

# Operator Manual



an ARBOS Company



# **SUMMARY**

Chapter No.	Description
1	GENERAL INFORMATION
2	<b>GENERAL SAFETY RULES</b>
3	TECHNICAL CHARACTERISTICS
4	CONTROLS AND INSTRUMENTS
5	<b>OPERATING INSTRUCTIONS</b>
6	SERVICE PROCEDURES
7	TROUBLESHOOTING



# 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 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
<b>4</b>	Turn signal indicator	<del>- +</del>	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



<b>+</b>	Transmission oil pressure indicator		Service indicator; see the technical manual	€ <b>_</b> ©	Rear PTO indicator
<b>₽</b>	Front PTO indicator	1000	Rear PTO 1000 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	<b>⇔</b>	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
cm <sup>3</sup>	Cubic centimetres
dB	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

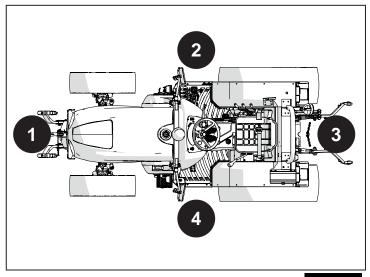


Fig. 1.1



### 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

Note

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, each one of which is identified by metal identification plates and/or punched information.

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.

#### 1.5.2 Engine information

The engine identification plate is situated at the bottom right of the engine, underneath the tractor cowl.

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

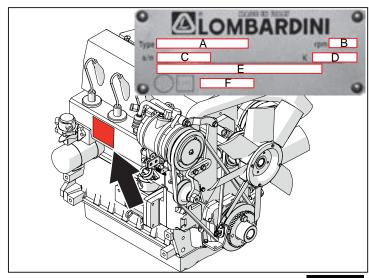


Fig. 1.2

The EPA Regulations plate is situated on the rockers cover underneath the cowl of the tractor.

- A- Current year
- B- Power category (kW)
- C- Emissions control system (ECS)
- D- Engine displacement
- E- Particulate emission class (g/kWh)
- F- Engine family identification No
- G- Type of application
- H- Injection advance (\*PPMS)
- I- Injector calibration pressure (bar)
- L- Production date

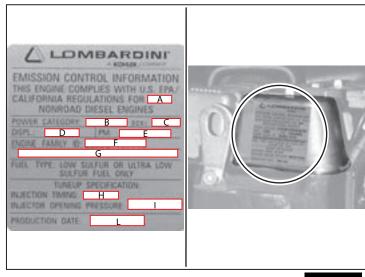


Fig. 1.3



# 1.5.3 Chassis

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

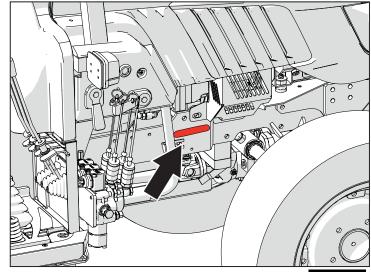


Fig. 1.4

- 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)

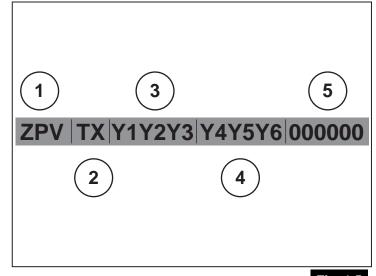


Fig. 1.5



# 1.5.4 Tractor identification plate

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

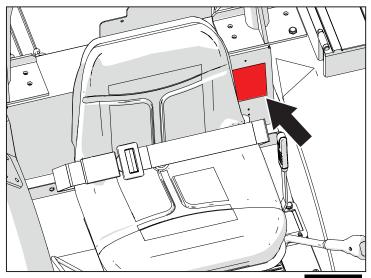


Fig. 1.6

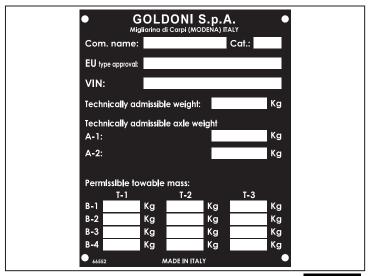


Fig. 1.7



### 1.5.5 Label with type of protective structure

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

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.

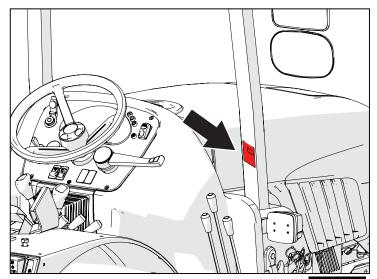


Fig. 1.8

- 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

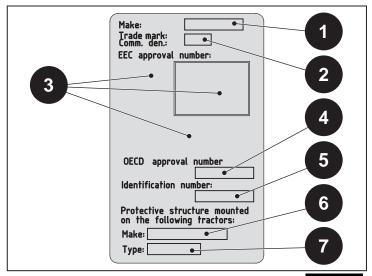


Fig. 1.9



# 1.6 Cab category

The cab category indicates the degree of protection offered by the cab against dangerous substances. The degree of protection of the cab is classified in categories from 1 to 4. The category of the cab is indicated on a decal applied to the cab itself.

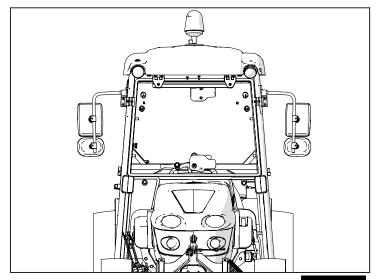


Fig. 1.10

These models are equipped with a "Category 1" cab. The decal indicating the category is situated on the right hand front pillar of the cab.

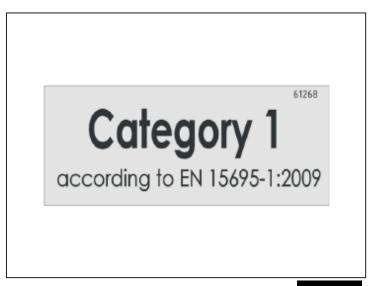


Fig. 1.11

# 1.7 Type approval types

Commercial name	Туре	Variant	Version	Main features	
RONIN 40	TX	D11	1AG	Engine LDW 1603/G (3 cyl.)	Roll bar K57
	TX	D10	1AG	Engine LDW 1603/G (3 cyl.)	GL12 cab
RONIN 50	TX	E11	1AG	Engine LDW 2204/G (4 cyl.)	Roll bar K57
	TX	E10	1AG	Engine LDW 2204/G (4 cyl.)	GL12 cab



# 2: 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.

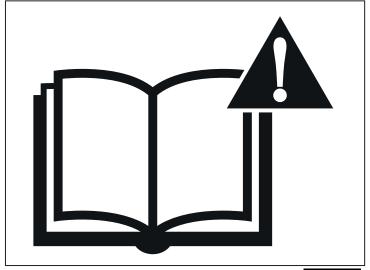


Fig. 2.1

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

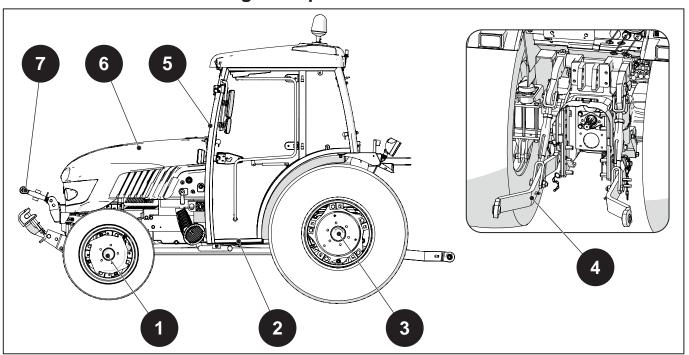


Fig. 2.2

1 - Front wheels	Risk of being run over by parts of moving vehicle.
	Risk of crushing by tyre.
	Tyre explosion.
2- Access to driver seat / Refuelling	Fall hazard.
	Avoid fuel spillage. Risk of fire
	Avoid contact with hot parts.
3- Rear wheels	Risk of being run over by parts of moving vehicle.
	Risk of crushing by tyre.
	Tyre explosion.
4- 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.
5- Cab	Risk of toxic/harmful substances entering cab.
	Risk of intrusion of falling objects.
	Caution: reduced field of vision.
	Injury caused by failure to use seat belts.
6 - Engine bonnet	Avoid contact with hot parts.
	Caution, possible contact with live parts.
	Avoid contact with sharp parts.
7- Front 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.



### 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.

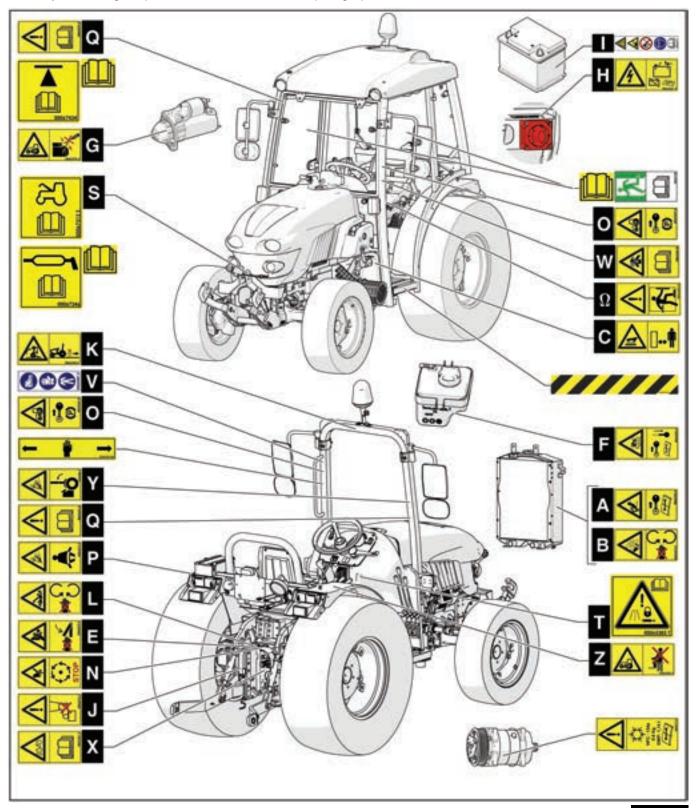


Fig. 2.3



#### (A) 00065368 - Moving belt hazard

**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

**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) 00065415 - 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



#### (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. 2.7

#### (E) 00069710 - 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:** Front lift area



Fig. 2.8

#### (F) 00065402 - Scald hazard

**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. 2.9



(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. 2.10

#### (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. 2.11

#### (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

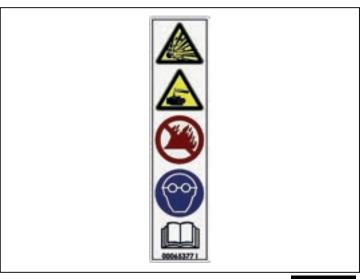


Fig. 2.12



(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. 2.13

(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 (ROPS Version): Upper inner area



Fig. 2.14

**(L) 00065965** - 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 (FRONT)** 

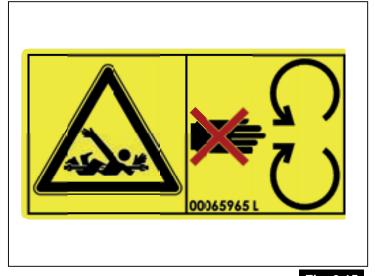


Fig. 2.15



**(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 (REAR)



Fig. 2.16

(N) 00065403 - Entanglement and shear hazard

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

POSITION: PTO guards (REAR)



Fig. 2.17

(N) 00065967 - Entanglement and shear hazard

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

**POSITION: PTO guards (FRONT)** 



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 (ROPS 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 centre pillar **POSITION (ROPS 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

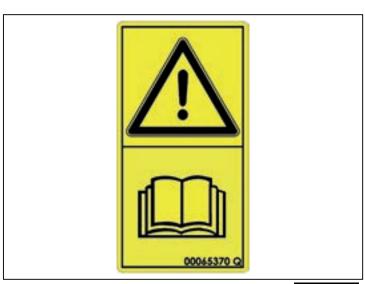


Fig. 2.21



(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

#### (T) 00065383 - Hydraulic valves

**WARNING:** Hydraulic valves. Before driving on a road, raise implements to the correct height and lock the hydraulic functions of the tractor. The hydraulic functions must be locked when the front lift is not in use.

**POSITION:** Draft control / electronically controlled lift: Lift oil flow lock area. Hydraulic distributor levers: Distributor lever area.



Fig. 2.23

FEM51201102 - Step present

**WARNING: -**

**POSITION:** Left hand footboard



Fig. 2.24



**(V) 00065387** - Personal Protective Equipment (PPE)

**WARNING:** Personal protective equipment (PPE). 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. 2.25

- A category one
- B category two
- C category three



Fig. 2.26

**(W) 00065384** - Hazardous environmental conditions

**WARNING:** Hazardous environmental conditions. Wear protective garments, safety goggles and a respirator when working in areas where crop treatment products are used. See the section 'Operation' of the operator instruction manual for detailed information.

POSITION (Cab Version): Left hand front pillar

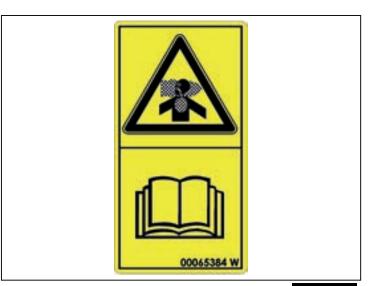


Fig. 2.27



(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, left hand side

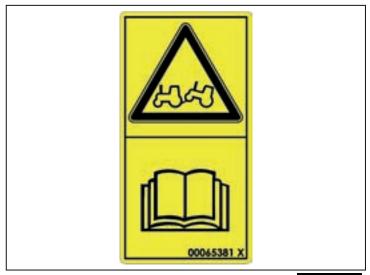


Fig. 2.28

#### (G) 00065386 - Always keep the roll bar locked

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

**POSITION (ROPS Version):** ROLL BAR, right hand side



Fig. 2.29

#### (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 (ROPS Version):** Left hand rear mudguard



Fig. 2.30



#### ( $\Omega$ ) 00065423 - Fall hazard

**DANGER:** Use the specific ladders and handrails to access the driver seat, maintaining three points of contact at all times.

POSITION: Control panel: left hand side



Fig. 2.31

00067346 - Lubricant grease

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

POSITION: Grease nipple area

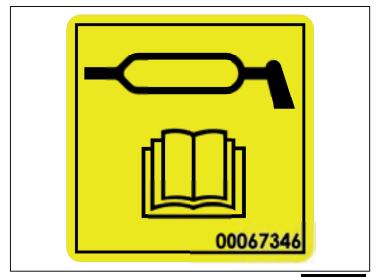


Fig. 2.32

#### 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



Fig. 2.33



**00067748** - Emergency exit

**WARNING:** Emergency exit. The decal indicates the exit to use to reach safety in the event of an emergency. Exit via the right hand door. Read the specific instructions in the Operator Instruction Manual thoroughly.

**POSITION (Cab Version):** Right hand door and rear screen

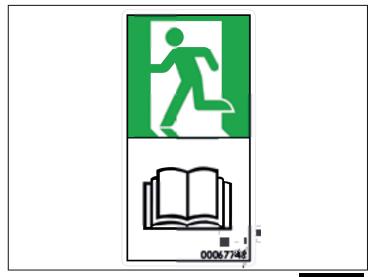


Fig. 2.34

00069712 - Pressurised refrigerant

**WARNING:** Pressurised refrigerant (R134A). Maintenance may only be performed by specialised personnel at the dealer.

**POSITION:** Radiator zone



Fig. 2.35

FDM51201104 - Roll-bar grip point

**WARNING:** -

**POSITION:** Roll-bar left pillar with central height of 1500 mm from the ground

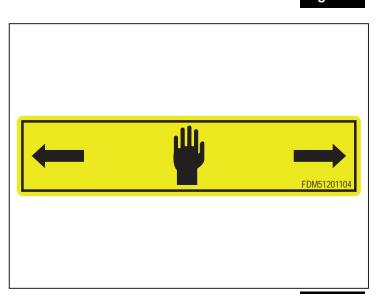


Fig. 2.36



## 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, especially when steering.

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 guidelines 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.

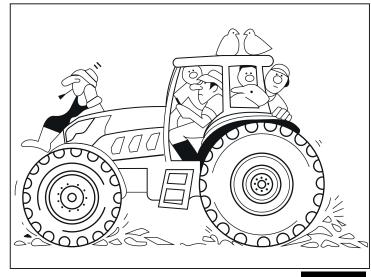


Fig. 2.37



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.



# 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.

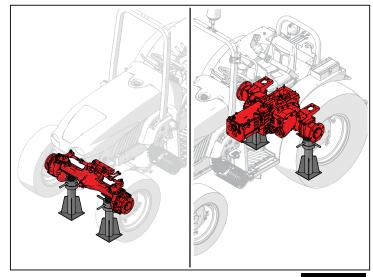


Fig. 2.38

The permitted tractor lift points are listed as follows:



Ballast weights support.

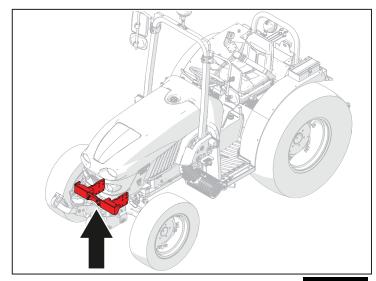


Fig. 2.39

Front axle.

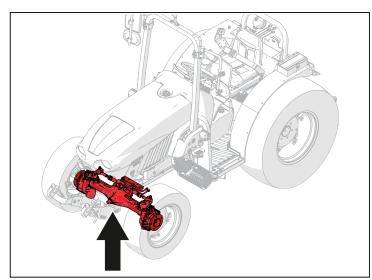


Fig. 2.40

Rear differential casing.

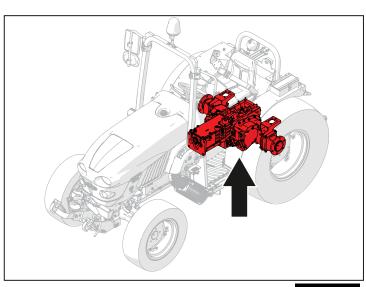


Fig. 2.41



## 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. 2.42

### 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. 2.43



## 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.



#### Caution

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.

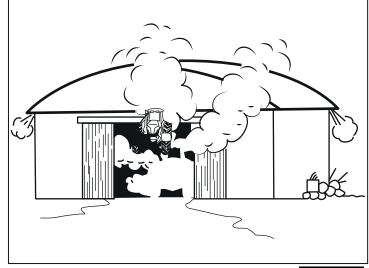


Fig. 2.44

## 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.

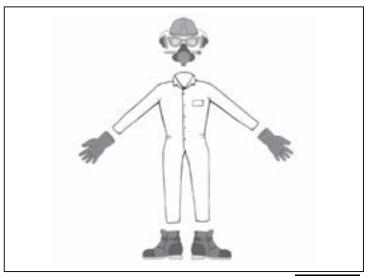


Fig. 2.45

## 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.

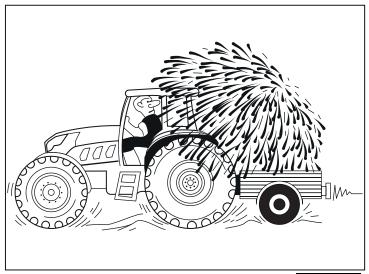


Fig. 2.46



# 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. 2.47

- 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 are equipped for a correct waste disposal, ensuring that the environment is respected.
- 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 attention;
  - 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. 2.48

### 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 belt is 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.

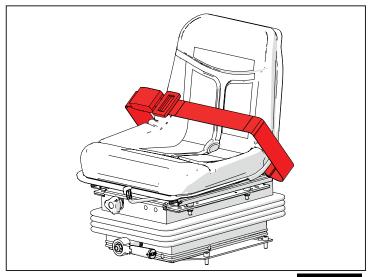


Fig. 2.49



## 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 guidelines given as follows to prevent 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.

The use of an FOPS structure is recommended 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 guidelines to prevent 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. 2.50

# 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.

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.

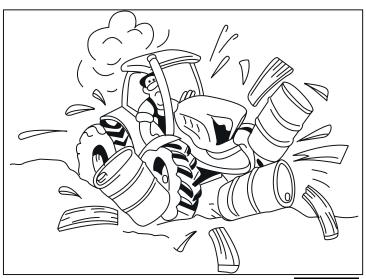


Fig. 2.51

# 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.

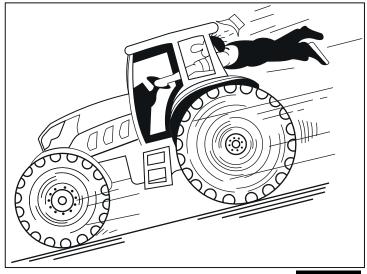


Fig. 2.52

# 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.

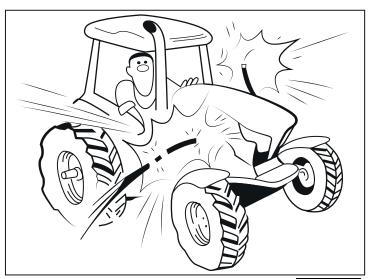


Fig. 2.53

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.

