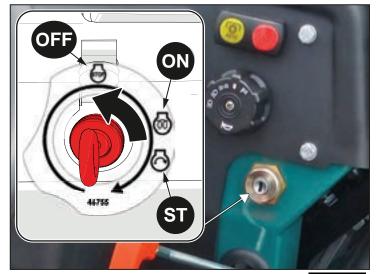


Fig. 5.5



5.1.5 Starting the tractor



Danger

Always start the engine from the driver's seat with all the gear levers and the power take-off lever in neutral. The brakes must be correctly adjusted so that they bite simultaneously. Adjust the seat and fasten the seat belt.



Danger

Never operate the engine in an enclosed space without ensuring that the space itself is adequately ventilated. Exhaust fumes are harmful to the health and may be lethal.



Danger

Before starting the engine, ensure that the parking brake is disengaged and that the transmission and PTO are in neutral. This is necessary even though the tractor is equipped with a start safety device. Never override the start safety switch. If this component does not work correctly, it must be repaired by the qualified personnel of your dealer.



Danger

Make sure that all connected implements have been lowered completely to the ground before starting the engine.



Danger

Ensure that all safety covers, guards and protective structures necessary are correctly installed on the tractor (ROPS safety roll bar, front cowl panels, cowl, PTO guard, front axle driveshaft guard, etc.).



Danger

Make sure that there are no persons or obstacles within the operating radius of the tractor before starting the engine.



Danger

After starting the engine, always check that all lights and instruments are working correctly. In any malfunction is found, DO NOT use the tractor until the fault has been rectified.



After starting the engine:

Depress the clutch pedal (1);

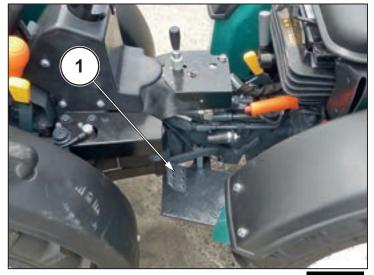


Fig. 5.6

Use the gear lever (2) to select the required gear; Use the range selector levers (3) to select the required range;

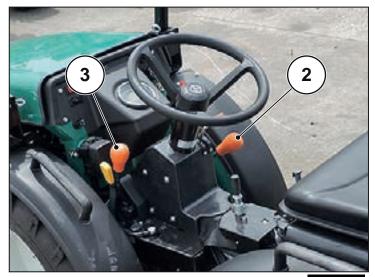


Fig. 5.7

Release the parking brake (4);

Gradually release the clutch pedal (1) while increasing engine speed with the throttle.

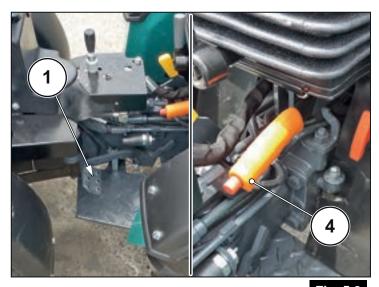


Fig. 5.8



5.1.6 Stopping the tractor



Danger

Always lower any mounted implements completely to the ground before leaving the tractor. Never leave the implements raised from the ground.



Danger

Before leaving the tractor, always put all the control levers in neutral, engage the parking brake, stop the engine and engage a gear.



Danger

Always remove the ignition key before leaving the tractor unattended.



Danger

Park the tractor on level ground if possible, engage a gear and engage the parking brake. When parking on a gradient, in addition to engaging the parking brake, select the lowest forward gear if parking uphill or the lowest reverse gear if parking downhill. For greater safety, also use chocks. Chocks are always required, however, when parking with a trailer hitched to the tractor.

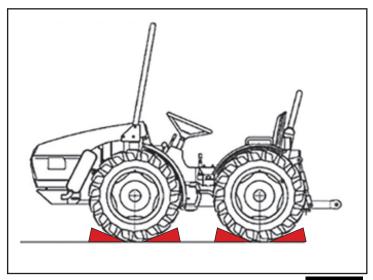


Fig. 5.9



Stop the engine as follows:

Reduce engine speed;

Press the clutch pedal (1) and the brake pedals (2), and decelerate to a complete stop;

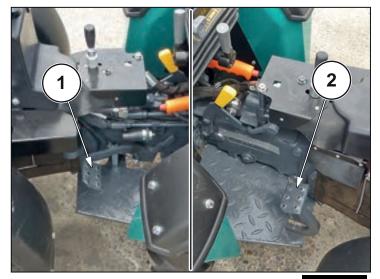


Fig. 5.10

Set the range (3) and gear (4) levers to neutral;



Fig. 5.11

Release the clutch pedal (1);

Engage the parking brake (5) by pulling the lever;

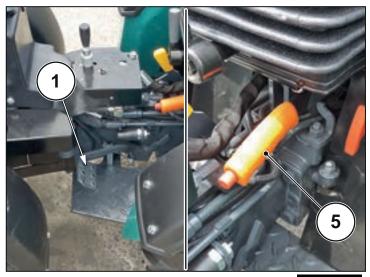


Fig. 5.12



Turn the ignition switch to OFF;

Remove the ignition key from the ignition switch to prevent unauthorised persons from starting the engine.

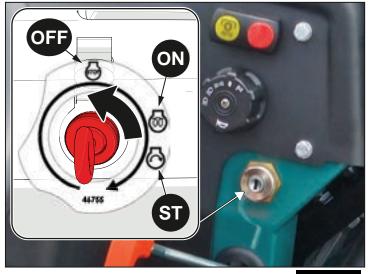


Fig. 5.13

5.1.7 Running in

Before being used, the tractor must run for a period of time under the envisaged conditions of lubrication, rotation speed and load. Meanwhile, carry out necessary checks, adjustments and maintenance to normalise the technical conditions.

Preparations before running-in

- Check the oil level in the engine sump, the transmission system, the lift, the central drive gear of the front wheel drive axle and the final drive unit and top up if necessary.
- Top up with diesel fuel and coolant.
- Check that the tyres are inflated to the correct pressure.
- Check that the electrical system functions correctly and that all electrical connections are secure.

Running in

Do not exceed 70% maximum engine load during the running-in period (first 50 hours of operation).

- Avoid prolonged usage of the engine at maximum performance during the running-in period.
- Running the engine in for a period of at least 50 operating hours, using the engine within a range between 50 and 70% of its maximum rated power, will extend the service life of the components of the engine and reduce maintenance costs.
- During the running-in period, carry out the specified maintenance procedures at the intervals indicated (see chapter "Services").



5.2 Steering central joint



Danger

Pay the utmost attention during steering; the particular design of the articulated machine leads to a reduction of the space between the mudguards near the footboard.



L Danger

The tractor front axle shifts during steering; pay the utmost attention to the surrounding space.

Steering central joint



Fig. 5.14



Fig. 5.15



5.3 Transmission controls

5.3.1 Hand throttle

The hand throttle lets the operator manually control the required engine speed and maintain this speed.

Push the lever gradually downwards to reduce engine speed and set idle speed. Push upwards gradually to increase engine speed.



Fig. 5.16

5.3.2 Clutch pedal



Danger

NEVER travel along any slope with the clutch disengaged.



Warning

Never leave you foot resting on the clutch pedal when working as this will cause premature clutch plate wear.



Warning

Lengthy clutch disengagements could wear out the thrust bearing.

When the clutch pedal is completely raised, the clutch is engaged and transmits torque from the engine to the transmission. Press the pedal (1) to disengage the clutch. Release to engage the clutch again.

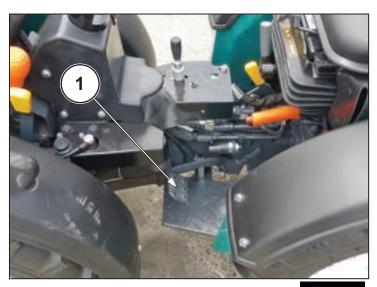


Fig. 5.17



5.3.3 Range lever

The range lever lets the operator select two different forward work ranges and reverse.

To shift from one range to another: stop the machine, press the clutch pedal to disengage the transmission clutch, select the required range with the lever and then gradually release the clutch pedal.

The lever has three positions plus neutral:

•	Reverse
	Neutral
-	Low (Turtle)
	Neutral
4	Fast (Hare)

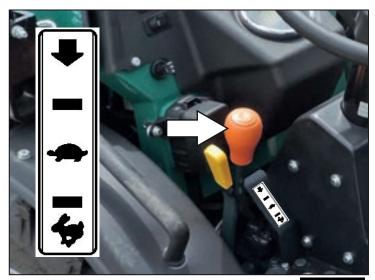


Fig. 5.18

Gear selections are synchronized. To change gear:

- Stop the machine.
- Depress the clutch pedal.
- Select the required range.
- Release the clutch pedal gradually.



5.3.4 Gear lever

The lever has three positions plus neutral (N):

1.4	1st Slow • 1st Fast
	Neutral
2.5	2nd Slow • 2nd Fast
	Neutral
3.6	3rd Slow • 3rd Fast

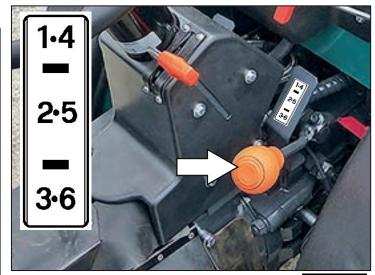


Fig. 5.19

Gear selections are synchronized. To change gear:

- Depress the clutch pedal.
- Select the required range.
- Release the clutch pedal gradually.



5.3.5 **Differential lock**



For the differential lock to be more effective, it should be engaged before the wheels start slipping. Do not engage the differential lock when one wheel is already slipping.



Warning

The differential lock prevents the tractor from steering when engaged.



Warning

Do not use the differential lock when approaching a bend or steering, and do not use in high gears or at high engine speeds.



Warning

If a wheel sinks into the soil, reduce engine speed before engaging the differential lock to prevent damage to the transmission.



Danger

Do not use the differential lock at speeds above 10 km/h.

5.3.5.1 Rear differential lock

The tractor is equipped with a rear differential lock. Use is recommended for ploughing jobs or if one of the two drive wheels encounters poor grip conditions when driving on muddy, rough or slippery terrain.

The differential lock is controlled mechanically with the lever. It is disengaged by releasing the lever.



Danger

If the differential does not disengage, reduce engine speed, stop the machine and release the differential by moving the steering wheel.

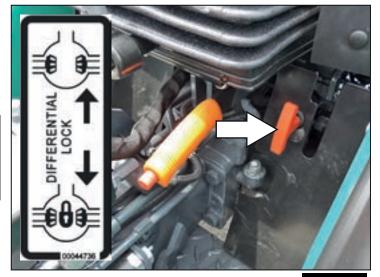


Fig. 5.20



5.3.5.2 Front differential lock

The tractor is equipped with a front differential lock. Use is recommended for ploughing jobs or if one of the two drive wheels encounters poor grip conditions when driving on muddy, rough or slippery terrain.

The differential lock is controlled mechanically with the lever. It is disengaged by releasing the lever.



If the differential does not disengage, reduce engine speed, stop the machine and release the differential by moving the steering wheel.

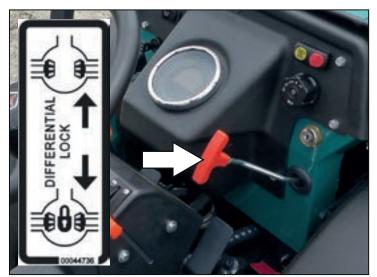


Fig. 5.21



5.4 Braking system

5.4.1 Service brakes

Depress the brake pedal. The machine is braked by pressing the brake pedal.

If braking feels excessively spongy or the brakes can be pressed all the way to the floor without resistance:

- Do not set the machine in motion.
- Identify the cause of the problem and resolve it immediately.
- If you cannot resolve the fault, consult immediately an authorised service centre.



Fig. 5.22



Avoid sudden braking unless in an emergency.

Braking gently and progressively is safer and reduces brake wear, increasing the lifespan of the brake components.



Danger

Check that the brakes work correctly before setting off with the tractor.



Danger

Do not leave you foot on the brake pedal when not braking.

5.4.2 Parking brake

The parking brake is a fully independent disc brake operated mechanically with a lever (1).