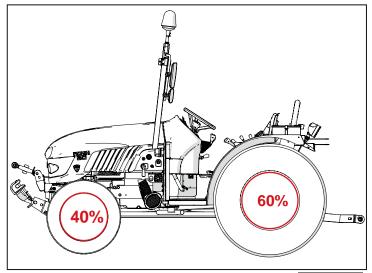


Fig. 2.54



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.



Warning

When connecting implements at the rear of the tractor, at least 20% of the weight must be distributed on the front axle.

#### 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		Ronin 40	Ronin 50
Manufacturer		Lombardini	Lombardini
Model		LDW 1603/G	LDW 2204/G
Emissions compliance		2004/26/CE Stage 3A	2004/26/CE Stage 3A
Rated power (ECE R120)	kW (HP)	28 (38)	35.3 (48)
	rpm	@ 2800	@ 2800
Number of cylinders		3	4
Rated speed	rpm	2800	2800
Cooling		Water	Water
Displacement	cm <sup>3</sup>	1649	2199
Maximum torque	Nm	113	144
	rpm	@ 1600	@ 2200
Torque rise		8.9%	7.9%
Tank capacity	I	45	45

# 3.1.2 Transmission

Transmission type		Mechanical transmission, four wheel drive
Gearbox type		12+12+4 Fast reverse
Shift control system		Mechanical with frontal levers
Clutch		Single plate dry clutch, 9" diameter
Clutch control		Mechanical with pedal
Safety		PUSH & START device on clutch pedal
Reverse shuttle type		Mechanical, synchronised
Reverse shuttle control		Lever
Rear differential lock		Mechanical
Front axle		Four wheel drive
Front axle swing angle		11°
Minimum speed	km/h	0.7
Maximum speed	km/h	30

# 3.1.3 Brakes

Rear brake type	Mechanically controlled multi-disc wet brakes
Emergency and parking brake	Independently and mechanically controlled. Braking action on rear wheels
Trailer brake mechanical lever mount	Type CUNA

# 3.1.4 Steering wheel

Steering type		Hydrostatic
Steering angle	Degrees	55°



# 3.1.5 Rear power take off

Туре		Bialbero, independent and synchronised
PTO speed independent of ground speed	rpm	540/1000
Ground speed synchronised		Yes
Direction of rotation		Clockwise
Profile		1-3/8" with 6 splines
Clutch		Independent, mechanical dry clutch
Clutch control		Mechanical
Safety		PUSH & START device on PTO selector.

# 3.1.6 Front Power Take Off

Туре		Single shaft, independent
PTO speed independent of ground speed	rpm	1000
Direction of rotation (looking at PTO)		Anticlockwise
Profile		1-3/8" with 6 splines
Clutch		Electromagnetic
Clutch control		Electric

# 3.1.7 Rear lift

Туре		Hydraulic with position and draft control
Lift capacity at lower link ends	kg	1800
3-point linkage category		Category 1
Mechanical top link arm		Category 1
Lower link arm type		Fixed
Right hand tie-rod type		Mechanical

# 3.1.8 Front lift

Туре		Hydraulic, up and down
Lift capacity at lower link ends	kg	350
3-point linkage category		Category 1N
Mechanical top link arm		Category 1N

# 3.1.9 Hydraulic System

Туре		Open centre
Pump delivery	l/min.	33
Rear hydraulic distributors		N.2 in double acting engine block with sprung lever return
Front hydraulic distributors		3-way engine block front hydraulic distributor (optional)
Free oil return coupling		1/2 NPTF quick coupler



# 3.1.10 Electrical system

Battery		12V 500A 60Ah
Safety		Battery master switch
Instrument		Digital / analogue
1-pole socket	Volts	12
7 pole socket	Volts	12
Rear work light		Adjustable (optional)
Rotating beacon		Orange (optional)

# 3.1.11 Station

Platform	Full size, suspended
Platform carrier	Silicone variable deformation silent-blocks
Rear mudguard protection	Rubber profile
ROPS	Central, fully foldable
Standard cab (optional)	Goldoni Overview GL12 Full Glass with heating
LH rear-view mirror	Adjustable
Seat	With elastic suspension and seat belt
Seat adjustment	Fore/aft, up/down and driver weight
Toolbox	Yes
Use and maintenance manual	Yes

# 3.1.12 Standard cab equipment

ROPS homologation	Goldoni Overview GL12 Full Glass
Lateral doors	With door pull handle, gas strut and key-operated lock
Cab air dust filter	Paper
Cab air processing filter	Active carbon (optional)
Front screen	Opening
Rear screen	Opening
Windscreen wiper	One speed
Rear wiper	One speed
Windscreen washer	0.5 litres
Right/left hand rear view mirrors	Adjustable and folding
Front sun shade	With height adjustment
Provision for rotating beacon	Switch in cab and external bayonet fitting
Ventilation and heating system	With electric blower fan
Front work light	2
Rear work light	2
Provision for audio system	Audio head unit housing and mountings for speakers



# 3.1.13 Towing devices

Rear towing hitch	X193F
Drawbar	GTF30067
Front towing hitch	Fixed

Make		СВМ	СВМ
Туре		GTF30067	X193F
Approval no.		e11 00299*00*	e11 00304*00*
Overhang between rear axle and device centre	mm	299	304
Max towable mass allowed by the device (T)	t	10	6
Max vertical load allowed by the device on the coupling point (S)	kg	1350	1500
Maximum horizontal load allowed by the device (D)	kN	-	-
Min/max height	mm	310/610	325/610

# 3.1.14 Ballast weights

Front	75 kg, with 5 suitcase weights of 15 kg each
Water ballast in tyre	With air / water valve



# 3.2 Weights and dimensions

# Dimensions of version with platform

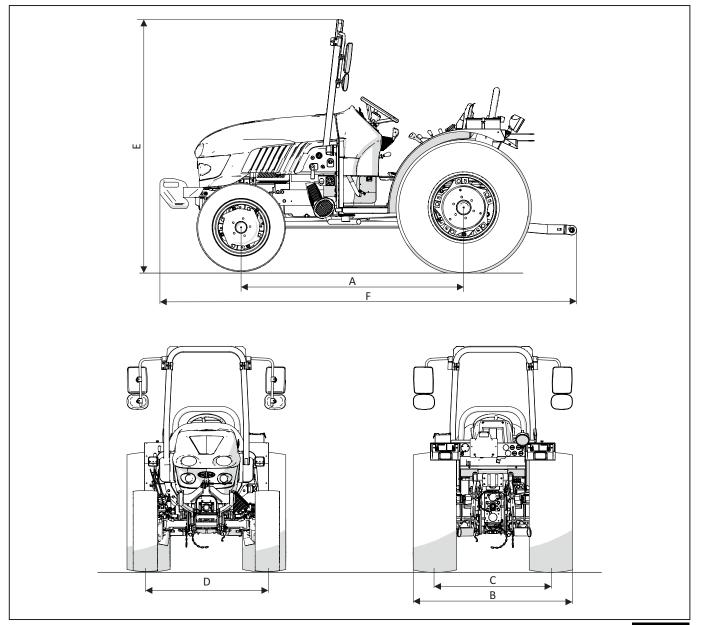


Fig. 3.1

Model		Ronin 40	Ronin 50
Α	Wheelbase	1623 mm	1723 mm
D	107: -141-	1090 r	nm (min)
В	Width	1500 n	nm (max)
	De on trootle	834 m	nm (min)
C	Rear track	1200 n	nm (max)
5	Franktinaali	900 m	nm (min)
D	Front track	1216 n	nm (max)
F	Haimba	1885 r	nm (min)
E	Height	1940 n	nm (max)
F	Length	3026 mm	3126 mm



### **Dimensions of cab version**

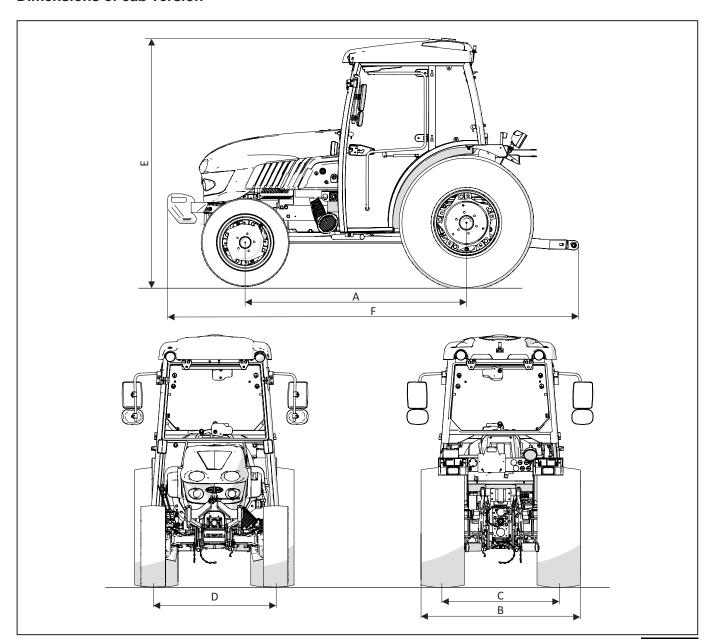


Fig. 3.2

Model		Ronin 40 Ronin 50
Α	Wheelbase	1623 mm 1723 mm
В	Width	1090 mm (min) 1500 mm (max)
С	Rear track	834 mm (min) 1200 mm (max)
D	Front track	900 mm (min) 1216 mm (max)
E	Height	2090 mm (min) 2180 mm (max)
F	Length	3026 mm 3126 mm



# Unladen weight with fluids and lubricants

Tractor	Ronin 40	Ronin 40	Ronin 50	Ronin 50
Version	Platform	Cab	Platform	Cab
Unladen weight - maximum	1440 kg	1610 kg	1475 kg	1645 kg
Unladen weight - minimum	1440 kg	1610 kg	1475 kg	1645 kg
Distribution over the axles - 1st axle	580 kg	560 kg	600 kg	580 kg
Distribution over the axles - 2nd axle	860 kg	1050 kg	875 kg	1065 kg

### Maximum permissible laden weights

Maximum technically permissible mass of the vehicle at full load: 2500 Kg

- 1st axle 1100 Kg
- 2nd axle 1650 Kg



# 3.3 Lubricants, fuels and coolants

Assembly	Lubricants, fuels and coolants	Capacity	Recommended products	Туре	Specifications
	Engine oil	Ronin 40: 4.4   Ronin 50: 5.3	ARBOS ONYX - ENGINE OIL E7 10W/40	SAE 10W-40	ACEA A3/B4/E7 - API CI-4/SL
Engine	Fuel	45 I	-	-	DIN EN 590
	Coolant (1)	81	OPAL ARBOS ICE RED 40	ETHYLENE GLYCOL	ASTM D 3306 TYPE 1
Cab	Screen wash fluid	0.5	-	Mixture of alcohols, water and surfactants	-
	Refrigerant (gas)	0.8 kg	-	R134a	-
Transmission	Transmission Oil - Rear Differential	21	ARBOS AMBER STOU GL4 15W/40	UNIVERSAL 15W- 40	API GL 4
	Front axle oil - Front differential	31	ARBOS ZIRCON TRANSMISSION OIL GL5 80W/90	TRW 90	API GL-5
	Front PTO oil	1.5	ARBOS ZIRCON TRANSMISSION OIL GL5 80W/90	TRW 90	API GL-5
Other (greasing)	Grease	-	ARBOS CORAL - MULTIPURPOSE EP 2	MULTIPURPOSE E.P.	NLGI 2

(1) - The coolant must be composed of 50% protective fluid for radiators based on mono-ethylene glycol with organic inhibitor formulation OAT, compliant with ASTM D 3306 type 1 and 50% demineralized or distilled water.

#### 3.3.1 Fuel



## Caution

Use automotive-type fuel complying with ASTM standard D-975 - 1D or 2D, EN590, or other equivalent standards. 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. Clean any fuel spilt when refuelling immediately.

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.

Using fuels with a high sulphur content will cause engine wear. In countries where only high sulphur diesel fuel is available, use an alkaline engine lubricant oil or, alternatively, change the lubricant oil recommended by the manufacturer more frequently. Countries where diesel is normally low in sulphur content are: Europe, North America and Australia.

#### Recommended oil:

Low sulphur fuel	API CF4 - CG4
High sulphur fuel	API CF



### 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.

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

The fuels are divided into:

Summer	0°C
Winter	-10°C
Alpine	-20°C
Arctic	-30°C

#### 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.

#### 3.3.1.3 Kerosene AVIO

The only AVIO fuels that can be used in this engine are: JP5, JP4, JP8 and JET-A if 5% of oil is added.

#### 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 Noise levels

The external noise level at engine speed of 2800 rpm is 82 dB when the vehicle is stationary and 79 dB when the vehicle is running.

### 3.4.1 Sound lever at the driver's ear

#### **Ronin TX**

Tests performed in accordance with point 2 of Annex XIII based on which the following maximum values were obtained:

#### Test conditions:

- Engine RPM: 2800 rpm

- Test speed: the closest to 7.5 km/h

Vehicle	Gear and speed	max. dB (A) obtained	dB limit	
protective structure	3a medium	00.5	00	
(engine LDW 2204/G (4 cylinders)	V = 6.6 km/h	88,5	90	
protective structure	4a medium	00.0	00	
(engine LDW 2204/G (4 cylinders)	V = 8.7 km/h	89,6	90	
protective structure	4th fast	00.0	00	
(engine LDW 2204/G (4 cylinders)	V = 30 km/h	89,3	90	

Vehicle	Gear and speed	max. dB (A) obtained	dB limit	
protective structure	4a medium	05.4		
LDW1603/G (3 cylinders)	V = 8.5 km/h	85,4	90	
protective structure	3a medium	88,6	90	
LDW1603/G (3 cylinders)	V = 6.5 km/h	00,0		
protective structure	4th fast	00.0	00	
LDW1603/G (3 cylinders)	V = 30 km/h	90,0	90	

Vehicle	Gear and speed	max. dB (A) obtained		
		all closed	with the rear window open	dB limit
protection cab	3a medium	87,9	88,7	90
(engine LDW 2204/G (4 cylinders)	V = 6.6 km/h			
protection cab	4a medium	89,3	88,3	90
(engine LDW 2204/G (4 cylinders)	V = 8.7 km/h			
protection cab	4th fast	88,7	90,0	90
(engine LDW 2204/G (4 cylinders)	V = 30 km/h			





Vehicle	Gear and speed	max. dB (A) obtained		
		all closed	with the rear window open	dB limit
protection cab	3a medium	86,60	85,90	90
LDW1603/G (3 cylinders)	V = 6.5 km/h			
protection cab	4a medium	86,20	86,60	90
LDW1603/G (3 cylinders)	V = 8.7 km/h			
protection cab	4th fast	90,00	89,20	90
LDW1603/G (3 cylinders)	V = 29.75 km/h			



# 3.5 Speed table

## 3.5.1 12x16 tractor speeds (km/h)

EXECUTION SPEED (km/h) for the GEAR OF TYPE: ("-" for reverse gear)	GB28
RATED ENGINE SPEED (rpm)	2800
REAR TYRE MAXIMUM ROLLING CIRCUMFERENCE (mm)	3202

Mode	Gear	Range	Speed (km/h)
	1	FW1	0.79
	2	FW2	1.16
Slow	3	FW3	1.64
	4	FW4	2.17
	1	FW5	3.18
Ma di	2	FW6	4.66
Medium	3	FW7	6.55
	4	FW8	8.70
	1	FW9	10.87
First	2	FW10	15.94
Fast	3	FW11	22.41
	4	FW12	29.75
	1	RV1	4.07
D	2	RV2	5.97
Reverse	3	RV3	8.40
	4	RV4	11.15
	1	RV5	0.80
Ole In order	2	RV6	1.17
Slow Inverter	3	RV7	1.64
	4	RV8	2.18
	1	RV9	3.19
	2	RV10	4.68
Slow Inverter	3	RV11	6.58
	4	RV12	8.73
	1	RV13	10.91
Fact lavantan	2	RV14	16.00
Fast Inverter	3	RV15	22.49
	4	RV16	29.85
	•		



### 3.6 Rear

## 3.6.1 Available tyres

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

Front	Load index	Pressure (bar)	Rear	Load index	Pressure (bar)
240/70 R16	104 A8	2.4	320/70 R24	116 A8	1.6
240/70 R16	104 A8	1.6	280/85 R24	115 A8	1.6
11.0/65 - 12	8 PR	2.3	260/70 R20	120 A8	1.6
200/70 R16	94 A8	2.4	360/70 R20	120 A8	1.6
11.0/65 - 12	8 PR	2.3	320/85 R20	119 A8	1.6
200/70 R16	94 A8	2.4	320/85 R20	119 A8	1.6
6.5/80 - 12	4 PR	2.4	300/70 R20	110 A8	1.6
6.5/80 - 12	4 PR	2.4	260/80 R20	106 A8	1.6
6.5/80 - 12	4 PR	2.4	280/70 R20	116 A8	2.4
6.5/80 - 12	4 PR	2.4	364/65 R20	114 A8	1.6
200/70 R16	94 A8	2.4	280/85 R20	114 A8	1.6
200/70 R16	94 A8	2.4	8.3 - 24	8PR - 105A8	2.6
27/8.50 - 15	4 PR	2	38/14.00 - 20	4 PR	1,8

The correct inflation pressures of the tyres are indicated on the decal on the left hand mudguard.

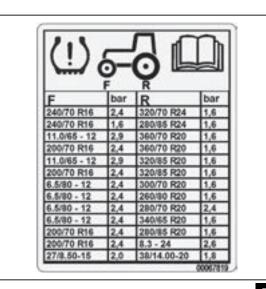


Fig. 3.3



# 4: Controls and instruments

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### **CONTROLS AND INSTRUMENTS**



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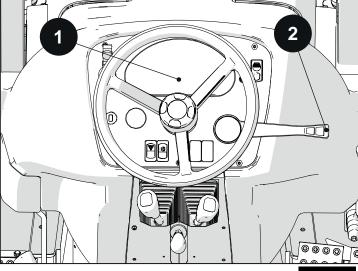
### 4.1 General controls

#### 4.1.1 Driver station controls

This paragraph provides an overview of all the available tools and controls. Unless specified otherwise, these are applicable for all versions. Read the chapter "Operating instructions" thoroughly to use the controls indicated herein correctly.

#### 4.1.1.1 Front/dashboard controls

- 1 Multifunction instrument
- 2 Hand throttle lever



- 3 Lights selector stalk with horn button
- 4 Starter switch
- 5 Turn indicator, high beam headlights
- 6 Hazard warning lights switch
- 7 Beacon light switch

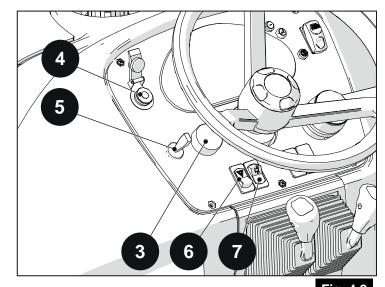


Fig. 4.2



- 8 Multifunction instrument controller button
- 9 Front PDO engage switch (if available)
- 10 PTO enable switch (safety switch)

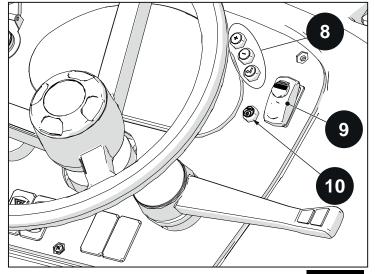


Fig. 4.3

- 11 Clutch pedal
- 12 Left hand brake pedal
- 13 Right hand brake pedal
- 14 Foot throttle pedal
- 15 Parking brake lever
- 16 Control levers for the front distributors (if available)

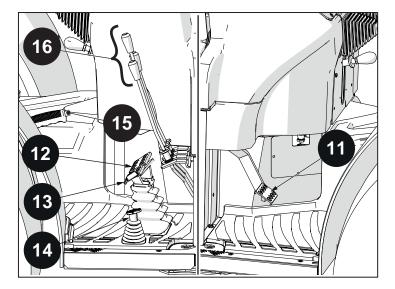


Fig. 4.4

- 17 Gear selector lever
- 18 Reverse shuttle lever Forward-Reverse gear
- 19 Rear PTO clutch lever

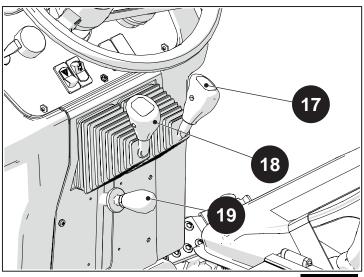


Fig. 4.5



### 4.1.1.2 Driver zone controls

- 1 Rear differential lock pedal
- 2 PTO speed selector lever

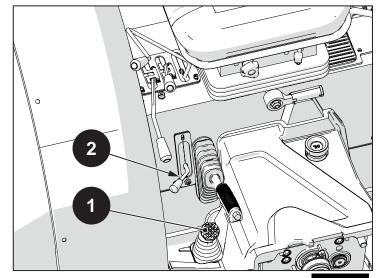


Fig. 4.6

- 3 CAN diagnostic port
- 4 Rear PTO selection lever, independent or synchronised
- 5 Range selector lever
- 6 Transmission casing oil level and intake cap

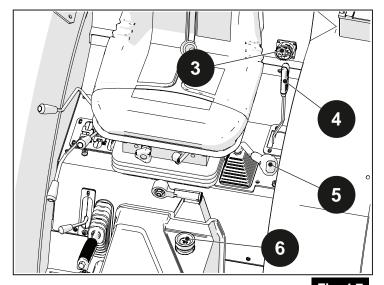


Fig. 4.7



## 4.1.1.3 Driver zone controls (Version Up-Down)

- 1 Lift control up/down lever
- 2 Control levers for the rear distributors

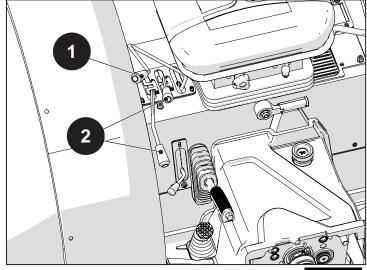
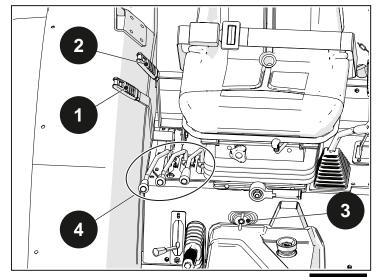


Fig. 4.8

## 4.1.1.4 Driver zone controls (Version draft control)

- 1 Rear power lift position adjustment lever (outer part)
- 2 Rear power lift draft adjustment lever (close to the seat)
- 3 Setting power lift sensitivity
- 4 Control levers for the rear distributors





### 4.1.1.5 GL cab controls

- 1 Air recirculation vents
- 2 Air temperature selector
- 3 Blower speed selector
- 4 Air vents
- 5 Air conditioning switch

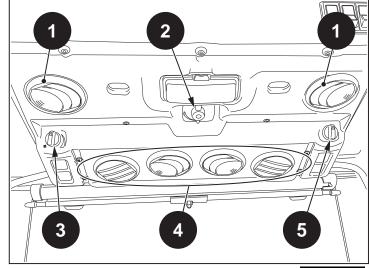


Fig. 4.10

- 6 Work lights switch
- 7 Screen wash pump switch
- 8 Work lights switch
- 9 Beacon light switch
- 10 Rear wiper switch

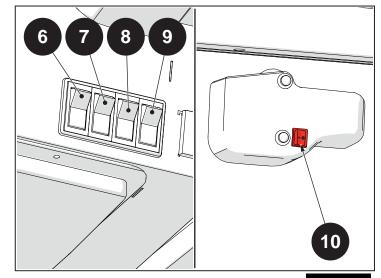


Fig. 4.11



### 4.1.2 External controls

1 - Battery master switch

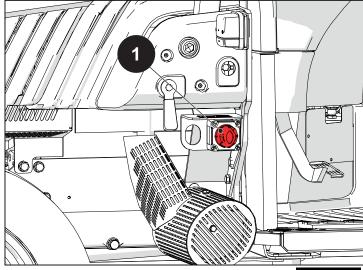


Fig. 4.12

- 2 12V power socket
- 3 7 pole socket for trailer
- 4 Rear distributor quick couplings

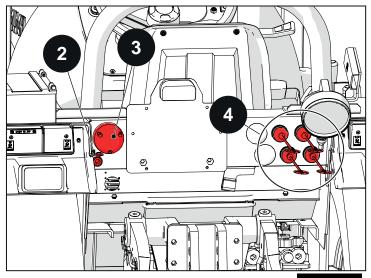


Fig. 4.13

5 - Front distributor quick couplings (if present)

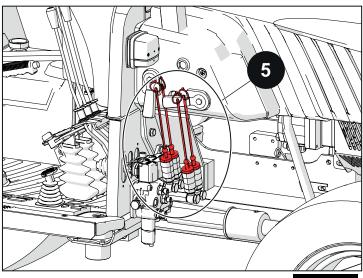


Fig. 4.14



## 4.2 Controls

### 4.2.1 Rear view mirrors

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

ROPS

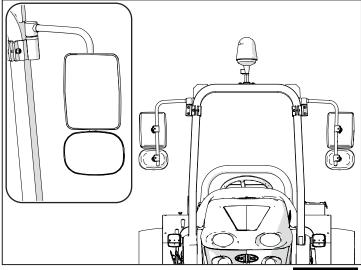
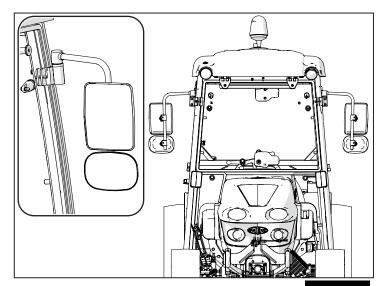


Fig. 4.15

GL cab





## 4.2.2 Toolbox

#### **ROPS**

The tool box is situated on the left hand mudguard, on the side of the seat.

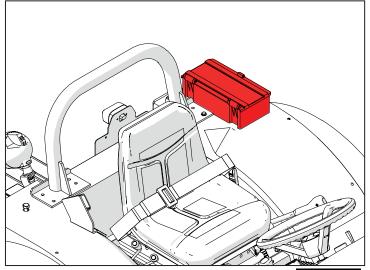


Fig. 4.17

#### GL cab

The tool box is situated in the front part, on the left side next to the battery master switch.

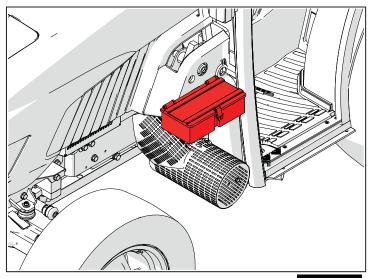


Fig. 4.18



#### 4.2.3 Seat

Danger

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



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

#### Seat controls:

- 1 Longitudinal adjustment
- 2 Height adjustment (limiter)
- 3 Weight adjustment
- 4 Seat belts

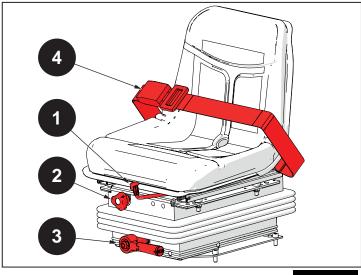


Fig. 4.19

#### Weight adjustment

Turn the lever at the front of the seat suspension system clockwise or anticlockwise. On certain suspension versions, this lever has a ratchet action. 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.

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, the seat is adjusted correctly when the pointer is in the centre of the green zone.



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

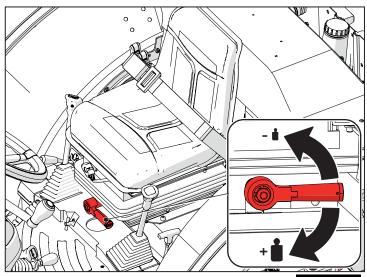


Fig. 4.20



### Height adjustment (limiter)

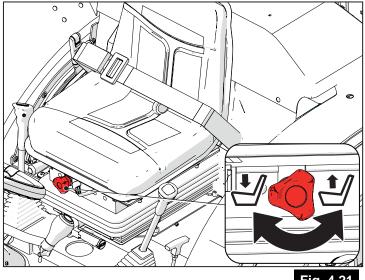
The limiter limits the maximum upward excursion of the seat suspension.

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.



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



#### Fig. 4.21

### 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.

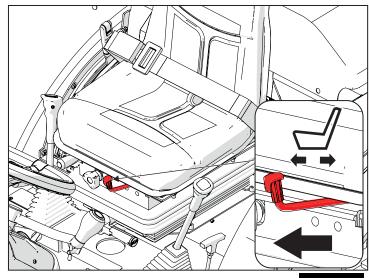


Fig. 4.22

#### **Document holder (if applicable)**

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

<sup>\*</sup> may be padlocked.



### 4.2.3.1 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 (5) or lengthen by pulling the part (6).

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

To release the seat belt, press the red button (7) on the buckle completely until it clicks and releases the tongue.

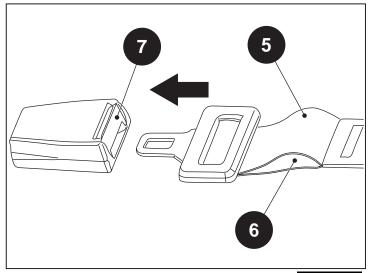


Fig. 4.23

#### **Belt retractor functions**

The belt retractor performs two functions:

- retracts the belt automatically when worn while allowing the driver to move. 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 itself.

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

#### 4.2.3.2 Looking after the seat

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

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



Risk of injury caused by backrest springing forwards! When cleaning the upholstery of the backrest, the backrest adjustment must be enabled only if the backrest is held with one hand.



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.



#### 4.2.4 Horn

Press the light selector on the dashboard. to 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.

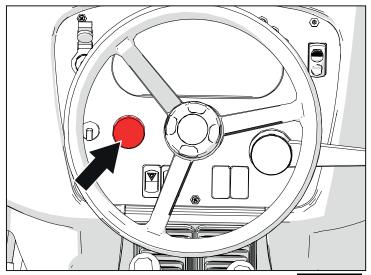
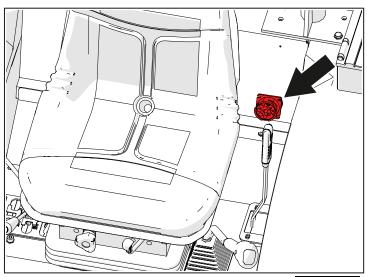


Fig. 4.24

## 4.2.5 CAN diagnostic interface

The CAN diagnostic interface permits communication between the diagnostic tool and the tractor in order to diagnose faults, and indicates the fault codes generated by the control unit with flashing sequences.





#### 4.2.6 ROPS

Models without a cab are equipped with a folding rollover protection frame.



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

When in 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.



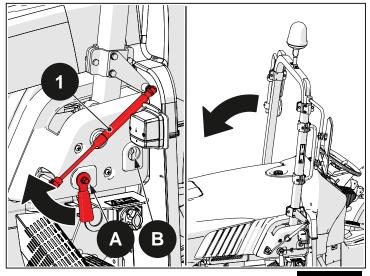
Do not modify the structural components of the ROPS for any reason whatsoever by welding on additional parts, drilling holes, grinding, etc. Failure to observe this instruction may compromise the stiffness of the ROPS, reducing the level of protection ensured by the original equipment.



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.

To lower the ROPS, carry out the following on both sides:

- Rotate the spring pin 90° horizontally to unlock it, and extract it.
- Fold down the ROPS. The gas dampers (1) help the lifting action and reduce the recoil when lowering.
- Insert the pin in the hole (A) to fasten the rollbar in vertical position; Insert the pin of the hole (B) to fasten the roll-bar in horizontal position.
- Turn the spring pin 90° vertically to lock it.





### 4.3 Cab controls

## 4.3.1 Windscreen wiper

Only works with the ignition switch turned to ON.

Press the button (1) on the right hand side of the upper cab panel to switch on the windscreen wiper.

The switch is situated on the right hand side of the upper cab panel.

Position A = wiper off

Position B = wiper on

Position C (press switch and hold - switch returns automatically to position B when released) = screen washer



The lower part of the button illuminates when the light selector dial is turned to the daytime running lights on position (first notch).

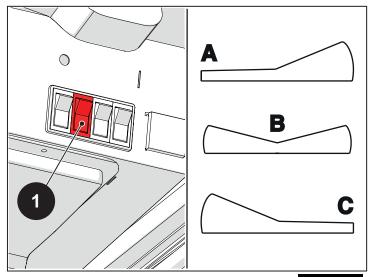


Fig. 4.27

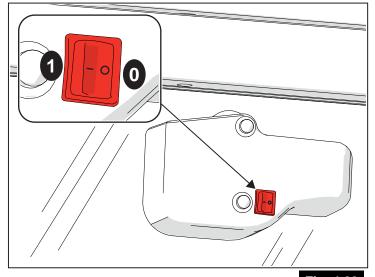
## 4.3.2 Rear wiper

Only works with the ignition switch turned to ON.

Press the button on the windscreen wiper motor to switch on the rear windscreen wiper.

Position 1 = on

Position 0 = off





#### 4.3.3 Sun shade

The driver may lower the sun shade to protect the eyes from direct sunlight when operating the tractor. The driver may lower the sun shade to protect the eyes from direct sunlight when operating the tractor.

- 1 Sun shade retract button
- 2 Sun shade button

To lower the sun shade, pull down while pressing the sun shade button (2) as shown by the arrow. Press the sun shade retract button (1) to retract the sun shade.

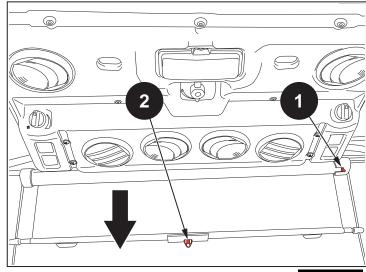


Fig. 4.29

### 4.3.4 Windscreen-rear screen washer

Only works with the ignition switch turned to ON.

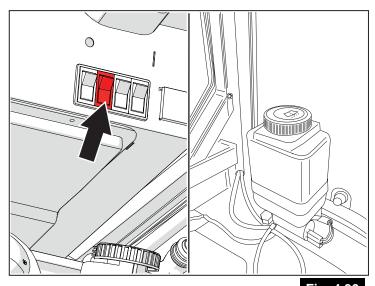
Press the switch as shown by the arrow. Press and hold to spray both the windscreen and the rear screen.



When the button is released, it returns automatically to the windscreen wiper on position.

Top the screen wash fluid tank with a specific screen wash product. Use a washer fluid with antifreeze properties in winter.

The button is situated on the upper cab panel.





### 4.3.5 Doors

Both doors can be opened from the outside by pressing the relative button (3) and from the inside by pressing the specific lever (4).

The doors are held in the open or closed position by gas struts.

The doors are also equipped with key-operated security locks.

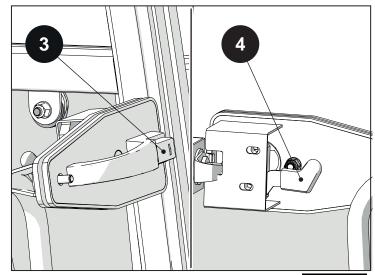


Fig. 4.31

### 4.3.6 Windows

The window may be opened from inside the cab by turning the lever counter-clockwise. The rear window is held in the open or closed position by gas struts.

- 1 Front window lever
- 2 Rear window lever

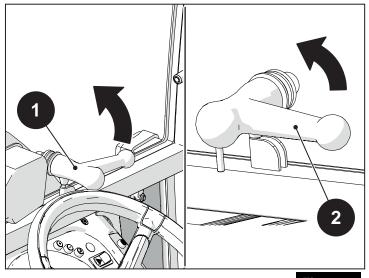
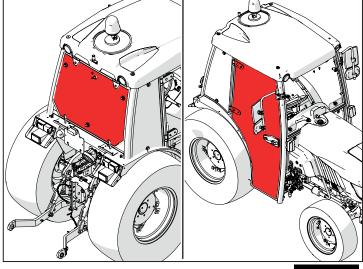


Fig. 4.32



## 4.3.7 Emergency exit

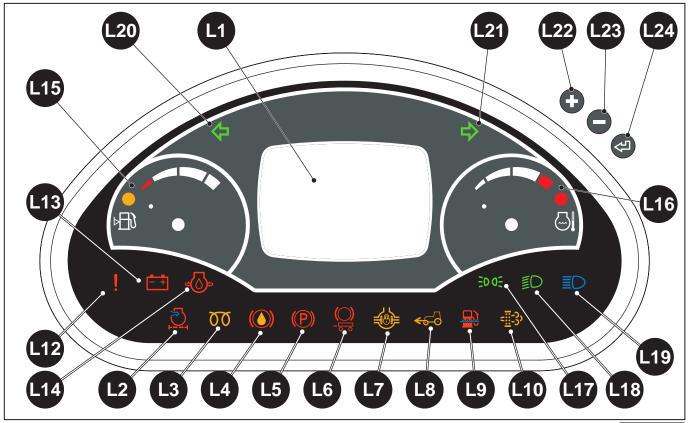
The emergency exits are the rear screen and the right hand door.





## 4.4 Multifunction instrument

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



- L1 Digital information display
- L2 Engine air filter clogged
- L3 Engine preheat
- L4 Not used
- L5 Parking brake engaged
- L6 Not used
- L7 Not used
- L8 Not used
- L9 Not used
- L10 Not used
- L12 General alarm
- L13 Battery charge
- L14 Insufficient engine oil pressure
- L15 Reserve fuel alarm
- L16 Engine Coolant Temperature alarm
- L17 Sidelights
- L18 Low beam headlights
- L19 High beam headlights
- L20 Left hand turn indicator
- L21 Right hand turn indicator
- L22 + button
- L23 - button
- L24 Confirm/Enter button



Turn the ignition switch clockwise to ON to turn the display on. The welcome screen is displayed.

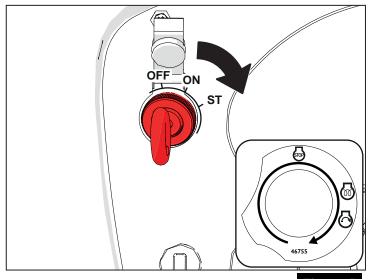


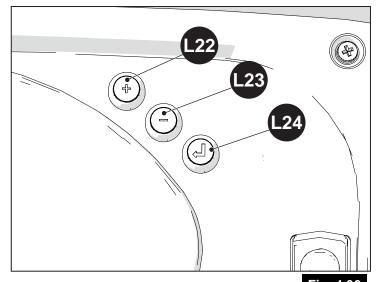
Fig. 4.35

Use the following to navigate between the functions of the display:

L22 - Forward button

L23 - Back button

L24 - Confirm button





#### 4.4.1 Welcome screen

The Goldoni logo is displayed for 5 seconds when the instrument panel is switched on.

The analogue indicator hands will be positioned on the full scale and then return to the rest position.

In the same way the LED lights will turn on simultaneously, then go off.



The respective indicator lamp illuminates if a malfunction is identified by the system.

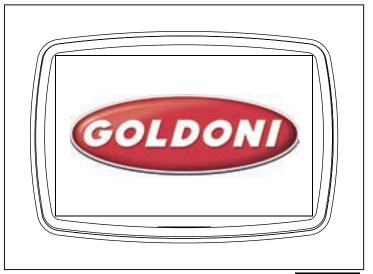


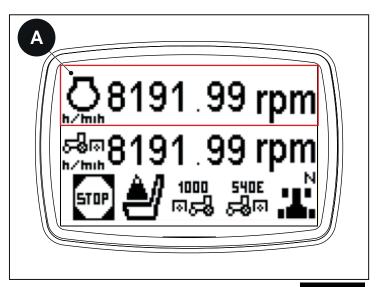
Fig. 4.37

### 4.4.2 Main screen

The following information is displayed in the main screen:

#### (A) - Engine rpm

In this position the engine rpm will be displayed.





#### (B) - PTO rpm

The rpm of the rear PTO is displayed in this area.

To be able to view the rounds of the front PTO, if engaged, press and hold the enter button.

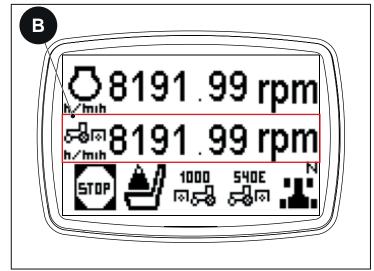
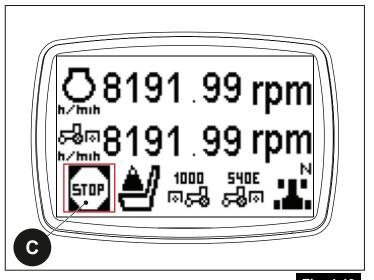


Fig. 4.39

#### (C) - Active error

The icon for the currently active error is displayed in this position on the dashboard. See the table given below for descriptions of the icons displayable.

Icon	Description
STOP	This icon is accompanied by a continuous warning tone. SWITCH THE ENGINE OFF IMMEDIATELY. CONTACT THE GOLDONI TECHNICAL SUPPORT SERVICE.
<b>(</b>	This icon is accompanied by an intermittent warning tone. While it is not necessary to switch the engine off immediately, the problem causing the error should be diagnosed as soon as possible. CONTACT THE GOLDONI TECHNICAL SUPPORT SERVICE.





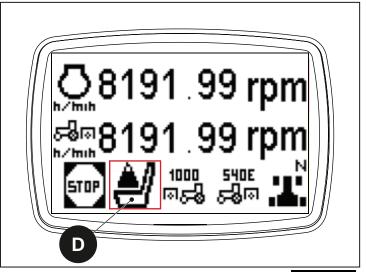
#### (D) - Safe start-up

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

During engine start, the operations necessary to start the tractor safely are shown on the display.



The tractor cannot be started if the necessary safety operations are not performed.