Fig. 5.23



To engage the parking brake, depress the service brake fully, pull the lever (1) up and then release the pedal. The red indicator lamp (3) on the dashboard illuminates when the parking brake is engaged.

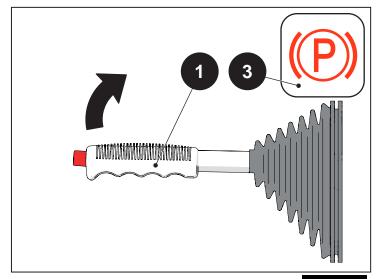


Fig. 5.24

To release the parking brake, press the button (2) and lower the lever (1). The red indicator lamp (3) on the dashboard extinguishes when the parking brake is disengaged.

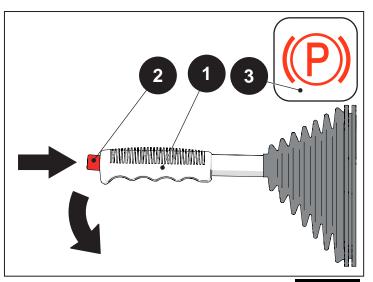


Fig. 5.25



Danger

Before setting off, make sure that the parking brake is released and the relative indicator on the display is off.



Danger

Always engage the parking brake before leaving the driver seat.



⚠ Warning

Never use the parking brake as a substitute for the service brake system.



5.5 Power Take Off

The PTO consists of a rotating shaft onto which different implements may be attached for different tasks.

Note

For safety, engine start is inhibited if the PTO is rotating



When not using the PTO, move the mode selector lever to Neutral. This stops the PTO shaft and any other connected rotating components from accidentally turning.

A Danger

Do not remove or damage the metal guard.



When the PTO is not in use, the shaft must be covered with the specific guard.



When connecting high inertia implements (e.g. mower decks, flail mowers etc.) to the PTO, a universal joint shaft drive with a freewheel mechanism should preferably be used. This prevents drive from being transmitted by inertia from the implement to the machine, and ensures that the tractor stops immediately when the clutch is depressed.

5.5.1 Rear power take off

Maximum torque demand from PTO: 30 kgm



Caution

Only couple implements to the PTO with a transmission ratio no lower than 3.4:1, using a connection with a torque limiter calibrated to 300 Nm (30 kgm).



Fig. 5.26



The rear PTO may be used in two modes (ground speed or independent) and at two operating speeds (540 rpm or 750 rpm).

Turn the PTO shaft guard (1) clockwise to unlock it and then remove the guard. Align the shaft guard (1) with the lock pins and turn anticlockwise to lock in place.

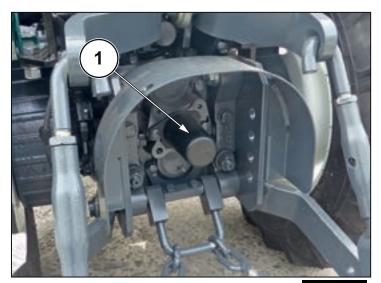


Fig. 5.27

PTO controls

The rear PTO is operated using two levers and a button.

The PTO mode selector lever (1) has three positions:

- Groundspeed lever in position (S)
- Neutral lever in centre (N)
- Independent lever in position (I)

Pull the lever (1) back to select Groundspeed mode. Push the lever (1) forwards to select Independent mode. In both cases, the indicator lamp (L) illuminates on the dashboard instrument when the respective mode is selected.

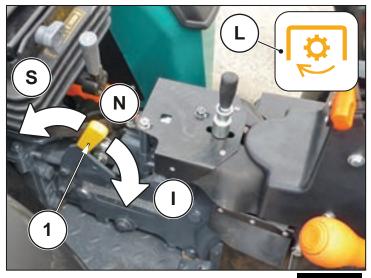


Fig. 5.28



The PTO speed selector lever (2) has three positions:

- Slow 540 rpm lever pushed forwards (A)
- Neutral lever in centre (N)
- Fast 750 rpm (540E) lever pulled back (B)

Return the PTO speed selector lever (2) to the neutral position (N) as soon as the task requiring use of the PTO is complete .

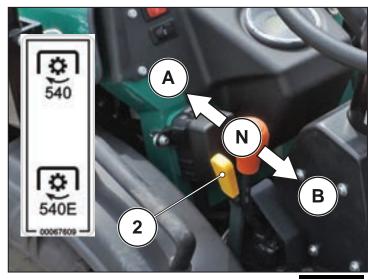


Fig. 5.29



Pressing the transmission clutch pedal of the machine also disengages drive to the PTO shaft.

To engage the PTO:

- Depress the clutch pedal.
- Set the PTO mode selector lever (1) to Groundspeed (S) or Independent (I).
- Set the PTO speed selector lever (2) to Slow (A) or Fast (B).
- Release the clutch pedal gradually.
- As soon as the task requiring use of the PTO is complete, set both levers (1) and (2) to neutral (N).

The tractor is equipped with a safety system that stops the engine if the operator has to get up from his seat while the rear PTO is engaged.

If the operator stands up from the seat while the PTO is engaged, a buzzer sounds and the PTO warning lamp (L) on the dashboard starts to flash: if the operator sits down again within 2 seconds, the warning lamp (L) and buzzer are deactivated; if not, the engine stops within 5 seconds, the buzzer stops but the warning lamp (L) continues to flash to warn that the PTO is still engaged.

Once the 5 second period has elapsed and the engine stops, the engine may only be started again with the normal engine start procedure (see section "Starting and stopping the engine"), and the PTO must be activated again, if required, as described in this section. You cannot reactivate the engine (and the PTO) automatically simply by sitting on the seat.



Danger

The engine stops (and the PTO is disengaged) approximately 5 seconds after the operator stands up. During the period of time an acoustic signal (buzzer) indicates that the PTO is still in operation.



To allow the PTO to continue operating even when the driver is not seated, the "PTO Auto" mode must be activated with the switch (3). Push the safety device (X) to the left and set the switch to (ON) to activate automatic mode. The switch itself illuminates when the mode is active.

Set the switch to (OFF) to deactivate automatic mode. The lamp incorporated in the switch extinguishes.

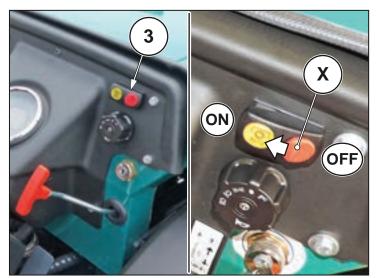


Fig. 5.30

Power Take Off operating functions

If the PTO is engaged and the operator gets up from his seat, the alarm buzzer sounds and the PTO warning light (1) starts to flash. If the operator sits down again, the buzzer stops.

If the PTO is disengaged, the alarm buzzer is not activated. If the engine is turned off when a protective device is activated, the buzzer stops.

When the engine is turned off for safety reasons regarding the PTO (for example, the operator gets up from his seat), then the PTO warning light (1) starts to flash.

When the engine is turned off for safety reasons regarding the PTO, you must restart the engine and reactivate the PTO. You cannot reactivate the engine (and the PTO) automatically simply by sitting on the seat.

If malfunctioning on the seat is detected, an error is displayed and the engine is turned off automatically each time the PTO is engaged.

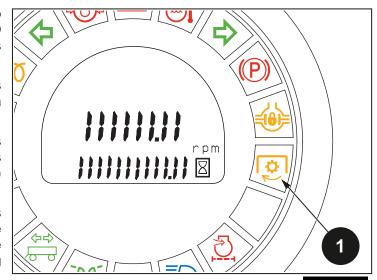


Fig. 5.31



5.5.2 Power Take Off speed

Power Take Off	540	750 (540E)	1000
Position	Rear	Rear	-
Direction of rotation	Clockwise	Clockwise	-
Туре	Independent	Independent	-
Specified PTO speed (rpm)	540	750	-
Engine speed / PTO speed (rpm)	5,27 / 1	3,59 / 1	-
Engine speed @ specified PTO speed (rpm)	2846	2692	-
Ratio between PTO speed / wheel speed (rpm)	15,04 : 1	15,04 : 1	-

5.5.3 Universal joint

See the specific manuals for the relative instructions for operating and servicing third party components safely.



For the universal joint to function correctly and to prevent damage to components and guards, bear in mind that the maximum operating angle technically possible for the universal joint depends on the dimensions and conformation of the PTO guard elements as much as on dimensions and conformation of the universal joint itself and its protective devices. As a result, the maximum operating angle of the universal joint effectively possible may vary from case to case.

▲ Danger
Only use universal joints with adequate protective measures.



5.6 Rear lift

This is a 3 point hydraulic rear lift controlled from a hydraulic distributor.

The following operating modes are available:

- Up-Down



Fig. 5.32

5.6.1 **Up-Down**

- Lever forwards = Raise implement.
- Lever back = Lower implement (float mode for implements that need to follow the contours of the terrain).
- Lever in middle position = Blocks the implement at various heights.

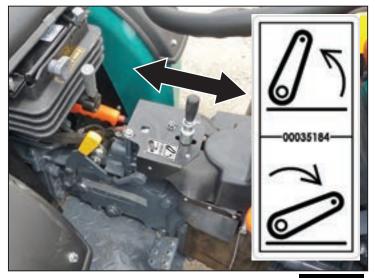


Fig. 5.33



5.7 Towing hitch and drawbar

5.7.1 Safety precautions and warnings



Danger

All installation, usage, cleaning, maintenance and adjustment procedures must be performed with the machine off and with the lift in the safety lock position. Wear suitable personal protective equipment (safety gloves and footwear) when performing these operations.



Danger

For safety, the correct type of towing device must be used for the trailer or implement towed in accordance with applicable legislation.



Danger

The risk of the machine rearing is increased when the towing device is set to the highest position. Keep out of the area between the tractor and the towed vehicle.



Danger

Before use, inspect the device and check that it works correctly to prevent the risk of damage and identify any worn components which must be replaced. Never use the device with damaged, worn or missing components.



Do not make any modifications or alterations to the device.



Warning

The device may only be used by persons with adequate experience in the use of this type of equipment. Always refer to the instructions given herein. All adjustment and maintenance procedures may only be performed by authorised, qualified personnel.



🔔 Warning

The towing device must be used correctly and set to the correct height to ensure the driveability of the machine.



Warning

When using a trailer with synchronised driven wheels, the drawbar must be kept in as horizontal position as possible.



Warning

The machine is equipped with an emergency front tow hitch for moving a trailer in an emergency or for towing the machine itself if necessary.



5.7.2 Emergency front tow hitch

The machine is equipped with an emergency front tow hitch for moving a trailer in an emergency or for towing the machine itself if necessary.

To prevent damage to the transmission and hydraulic system, ensure that:

- the differential lock is disengaged;
- the gear and range selector levers are in neu-
- the parking brake is disengaged.



Fig. 5.34

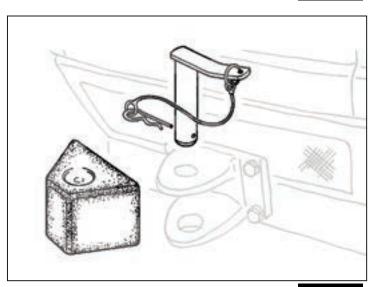


Fig. 5.35



Warning

Only use the front towing hitch to tow the tractor in an emergency.

Only tow in a straight direction relative to the centreline of the tractor.

Use only for the intended purpose and as indicated.



Caution

Do not exceed 10 Km/h when towing the tractor.

An operator must remain on board the towed vehicle to manoeuvre the vehicle itself as necessary.



More force is needed to steer the wheels when the engine of the tractor is not running.



5.7.3 Rear towing hitch

5.7.3.1 EEC-X towing hitch

The tractor may be equipped with an "EEC-X" rear towing hitch for towing trailers with one or two axles.

Туре	Hitch slider
Category	X
Make	СВМ
Type designation attributed by manufacturer	X193F
EU mark or approval number	e11 00304 NS
Static vertical load for category	500 kg
Hitch offset "c"	380 mm
Wheelbase of agricultural machine "I"	990 mm
Ratio between front axle load/ total axle load "Ma/Mt"	0,59
max. permissible height (a) (0.5xl) "h"	495 mm
max. effective height min/max	330 mm

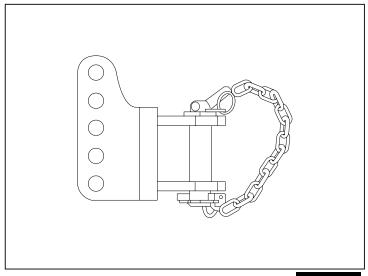


Fig. 5.36

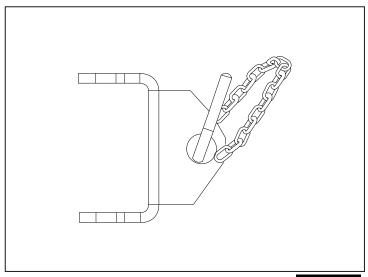


Fig. 5.37



5.8 Towing trailers



Danger

Stopping distances increase with speed and with the weight of the towed weight. Drive slowly and allow more time and distance to stop safely.



Danger

The total towed weight must not exceed the combined weight of the tractor, the ballast and the operator. Apply counterweights or ballast weights to the wheels as described in the operator manual of the implement or of the tractor.



Danger

Towing an excessive load may cause loss of traction and loss of control on slopes. Reduce the weight towed by the tractor when working on slopes.



Danger

Never carry persons or allow children in or on the towed implement



Danger

Use only homologated towing hitches. Only tow with a machine with a suitable towing hitch. Towed implements must only be hitched to the approved hitching point.



Danger

If it is not possible to reverse up a slope when towing a load, this means that the gradient is too steep for working with a towed load. Reduce the load towed or abandon the task.



Danger

Never negotiate a downhill gradient with the machine in neutral.



Danger

Keep out of the area between the tractor and the towed vehicle.



Danger

Do not make sudden turns. Work with particular caution when turning or working on poor surfaces. Take extreme care when reversing.



∆ Warning

Fit supplementary lights if the towed implement obstructs or limits visibility of the turn indicators or other lights on the rear of the machine.



Set the towing hitch to the correct height for the weight of the load towed.



Fig. 5.38

5.8.1 7 pole socket for trailer

The seven-pole socket allows connecting the lights, turn indicators and other electrical devices for a trailer or implement.

Fit supplementary lights if the towed implement obstructs or limits visibility of the turn indicators or other lights on the rear of the machine.



Fig. 5.39

Terminal function:

- 1 Left turn indicator
- 2 Free
- 3 Earth
- 4 Right turn indicator
- 5 Right tail light
- 6 Brake lights
- 7 Left tail light

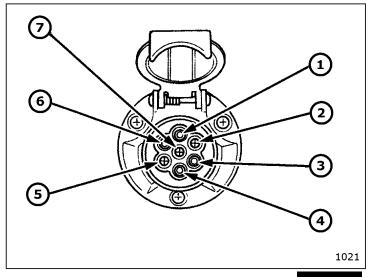


Fig. 5.40



5.9 Three point linkage for implements



Danger

Any adjustments to the three point linkage or to the implement must be made with the engine off, the key removed from the ignition switch and the implement lowered to the ground.



Danger

Keep out of the area between the tractor and the towed vehicle/implement when checking the three point linkage.



Danger

Do not use the top link of the lift as a towing point for the machine.



Danger

When driving on roads with an implement carried on the three point linkage, take up the slack in the chains and keep the lift raised.



Danger

Never work under an implement raised only by the hydraulic lift. Always use a suitable support to hold it in place and turn off the engine.



Caution

The maximum permissible load value of the lift is indicative only. The weight of the implements lifted must be less than maximum liftable load, as the distance between the three point linkage and the centre of gravity of the load also significantly influences the load effectively sustained by the linkage.

The weight sustained by the linkage increases significantly within increasing distance.



Warning

The top link must be set in the highest hole when driving on the road to prevent damage to the swinging drawbar carrier.

The machine is equipped with a three-point hitch.

For the lift to operate properly, carefully check the dimensions of the implement to be hitched to the tractor.

To prevent the undue stress to the linkage assembly caused by incompatible dimensions, the implement hitch point must be of the same category as the three point linkage of the tractor hitch.



5.9.1 Rear three-point linkage

The three point linkage consists of the following components:

- 1 Top link arm
- 2 Adjustable tie rod
- 3 Sway chains
- 4 Lower lift arm

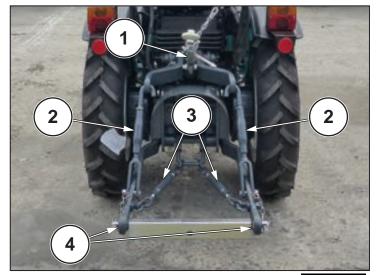


Fig. 5.41

5.9.1.1 Top link arm

Adjust the length of the top link arm to vary the angle of attack of the implement compared to the ground.

Turn the top link to set the required length using the lever (1).

The implement hitch ball (2) is a category 1 device.

Tighten the lock ring (3) to secure the top link in the required position.

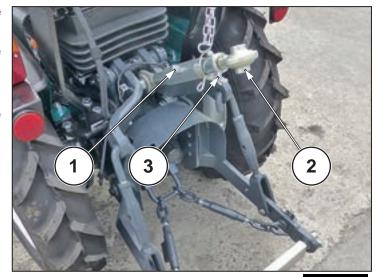


Fig. 5.42



5.9.1.2 Adjustable vertical tie rods

Adjust the adjustable tie-rod to level and align the lower lift arms in the correct position for the implement used and the task.

To adjust the tie-rod, turn the handle (1) clockwise to raise the lower arm or anticlockwise to lower the arm to the required height.

After adjusting, with the lift completely raised, check that implement is not lifted by more than necessary, and with the lift lowered, check that implement still has additional downward travel.



Fig. 5.43

5.9.1.3 Stabilizer chains

Adjust the sway chains to limit the lateral movement of the lower lift arms:

- 50-60 mm lateral swing for ploughs, rotary harrows etc.;
- 10-50 mm lateral swing for grader blades, cultivators etc.;
- 0 mm lateral transporting implements (implement not in use).

To adjust the chains, undo the lock nut (1), shorten or lengthen the chains by turning the handle (2) to attain the required degree of sway, and then tighten the nut to lock the adjuster handle.

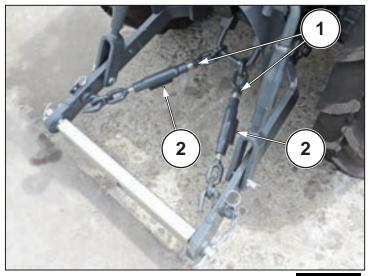


Fig. 5.44

5.9.1.4 Implement coupling end

Category 1 ball socket.

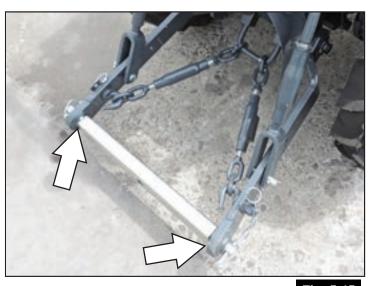


Fig. 5.45



5.10 Wheels and tracks



Danger

Tyres must be replaced by qualified personnel using suitable equipment and technical expertise.

A failure to comply with this recommendation may result in serious injury or death.



Danger

The tyre may explode when being inflated if it is damaged or if the rim is not intact or correctly matched.



Warning

Replace any tyres that show signs of damage, punctures or swelling immediately.



Warning

Periodically check that the tyres are inflated to the correct pressure and check the values with the information provided by the manufacturer in relation to use of the tractor.

Follow the following instructions on use, maintenance and replacement of tyres:

- choose tyres that are suitable for tractor use, in the recommended combinations;
- use tyres that are suitable for the work load;
- do not exceed the speed limit indicated on the tyres:
- check that the nuts on the tyres which have just been fitted are tight after 3 hours of work;
- periodically check that the nuts are tight, that tread wear is even and that there are no signs of damage, swelling or punctures:
- contact specialised technicians if a tyre is subjected to a violent impact or is torn;
- do not park on petroleum-based substances (oil, grease, diesel, etc.) to avoid damaging the tyres;
- tyres fitted on tractors which are put into storage may deteriorate more quickly; make sure the tractor is raised off the ground and protect the tyres from direct sunlight.
 - 1 Tyre
 - 2 Well
 - 3 Connecting bracket
 - 4 Rim (or disc)

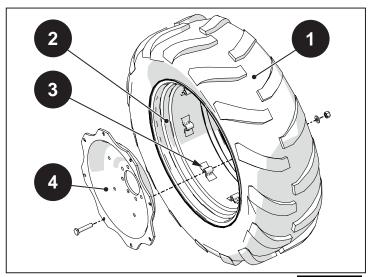


Fig. 5.46



5.10.1 Inflating the tyres



Danger

Always keep tyres inflated to the correct pressure. Never exceed this value since excessive pressure may cause the tyre to explode. Using tyres inflated to incorrect pressure may have fatal consequences.

Inflating the tyres to the correct pressure is vital to ensuring that they are safe and long lasting. Incorrect inflation pressure involves the following risks:

- Low pressure causes premature and uneven wear and significantly shortens the life of the tyre. A flat tyre may also result in bead unseating.
- Excessive pressure reduces the tyre's resistance to impact and increases the probability of it developing swelling and deformation which may also involve the rim and lead to the tyre bursting.

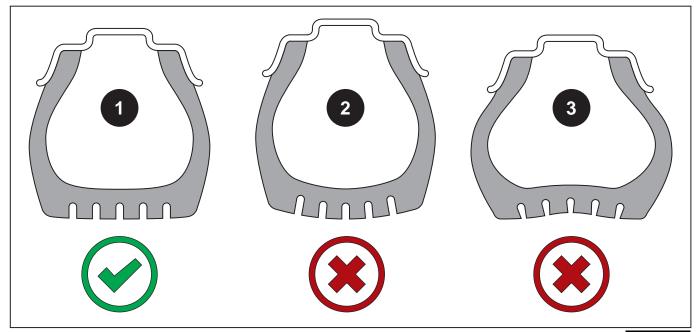


Fig. 5.47

- 1 Correct pressure
- 2 Excessive pressure
- 3 Low pressure



Pressure ctrl

The pressure must be checked regularly, at least once every 15 days, especially if the tyres are ballasted with liquid.

Check the pressure when the tyres are cold since pressure is affected by overheating. Tyres are cold if they have not been used for at least 1 hour.

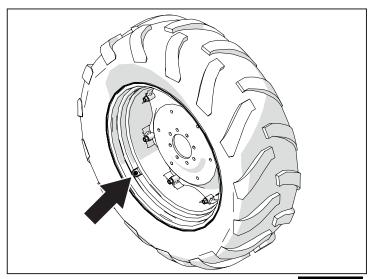


Fig. 5.48



Caution

When checking the tyre pressure, stand out of line of the valve or cap as far as possible.



Warning

Never reduce the inflation pressure when the tyres are still warm.



Warning

Do not overload the tractor when the track is widened.



Axle load affects inflation pressure.



5.10.2 Puncturing of a tyre



Danger

Stop driving immediately if the tyre is flat after puncturing or any other reason.

If it is not safe to stop immediately, when on a road, for example, find a safe place to stop.

Tyres must be repaired and replaced by authorised, suitably qualified personnel.

The procedure for replacing a wheel is described in the "Replacing a wheel" section.

5.10.3 Replacing a wheel

To replace a wheel, do the following.



Danger

Tyres must be repaired and replaced by authorised, qualified personnel using suitable equipment.

Make sure that other personnel keep a safe distance away during the operation.

- 1 Remove the wheel ballast, if installed.
- 2 Lift the tractor. See the "Lift points" section in the chapter "General safety rules" for information on how to lift the tractor safely.
- 3 Completely deflate the tyre on the wheel that you want to replace.
- 4 Unscrew the nuts that fasten the wheel to the axle shaft and then remove the wheel.
- 5 Fit the new wheel and then tighten the nuts/ screws to the correct tightening torque.
- 6 Lower the tractor.



Fig. 5.49



Warning

Once the first 10 hours of work have elapsed after refitting the wheel, check the torque by retightening the screws on the wheel using a suitable torque wrench.

Tightening torques

The following table shows the tightening torques for fastening the wheels to the hubs (axle shaft).