Function	Icon shown on display	Description of icon	Tractor behaviour	Solution
Operator seated detector switch		The icon indicates that the operator must be seated when the tractor is started	If the system does not detect that the operator is seated, the relative icon is shown on the display followed by an audible warning signal. It will not be possible to start the tractor	Sit in the seat in order to start the tractor.
Reverse shuttle position sensor	N	The icon indicates that the shuttle lever must be in neutral (N)	If the system does not detect that the shuttle lever is in neutral (N), the relative icon is shown on the display followed by an audible warning signal. It will not be possible to start the tractor	Move the reverse shuttle lever into neutral (N).
Front and rear PTO engaged sensors	<b>\$</b>	The icon indicates that the front and rear PTOs must not be engaged	If the system detects that the front or rear PTO is engaged, the relative icon is shown on the display followed by an audible warning signal. It will not be possible to start the tractor	Disengage the front PTO and set the rear PTO speed selector lever to neutral.
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		The icon indicates that the clutch pedal must be depressed	If the system detects that the clutch pedal is not depressed, the relative icon is shown on the display followed by an audible warning signal. It will not be possible to start the tractor	Depress the clutch pedal



#### (E) - Front Power Take Off engaged

The status of the front PTO is displayed in this area. See the table given below for descriptions of the icons displayable.

Icon	Description
1000 F 등	Front PTO engaged

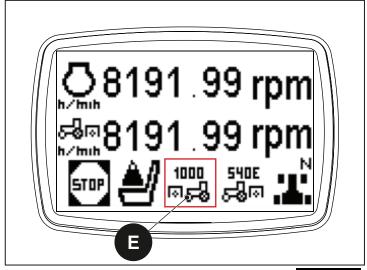


Fig. 4.42

#### (F) - Rear Power Take Off engaged

The status of the rear PTO is displayed in this area. See the table given below for descriptions of the icons displayable.

Icon	Description
540 5월(이	Rear PTO engaged with speed mode 540
540E 6=0 ⊙	Rear PTO engaged with speed mode 540E

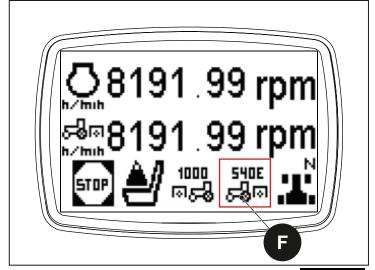


Fig. 4.43

#### (G) - Reverse shuttle

The status of the reverse shuttle is displayed in this area. See the table given below for descriptions of the icons displayable.

Icon	Description
, z	Reverse shuttle in Neutral
÷.	Reverse shuttle in Forward
.Ţ.	Reverse shuttle in Reverse

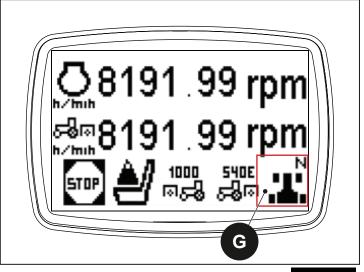


Fig. 4.44



#### 4.4.3 Information screen

The following information is displayed in the Information screen:

#### (A) - Operating hours

The total engine operating hours count is displayed in this area.

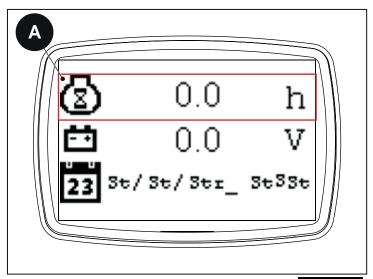


Fig. 4.45

#### (B) - Battery information

The battery voltage is displayed in this area.

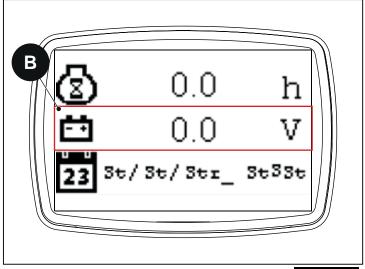


Fig. 4.46

#### (C) - Date and Time

The date and time, in the format "dd/mm/yyyy hh:mm", is displayed in this area

- dd Day
- mm Month
- yyyy Year
- hh Hours
- mm Minutes

To modify the date and time, press and hold Enter until the Day value (dd) starts flashing. Press + and - to modify the value. Press Enter to save the new setting and move on to the next value, and repeat to set all the date and time values.

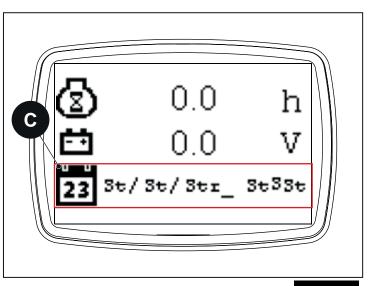


Fig. 4.47



## 4.4.4 Diagnostic screen

To access the diagnostic system of the tractor, connect the diagnostic tool to the OBD port on the front left of the dashboard.

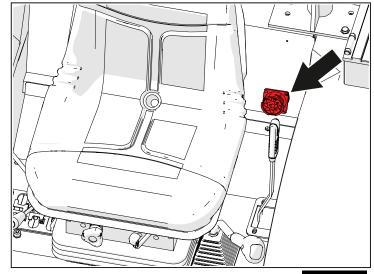


Fig. 4.48

All the active errors registered automatically by the tractor diagnostic system are displayed in this screen.

Each error code consists of two parts identifying the fault:

- (A) Icon identifying the part/system involved (PTO, VCU, Generic Error etc.);
- (B) 4-digit code identifying the error itself.

If more than 6 errors are currently active on the tractor, the most severe errors are displayed.

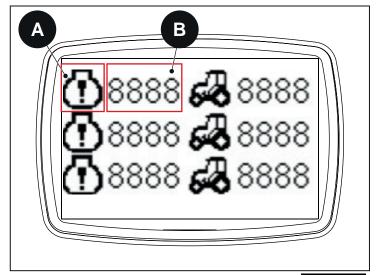
Errors of the same degree of severity are displayed in chronological order (most recent first).



See the section "Error codes" to show the complete list of the errors.



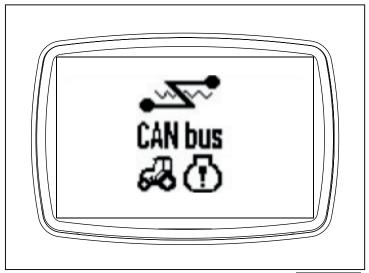
This screen is only displayed if there are active errors present.





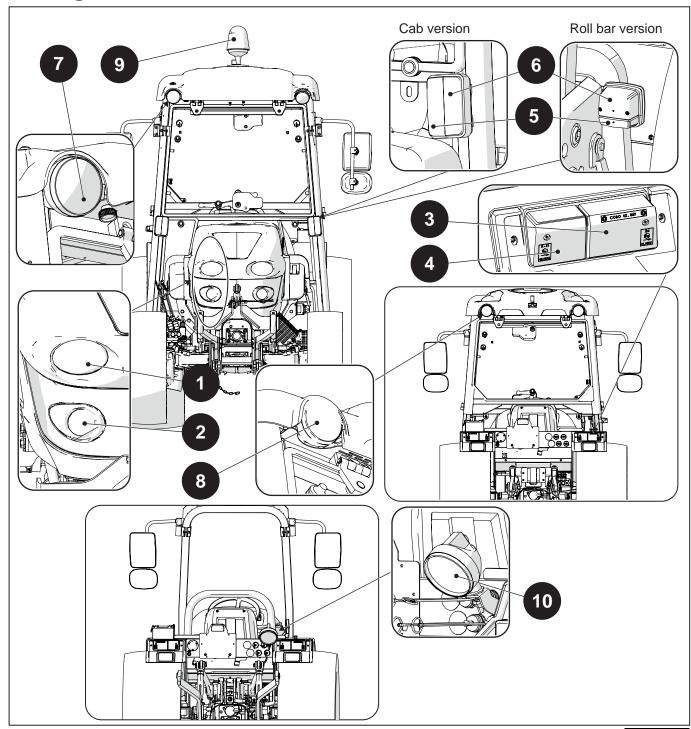
## 4.4.5 BUS OFF screen

This screen is displayed when no communication with the electronic control units is detected. A continuous warning tone also sounds.





## 4.5 Lights



- 1 Low beam headlights
- 2 High beam lights (if available)
- 3 Rear turn indicator
- 4 Brake light and rear running light
- 5 Front sidelight
- 6 Front turn indicator
- 7 Front work light
- 8 Rear work lights
- 9 Rotating beacon
- 10 Rear work light (roll bar version)



## 4.5.1 Running lights, high and low beam headlights (if available)

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

Set the light selector stalk to position (2) to switch on the right and left hand low beam headlights.

Set the light selector stalk to position (3) to switch on the high beam headlights (if available).

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.

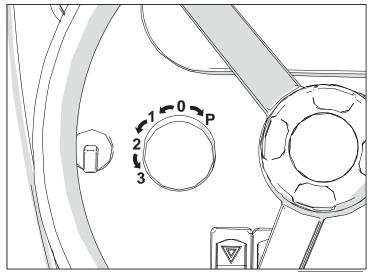


Fig. 4.52

## 4.5.2 Turn indicator lights

To indicate a change of direction to the right, move the switch to the right. To indicate a change of direction to the left, move the switch to the left. The relative indicator lamp on the instrument panel for the turn signal selected flashes.

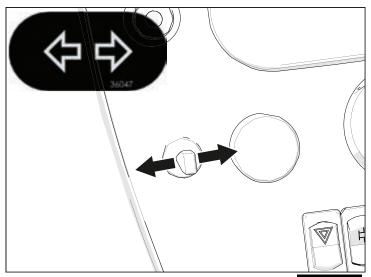
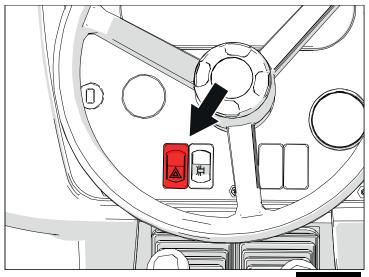


Fig. 4.53

## 4.5.3 Hazard warning lights

The hazard warning light button is used to turn the hazard warning lights on and off. Press to flash all the turn indicators simultaneously. Press again to deactivate the indicators.





## 4.5.4 Work lights

Press the button (10) to turn the front work lights on. Press the button (11) to turn the rear work lights on.



Only available for the cab version.

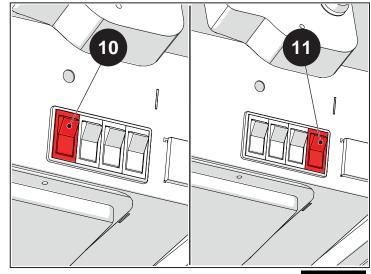


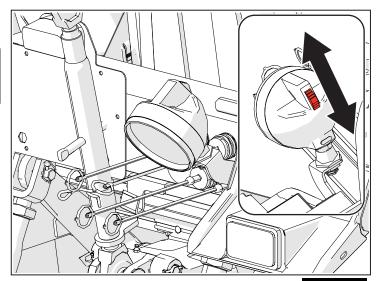
Fig. 4.55

## 4.5.5 Rear work light

To turn on work light press the switch above it. Only works with the ignition switch turned to ON.



Only available for the roll bar version.





## 4.5.6 Rotating beacon

Press the button (12) to turn the rotating beacon on.

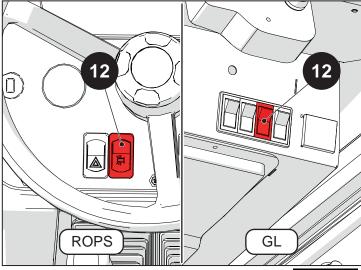


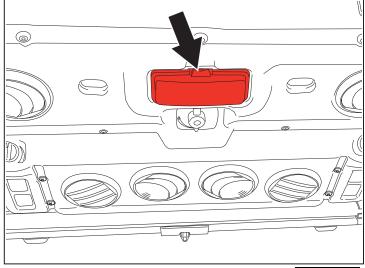
Fig. 4.57

## 4.5.7 Cabin light unit and switch

Press the indicated switch to turn the cabin light on.



As the cabin light unit is powered by the battery for the electric systems, it can be switched on even when the ignition switch is turned off.





## 4.6 Air conditioning

#### 4.6.1 Air conditioning controls

The air conditioning control panel consists of the following:

- 1 air speed setting dial
- 2 temperature setting dial
- 3 Compressor knob

Select between the three blower speed settings (1) available to adjust the air flow into the cab.

Set the heater air temperature with the dial (2). Turn the dial (2) to adjust the temperature. Turn the dial fully clockwise (to the right) for maximum heating. Turn fully to the left to deactivate heating. Switch on the air conditioner to dehumidify the air in the cab.

Set the cooling air temperature with the dial (3). Turn the dial (3) to adjust the temperature. Turn the dial fully clockwise (to the right) for maximum cooling. Turn fully to the left to deactivate cooling. For maximum cooling effect, the heating must be off when the air conditioner is used.

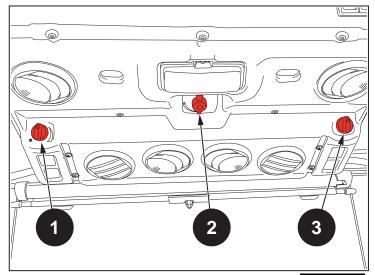


Fig. 4.59



Close the doors and windows of the cab when the air conditioner or heater are working. Otherwise the cooling or heating effect will be reduced.



## Warning

To prevent the risk of damage to the air conditioning system, never disassemble any of the components of the air conditioner parts.



### Warning

The condenser must be cleaned regularly, removing dust, insects and other foreign matter for the air conditioner system to function correctly



#### 🔼 Warning

To prevent the compressor from seizing, the air conditioning system must be switched on, even if only for a few minutes, at least once every month. Switch on the compressor and turn the temperature adjustment switch to the maximum and minimum positions in order to idle the engine for a few minutes.



#### 🔼 Warning

Special tools and suitable protective equipment are necessary to service the air conditioner. To avoid the risk of fire or other accidents due to improper maintenance, faults concerning the air conditioner must only be repaired by the GOLDONI service network.



Avoid direct contact with the refrigerant! In the event of contact with the eyes, seek immediate medical treatment to prevent further damage

The temperature in the vicinity of refrigerant lines piping must not exceed 80°C.



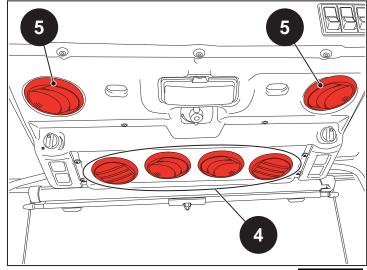
### 4.6.2 Air vents

The recirculation system uses:

- 4 air outlet vent (diffuser)
- 5 air inlet vent

The air vent cover may be turned to adjust the volume and direction of the air delivered.

To create a recirculation effect in the cab, run the cab ventilation system with all the vents (4) and all the intakes (5) open and the doors closed, so that the system draws air from the cab rather from outside.





# 5: Operating instructions

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5.1	Startii	ng and stopping the engine	5-3
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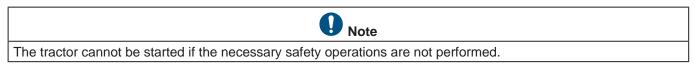


## 5.1 Starting and stopping the engine

## 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.

During engine start, the operations necessary to start the tractor safely are shown on the display.



Function	Icon shown on display	Description of icon	Tractor behaviour	Solution
Operator seated detector switch		The icon indicates that the operator must be seated when the tractor is started	If the system does not detect that the operator is seated, the relative icon is shown on the display followed by an audible warning signal. It will not be possible to start the tractor	
Reverse shuttle position sensor	N	The icon indicates that the shuttle lever must be in neutral (N)	If the system does not detect that the shuttle lever is in neutral (N), the relative icon is shown on the display followed by an audible warning signal. It will not be possible to start the tractor	Move the reverse shuttle lever into neutral (N).
Front and rear PTO engaged sensors	<b>\$</b>	The icon indicates that the front and rear PTOs must not be engaged	If the system detects that the front or rear PTO is engaged, the relative icon is shown on the display followed by an audible warning signal. It will not be possible to start the tractor	Disengage the front PTO and set the rear PTO speed selector lever to neutral.
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		The icon indicates that the clutch pedal must be depressed	If the system detects that the clutch pedal is not depressed, the relative icon is shown on the display followed by an audible warning signal. It will not be possible to start the tractor	Depress the clutch pedal



## 5.1.2 Access to the driver's seat (version with roll bar)

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

- Steady yourself by grasping the handrails (1) and placing one foot on the footboard (2), then carefully board the tractor.

## **A** 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.

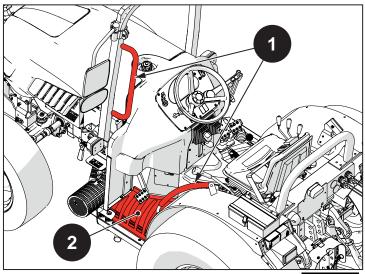


Fig. 5.1

## 5.1.3 Access to the driver's seat (version with cab)

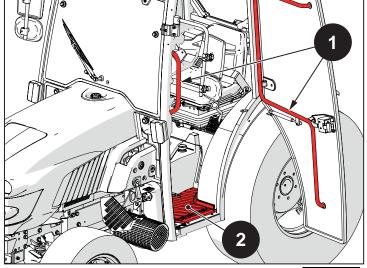
Follow the instructions given below to access the driver seat correctly and safely:

- Open the door.
- Steady yourself by grasping the handrails (1) and placing one foot on the footboard (2), then carefully board the tractor.



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

- Sit in the seat.
- Close the door.
- 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.





## 5.1.4 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.

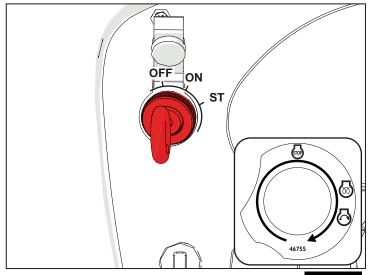
Wait at least 30 seconds with the engine at idle speed before pulling away from a standstill to allow lubricating oil to reach all components.



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.
- ST: In this position it is possible to start the engine, or to preheat the glow plugs. The key automatically returns to the ON position when it is released.





Start the engine as follows.

- Turn the ignition switch to ON and check that no fault warning indicators are shown on the display.
- Turn the switch to the ST position without pressing the clutch pedal (to prevent the ignition) in order to preheat the glow plugs. After a suitable time, turn the ignition switch back to OFF.

## Warning

Hold the ignition switch in the ST position for a maximum of 10-15 seconds to avoid damaging the glow plugs.

- Depress the clutch pedal completely and turn the ignition switch to ON, the turn 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 fails to start, wait for 2 minutes to allow the starter motor to cool and then try again. If the engine still fails to start after 4 consecutive attempts, identify and resolve the problem before attempting to start the engine again.

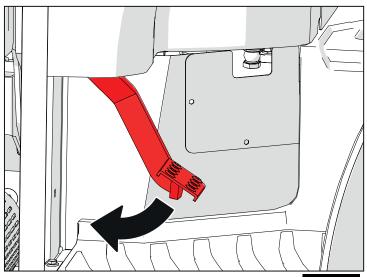
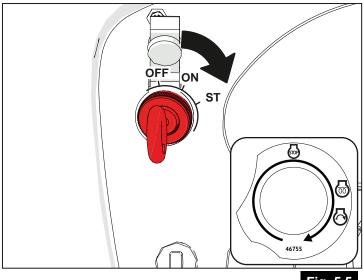


Fig. 5.4





### 5.1.4.1 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.

At low temperatures, idle the engine for 3 to 4 minutes before starting work.

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.

## 5.1.5 Stopping the engine

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

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

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

Always lower any mounted implements to ground level.

Turn the ignition switch to OFF.

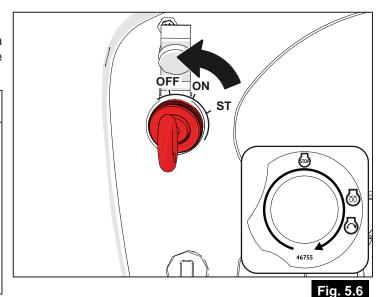
Remove the ignition key from the ignition switch to prevent unauthorised persons from starting the engine.



### 🔼 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.







### Caution

The steering action of the power steering system is reduced in the event of accidental stop of the engine. Depress the main brake to allow the machine to come to a full stop.



#### Caution

Do NOT leave the machine with the key inserted in the ignition switch.

## 5.1.6 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);

Use the lever (2) to select the required gear;

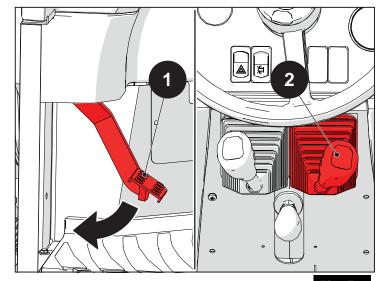


Fig. 5.7

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

Use the reverse shuttle lever (4) to select the required drive direction;

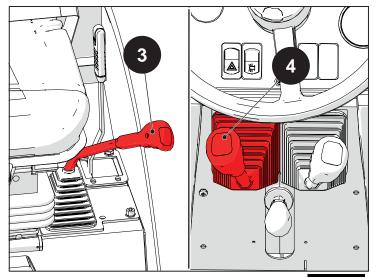
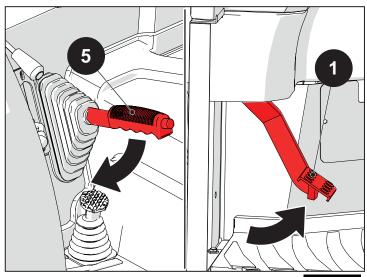


Fig. 5.8

Release the parking brake (5);

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





## 5.1.7 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.



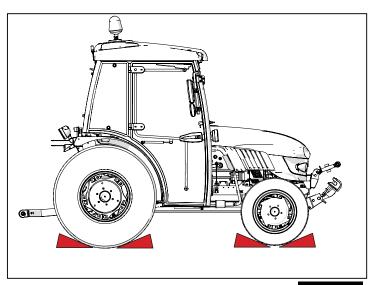
### Danger

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.





Stop the engine as follows:

Reduce engine speed.

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

Put the range, gear and reverse shuttle levers in neutral.

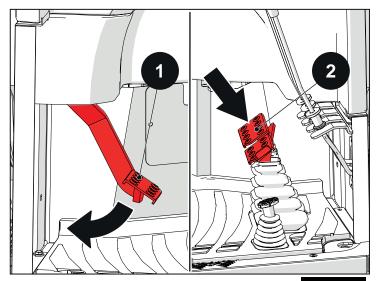


Fig. 5.11

Release the clutch pedal (1).

Engage the parking brake (3) by pulling the lever.

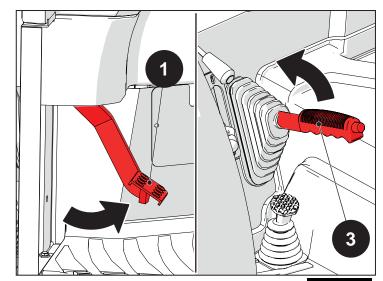


Fig. 5.12

Turn the ignition switch to OFF.

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

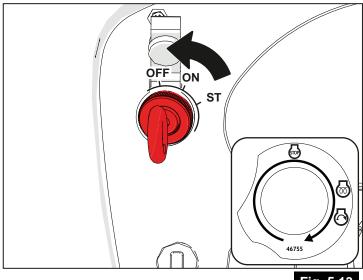


Fig. 5.13



## 5.1.8 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:

- Fill the front hub oil sump and lubricate the front wheel drive axle king pin and the water pump shaft. 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 fuel and coolant, and compile the respective fluid labels correctly.
- Check that the tyres are inflated to the correct pressure.
- Check that the electrical system functions correctly and that all electrical connections are secure.
- Put all the control levers in neutral.

#### Running in:

- Avoid exceeding 75% of maximum power during the first 50 operating hours of the engine.
- Do not run the engine for prolonged periods in low load conditions or at low engine speeds when running the engine in: A running-in carried out in such a way may result in excessive oil consumption and/or oil in the exhaust.



### **5.2 Transmission controls**

### 5.2.1 Hand throttle



The hand throttle must only be used for tasks requiring a constant engine speed. Never use the hand throttle when driving on roads.

The hand throttle lever is located in the front righthand part of the machine.

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.

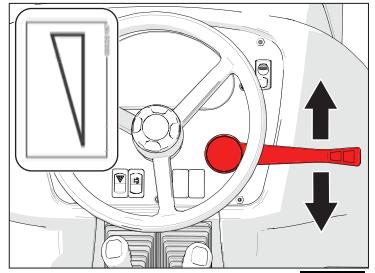


Fig. 5.14

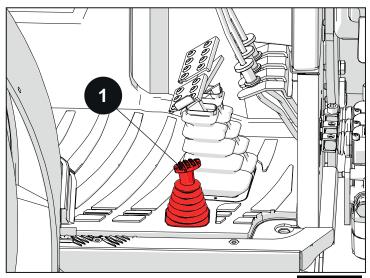
## 5.2.2 Foot throttle pedal



When using the throttle pedal, preferably move the hand throttle into the lowest position to set idle speed.

Pressing the throttle pedal (1) overrides the position of the hand throttle. When the pedal is released, the engine speed returns to the value set with the hand throttle.

Press the pedal (1) to increase speed. Release the pedal to reduce speed.





#### Clutch pedal 5.2.3



### 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.



# ⚠ War<u>ning</u>

Lengthy clutch disengagements could wear out the thrust bearing.

Press the pedal to disengage the clutch. Release to engage the clutch.

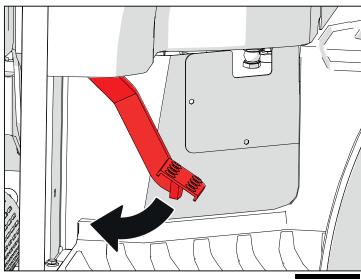


Fig. 5.16

#### 5.2.4 Reverse shuttle lever

This lever is used to select the drive direction of the tractor. Press the clutch and stop the tractor with the brakes before changing the position of the reverse shuttle lever.

The reverse shuttle lever has 3 positions:

- Forward: lever in (F) position - Neutral: lever in (N) position
- Reverse: lever in (R) position



## Warning

Never invert the drive direction while the tractor is moving. This may damage the transmission.



### Note

The reverse shuttle lever decal is coupled to the one of the rear PTO clutch, see figure Fig. 5.30 (left side).

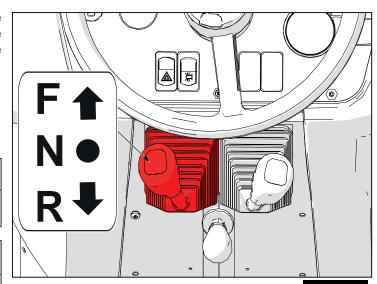


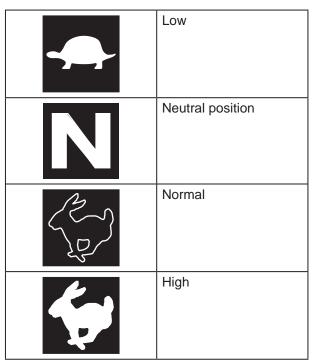
Fig. 5.17



### 5.2.5 Selecting ranges

The range selector lever offers a choice of three different working ranges for a total of 12 different speeds in both directions.

To shift from one range to another, press the clutch pedal to disengage the transmission clutch, bring the tractor to a stop and select the required range with the lever.



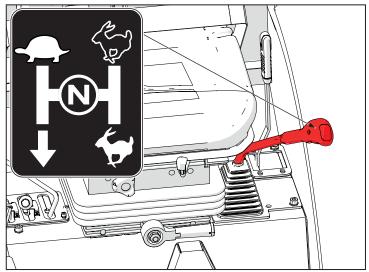


Fig. 5.18

### 5.2.6 Selection Fast Reverse

Without acting on the reverse shuttle lever and on the one of the speed selection but simply by engaging the reverse gear Fast Reverse, the operator can perform manoeuvres much quicker. For example, if the operator is moving to the speed of 2 km/h (in 4th gear reduced) and acts on the reverse shuttle lever, the tractor reverses at the same speed. If the manoeuvre requires to reverse quicker without operating other transmission levers but simply by engaging the Fast Reverse, the operator can reverse at 11 km/h, over five times more quickly. For example this device will be very useful for manoeuvres to be carried out at the end of the headland.



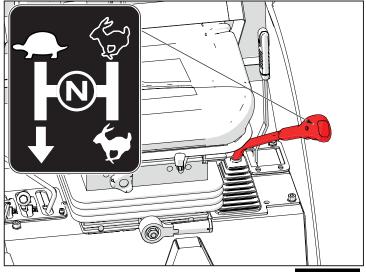


Fig. 5.19



### 5.2.7 Gear lever

The gear lever lets the driver select from four different synchronised speeds in both forward and reverse drive directions.

To change gear, press the clutch pedal to disengage the transmission clutch and select the require gear. The positions of the gears are identified by numbers on the gear knob.

No gear is engaged when the lever is set to the central position (neutral).

To select reverse speed, use the reduced control.

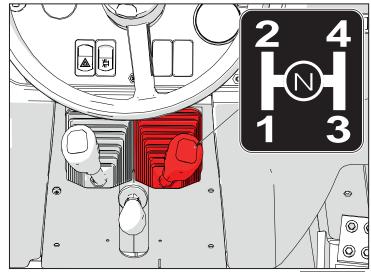


Fig. 5.20



### Caution

Engagement of reverse gear and/or the consequent engagement of forward gear must be carried out ALWAYS with the engine at idling speed and with the wheels not turning.

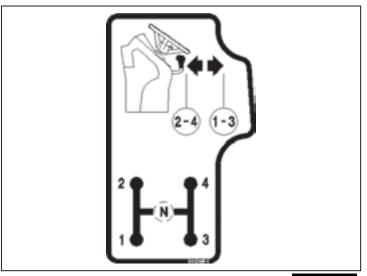


Fig. 5.21

The speed decal summarises the gear data of the tractor.

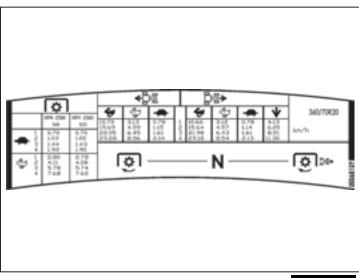


Fig. 5.22



### 5.2.8 Differential lock

The differential lock system installed in the rear axle of the vehicle allows the driver to lock the left and right hand wheels together on both axles so that they rotate at the same speed.

This function is particularly useful for tasks such as ploughing or when one of the two drive wheels encounters poor grip conditions when driving on muddy, rough or slippery terrain.



### Note

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.

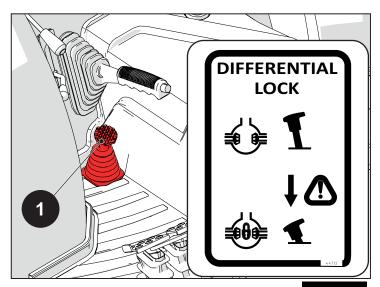


### Danger

Do not use the differential lock at speeds above 15 km/h. Engaging the differential lock is not recommended if the vehicle has already exceeded 8 km/h.

The differential lock system is controlled from the pedal (1) on the right hand side under the parking brake lever.

Press the pedal (1) to engage the differential lock. Release the pedal (1) to disengage the differential lock.





## 5.3 Braking system

### 5.3.1 Service brakes

The service brakes may be used either independently or, when latched together by a specific pin, simultaneously.

When using the brakes independently, the left hand pedal (1) may be pressed to brake and lock the left hand wheel and the right hand pedal (2) may be pressed to brake and lock the right hand wheel.

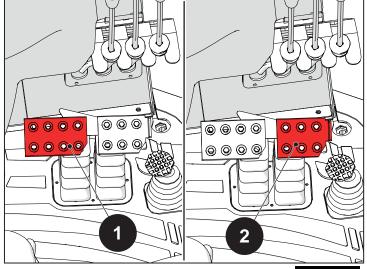
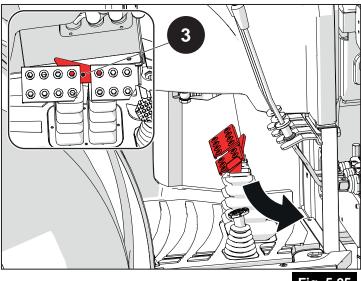


Fig. 5.24

To use the brakes on both wheels simultaneously, latch the pedals with the link pin (3). Press the pedals to brake both wheels simultaneously.





If the brake pedals feel excessively spongy when braking or can be pressed all the way to the floor without resistance:

- Do not drive the tractor.
- Identify the cause of the problem and rectify it immediately.
- If you cannot resolve the fault, consult immediately an authorised service centre.



Avoid sudden braking unless in an emergency.

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



**NEVER** use independent pedals during travel on the road.



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



The brake pedals must always be latched together with the link pin when driving on the road.



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



## 5.3.2 Parking brake

The parking brake is operated with the lever on the left hand side of the seat. Pull the lever (1) up to engage the parking brake. The relative symbol (3) illuminates on the display.

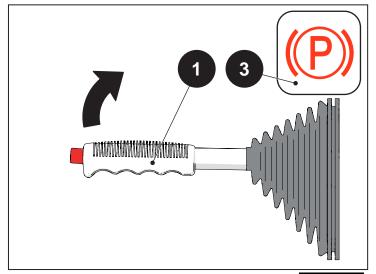


Fig. 5.26

To release the parking brake, pull the lever (1) up, and then simultaneously press the release button (2) while lowering the lever (1) completely. The symbol (3) on the display extinguishes.

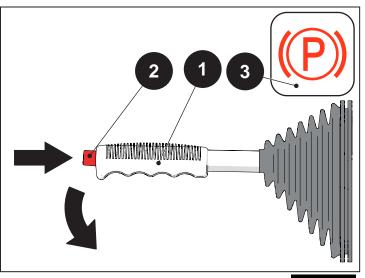


Fig. 5.27



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.



### 5.4 Power Take Off

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



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



### Warning

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



Danger

Do not remove or damage the metal guard.



Danger

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

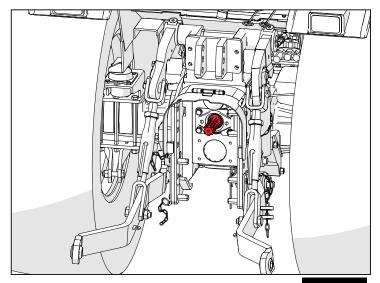


Danger

When connecting high inertia implements (e.g. mower decks, flail mowers etc.) to the PTO, a universal join 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.

#### 5.4.1 Rear power take off

The rear PTO may be used in two modes (ground speed or independent) and at two operating speeds (540 rpm or 1000 rpm).





The rear PTO is operated with three levers.

The PTO clutch control lever. (1) has 2 positions:

- PTO engaged lever up;
- PTO disengaged lever down.

Push the lever (1) down to disengage the PTO.

Engaging the PTO: pull the lock ring (2) to release and then push the lever (1) up.



### Danger

Releasing the clutch lever abruptly may cause the machine to respond dangerously.

When the PTO clutch lever is lowered, the icon (X) is displayed on the instrument panel to indicate that the PTO is disengaged.

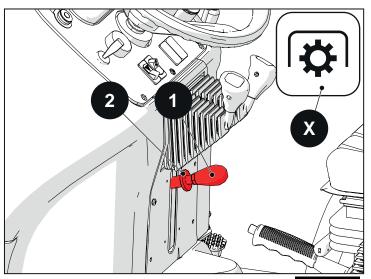


Fig. 5.29



## Warning

The lever (1) must be kept in the lowered position as briefly as possible, and only for the length of time strictly necessary to select speed and mode.

Holding the PTO clutch lever in the lowered position for longer than necessary may cause severe damage to the clutch.

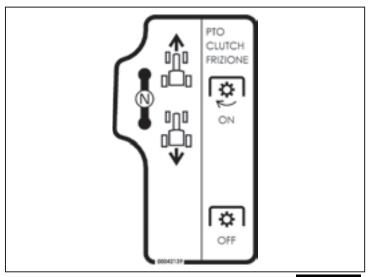


Fig. 5.30

PTO mode selector lever. (3) has 3 positions:

- Groundspeed lever pushed forwards (S);
- Neutral lever in centre;
- Independent lever pulled back (I).

Pull the lever (3) back to select Independent mode. Push the lever (3) forward to select Groundspeed mode.

Once the relative task is complete, return the PTO mode selector lever (3) to Neutral.

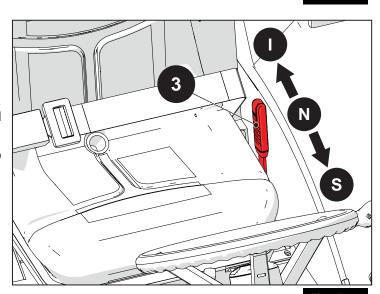


Fig. 5.31



PTO speed selector lever. (4) has 3 positions:

- fast 1000 rpm. lever upward (A).
- slow 540 rpm. lever downward (B);
- Neutral lever in centre (N).



### Warning

The lever must be put in neutral position to start the engine.

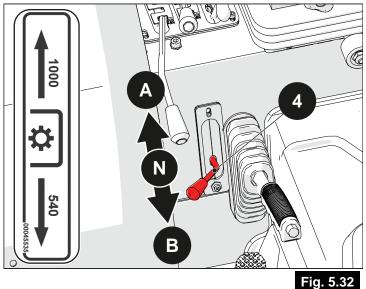


Fig. 5.32

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 gets up from his seat when the PTO is engaged, a buzzer is activated and the PTO warning light (7) on the dashboard starts to flash: if the operator sits down again within 2 seconds, the warning lamp (7) and buzzer are deactivated; if not, the engine stops within 7 seconds, the buzzer cuts out but the warning light (7) continues to flash because the PTO is still on.

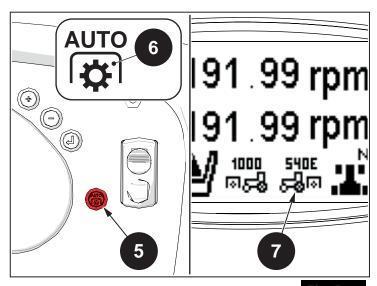
When the engine stops once 7 seconds have elapsed, you must carry out the normal engine start-up procedure (see the "Starting and stopping the engine" section), then reactivate the PTO as described in this section. You cannot reactivate the engine (and the PTO) automatically simply by sitting on the seat.



#### Danger

The engine stops (and the PTO is disengaged) approximately 7 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 has to be activated by pressing **the button (5) twice within 2 seconds** of engaging the PTO; The icon (6) is shown on the display. "PTO Auto" is automatically deactivated when the operator sits again.





The rear PTO is equipped with a safety cover. Turn the cover clockwise to release and then remove the cover. Refit the cover, aligning the holes with the lock pins (shown in the figure) and then turning the cover anticlockwise to lock it in place.

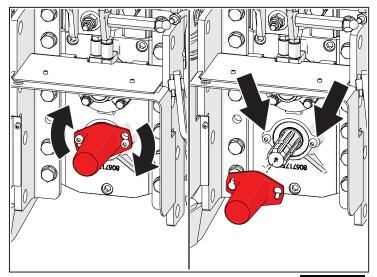


Fig. 5.34

### **Power Take Off operating functions**

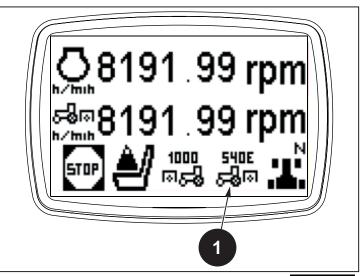
If the PTO is engaged and the operator gets up from his seat, the alarm buzzer sounds and the PTO warning light. (1) starts to flash. If the operator sits down again, the buzzer stops.

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. (e.g. the operator raises from his seat) 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.





### 5.4.2 Front Power Take Off

The front Power Take Off can be used in Independent mode at an engine speed of 1000 rpm.

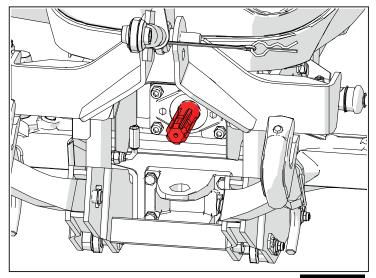


Fig. 5.36

The front Power Take Off is controlled using switch (1).

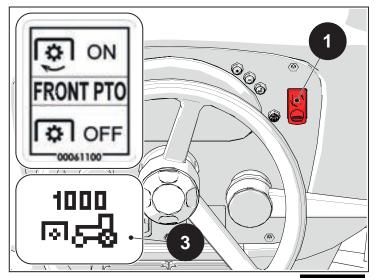


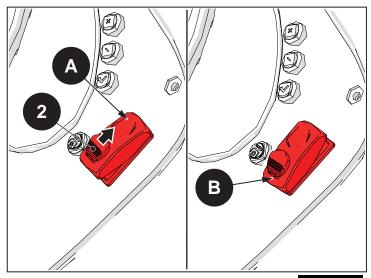
Fig. 5.37

### **Engaging the front PTO:**

- Bring the engine to an engine speed of between 1300 1900 rpm.
- Press the lock ring (2) placed on the switch (1) upwards, then press the switch (1) into position (A).
- The indicator (3) lights up on the display and remains lit during all the use of the front PTO.

### Disengaging the front PTO:

- Press switch (1) into position (B).
- The indicator (3) on the display turns off.





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

If the operator gets up from his seat when the PTO is engaged, a buzzer is activated and the PTO warning light (3) on the dashboard starts to flash: if the operator sits down again within 2 seconds, the warning lamp (3) and buzzer are deactivated; if not, the PTO stops within 7 seconds, the buzzer cuts out but the warning light (3) continues to flash because the engage button (1) is still pressed.

When the PTO stops once 7 seconds have elapsed, release and re-press the engage button (1) to re-engage the PTO. You cannot reactivate the PTO automatically simply by sitting on the seat.



### **Danger**

The Power Take Off disengages approximatively 7 seconds after the operator has got up from the seat. 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 has to be activated by pressing **the button (4) twice within 2 seconds** of engaging the PTO; the icon (5) is shown on the display. "PTO Auto" is automatically deactivated when the operator sits again.