Wheel	Torque
Front wheel	85 Nm (8.5 kg·m)
Rear wheel	85 Nm (8.5 kg·m)



5.10.4 Adjusting the tracks



Danger

Only use the tractor if the wheels, rims and wells are securely fastened. Tighten screws and nuts to the recommended torque.

Different types of agricultural work may require different track widths.

A simple adjustment to the track is obtained by fastening the wheel rim to the axle shaft (4) with the concave part facing inwards or outwards by inverting the position of the wheels on the axle to keep the tops of the tread facing the drive direction.

If the wheels have an adjustable track rim, you can also remove the wheel (2) from the well (1) and refit it in a different position. The connecting brackets (3) are off-centre to the well axle (1) so that different track widths can be determined according to the refitting configuration. This adjustment is not possible for fixed track rims since the wheel (2) and the well (1) are one single piece.

In practice, not all track widths can be used since the tyre may not have enough space.

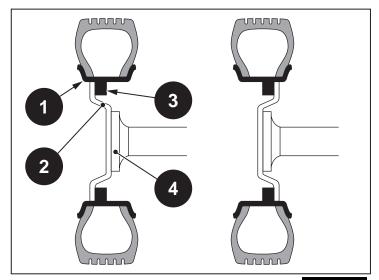


Fig. 5.50



Warning

When adjusting the track widths, make sure that the tread is correctly positioned for the forward drive direction. The position of the tread is indicated by an arrow on the side of the tyre.



Warning

Use suitable lifting equipment to support the wheels and wear suitable protective clothing.

Work on one wheel at a time and only move on to the next after completely securing the previous one.

Checking the maximum steering angle



Warning

After adjusting the track widths, it is important to check the maximum steering angle. Carry out the following procedure.

- Lift the front end off the ground so that the front axle can reach maximum oscillation. See the "Lift points" section in the chapter "General safety rules" for information on how to lift the tractor safely.
- Turn on the engine and turn the steering wheel to full lock, both left and right.
- Make sure that the tyres (or mudguards, if steered) remain at a minimum distance of 2 cm from the bodywork (or from the mudguards, if fixed),
- If this distance is not correct, you must adjust the steering angle and, if necessary, the pivot angle of the front mudguards (if applicable).



5.10.4.1 Track widths

Axle width

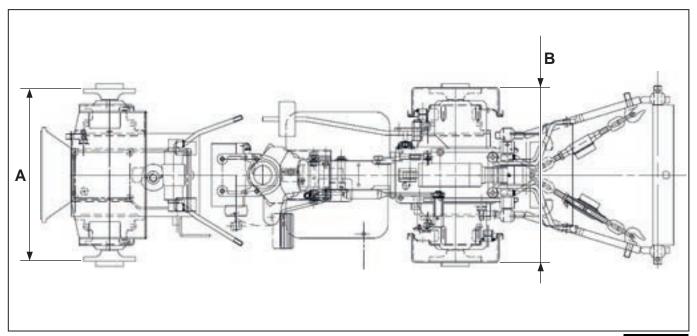


Fig. 5.51

The "axle width" is the distance between the mating surfaces of the axle shafts (without wheels).

А	Width between front axle flanges	492 mm
В	Width between rear axle flanges	500 mm



Track widths

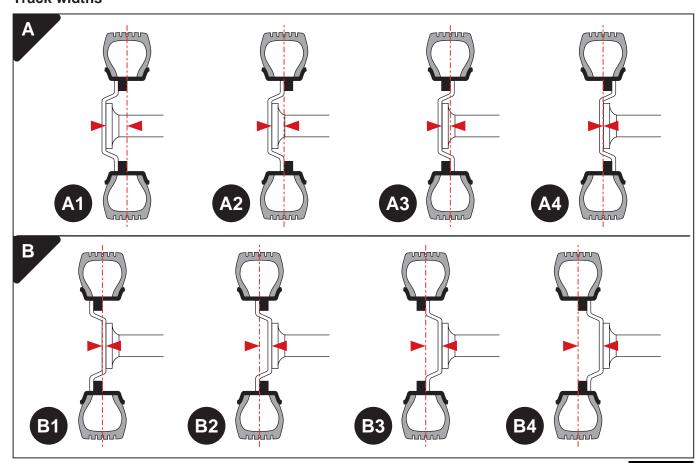


Fig. 5.52

- A Internally mounted flange
- B Externally mounted flange

Set	Axle	Tyre	Wheel	A1	A2	A3	A4	B1	B2	B3	B4
				(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
1	Front	6.00-16	4.00EX16	364	/	/	/	632 *	/	/	/
	Rear	6.00-16	4.00EX16	378	/	/	/	646 *	/	/	/
2	Front	6.5/80-15	5JX15	364	/	/	/	632 *	/	/	/
	Rear	6.5/80-15	5JX15	378	/	/	/	646 *	/	/	/
3	Front	5.00-15	4JX15	412	/	/	/	584 *	/	/	/
	Rear	5.00-15	4JX15	426	/	/	/	598 *	/	/	/
4	Front	23x8.5-12	4.00EX16	364	/	/	/	632 *	/	/	/
	Rear	23x10.50-12	4.00EX16	378	/	/	/	646 *	/	/	/

- * Base version
- † Not recommended
- ‡ Non possible
- ^ Special, available as an option
- Set Tyre combinations



If the track widths are lower than the factory track widths, you may have to adjust the steering angle and remove the front mudguards (if present).



5.10.5 Adjusting steering angle

The machine is delivered with optimised steering characteristics according to the original equipment covers.

When adjusting the track widths, the tyres or mudguards may come into contact with the bodywork when the wheels are turned to the maximum steering angle. Turn the specific adjuster screws to correct this problem.



Warning

This must be done by qualified personnel using suitable equipment.



Warning

Adjustment must be carried out with the axle on full lock (on a wedge, first on one wheel and then on the other).

Carry out the following procedure.

- Steer the wheels to the maximum steering angle on one side and measure the gap between the front and rear mudguards.
 - If the maximum steering angle is set correctly, the gap X measured will be between 1.5 and 2 cm, as shown in (A).
 - If the gap measured is not within the indicated range, as shown in the example in figure (B), adjust the maximum steering angle.

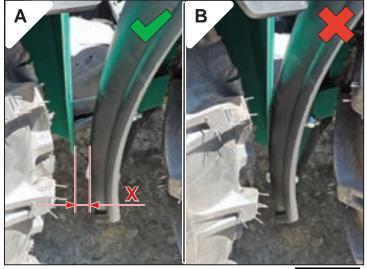


Fig. 5.53



- The screws (1) for adjusting the steering stops are situated on the centre tunnel. The screw on the right sets the maximum steering angle to the right, the screw on the left sets the maximum steering angle to the left. Turn the screw (1) on the respective side to adjust the maximum steering angle on that side.
 - Tighten the screw (1) to reduce the gap between the mudguards.
 - Loosen the screw (1) to increase the gap between the mudguards.
- Turn the wheels to the maximum steering angle on the same side as before and measure the gap between the mudguards again. Repeat the procedure described above as necessary until the gap measured is correct.
- When the gap between the mudguards at the maximum steering angle is within the range indicated, tighten the checknut (2) completely to lock the adjuster screws (1).



Fig. 5.54

The adjustment procedure must be performed on both the right and left hand sides of the centre articulation joint. Carry out the adjustment procedure described above on both sides of the tractor.

Once the entire procedure is complete, check again that there is a gap of at least 2 cm between the tyre and the bodywork on both sides.



5.11 Ballast weights

5.11.1 Wheel ballast weights

Working with high draft force may cause the drive wheels to lose traction with the terrain. This reduces the effective speed of the tractor, increases fuel consumption and damages the tyre treads. In these situations, cast iron ballast weights may be applied to the wheels to increase grip.

Maximum number of ballast weights permitted per wheel	1
Weight of single ballast weight	30 kg
Material	Cast iron

5.11.2 Liquid ballast

The driving wheels are ballasted by pouring water into the tyres.



Warning

The use of liquid ballast requires special tools and specific training. Have the procedure done by your dealer or a tyre service centre.



Warning

NEVER fill a tyre with water to over 90% of its volume. Overfilling with water may damage the tyre.



🔔 Warning

It is preferable to use tyres with inner tubes.

If using tubeless tyres, ask your dealer for information on lubricating the disc to prevent corrosion.



Warning

Use water with an antifreeze solution in cold weather.



Warning

Do not use alcohol as liquid ballast.



Danger

Do not exceed a road speed of 32 km/h (20 mph) when using liquid ballast.



To fill with water:

- rotate the wheel so that the valve is at the top;
- carefully unscrew the movable valve fitting;
- fill the tyre with water using the specific tool;
- occasionally stop filling with water and wait for the air to escape;
- fill the front tyres to 40% or 75%, depending the amount of ballast needed; fill the rear tyres to no more than 40%;
- tighten the movable valve fitting;
- Inflate the tyre to the normal operating pressure.



The tyres must be filled to the same level on both sides of the axle.

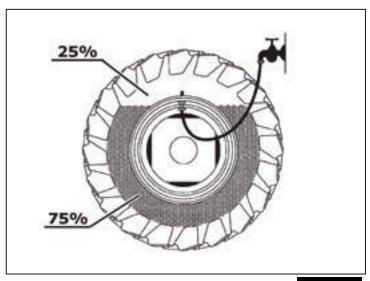


Fig. 5.55

How to drain out the water:

- rotate the wheel so that the valve is at the bottom;
- carefully unscrew the movable valve fitting;
- let the water drain out:
- connect a suitable fitting to the valve with a length of tube reaching the bottom of the tyre to complete draining the tyre;
- inflate the tyre until all the water remaining in the tyre is expelled;
- tighten the movable valve fitting;
- Inflate the tyre to the normal operating pressure.

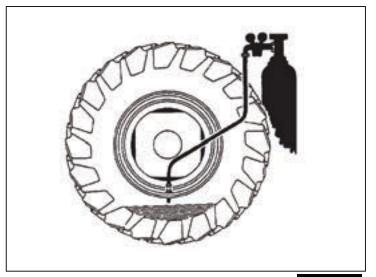


Fig. 5.56



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6 : Service procedures

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6.1 Service intervals

See the table for the parts subject to service, the parts involved and the service period.



Warning

All work must be performed with the engine off and at ambient temperature.



Warning

The oil level must always be checked and topped up with the engine in a horizontal position.



Warning

To prevent oil spillage, before starting the engine, always:

- check that all dipsticks are fitted correctly;
- check that the following are fitted and tighten correctly:
- all oil drain plugs and;
- all oil filler caps.



Note

After maintaining, cleaning or repairing the tractor, reinstall all protective covers or plates before starting it up.



6.1.1 Check and clean

		Inspection interval							
Assembly	Description of procedure	Hours	10	50	200	300	1,000		
		Months		12	12	12	12		
	Engine oil		Х						
	Engine air filter		Х						
	Rubber inlet hose from dry air filter (intake manifold)		Х						
Engine	Fuel tank						Х		
	Fuel pipes		Х						
	Cooling system				X				
	Calibrating and cleaning injectors (1)					X			
	Front axle oil - Front differential			Х					
Transmission	Transmission Oil - Rear Differential			Χ					
	Oil suction line filter			Χ					
	Tyre pressure			X					
Bodywork	Tightening torques for wheel fasteners			Х					
	Clutch pedal travel		Х						
	Brake pedal travel		Х						

(1) - Have the procedure performed by an authorised GOLDONI service centre

6.1.2 Replacement intervals

	Description of procedure	Replacement interval							
Assembly		Hours	200	800	1000	1200	2500	5000	
		Months	12	12					
	Engine oil (1)		Х						
	Engine oil filter (1)		X						
	Fuel filter		Х						
	Engine Air Filter - External (1) (2)								
Engine	Rubber inlet hose from dry air filter (intake manifold)				X				
	Cleaning interior of radiator (3)					Х			
	Adjusting rocker clearance				X				
	Partial engine overhaul (3)						Х		
	Complete engine overhaul (3)							X	
Transmission	Transmission Oil - Rear Differential			Х					
Transmission	Front axle oil - Front differential			X					

^{(1) -} In heavy duty working conditions, such as when working in dusty environments and operating under extreme loads, change every 150 operating hours

^{(2) -} After checking and cleaning 6 times

^{(3) -} Have the procedure performed by an authorised GOLDONI service centre



6.2 General maintenance and inspection

6.2.1 Opening the bonnet

Fit the specific pin in the hole indicated to release the cowl and then lift the cowl.



Fig. 6.1

The engine cowl is held in position by the gas strut.



Fig. 6.2



Make sure that the cowl is closed properly during normal work.



6.2.2 Refuelling



Danger

Only refuel with the engine off.

Do not smoke near fuel or when the tank is being filled.



Caution

Do not fill the fuel tank completely. Fill to approximately 1 cm below the max. level indicated to allow some freedom of movement for the fuel.

Clean any spilt fuel before starting the engine.



Warning

Do not use fuels with characteristics differing from those indicated.

Do not use fuel contaminated with water or other substances as this may damage the engine.

Open the cowl to access the fuel tank filler cap.

Use a funnel when refuelling to prevent the risk of spillage. Make sure that the container used for refuelling is clean and contains no residue or contaminants. If necessary, filter the fuel appropriately.

Use quality fuels with technical characteristics meeting the requirements indicated in the section "Lubricants, fuels and coolants" in the chapter "Technical characteristics".

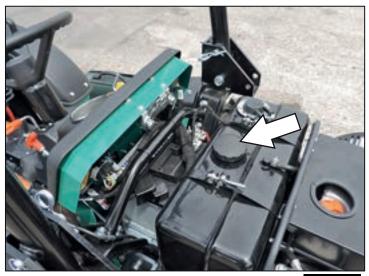


Fig. 6.3

6.2.3 Checking engine oil level and topping up



Caution

Wear protective gloves as the oil and dipstick may cause burns if hot.



Caution

Repeated and/or prolonged contact with used oil may cause skin cancer. If contact with oil cannot be avoided, wash your hands thoroughly with soap and water as soon as possible.



Warning

Operating the engine with insufficient oil may cause damage to the engine itself. Overfilling with oil is also harmful, as excess oil combusting in the cylinder may cause a sudden increase in engine speed.



Proceed as follows.

- Start the engine and warm up to operating temperature (70 - 80°C).
- Turn off the engine and remove the key from the ignition switch.
- Ensure that the engine is perfectly level.
- Wait a few minutes for all the oil to drain back into the sump.
- Remove the dipstick (1) and check the oil level. Top up if the level is not near the MAX marking.

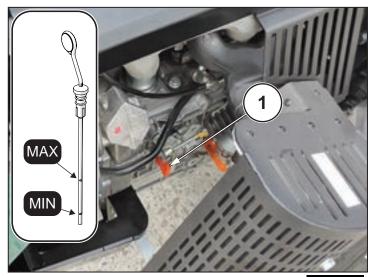


Fig. 6.4

- If necessary, top up via the fillers (2). Fill to the correct level, adding only small quantities of oil at a time (100 to 200 ml) to prevent the risk of filling beyond the maximum permissible fill level. See "Lubricants, fuels and coolants" for the correct oil quantity.
- Refit the dipstick (1) correctly.

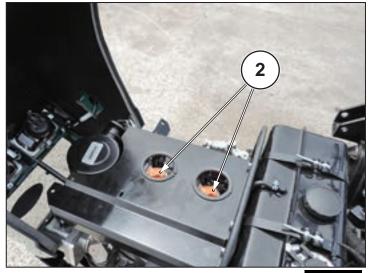


Fig. 6.5



Warning

The oil level must be between the MIN and MAX markings on the dipstick (1).

Never mix oils of different brands or with different characteristics (see "Lubricants, fuels and coolants").



Warning

Do not discard fluids like fuels, lubricants, coolants or other fluids in the environment.

ALWAYS place a collection basin under the tank to drain near the drain point.



Replacing the engine oil filter cartridge



Caution

Wear protective gloves as the oil and dipstick may cause burns if hot.



Caution

Repeated and/or prolonged contact with used oil may cause skin cancer. If contact with oil cannot be avoided, wash your hands thoroughly with soap and water as soon as possible.



Warning

Dispose of harmful materials correctly. Dispose of in compliance with applicable legislation.

Perform the maintenance replacing the filter following the procedure described below.

- Turn off the engine and remove the key from the ignition switch.
- Wait for the engine to cool sufficiently to prevent the risk of burns.
- Unscrew the filter (1) and replace.
- Check the condition of the filter sealing gasket and replace it if necessary.
- Lubricate the gasket of the new cartridge before fitting.
- Fit the oil filter.

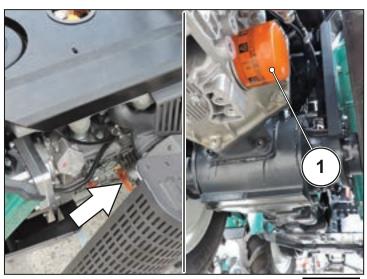


Fig. 6.6



Warning

If any oil leaks are noted, stop the engine immediately and contact an authorised GOLDONI service centre.



6.2.5 Changing the engine oil



Caution

Wear protective gloves as the oil and dipstick may cause burns if hot.



Caution

Repeated and/or prolonged contact with used oil may cause skin cancer. If contact with oil cannot be avoided, wash your hands thoroughly with soap and water as soon as possible.



Warning

Operating the engine with insufficient oil may cause damage to the engine itself. Overfilling with oil is also harmful, as excess oil combusting in the cylinder may cause a sudden increase in engine speed.



Warning

Dispose of harmful materials correctly. Dispose of in compliance with applicable legislation.



Warning

The oil must be changed with the engine in a perfectly level position.

Proceed as follows.

- Start the engine and warm up to operating temperature (70 80°C).
- Ensure that the engine is perfectly level.
- Turn off the engine and remove the key from the ignition switch.
- Wait for the engine to cool sufficiently to prevent the risk of burns.



Note

To drain the engine oil more rapidly and completely, preferably drain while the engine is still warm (approximately 60°C).

- Place a suitably sized drain pan underneath.
 See "Lubricants, fuels and coolants" for the correct oil quantity.
- Unscrew the oil filler caps (2) and pull out the oil dipstick (3).
- Unscrew the drain plug (1) on the oil sump on the underside of the engine and wait for all the oil to drain into the pan.
- Refit the oil drain plug (1), using a new copper gasket, and tighten 22 Nm (2.2 kgm).

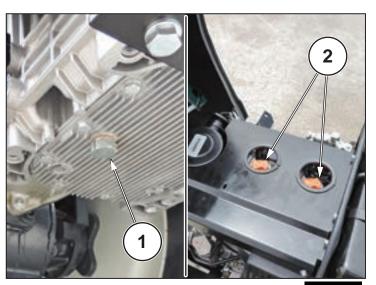


Fig. 6.7



- Add new oil via the filler orifice (2) to reach the correct level indicated on the oil dipstick (3).
- Refit and righten the filler cap (2).



Warning

Before starting the engine again, check that: the oil dipstick (3), the oil drain plug (1) and the oil filler caps (2) are fitted and tightened correctly to prevent the risk of escaping lubricant oil

- Start the engine and warm up to operating temperature (70 - 80°C). Check for oil leaks.
- Switch off the engine.
- Wait a few minutes for all the oil to drain back into the sump.
- Check the oil level.

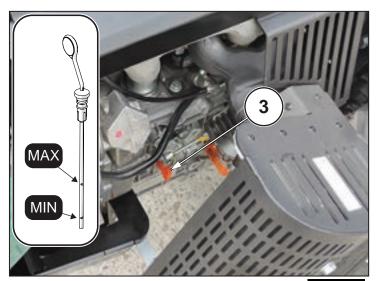


Fig. 6.8

6.2.6 Check the tightness of the screws and connectors

Proceed as follows.

- Wait a few minutes with the engine at idle speed to warm the engine to operating temperature.
- Run the engine to warm to operating temperature (70 to 80°C).
- Switch the engine off and wait for it to cool.
- Check the tightness of the fastener screws of the main components.
- Check the tightness of the connectors in the circuit.
- Check the tightness of the clamps.
- Check for fluid leaks.

To check the pipes, press or bend the pipes gently along the full length of the pipes themselves and, in particular, near fastener clamps.

Replace any pipes with signs of ageing, cracks or leakage, and which are no longer sufficiently elastic.



Warning

Contact an authorised GOLDONI service centre if any damaged pipes are found.



6.2.7 Bodywork maintenance



When using a pressure cleaner, do not direct the jet of water at the following:

- Electrical system components
- Rear
- Hydraulic pipes
- Radiator
- Electrical components
- Soundproofing seals
- Any other components which could be damaged by high pressure water

Periodically check the condition of the bodywork. Abrasions and deep scoring must be repaired by specialized personnel to ensure long life. Check for residual water in hidden parts of the bodywork.

Clean the bodywork with a normal solution of water and a specific shampoo:

- When needed, if the tractor is used in a normal environment.
- Frequently, if it is used in places near the sea.
- Immediately after using organic substances or chemicals.

Clean the mudguards and bumpers regularly and remove any mud.



Do not discard fluids like fuels, lubricants, coolants or other fluids in the environment.

6.2.8 Engine checks and inspections

Some of the maintenance procedures, checks and inspections which must be performed on the engine during normal operation are indicated in the following list.

- bleed fuel system;
- check the tightness of the screws and connectors;
- check engine oil level;
- check belt tension;
- change engine oil;
- change engine oil cartridge;
- change the fuel filter.



Changing the air filter oil 6.2.9



Caution

Stop the engine and wait until it has cooled down before starting any maintenance procedure.



Warning

Use oil is extremely harmful for the environment. Take all precautions to prevent environmental contamination.

Carry out the following procedure.

- Release the two levers (1) and remove the cover (2).

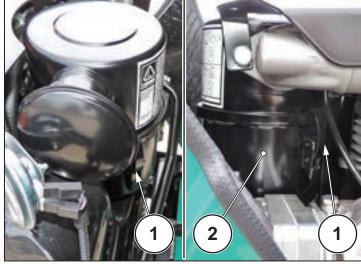


Fig. 6.9

- Remove the filter core (3).
- Pour engine oil of the specified type into the cover (2) up to the level indicated.
- Refit the air filter.



Warning

Make sure that the filter is fitted correctly to prevent the risk of dust or other foreign matter entering the intake duct.

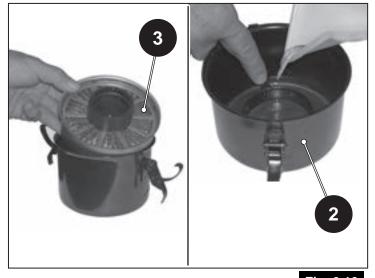


Fig. 6.10



6.2.10 Cleaning the oiled air filter



Caution

Stop the engine and wait until it has cooled down before starting any maintenance procedure.



Caution

Wear protective eyewear when using compressed air.



Warning

Use oil is extremely harmful for the environment. Take all precautions to prevent environmental contamination.



Note

The filter clogging indicator lamp (A) is situated on the dashboard instrument. This lamp illuminates to indicate that the air filter is clogged and must be serviced or replaced.

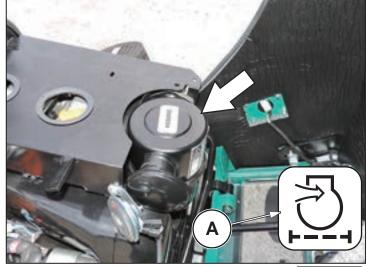


Fig. 6.11

Carry out the following procedure.

- Release the two levers (1) and remove the cover (2).





- Remove the upper foam filter core (3).
- Wash the foam filter core (3) with soapy wa-
- Dry with compressed air at a pressure not exceeding 7 bar.

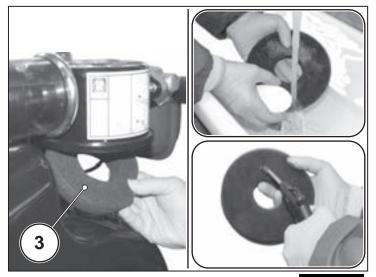


Fig. 6.13

- Remove the lower filter core (4).
- Wash the lower filter core (4) with diesel fuel.
- Dry by blowing compressed air slowly through all the pleats (max. 7 bar).