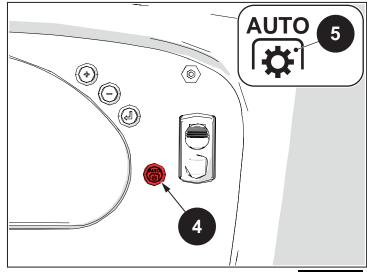


Fig. 5.39

The PTO is equipped with a safety cover. Turn the cover clockwise to release and then remove the cover. Refit the cover, aligning the holes with the lock pins and then turning the cover anticlockwise to lock in place.

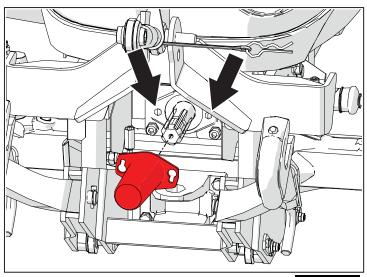


Fig. 5.40



### **Power Take Off operating functions**

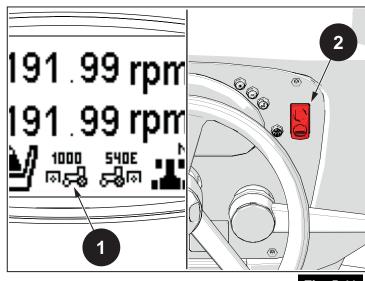
If the PTO is engaged and the operator gets up from his seat, the alarm buzzer sounds and the PTO warning light. (1) starts to flash. If the operator sits down again, the buzzer stops.

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

When the PTO is disengaged for safety reasons (e.g. the operator raises from his seat) the PTO warning light. (1) starts to flash.

When the PTO stops for safety reasons, it must be re-inserted by pressing button (2) to re-engage it. You cannot reactivate the PTO automatically simply by sitting on the seat.

If malfunctioning on the seat is detected, an error is displayed and the PTO is permanently disengaged.



### Fig. 5.41

## 5.4.3 Power Take Off speed

### Rear power take off

Shaft direction of rotation: clockwise.

PTO speed selector lever	Ratio	PTO speed. / minute	Engine rpm
540	4.66	540	2516
1000	2.5	1000	2500

#### Front Power Take Off

Shaft direction of rotation: anticlockwise.

PTO speed selector lever	Ratio	PTO speed. / minute	Engine rpm
1000	2.59	1000	2590

## 5.4.4 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.



Only use universal joints with adequate protective measures.



## 5.5 Rear lift

## 5.5.1 Rear lift Up/down

This is a 3-point hydraulic rear lift controlled by a distributor.

The lift is controlled from the a lever located on the right hand side of the seat.

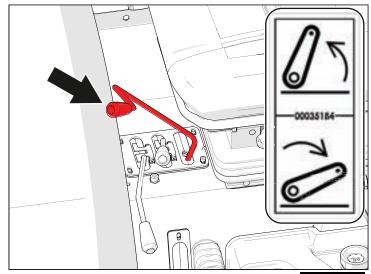


Fig. 5.42



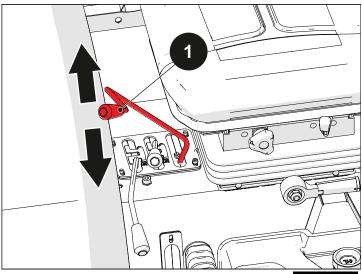
### 5.5.1.1 Up-Down operation

The position up/down is used to set a specific position for the implement at any point from the minimum implement height to the maximum height, and with the implement either engaged with or above the soil, and maintain this position.

This function may be used with for both implements without wheels or other supporting elements, and with wheels or other supporting elements.

The lift cylinders move each time the lever is moved (1) is moved up or down, stopping when the lever (1) returns to the neutral position.

- Lever (1) pulled back: lift implement.
- Lever (1) pushed forwards: Lower implement (float mode for implements that need to follow the contours of the terrain).
- Lever (1) in intermediate position: lock the implement at current height.





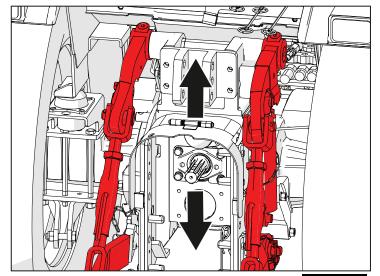


Fig. 5.44



## 5.5.2 Rear lift with position and draft control

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

The following operating modes are available:

- Position control
- Draft control
- Float mode
- Mixed control mode

The lift is controlled from the two levers on the right hand side of the seat:

- 1 Position control lever;
- 2 Draft control lever;

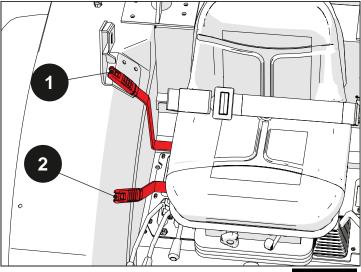


Fig. 5.45

## 5.5.2.1 Using position control mode

Its use is advised for jobs that require a constant position of the implement (augers, shovels, mounted fertilizer spreader, etc.).

- Move the draft control lever (2) completely forwards to the end stop.
- Raise or lower the lift with the lift position control lever (1). The lift position is proportional to the action of the lever.

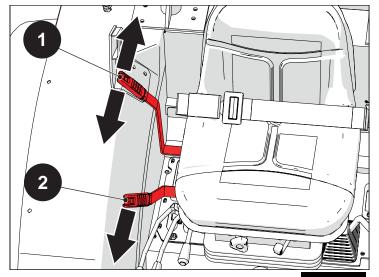
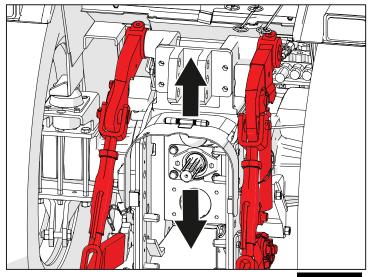


Fig. 5.46





## 5.5.2.2 Using draft control mode

The lift may be used in draft control mode to maintain constant draft force irrespective of variations in working conditions.

This function may be used with all implements carried by the tractor with no form of support on the ground such as sleds, wheels etc.

- Move the lift position control lever (1) completely forwards to the end stop.
- Set the required draft setting with the draft control lever (2).
- Raise or lower the lift with the lift position control lever (1).

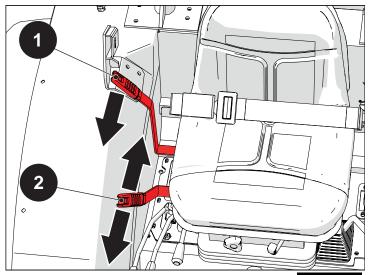


Fig. 5.48



The working depth attained by the implement is proportional to the draft force and dependent on the consistency of the soil. In this mode, the draft force requested by the lift from the tractor remains constant.



### 5.5.2.3 Mixed position/draft control

This function is intended for tasks requiring draft control in irregular soil consistency conditions, which may lead to the implement engaging too deeply in the soil.

The lift operates with draft control but also prevents the implement from engaging too deeply in the soil if it encounters zones with less soil resistance.

Engage the implement to the required working depth as described for "Draft control mode".

- Move the lift position control lever (1) completely forwards to the end stop.
- Set the required draft setting with the draft control lever (2).
- Raise or lower the lift with the lift position control lever (1).
- When the desired depth is reached, move gradually the lift position control lever (1) back, until the arms of the lift begin to lift.

The lift operates with draft control but also prevents the implement from engaging too deeply in the soil if it encounters zones with less soil resistance.

Use the lift position control lever only to lift and engage the implement in the soil.

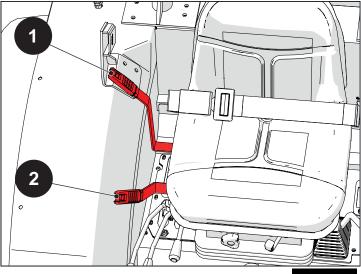


Fig. 5.49



### 5.5.2.4 Float mode

This function allows the implement to move freely and follow the contours of the terrain when using implements such as cultivators, ridge tills, shovels etc.

- Move the draft control lever (1) completely forwards to the end stop.
- Move the lift position control lever (2) completely forwards to the end stop.

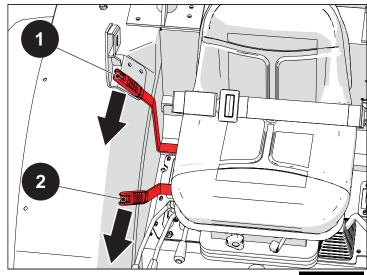


Fig. 5.50

## 5.5.2.5 Speed adjustment and lift sensitivity

Screwing out this regulator increases the lift descent speed; Screwing in reduces the lift descent speed.

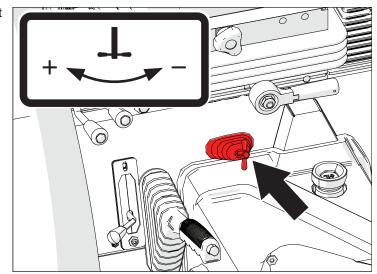


Fig. 5.51



Caution

When the adjuster screw is tightened completely, the implement remains locked in raised or lowered position. This is a safety device when implements are transported on road.



## 5.6 Front lift (if present)

This is a 3-point hydraulic front lift controlled by an hydraulic distributor.

The following operating modes are available:

- Up-Down
- Float mode

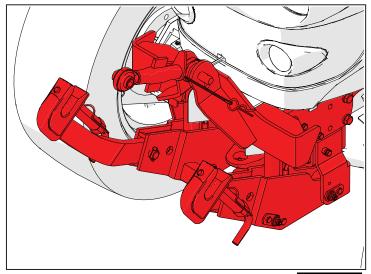


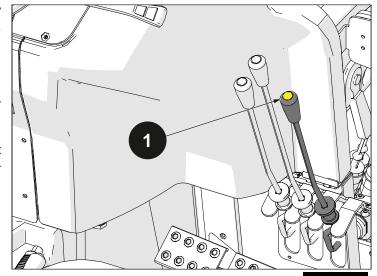
Fig. 5.52

## 5.6.1 Up-Down with Float mode

Indicated use when the implement shall move freely and follow the contours of the terrain (cultivators, ridge tills, shovels, etc.).

The lift system is operated using a lever (1):

- Lever pushed forwards: Lift implement.
- Lever in intermediate position: Lock the implement at current height.
- Lever pulled back: Lower implement.
- Lever detent: Float position, the implement remains on the terrain and follows the undulations.





## 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.



#### **Danger**

Do not make any modifications or alterations to the device.



### Warning

All adjustment and maintenance procedures may only be performed by authorised, qualified personnel.



### 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.



### 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 Front towing 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.



## 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.

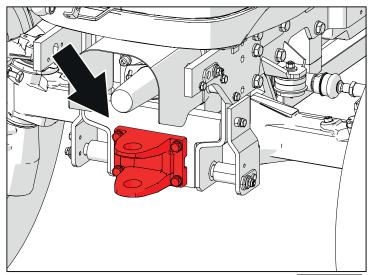


Fig. 5.54



### Note

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

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

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



### 5.7.3 Rear towing hitches

### Instructions for using the towing hitch

- Fit the hitch into the slider guides on the tractor chassis, securing in place with the retractable lock pin handle.
- Adjust the towing hitch to the correct height for the towing eye of the trailer, and secure in this position, using the retractable lock pin handle to engage the pins in the corresponding pair of holes in the slider guides on the tractor chassis.
- Lift the towing eye hitch pin and reverse with the tractor to align the towing hitch correctly with the towing eye of the trailer.
- Push the hitch pin back into the hitch and ensure that the accidental uncoupling prevention device is fitted in place.

### 5.7.3.1 Towing hitch CEE-X D.28

Moles	CDM		
Make	CBM		
Туре	X193F		
Approval no.	e11 00304*00*		
Overhang between rear axle and device centre	304 mm		
Max towable mass allowed by the device (T)	6 t		
Max vertical load allowed by the device on the coupling point (S)	1500 kg		
Maximum horizontal load allowed by the device (D)			
Max height	325 mm		
Min height	610 mm		

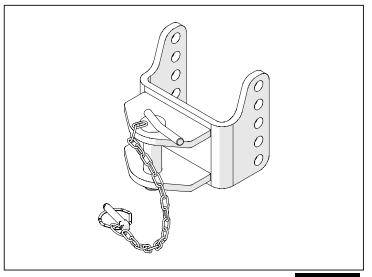


Fig. 5.55

### 5.7.3.2 Towing hitch CEE D.31

	ı
Make	CBM
Туре	GTF30067
Approval no.	e11 00299*00*
Overhang between rear axle and device centre	299 mm
Max towable mass allowed by the device (T)	10 t
Max vertical load allowed by the device on the coupling point (S)	1350 kg
Maximum horizontal load allowed by the device (D)	
Max height	310 mm
Min height	610 mm
	•

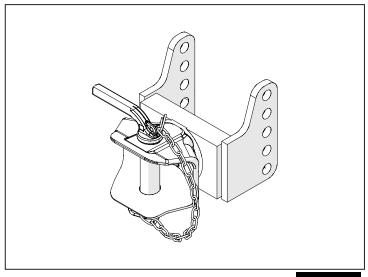


Fig. 5.56



## 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.

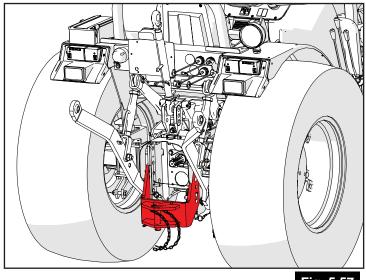


#### Danger

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



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



### Fig. 5.57

#### 7 pole socket for trailer 5.8.1

The seven pole socket is situated at the rear of the cab, to the right of the rear multifunction bracket. The socket is used to connect the lights, turn signals and other electric utilities of a trailer or implement.

- 1 7 pole socket
- 2 12V 1-pole socket



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

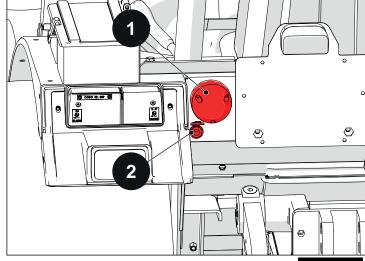


Fig. 5.58

#### 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

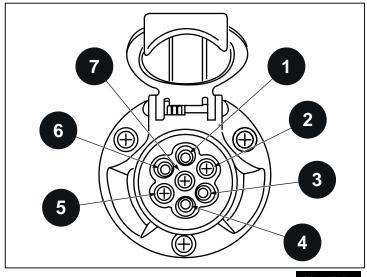


Fig. 5.59



## 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.



### 5.9.1 Rear three-point linkage

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.

The three point linkage consists of the following components:

- 1 Top link arm
- 2 Adjustable tie rod
- 3 Lateral stabiliser
- 4 Lower lift arm
- 5 Implement coupling end

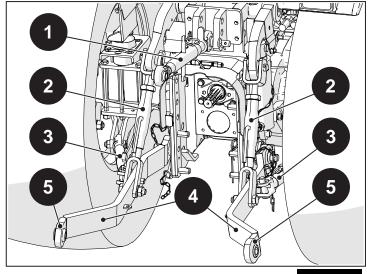


Fig. 5.60

### 5.9.1.1 Adjusting the three point linkage of the lift Up/down

The top link arm coupling has three holes to facilitate hitching the implement and setting the correct implement inclination angle.

To adjust the top link, remove the split pin from the retainer pin, pull the retainer pin out from the brackets, set the top link at the required hole height and refit the retainer pin and the split pin.

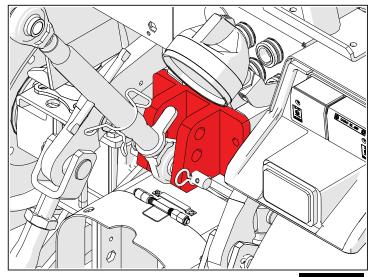


Fig. 5.61



Danger

The following adjustment must only be performed with the machine stationary with the engine switched off and the parking brake engaged.



### 5.9.1.2 Adjusting the three point linkage of the lift with position and draft control

The top link arm coupling has three holes to facilitate hitching the implement and setting the correct implement inclination angle. This angle also determines the correct draft control sensitivity setting to use with the implement.

To adjust the top link, remove the split pin from the retainer pin, pull the retainer pin out from the brackets, set the top link at the required hole height and refit the retainer pin and the split pin.

Consider the following when choosing the top link fastening hole used:

- fastening the top link on the uppermost hole offers the least sensitivity (suitable for implements with high draft forces);
- fastening the top link on the lowermost hole offers the greatest sensitivity (suitable for light implements).

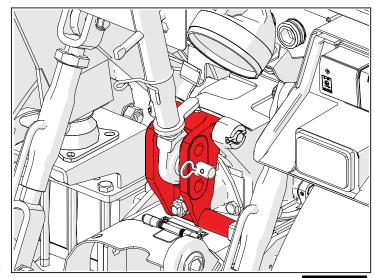


Fig. 5.62



### Danger

The following adjustment must only be performed with the machine stationary with the engine switched off and the parking brake engaged.

### **5.9.1.3 Top link arm**

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

- 1 Undo ring nut (2).
- 2 Adjust the length of the arm by turning lever (1).
- 3 Securely tighten ring nut (2) to secure the arm.

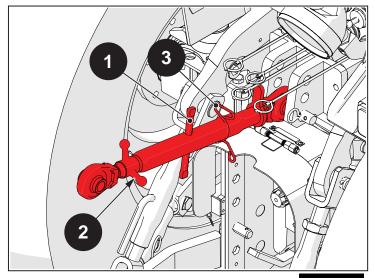


Fig. 5.63



When the top link is not in use, attach the spring (3) to the fixed bracket (4).

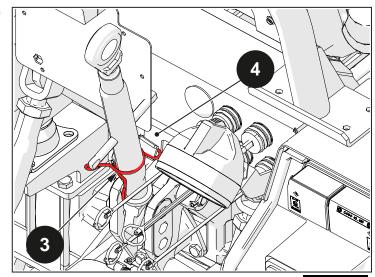


Fig. 5.64

### 5.9.1.4 Adjustable vertical tie rods

Turn 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, loosen the nut (2) and turn the handle (1) clockwise to raise the lower arm or anticlockwise to lower the arm to the required height. Tighten the nut (2) to fix the tie-rod position.

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.

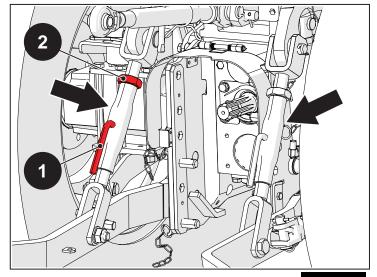


Fig. 5.65

### 5.9.1.5 Lateral stabiliser

Adjust the lateral stabilisers to limit the lateral movement of the lower lift arms.

Loosen the nut (1), then tighten or loosen the stabiliser with the handle (2) to set the required amount of swing. Tighten the nut (1) to lock the stabiliser position.

- 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).

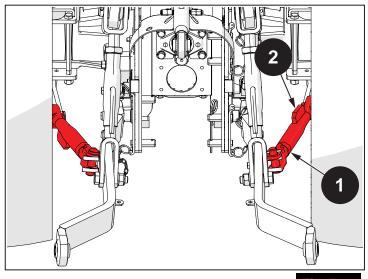


Fig. 5.66



### 5.9.2 Front three point linkage (if present)

The machine is equipped with a three-point hitch. To ensure that this system operates, always check that the dimensions and weight of the equipment meet the specifications of the linkage and lift.

The three point linkage consists of the following components:

- 1 Top link arm
- 2 Lower lift arm
- 3 Implement hitching lever
- 4 Implement coupling end

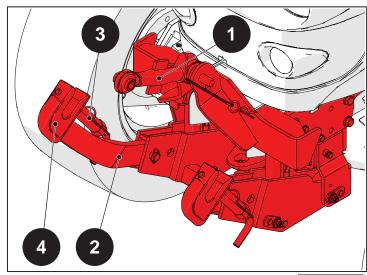


Fig. 5.67

### 5.9.2.1 Adjusting the three point linkage

The top link arm coupling has two holes to facilitate hitching the implement and setting the correct implement inclination angle.

To adjust the top link, remove the split pin (1) from the retainer pin (2), pull the retainer pin (2) out from the brackets, set the top link at the required hole height and refit the retainer pin (2) and the split pin (1).



### Danger

The following adjustment must only be performed with the machine stationary with the engine switched off and the parking brake engaged.

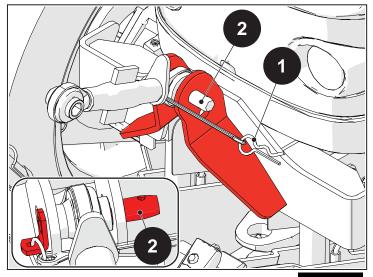


Fig. 5.68

### **5.9.2.2 Top link arm**

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

- 1 undo ring nut (2);
- 2 adjust the length of the arm by turning lever (1);
- 3 securely tighten ring nut (2) to secure the arm.