Danger

Never clean with highly flammable solvents, as this may cause an explosion.

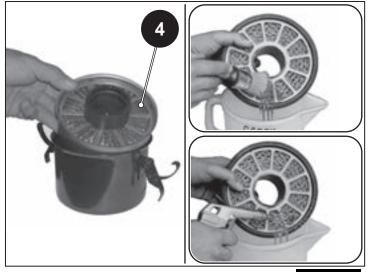


Fig. 6.14

- Empty and clean the housing (2).
- Pour engine oil of the specified type into the cover (2) up to the level indicated.
- Refit the air filter.



Warning

Make sure that the filter is fitted correctly to prevent the risk of dust or other foreign matter entering the intake duct.

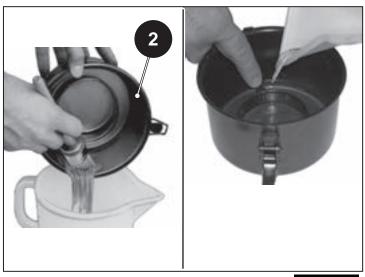


Fig. 6.15



6.2.11 Checking and adjusting service brake pedal height



The adjustment procedure may only be carried by the dealer or specialised personnel.

When the pedal is released, the distance (A) between the pedal and the footboard is 110 mm. With new brake shoes, the machine starts to brake at a pedal heigh of approximately 85 mm from the footboard.

Make the adjustment when:

- Brake pedal travel is excessive or too light.
- When the braking of one of the wheels is unbalanced compared to the other wheels.
- When the braking distances increase compared to the same conditions of use.



Have the adjustment procedure performed by an authorised GOLDONI service centre.

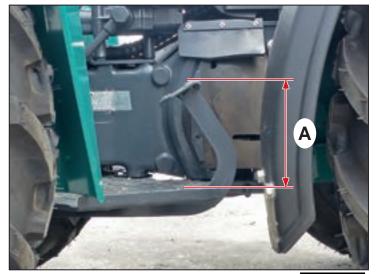


Fig. 6.16



6.2.12 Checking and adjusting clutch pedal travel

Danger

The adjustment procedure may only be carried by the dealer or specialised personnel.

Periodically check the dead zone of the control. The pedal must have a dead zone of approximately 20 mm; if the dead zone is not correct, adjust the clutch pedal as necessary.

Start of travel (A)	130 mm
Kiss point (B)	110 mm

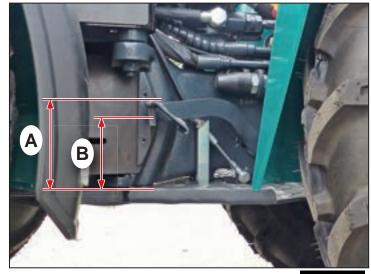


Fig. 6.17

Unscrew the adjuster nut (1) to increase the dead zone or tighten to reduce the dead zone.

The adjustment procedure is complete once the travel and dead zone of the control comply with the measurements specified.



Note

Have the adjustment procedure performed by an authorised GOLDONI service centre.



Fig. 6.18



6.2.13 Checking engine idle speed

Position the lever (1) completely down and make sure that the number of engine revolutions stabilizes at the idle speed. If not, contact an authorized workshop.

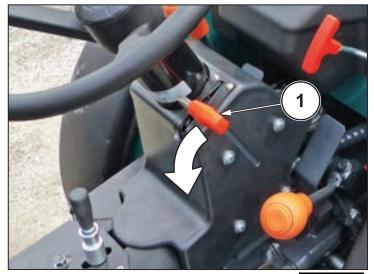


Fig. 6.19

6.2.14 Adjusting the valve clearance

Have this maintenance procedure performed by an authorised GOLDONI service centre.

6.2.15 Adjusting rocker clearance



This adjustment procedure must only be performed by specialised personal using specific tools.

To adjust the clearance between the valves and rockers: Remove the rocker cover. Turn the crankshaft to bring the piston to TDC on the compression stroke. Loosen the lock nuts of the adjuster screws. Fit a 0.15 mm feeler gauge between the rockers and the valves. Tighten the adjuster screws until the feeler gauge can be pulled out with no resistance. Tighten the lock nuts of the adjuster screws.

6.2.16 Checking the seatbelt

Check the seat belt and the respective fasteners at least once a year. If the belt is cut, broken, excessively/abnormally worn, faded, rusted or scratched, or if its circlip or winding apparatus is damaged, replace it immediately. For your safety, only use the accessories indicated for this machine when replacing the belt.



6.3 Cooling system maintenance



Caution

Stop the engine and wait until it has cooled down before starting any maintenance procedure.



Caution

Wear protective eyewear when using compressed air.

6.3.1 Cleaning the cooling system

Carry out the following procedure.

- Undo the indicated screws and remove the engine cover (1).

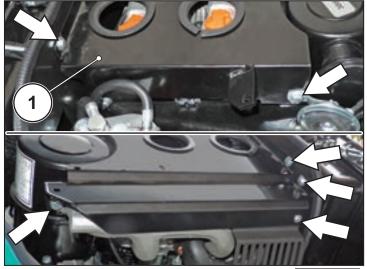


Fig. 6.20

- Undo the fastener screws of the fuel filter (2) and move the filter aside so that it does not impede the following operations.

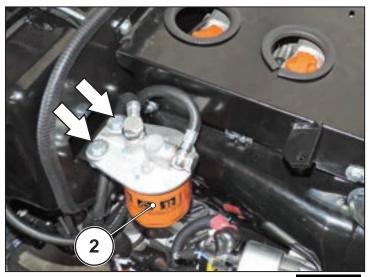


Fig. 6.21



- Undo the indicated screws and remove the duct (3).

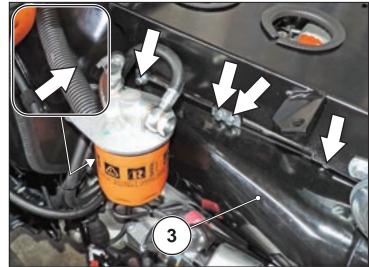


Fig. 6.22

- Clean the heat dissipation fins with a brush and diesel fuel.
- Dry with compressed air at a pressure **not exceeding 7 bar**.
- Refit the duct (3) and fasten by tightening the relative screws.
- Fit the fuel filter (2) in its original position and tighten the relative screws.
- Refit the engine cover (1) fasten by tightening the relative screws.

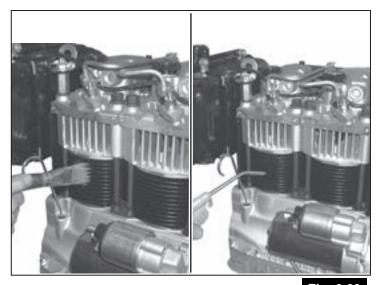


Fig. 6.23



6.4 Fuel system maintenance



Danger

All fuels are flammable.

Spilling or dropping fuel onto hot surfaces and electrical components may cause a fire.

To prevent the risk of explosion and fire, do not smoke and do not permit naked flames in the vicinity whenever working with the fuel system.



Danger

The fumes released by fuel are highly toxic. All operations involving fuel must be performed outdoors or in a well ventilated space.

Keep your face at a safe distance from the filler to prevent the risk of inhaling harmful fumes.



Danger

Fuel is extremely harmful for the environment. Take all precautions to prevent environmental contamination.

6.4.1 Fuel filter replacement



Danger

To prevent the risk of fire due to spilt/escaping fuel, only perform this procedure with the engine switched off and cold.

Proceed as follows.

- Turn off the engine and remove the key from the ignition switch.
- Wait for the engine to cool sufficiently to prevent the risk of burns.
- Place a suitable container underneath to collect any escaping oil.
- Remove the filter (1) and replace.
- Lubricate the gasket of the new filter before fitting.
- Fit the new filter.
- Bleed the air from the fuel circuit (see "Bleeding the air from the fuel circuit").
- Start the engine and check for any fuel leaks.

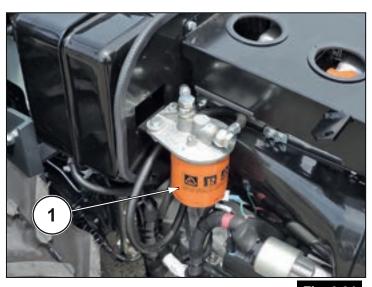


Fig. 6.24



Caution

If any fuel leaks are noted, stop the engine immediately and contact an authorised GOLDONI service centre.



Warning

Dispose of harmful materials correctly. Dispose of in compliance with applicable legislation.



6.4.2 Bleeding the air from the fuel circuit

Warning

This procedure must be performed after each fuel filter cartridge replacement.

Proceed as follows.

- Turn off the engine and remove the key from the ignition switch.



Caution

Wait for the engine to cool sufficiently to prevent the risk of burns.

- Place a suitably sized drain pan underneath.
- Loosen the screw (1).
- Manually operate the pump (2) to expel air from the circuit.
- Set the hand throttle lever to the maximum throttle position.
- Check that the fuel escaping from the bleed screw (1) is clean and contains no air bubbles.

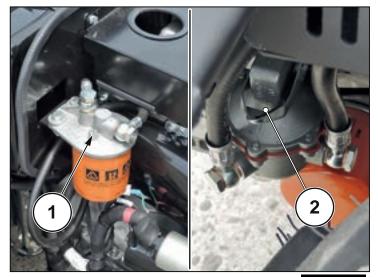


Fig. 6.25



Warning

Take care not to drain all the fuel contained in the filter. If the fuel filter is emptied, remove the filter, fill it manually with fuel, refit and repeat the bleeding procedure.

- Tighten the screw (1).
- Return the hand throttle lever to the idle position.
- Wipe off all residual fuel before starting the engine.

6.4.3 Fuel tank maintenance

Clean the zone surrounding the tank cap. Replace the fuel cap with a genuine spare if it is missing or damaged.

Check the tank is not dented or scuffed. If damaged, replace the tank with an original spare part.



Warning

The procedure to replace the tank must be carried out solely by the dealer or specialised personnel. Have the procedure performed by an authorised GOLDONI service centre.

Emptying sediment from the fuel tank

Have this maintenance procedure performed by an authorised GOLDONI service centre.

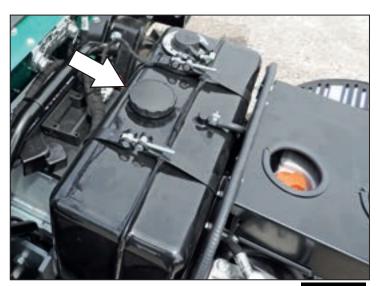


Fig. 6.26

6.4.4 Checking and replacing the fuel pipes

Check that there are no leaks from the fuel pipes. Contact an authorised GOLDONI service centre if any leaks are found.



Tractor hydraulic system maintenance



Warning

ALWAYS place a collection basin under the tank to drain near the drain point.



Warning

Do not discard fluids like fuels, lubricants, coolants or other fluids in the environment. Dispose of waste oil in accordance with the laws and regulations in force.

Transmission maintenance points:

- 1 Gearbox casing and front differential oil dipstick
- 2 Gearbox casing and rear differential oil dipstick
- 3 Front differential oil drain plug
- 4 Rear differential casing oil drain plug



Keep the zone surrounding plugs with dipsticks clean.

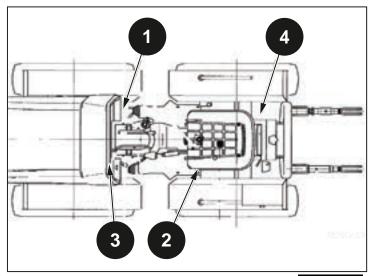


Fig. 6.27



6.5.1 Gearbox and front differential casing

Checking oil level

Park the tractor on level ground. Check the oil level with the dipstick (1). If the level is below the bottom notch (MIN), add oil of the recommended type to bring the level between the bottom (MIN) and top (MAX) notches on the dipstick.

After adding oil, run the engine for 5 minutes and then check the level again.



Do not overfill the gearbox as this will cause overheating and damage.

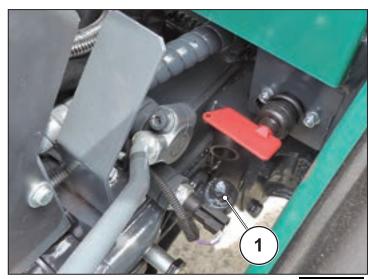


Fig. 6.28

Changing the oil

Place a suitably sized pan for collecting oil underneath the casing.

Lower the outer lift arm to drain the oil from the cylinder.

Remove the drain plug (2).

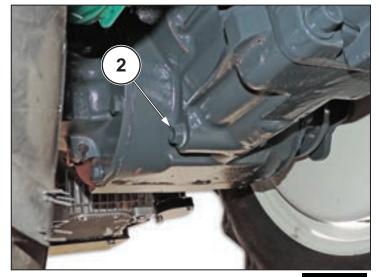


Fig. 6.29



6.5.2 Rear differential and lift casing

Checking oil level

Park the tractor on level ground. Check the oil level with the dipstick (1). The oil breather plug is situated above the lift housing, under the seat. If the level is below the bottom notch (MIN), add oil of the recommended type to bring the level between the bottom (MIN) and top (MAX) notches on the dipstick.

After adding oil, run the engine for 5 minutes and then check the level again.



Do not overfill the differential casing as this will cause overheating and damage.



Fig. 6.30

Changing the oil

Drain the oil into a suitably sized pan by removing the drain plug (2).

Add oil via the plug hole (1).

Allow the oil to settle before checking the level again.

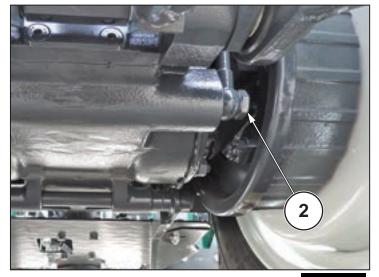


Fig. 6.31



6.5.3 Transmission oil filter - Suction



Protect hands because if the oil is too hot, it may cause burns.

The hydraulic lift oil suction line absorption filter is located at the bottom right hand side of the engine. The maintenance period is shown in the table.

To clean the filter:

- Unscrew the bolts that fix the cover.
- Remove the filter.
- Wash with gasoline or diesel fuel.
- Dry with compressed air.
- Fit the cover back on and close it.



Fig. 6.32



6.6 Electrical system maintenance



Caution

Keep the battery away from naked flames. The gas released by the electrolyte is explosive.

Keep away from vibrations and fire. Before carrying out maintenance work on the electrical system, disconnect the negative cable (-). If the battery needs to be disassembled, disconnect the positive cable (+).

Turn the ignition switch to OFF to switch off the tractor and then wait 2 minutes before disconnecting the battery. Failing to wait before disconnecting the battery may cause severe damage to the electronic engine control unit.



Caution

The electrolyte contained in the battery is corrosive: avoid contact between electrolyte and the eyes, skin and clothing. If the acid comes into contact with your eyes, rinse with water immediately and go to a hospital as soon as possible to avoid any risk of permanent injury.

When storing the battery after use, check regularly that the breather vent is in working order to prevent the battery from swelling or bursting.

When charging and discharging the battery, ensure that the area is sufficiently ventilated to evacuate any acid mist and combustible gases released during the charging process: In addition to minimising the corrosive effect of the acids released from the battery, exchanging contaminated indoor air with fresh outdoor air also prevents the risk of ignition of the combustible gases released.

The battery temperature must not exceed 45°C when charging. To avoid the risk of explosion, lower the temperature with a water bath and temporarily reduce the charging current or charging voltage.

The indoor space in which the battery is charged must be adequately ventilated. This is because the battery releases hydrogen whilst charging and, if the concentration of hydrogen in the air reaches 4%~7%, there may be an explosion if a fire breaks out. In particular, do not smoke or keep naked flames in the room.

Avoid short circuiting when connecting the charge cable, as this may cause a fire.



Note

Store batteries in a dry, clean and well ventilated place at a temperature between 5 and 40°C.

Keep the batteries out of direct sunlight and at least 2 m from any heat source (heaters etc.).

Protect from rain, dust and other contaminants. Avoid external short-circuit discharge.

Do not overturn or lay the batteries on their sides. Avoid impact or stress due to other machinery.

Batteries must be stored with a full charge. Do not store batteries in an almost discharged state.

Do not tilt the battery when setting it down. Never turn the battery upside down or knock the battery.

Check the battery voltage every three months. Charge the battery when the voltage falls below 12.5V, to avoid hard charging after long-term storage (which could reduce the battery lifespan).

Frequently check the colour of the hydrometer on the battery cap. Carry out maintenance and replacement on the basis of the colour.

Connect the positive terminal of the battery to the positive terminal of the charger, and connect the negative terminal of the battery to the negative terminal of the charger. Do not invert the connections.

Set the battery down. Fix the charging connections.



6.6.1 Battery

Battery status check

The battery is situated behind the fuel tank. Open the cowl to access the battery for maintenance.

Check that the battery is fastened correctly to the machine.

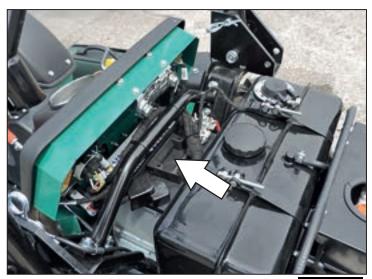


Fig. 6.33

Cleaning the battery

With the engine switched off, wipe the battery with a damp anti-static cloth. Clean and tighten the contacts and cable terminal clamps if necessary.

Lubrication

When needed, lightly grease the terminals and terminal clamps. Use Vaseline-based grease, not normal grease.

Topping up

Check the electrolyte level and keep it topped up correctly so that the battery plates are completely covered. Top up with demineralised water, with the engine off and with no naked flame in the vicinity.

Periods with the machine not in use

In case of prolonged periods with the machine not in use:

- Charge the battery as indicated by the manufacturer.
- Disconnect both cables.
- Keep the battery in a cool, dry and well ventilated place.

Removing and replacing the battery



Caution

Wait **2 minutes** after switching the engine off (ignition switch OFF). Failing to do so may cause severe damage to the electronic engine control unit.



Caution

To prevent the risk of fire, disconnect the negative terminal first to allow the battery to be moved for removal, and connect the positive terminal first when installing the battery.

If the battery has to be replaced, use a battery with the same technical specifications (see the values indicated on the battery itself).



Specifications for replacement battery

To replace the battery, consult your dealer.

Battery voltage: 12VStart current: 360 A

Battery charge modes

The charge modes normally used are constant current charging, constant voltage charging with limited current etc. Constant voltage, limited current charging is recommended for maintenance-free batteries.

1) Constant current charging:

After charging the battery to a voltage of 16V with a 12A current, switch to a 6A current to complete the charge. The charging cycle ends once the battery voltage has stabilised for 1 to 2 hours (with a *min* difference of 0.03 V between the two voltage values). Alternatively, the battery is charged for 3-5 hours at a current of 6 A once the voltage has reached 16 V.

2) Constant voltage charging:

14.8V~15.5V with constant voltage; the maximum current must not exceed 30A. Continue charging for 3 hours once the charge current reaches *min* 0.5 A. The total charging time must not exceed 24 hours.



Read the documentation provided by the manufacturer of the battery charger completely before charging.

6.6.2 Alternator belt maintenance

Checking the belt

Check that the belt shows no signs of wear or cracking.

Replacing the belt



Have this procedure performed by an authorised service centre.

6.6.3 Battery disconnector

This device disconnects the electrical system correctly and safely. It must be used prior to prolonged periods with the machine not on use or when it is necessary to work safely on the electrical system.

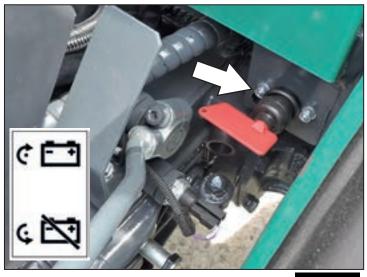


Fig. 6.34



6.6.4 Lights

Replacing the headlight bulb

Replace burnt light bulbs with new ones having the same technical characteristics (see the indications on the bulbs). Contact a specialised technician in case of any doubt.

Carry out the following procedure.

- Open the engine cowl.



Fig. 6.35

- Disconnect the cable (1) of the bulb to be replaced.
- Remove the protective cover (2).

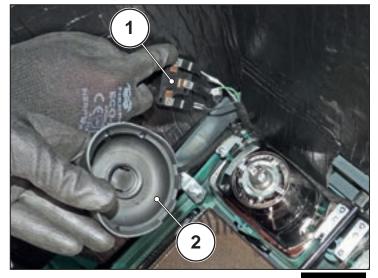


Fig. 6.36



- Remove the retainer clip (3) by pressing the 2 tabs down while simultaneously turning them anticlockwise.
- Remove the bulb and replace with a new component.
- Remove the clip (3) and the protective cover
- Connect the cable (1) to the bulb.
- Close the cowl.
- Test the low beam and high beam headlights.

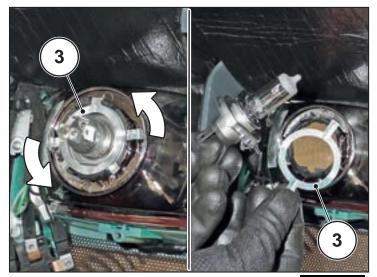


Fig. 6.37

Adjusting the aim of the headlights



Warning

This procedure may only be performed by specialised personnel using specific tools. Have the procedure performed by an authorised GOLDONI service centre.

Replacing the front sidelight and turn indicator

Carry out the following procedure.

- Undo the screws and remove the lens of the light unit.

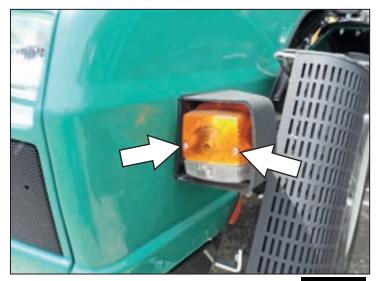


Fig. 6.38



- Turn the bulb (1) anticlockwise by 1/4 turn to remove.
- Fit the new bulb, pushing into the bulb holder and turning clockwise by 1/4 of a turn.
- Widen the lugs (3) to remove the bulb (2) and fit the new bulb.
- Refit the clear lens of the light unit.
- Check that it works.

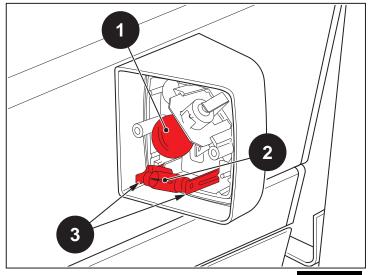


Fig. 6.39

Replacing the rear sidelight and turn indicator

Proceed as follows.

- Undo the screws and remove the lens of the light unit.



Fig. 6.40

- Turn the bulb anticlockwise by 1/4 turn to remove.
- Fit the new bulb, pushing into the bulb holder and turning clockwise by 1/4 of a turn.
- Refit the light unit cover.
- Check that it works.

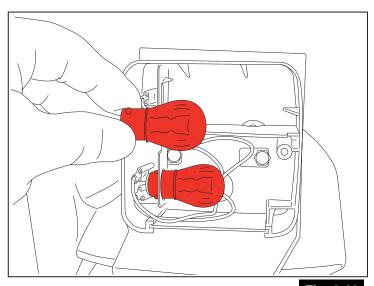


Fig. 6.41



Replacing the license plate light bulb

Proceed as follows.

- Remove the light unit cover.

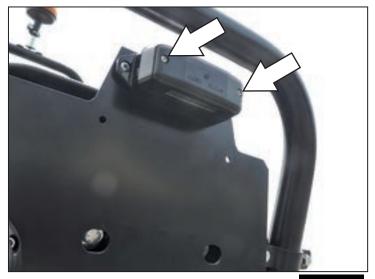


Fig. 6.42

- Turn the bulb anticlockwise by 1/4 turn to remove
- Fit the new bulb, pushing into the bulb holder and turning clockwise by 1/4 of a turn.
- Refit the light unit cover.
- Check that it works.