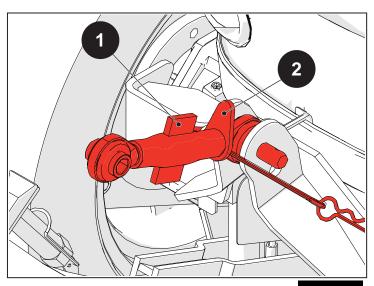


Fig. 5.69



### 5.10 Auxiliary hydraulic distributors



Danger

Always wear safety gloves and safety eyewear to protect your eyes.



Danger

Escaping pressurised hydraulic fluid can have enough force to penetrate the skin. The fluid for hydraulically controlled systems can also cause injection injuries. Seek immediate medical attention in the event of any injury caused by escaping hydraulic fluid. Otherwise, there is a risk serious skin infections and reactions. Never check for a fluid leak with your hands. Use a piece or wood or cardboard to locate leaks



**Danger** 

The tightness of all of the connection devices and the conditions of the hoses and pipes must be checked before pressurising the system. Release all the pressure in the system before disconnecting hoses and before carrying out any other work on the hydraulic system.



Danger

Use extreme caution when detaching and reconnecting implements.

The tractor is equipped with auxiliary hydraulic distributors for operating external hydraulic cylinders.

The distributor valves are equipped with 1/2" NPTF female couplers complete with rubber dust caps.

Tractors may be equipped with the following different types of distributor:

- single acting;
- double acting;
- double acting with detent;
- double acting with float mode.

These distributors are connected via lines to corresponding hydraulic couplers situated on the rear right hand side of the machine, depending on the configuration of the tractor. The numbers on the caps of the hydraulic couplers and on the control levers identify which coupler is assigned to which control.

The control levers for the rear distributors (1) are situated to the right of the driver seat and control the hydraulic couplers (2) on the rear right of the tractor.

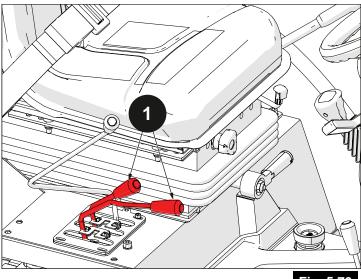


Fig. 5.70



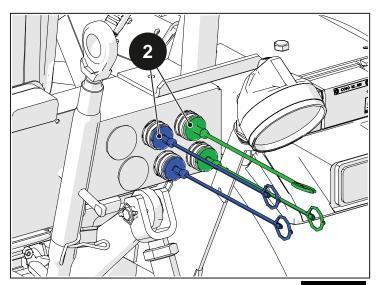
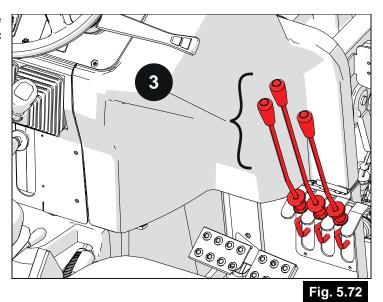


Fig. 5.71

The control levers (3) of the front distributors are located on the RH front side and control the hydraulic couplers (4) on the RH front side.



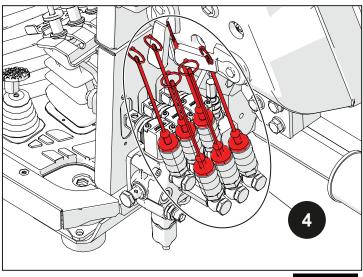


Fig. 5.73



Depending on the version of the hydraulic distributors installed on the machine, the control levers perform the following functions:

- **Single acting hydraulic distributor control lever**: the cylinder extends when the lever is raised and retracts when the lever is lowered as a result of the weight of the implement installed.
- Single acting hydraulic distributor control lever with coupling in floating position: the cylinder extends when the lever is raised and retracts when the lever is lowered as a result of the weight of the implement installed. The float function allows the implement to follow the contours of the terrain.
- **Double acting hydraulic distributor control lever**: the cylinder extends when the lever is raised and retracts when the lever is lowered.
- **Double acting hydraulic distributor control lever with detent**: the cylinder extends when the lever is raised and retracts when the lever is lowered. The detent function may be used to hold the distributor lever in a raised position.
- **Double acting hydraulic distributor control lever with sprung lever return**: the detent function may be used to hold the distributor lever in position. The sprung lever return function (KICK-OUT) automatically disables (releases) the detent function by moving the lever to the neutral position once the maximum set pressure has been reached.
- **Double acting hydraulic distributor control lever with float mode**: the cylinder extends when the lever is raised and retracts when the lever is lowered. The float function allows the implement to follow the contours of the terrain.



Check the transmission oil level often to ensure that the hydraulic circuit operates correctly.

The quick coupling with the black cap may be used as a free return line for returning external oil directly to the transmission casing.

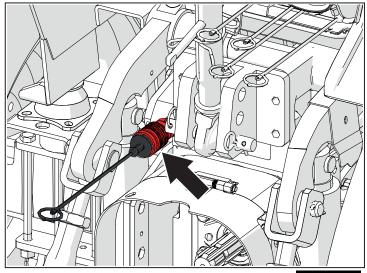


Fig. 5.74

The external hydraulic cylinders connected to the tractor hydraulic circuit must be equipped with hoses and 1/2" male couplings to connect them to the quick couplings on the back of the tractor.



## 5.10.1 Available configurations

### 5.10.1.1 Rear auxiliary distributors

These tractor models may be equipped with up to two double acting distributors.

The blue lever (A) controls the rear distributor with blue quick couplers.

Pushing the lever (A) up sends oil to the quick coupler (A1) and extends the cylinder.

Pushing the lever (A) down sends oil to the quick coupler (A2) and retracts the cylinder.

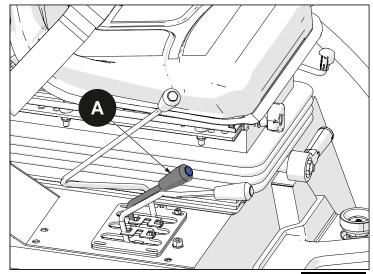


Fig. 5.75

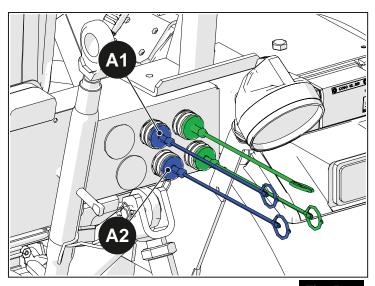


Fig. 5.76



The green lever (B) controls the rear distributor with green quick couplings.

Pushing the lever (B) up sends oil to the quick coupler (B1) and extends the cylinder.

Pushing the lever (B) down sends oil to the quick coupler (B2) and retracts the cylinder.

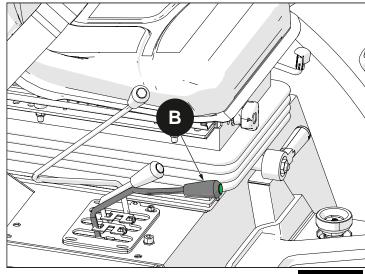


Fig. 5.77

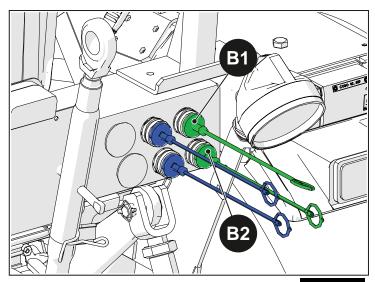


Fig. 5.78



### 5.10.1.2 Front auxiliary distributors (if available)

These models have only one 3-way engine block distributor.

Position	Туре
А	Double acting with valve return action
В	Double acting with fourth float mode position and lever detent
С	Double acting with fourth float mode position and lever detent

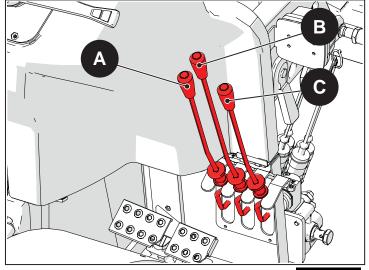


Fig. 5.79

### **Description**

The blue lever (A) controls the front distributor placed inside the engine.

Pushing the lever (A) up sends oil to the quick coupler (A1) and extends the cylinder.

Pushing the lever (A) down sends oil to the quick coupler (A2) and retracts the cylinder.

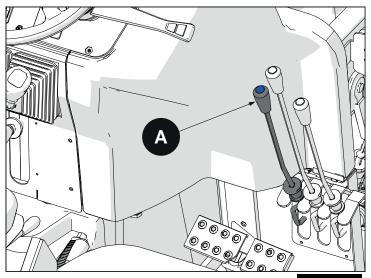


Fig. 5.80

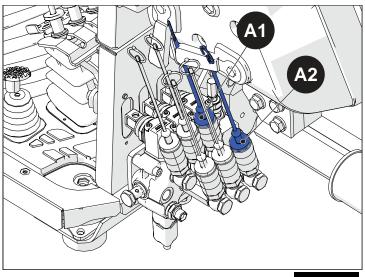


Fig. 5.81



The green lever (B) controls the front distributor placed in the middle.

Pushing the lever (B) up sends oil to the quick coupler (B1) and extends the cylinder.

Pushing the lever (B) down sends oil to the quick coupler (B2) and retracts the cylinder.

The detent function may be used to hold the distributor lever in position. To disengage the hooking function manually return the lever to the central position.

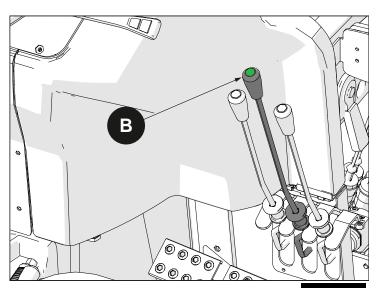


Fig. 5.82

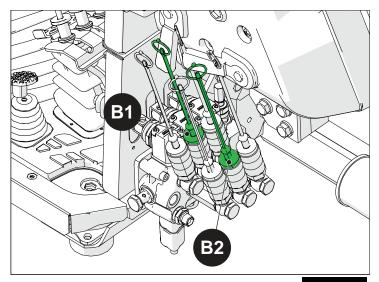


Fig. 5.83



The yellow lever (C) controls the front distributor placed outside the engine.

Pushing the lever (C) up sends oil to the quick coupler (C1) and extends the cylinder.

Pushing the lever (C) down sends oil to the quick coupler (C2) and retracts the cylinder.

The detent function may be used to hold the distributor lever in position. To disengage the hooking function manually return the lever to the central position.

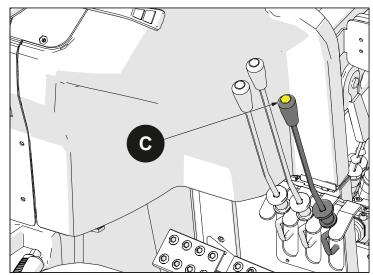


Fig. 5.84

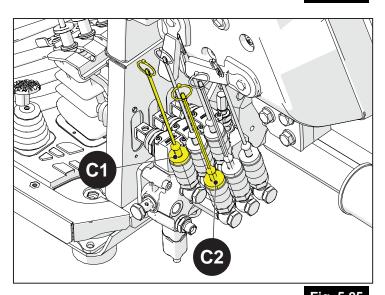


Fig. 5.85



### Note

Depending on the configuration, the distributor is used to control the front lift. See the section that specifically describes how it operates.

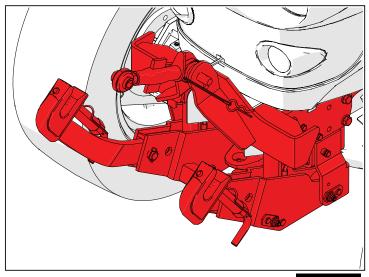


Fig. 5.86



### 5.10.2 Connecting external implements to the quick couplers

**Danger** 

Keep out of the working radius of implements when connecting quick couplers.

Danger

Make sure that the male connector is engaged correctly in the quick coupler before starting the tractor.

**Danger** 

Using lock valves on hydraulic drives is recommended for greater safety.

Connect the hose to the guick coupler of the distributor as follows:

- clean the male connector on the implement;
- stop the engine;
- make sure the hydraulic lift is lowered;
- move the lever of the distributor you intend to use for the connection several times throughout its entire travel to release the pressure from the circuit;
- lift the protective cover on the quick coupler connected to the distributor;
- clean the coupler and the male connector thoroughly;
- push the lock ring and engage the male connector in the coupler.

Once this procedure is complete, the engine may be started and the distributor may be used as required.

### 5.10.3 Disconnecting external implements from quick couplers

Disconnect the hose from the quick coupler of the distributor as follows:

- stop the engine;
- move the lever of the distributor you intend to use for the connection several times throughout its entire travel to release the pressure from the circuit;
- push the lock ring and disengage the male connector in the coupler;
- close the dust cap of coupler and clean the coupler.

Once this procedure is complete, the engine may be started and the distributor may be used as required.



### 5.11 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)

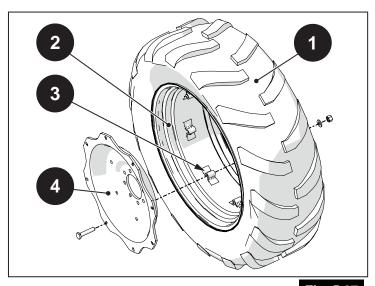


Fig. 5.87



### 5.11.1 Inflating the tyres



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.

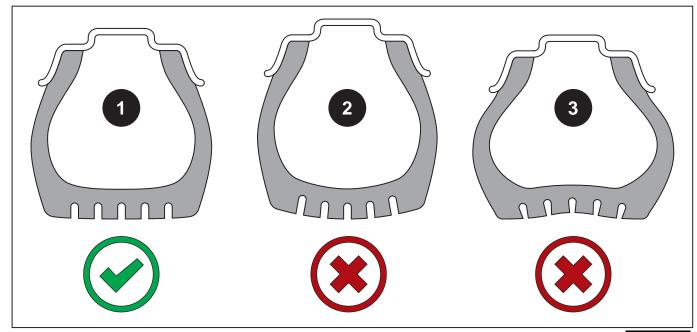


Fig. 5.88

- 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.

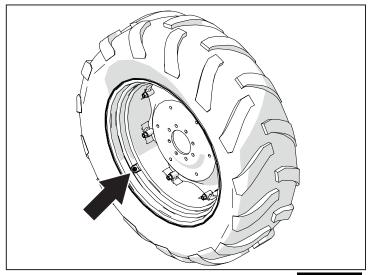


Fig. 5.89



### 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.



Note

Axle load affects inflation pressure.

### 5.11.2 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.



### 5.11.3 Replacing a wheel

To replace a wheel, do the following.



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.

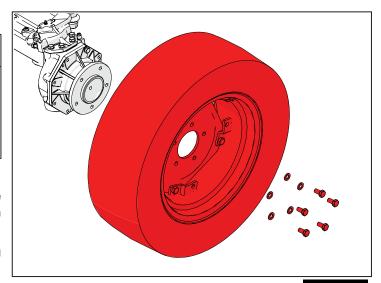


Fig. 5.90



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).

Type of axle	Torque
Front wheel	148 N·m (14.8 kg·m)
Rear wheel	226 N·m (22.6 kg·m)



### 5.11.4 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.

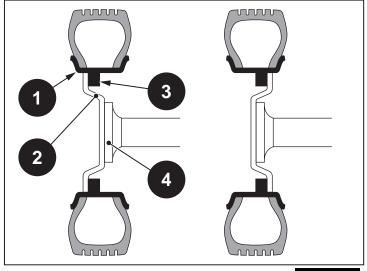


Fig. 5.91



#### 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** of the wheels.



### 5.11.4.1 Attaching the wheel to the well

In wheels with an adjustable track rim, you can adjust the track width by removing the wheels or discs from the well and refitting them in a different position. The wheel is fastened to the well by bolts screwed into special brackets.

Various types of brackets are used to attach the wheel to the wheel well.

### Types of connecting brackets

Block	Ring	
Zeta	Omega	
Double Omega	H.D Omega	
Waffle	-	-

### **Tightening torques**

The following tables show the torque values for the screws and nuts that fasten the wheel to the well for the wheels available.

#### Front wheels:

Wheel	Torque
8KY16	250 Nm
W7X16	112 Nm

#### Rear wheels:

Wheel	Torque
W10X24	250 Nm
W10X20	112 Nm
W7X24	112 Nm



### 5.11.4.2 Track widths

### Axle width

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

Α	Front axle width	1050 mm
В	Rear axle width	1004 mm

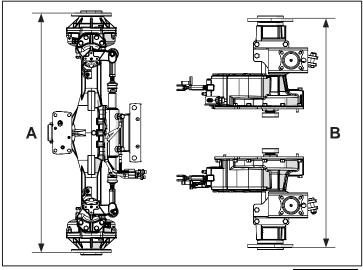


Fig. 5.92

### **Track widths**

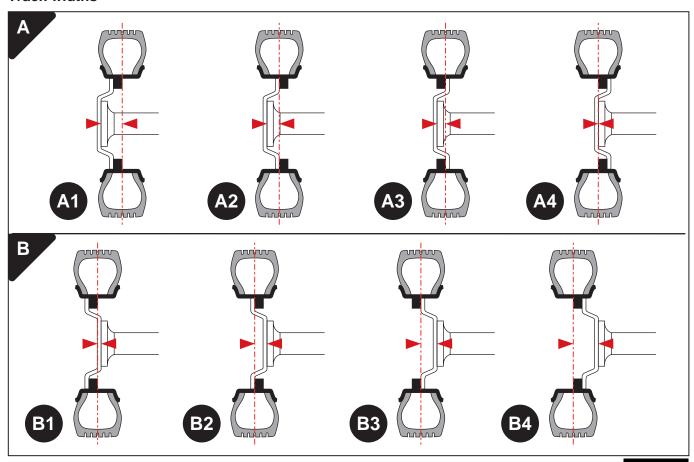


Fig. 5.93

- A Internally mounted flange
- B Externally mounted flange



### Front tyres:

Set	Tyre	Wheel	SRI	A1	A2	А3	A4	B1	B2	В3	B4
			(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
1	27/8.50-15"	7JAx15	330	1006	/	/	/	1110	/	/	/
2	240/70R16"	8KX16	350	910	1103	971	1164	950	1143	1011*	1204
3	11.0/65-12"	7.00-12	330	/	/	1016*	/	/	/	/	1096
4	200/70R16"	W7X16	330	1008	1010^	1074*	1076	1040	1042	1106	1108
5	200/70R16"	W7X16	330	904*	986	970	1052	1064	1146	1130	1212

### Rear tyres:

Set	Tyre	Wheel	SRI	A1	A2	А3	A4	B1	B2	В3	B4
			(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
1	38/14-20"	W11HX20	450	1008	/	/	/	1016*	/	/	/
2	320/70-R24"	W10x24	525	829	865	919	955*	1069	1105	1159	1195
3	360/70-R20"	W10X20	500	890†	924†	980	1014	1010*	1044	1100	1134
4	280/85-R20"	W10X20	475	890‡	924‡	980^	1014	1010*	1044	1100	1134
5	8.3-24"	W7x24	475	834	860*	924	950	1074	1100	1164	1190

Set - Tyre combinations: the front tyre 1 is combined with the rear tyre 1 and so on.

SRI - Speed radius index (mm)

- \* Standard
- † Not recommended
- ‡ Non possible
- ^ Special, available as an option



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).



### 5.11.5 Adjusting the steering angle

When adjusting the track widths, the tyres may come into contact with the bodywork when the wheels are on full lock. To correct this problem, turn the adjuster screw (1), located on both sides of the front axle.



## 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.
- Tighten or loosen the screw (1) until there is a distance of at least 2 cm between the tyre and the bodywork.
- Once the distance is correct, block the screw by securely tightening the checknut (2).

Do the above for both front wheels

Once you have completed the procedure, check again that there is a distance of at least 2 cm between the tyre and the bodywork on both sides

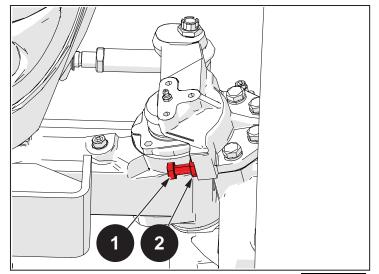


Fig. 5.94



### 5.12 Ballast weights

### 5.12.1 Front ballast weights (optional)



## Warning

The machine should **NOT** be overloaded with additional or different weights than those described in this booklet.



### Warning

When the machine is used for light work and for driving or towing on the road, the ballast urges unnecessarily moving the organs, it is therefore appropriate remove it.

The tractor may be fitted with cast iron front ballast weights for working with very heavy implements connected to the lift which could imbalance the tractor.

The plates are equipped with a handle for assembly and disassembly.

Ballast plates should be applied to the front support blade (optional) and must be fixed using the appropriate tie rods (optional).

A maximum of 5 plates can be mounted for a total of 75 kg.