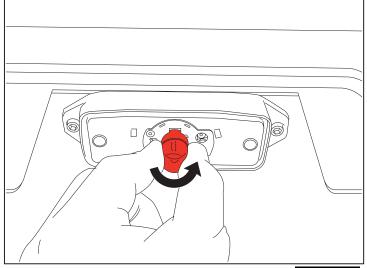


Fig. 6.43



6.6.5 Fuses and relays

All the electrical circuits are protected by fuses. Each fuse bears a label showing its amperage. Use the colour code to distinguish the various types of fuse and easily select the right spare part.



Identify and resolve the cause of the short circuit before replacing a fuse.



Do not replace the old fuse with a new one with a higher rated value. This may damage the machine. Contact an authorised service centre if replacement fuses with the correct rating blow continuously.

Functions of fuses

F1	Hazard warning lights fuse	10A
F2	Switch power feed fuse	5A
F3	+15 alternator fuse	7.5A
F4	Brake fuse	10A
F5	Instrument panel fuse	10A
F6	Fuel solenoid valve fuse	10A
F7	Differential lock indicator lamp fuse	5A
F8	Flasher unit fuse	10A
F9	RH parking light fuse	10A
F10	LH parking light fuse	10A
F11	RH brake light fuse	7.5A
F12	LH brake light fuse	7.5A
F13	RH low beam headlight fuse	7.5A
F14	LH low beam headlight fuse	7.5A
F15	RH high beam headlight fuse	7.5A
F16	LH high beam headlight fuse	7.5A
F17	Horn fuse	7.5A
F18	Rotating beacon fuse	7.5A
F19	Trailer power feed fuse	15A
R1	Operator seated sensor relay	\
R2	Start enable relay	\
R3	Reserve fuel warning lamp fuse	١

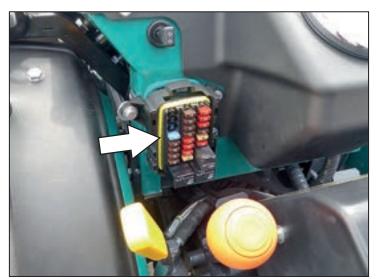


Fig. 6.44

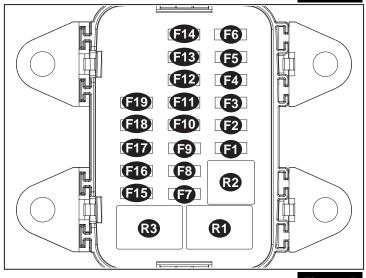


Fig. 6.45



The electrical system of the tractor is also protected by a blade type maxi fuse situated in the dashboard.

General electrical system protection 50A



Fig. 6.46



6.7 Lubrication and grease points

Perform whenever needed or at least every 50 operating hours.

Note

Lower the lift before lubricating the components.

Note

Use recommended lubricant grease.

The greasing points on the tractor are as follows:

- 1 Steering cylinders
- 2 Clutch cable

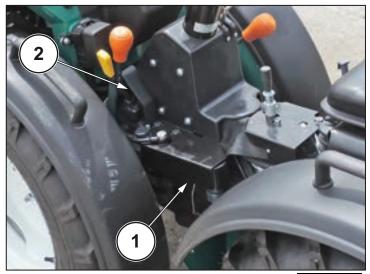


Fig. 6.47

- 3 Central knuckle, 2 lubricators (bottom and top)
- 4 Axial central joint

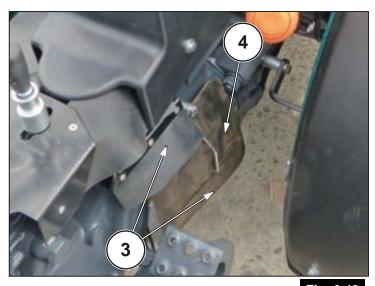


Fig. 6.48



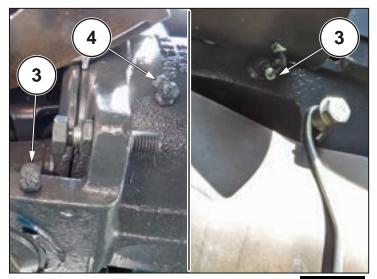


Fig. 6.49

5 - Rear lift



Fig. 6.50



6.8 Technical maintenance in case of long term storage

Prolonged periods with the tractor not in use

Before and during periods when the vehicle/equipment in which the engine is installed is not used, a number of maintenance procedures must be performed to keep the engine in proper working order.

Carry out the following in the case of short periods with the engine not in use:

- check electrical contacts and protect if necessary with anti-corrosion spray;
- check battery charge and the battery electrolyte level;
- perform any scheduled maintenance procedures necessary.



The engine should be started and warmed to operating temperature (70 to 80°C) at least once per month.

If the engine is used for an emergency application, observe the mandatory intervals for periodically starting and running the engine required by specific legislation: if no specific intervals are indicated, it is advisable to start and run the engine once every month.

If the tractor is not to be used for a period exceeding a month, take the following precautions:

- Clean the tractor as a whole and the bodywork components in particular. Protect painted parts with silicone based wax and protect unpainted metal parts with protective lubricant. Park the tractor in a covered, dry and, if possible, well ventilated place.
- Seal/cover the air intakes, exhaust, crankcase filler cap, fuel filler cap, transmission filler cap and hydraulic system filler cap with plastic bags and adhesive tape.
- Empty the fuel tank and fill completely with new diesel fuel.
- Change the engine oil and, if necessary, the filter.
- Clean the fuel filter.
- Lubricate all parts with grease nipples. Grease all parts necessary.
- Grease all exposed mechanical surfaces, such as the lift cylinders and the steering cylinder rod, with a light film of grease.
- Lower the lift.
- Ensure that all controls are in the neutral position and all electric switches are off.
- Do not leave the key in the ignition switch.
- Remove the batteries and place them in a cool, dry place away from direct sunlight. Keep the batteries charged. Spread stringy protective grease on the terminals and terminal clamps
- Place stands or other suitable supports under the axles to keep the wheels off the ground. Preferably keep the tyres deflated when the tractor is raised off the ground. If not, check the tyre pressure periodically.
- Release the ancillary drive belt tension and remove the belt from the air conditioner pulley (if applicable).
- Cover the tractor with a cloth. Due not use waterproof materials such as waxed canvas or plastic sheeting, as they will trap moisture and encourage corrosion.

Take the following additional precautions if it is necessary to keep the tractor outdoors:

- Cover the instrument panel, control levers and seat with cardboard to protect them against sunlight.
- Clean the tractor thoroughly, touching up any scratched or chipped paintwork.
- Wax the tractor bodywork or cover the entire tractor.
- Lift the tractor to raise the tyres from the ground and cover the tyres to protect them against heat and sunlight.



Disconnect the battery ground connection only if the tractor is to be out of use for brief periods (20 to 90 days).



Preparing the tractor for operation after storage

- Remove all the covers placed on the tractor prior to storage.
- Uncover all the apertures sealed/covered with plastic and tape.
- Remove all dirt and debris which may have accumulated during storage, especially in the area around the engine and inside the engine compartment.
- Inspect the tyres and check inflation pressure. If the tractor was kept on stands, inflate the tyres to the specified pressure and lower the tractor to the ground.
- Set the drive belt tension correctly.
- Check around and underneath the tractor for any signs of leaks.
- Check the transmission/hydraulic oil level. Add oil if necessary.
- Check the engine oil level. If necessary, top up or change in accordance with the respective service intervals.
- Change the engine oil filter in accordance with the respective service intervals.
- Top up the fuel tank.
- Change the fuel filter in accordance with the respective service intervals.
- Change the air filter in accordance with the respective service intervals.
- Check the tightness of the hydraulic connectors.
- Check the condition of the rubber hoses and the respective hose clamps.
- Perform all maintenance procedures required on a daily basis or at intervals of 10 hours, and any other maintenance needed.
- Check battery charge and the battery electrolyte level.
- Check the condition of the electrical contacts.
- Install the batteries and connect the cables.
- Check engine operation.
- Start the engine and run at idle speed and at zero load for a few minutes.



Note

While the engine is running at idle speed, check all the instruments and indicator lamps to ensure that the engine is operating correctly.

- If no malfunctions are noted, warm the engine to operating temperature (70 to 80°C).
- Check the systems and functions of the tractor, including the air conditioner (if applicable).
- Switch off the engine and check the engine oil level again.



Warning

If any signs of oil leakage are found, do not start the engine until the cause of the problem has been identified and the necessary repairs made.



Warning

Certain lubricants and engine components deteriorate over time even if the engine is not in use. The replacement intervals for these lubricants and components must therefore be determined in accordance with age rather than operating hours.

The maximum lifespans of certain components and lubricants, after which they no longer maintain the necessary chemical and physical properties for operation, are given indicatively as follows.

1 year - Lubricant oil

1 year - Fuel filter cartridge

2 years - Coolants



7: Possible faults and solutions

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7.1 Probable caused of faults in relation to symptoms noted

7.1.1 Engine



Caution

Stop the engine immediately if any of the following occurs:

- If the engine speed increases or decreases suddenly.
- An unusual and/or sudden noise is heard.
- Black smoke is suddenly produced from the exhaust.
- The oil pressure warning lamp illuminates while the engine is running.

Problem	Probable causes
	Head fastener nuts loosened.
	Pipes obstructed.
	Fuel filter clogged.
	Air or water in fuel circuit.
	Tank cap breather vent obstructed.
	Injector blocked.
	Injection pump valve stuck.
	Fuel pump faulty.
	Flat battery.
	Loose or incorrect cable connection.
Engine does not start	Ignition switch faulty.
Engine does not start	Starter motor faulty.
	No fuel.
	Air filter clogged.
	Governor arms not synchronised correctly.
	Overload.
	Injection advance incorrect.
	Valve stuck.
	Pump actuator rod stiff.
	Damaged head gasket.
	Excess piston blow-by.
	Engine governor arms not moving freely
	Fuel filter clogged.
	Air or water in fuel circuit.
Engine starts and then cuts out	Tank cap breather vent obstructed.
	Fuel pump faulty.
	Air filter clogged.
	Overload.
	Governor spring detached or broken.
	Engine governor arms not moving freely.
	Idle speed too low.
	Injection pump delivery rate calibrated incorrectly.



Problem	Probable causes
	Pipes obstructed.
	Fuel filter clogged.
	Air or water in fuel circuit.
	Tank cap breather vent obstructed.
	Injection pump actuator rod stiff.
	Air filter clogged.
Engine will not accelerate	Overload.
	Injection advance incorrect.
	Governor spring detached or broken.
	Injection pump delivery rate calibrated incorrectly.
	Injector incorrectly calibrated.
	Air or water in fuel circuit.
	Injection pump actuator rod stiff.
	Injection pump delivery rate calibrated incorrectly.
	Oil level too high.
Fluctuating engine speed	Governor arms not synchronised correctly.
Transacting original special	Injection pump actuator rod stiff.
	Idle speed too low.
	Engine governor arms not moving freely.
	Injector incorrectly calibrated.
	Excess piston blow-by.
	Injection pump delivery rate calibrated incorrectly.
Black smoke from exhaust	Fuel pressure limiter stuck.
Black Smoke from exhaust	Air filter clogged.
	Overload.
	Injection advance incorrect.
	Crankshaft not turning freely.
	Fuel filter clogged.
	Air or water in fuel circuit.
	Prolonged operation at idle speed.
	Running-in not completed.
White smoke from exhaust	Injection advance incorrect.
	Worn or seized piston rings.
	Cylinder worn.
	Oil level too high.
	Worn valve guides.
	Worn main crankshaft bearings-big end bearings.
	Fuel pressure regulator valve stuck.
	Regulator valve not adjusted correctly.
Engine oil pressure low	Worn oil pump.
Engine oil pressure low	·
Engine oil pressure low	Worn oil pump.





Problem	Probable causes
	Cylinder worn.
	Engine oil level too high.
	Worn or seized piston rings.
Excessive engine oil consumption	Prolonged operation at idle speed.
	Running-in not completed.
	Worn valve guides.
	Air filter clogged.
	Injector incorrectly calibrated.
	Prolonged operation at idle speed.
Oil and fuel dripping from exhaust	Running-in not completed.
Oil and fuel dripping from exhaust	Worn or seized piston rings.
	Cylinder worn.
	Worn valve guides.



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