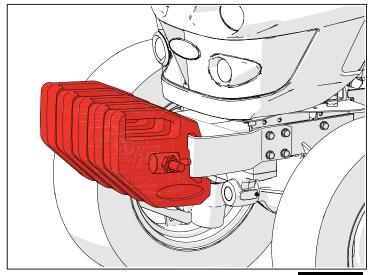


Fig. 5.95

#### Assembly instructions:

- place the ballast weight on the support (1);
- insert the pawls (2) on the right and left side of the ballast weight pack, then tighten the nuts (3) to fix them;
- insert the bar (4) in the appropriate hole and tighten the nuts (5) to fix it;

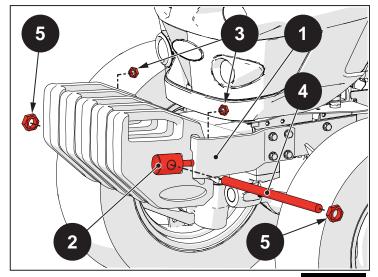


Fig. 5.96



### 5.12.2 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 GOLDONI 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.



## ⚠ Warn<u>ing</u>

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.

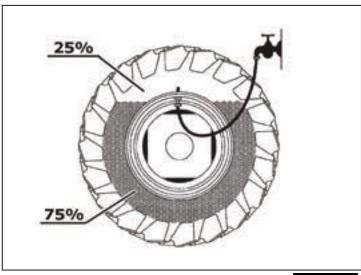


Fig. 5.97

#### 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.

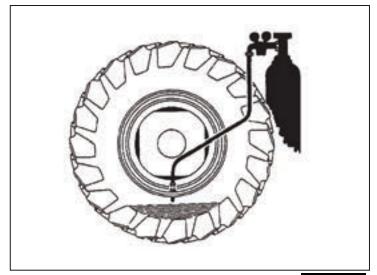


Fig. 5.98







# **6 : Service procedures**

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### **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.



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



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 the oil dipstick is seated correctly;
- check that the following are fitted and tighten correctly:
  - the oil drain plug;
  - the oil filler cap.



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



### 6.1.1 Check and clean

Assembly		Inspection interval							
	Description of procedure	Hours 10		50	300	900	5.000		
		Months		12	12	12			
Engine	Engine oil		Х						
	Coolant		Х						
	Radiator heat exchange surfaces		Х						
	Cooling circuit hoses				Х				
	Intake air hoses				X				
	Fuel tank					Х			
	Alternator belt				Х				
	Fuel pipes		Х						
	Fuel tank filter		Х						
	Engine air filter - External		Х						
	Engine air filter- Safety		Х						
	Starter motor and alternator (1)						Х		
Cab	Cab air filter (dust filter)		Х						
Transmission	Transmission Oil - Rear Differential			X					
	Front differential oil			Х					
	Oil suction line filter			Х					
Bodywork	Tyre pressure			Х					
	Tightening torques for wheel fasteners			Х					
	Clutch pedal travel		Х						
	Brake pedal travel		Х						

<sup>(1) -</sup> Have the procedure performed by an authorised Goldoni service centre



### 6.1.2 Replacement intervals

Assembly	Description of procedure	Replacement interval										
		Hours	50*	200	300		600	900	1.200	1.200	5.000	10.000
		Months	12*	12	12	12	24	12		24		
Engine (3)	Engine oil (1)		Χ	Х								
	Engine oil filter (1)		Χ	Х								
	Fuel filter			Х								
	Coolant									Х		
	Alternator belt (2)						Х					
	Engine Air Filter - External (1) (4)				X							
	Engine Air Filter- Safety (5)					Х						
	Calibrating and cleaning injectors (3)								Х			
	Cleaning interior of radiator (3)								Х			
	Replacing fuel pipes (3)								X			
	Partial engine overhaul (3)										Х	
	Complete engine overhaul (3)											Х
Cab	Cab air filter (dust filter)				X							
Transmission	Transmission oil filter - Suction				Х							
	Transmission oil - Rear Differential							Х				
	Front axle oil - Front differential							Х				
	PTO oil. Front							Х				

- \* For the first time only
- (1) In heavy duty working conditions, such as when working in dusty environments and operating under extreme loads, change every 150 operating hours
- (2) In case of infrequent use, change every two years
- (3) Have the procedures performed by an authorised Goldoni service centre
- (4) Replace filter after cleaning three times, or at least once every 12 months
- (5) Replace external air filter after cleaning three times, or at least once every 12 months



## 6.2 General maintenance and inspection

### 6.2.1 Opening the bonnet

Insert a suitable tool in the aperture (1) to release the cowl and then open the cowl.

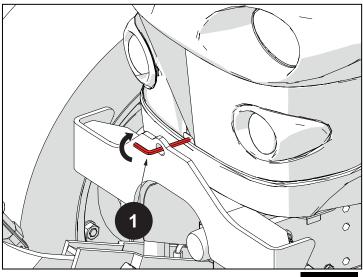


Fig. 6.1



## 6.2.2 Refuelling



Only refuel with the engine off.

Do not use any fuels other than those indicated in the "Fuel compatibility" table.

In countries where only high sulphur diesel fuel is available, use an alkaline engine lubricant oil or, alternatively, change the lubricant oil recommended by the manufacturer more frequently.

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.

The fumes released by fuel are highly toxic. All refuelling operations 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.

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

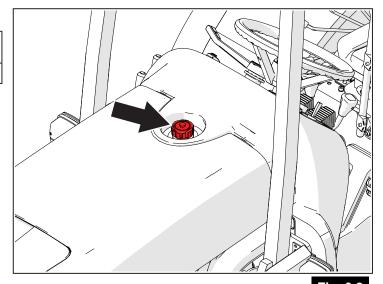
Use a funnel when refuelling to prevent the risk of spillage. A filter should also be used to keep dirt and dust out of the tank.

Do not fill the fuel tank completely, to allow space for the fuel to expand.

Undo the fuel tank cap to refuel the tractor.



Preferably use a funnel to fill the tank with fuel.





# 6.2.3 Checking engine oil level



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

The engine oil dipstick (1) is situated on the bottom right hand side of the engine.

- 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.
- If necessary, top up via the filler (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.

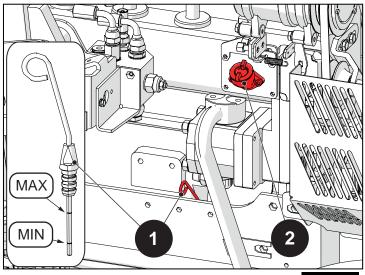


Fig. 6.3



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").



#### 6.2.4 Changing the engine oil



Caution

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

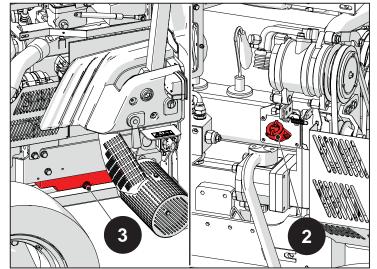


Warning

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).
- 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 suitably sized drain pan underneath. (See "Lubricants, fuels and coolants" for the correct oil quantity).
- Unscrew the filler cap (2).
- Undo the drain plug (3) and wait for all the oil to drain into the pan.
- Replace the gasket and refit and tighten the plug (3).



# Warning

Tighten the plug (3) with a tightening torque of 50 N·m.

- Fill with oil to the correct level as indicated on the dipstick.
- Refit and tighten the filler cap (2).
- 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.



Warning

Do not exceed the MAX level indicated on the dipstick (1) (Fig. 6.3).



Warning

Never use the engine if the oil level is below the MIN marking.



# 6.2.5 Dry air filter maintenance

Clean whenever the warning lamp on the dashboard comes on or when necessary, after assessing the environmental conditions in which the machine works (dusty, dry, etc.).

To clean the air filter proceed as 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;
- Release and remove the cover (1);
- Remove the external filter (2):
- Blow a jet of compressed air (maximum pressure 3 bar) from the inside towards the out-
- Fit the filter back into its housing;
- close with the cover.

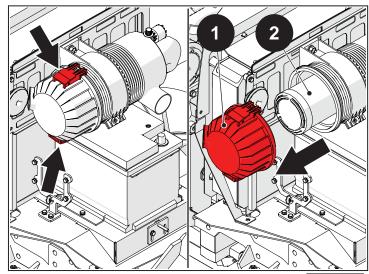


Fig. 6.5



# Warning

DO NOT remove the internal safety filter (3) (it must neither be cleaned nor damaged).

#### Replacement

- When the internal filter is dirty, it changes colour.

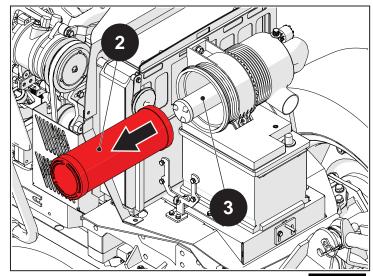


Fig. 6.6



#### Replacing the engine oil filter cartridge 6.2.6

Proceed as follows.



Warning

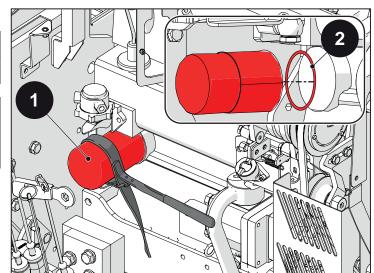
Do not use power tightening tools.



Note

When changing the oil filter, keep and dispose of the used filter separately from other waste.

- 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.
- Unscrew the filter (1) and replace.
- Check that condition of the gasket (2) and replace if necessary.
- Lubricate the gasket of the new cartridge before fitting.
- Fit the oil filter, tightening it by hand.





Warning

Tighten the screw to a torque of 25 Nm (2.5 kgm).

- Start the engine and run at idle speed for a few minutes to warm the engine to operating temperature (70 -80°C).
- Turn off the engine and remove the key from the ignition switch.
- Wait a few minutes for all the oil to drain back into the sump.
- Check that the oil level is correct and top up if necessary.
- Check for oil leaks.



Warning

If any oil 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 in the country of use.



## 6.2.7 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.

## 6.2.8 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.

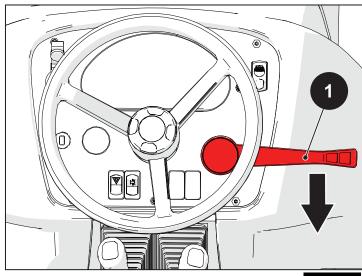


Fig. 6.8

# 6.2.9 Bodywork maintenance



#### Caution

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.



#### Note

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



## 6.2.10 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;
- checking engine oil level;
- check engine coolant level;
- check belt tension;
- change engine oil;
- change coolant;
- change engine oil cartridge;
- change the fuel filter.

## 6.2.11 Air intake system

Check the condition of the pipes (1) and hoses (2), and check that the relative clamps (3) are tightened correctly. Tighten the clamps (3) if not tightened sufficiently.

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.

Check the state of the air filter and check if is contaminated with foreign matter or liquid: remove any foreign matter; replace the air filter if damaged. See the section "Cleaning and replacing the air filter" for the correct procedure for cleaning the air filter.



Have the replacement procedure performed by an authorised service centre.

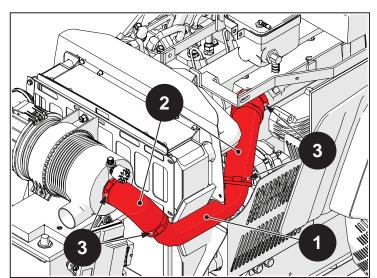


Fig. 6.9

# 6.2.12 Control and adjustment of the brakes

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.



The adjustment procedure must be carried out solely by the dealer or specialised personnel.



# 6.2.13 Checking and adjusting clutch pedal travel

Periodically check the dead zone of the control. The dead zone of the pedal must not exceed 25 mm. If the dead zone measured is greater, adjust the clutch pedal.

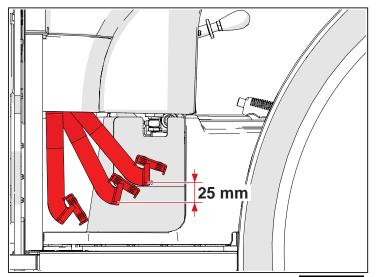


Fig. 6.10

The lateral cover panel must be removed to allow access to the adjuster screw (1). Adjust the pedal as follows:

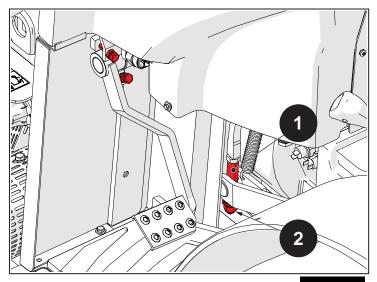
- Loosen the check nut (2);
- Tighten/loosen the adjuster screw (1) as necessary;
- tighten the check nut (2);
- check the dead zone again.

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



### Danger

The adjustment procedure must be carried out solely by the dealer or specialised personnel.





# 6.2.14 Checking and adjusting the rear PTO clutch

Periodically check the dead zone of the control. The dead zone of the lever must not exceed 20 mm. If the dead zone measured is greater, adjust the rear PTO clutch lever.

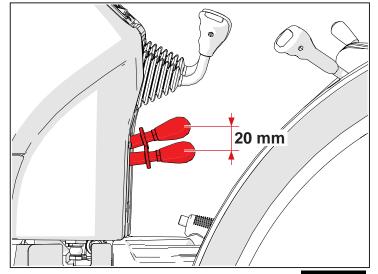


Fig. 6.12

The lateral cover panel must be removed to allow access to the adjuster screw (1). Adjust the lever as follows:

- Loosen the check nut (2);
- Tighten/loosen the adjuster screw (1) as necessary;
- tighten the check nut (2);
- check the dead zone again.

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



### Danger

The adjustment procedure must be carried out solely by the dealer or specialised personnel.

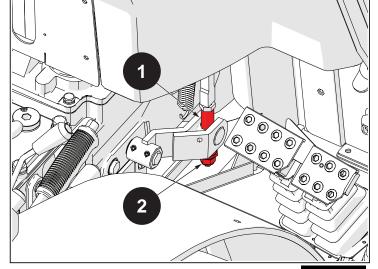


Fig. 6.13

If necessary, have the clutch assembly replaced by an authorized workshop. Use only original spare parts.



### Danger

The replacement procedure must be carried out solely by the dealer or specialised personnel.



# 6.3 Cooling system maintenance



Caution

The radiator must not come into contact with acid, alkalis or corrosive substances.



Note

In winter, regularly check that the antifreeze concentration is correct for the ambient temperature conditions.



#### Caution

Before starting up the engine, check whether the coolant in the radiator (1) needs topping up and make sure there are no leaks.

Make sure the radiator cover is fixed in place.

Make regular checks on the radiator core for weeds, dirt, grease or other contaminants, and remove them.

Check the thermostat is working properly, as problems could affect the circulation of the cooling water and reduce the cooling effect.

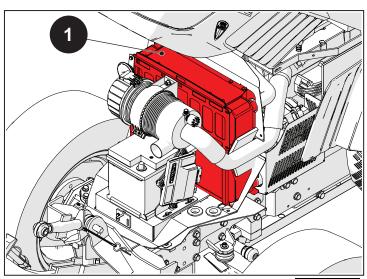


Fig. 6.14

#### 6.3.1 Cleaning the cooling system

Remove the protection grid (1) using the pulling handle (2). First remove all grass and debris and then clean the heat exchangers with compressed air (maximum pressure 3 bar).



#### Note

If the heat exchangers cannot be cleaned adequately with the procedure described above, contact an authorised GOLDONI service centre.



# Warning

Do not user a pressure washer to clean the cooling system as this may damage the components of the system itself.

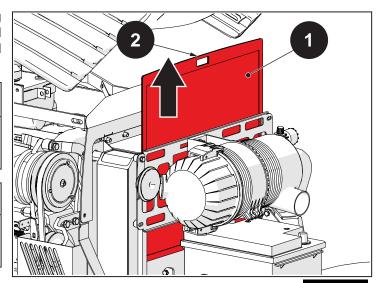


Fig. 6.15



#### Caution

Stop the engine and wait until it has cooled down before proceeding with any servicing operations.

Before proceeding with any servicing operations, never open the radiator's expansion tank whilst the engine is hot since the cooling fluid could cause burns as it is under pressure and very hot.



## 6.3.2 Filling the engine coolant



The coolant circuit is under pressure. Wait for the engine to cool before checking the cooling system, and even once the engine is cool, open the radiator or expansion tank cap with extreme caution.

On versions with an electric cooling fan, keep away from the fan when the engine is still hot as the fan may start without warning even when the engine is off.

Open the cowl and undo the cap (3) of the coolant tank.

Restore the liquid level and screw the cap back on and tighten completely.



Preferably use a funnel to fill with fluid.



The words "COOLANT LEVEL" is printed on the expansion tank LEVEL "surrounded by two arrows indicating the correct level of the coolant.

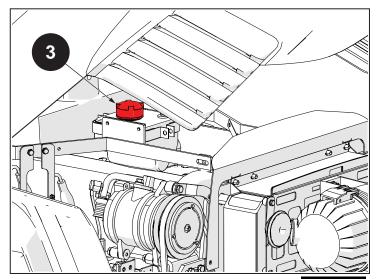


Fig. 6.16

# 6.3.3 Bleeding the cooling system

Start the engine with the cap on the radiator or expansion tank removed and leave running at idle speed to allow the coolant to circulate and force out any air bubbles trapped in the circuit. The coolant level will progressively drop during this procedure and then stabilise at a lower level. Stop the engine and top up. After a few hours of operation, leave the engine to cool and check the coolant level again.



# 6.3.4 Changing the engine coolant

# C:

#### Caution

The coolant circuit is under pressure. Wait for the engine to cool before checking the cooling system, and even once the engine is cool, open the radiator or expansion tank cap with extreme caution.

On versions with an electric cooling fan, keep away from the fan when the engine is still hot as the fan may start without warning even when the engine is off.

#### Proceed as follows.

- Drain the coolant from the radiator.
- Close the drain plug (1) of the radiator.

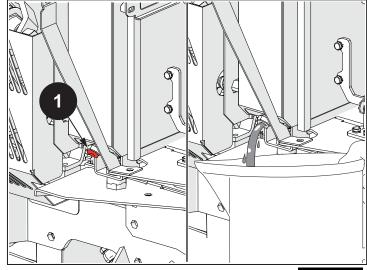


Fig. 6.17

- Remove the relative drain plug (2) from the engine block and empty the coolant from the engine.
- Refit the plug (2) on the engine block once the fluid has drained completely, fitting a new copper gasket and tightening to a torque of 40 Nm.

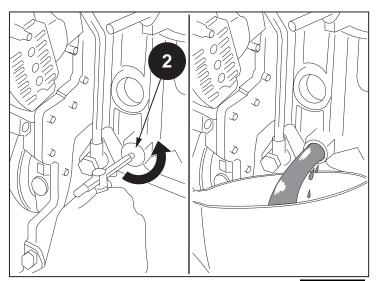


Fig. 6.18



- Remove the cap (3) and pour coolant into the radiator.



## Warning

Use only the coolant types specified by the manufacturer. See the section "Lubricants, fuels and coolants" in chapter 3.

- The level of coolant must be approximately 5 mm above the pipes inside the radiator. Refit the radiator cap (3).
- On engines with a separate expansion tank, fill up to the maximum level marking.
- See the relative section for the procedure to bleed the system.



# Warning

Before starting the engine again, make sure that the plug (2) on the engine and the cap (3) on the radiator are fitted and tightened correctly, to prevent coolant from escaping from the system.

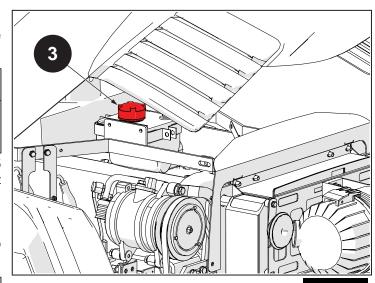


Fig. 6.19

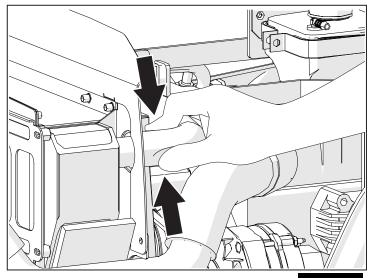


# Warning

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

#### Checking the cooling circuit hoses 6.3.5

- Press the hoses between your fingers to check for wear.
- Replace the hoses if they are worn, following the procedures described in the relative section.





# Replacing the cooling circuit hoses

- Drain the coolant from the radiator.
- Close the drain plug of the radiator.

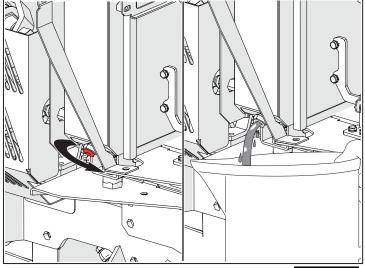


Fig. 6.21

- Loosen the hose fastener clamps.
- Remove the hoses.

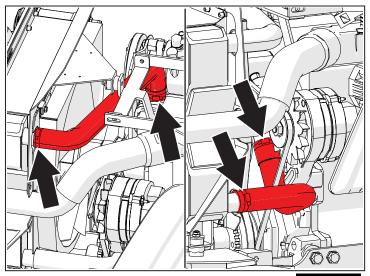


Fig. 6.22

- Refit the new hoses and clamps.



### Warning

When refitting, make sure that the clamps are fitted and tightened correctly to prevent coolant from escaping from the system.

- Remove the cap and pour coolant into the ra-
- The level of coolant must be approximately 5 mm above the pipes inside the radiator. Refit the radiator cap.
- On engines with a separate expansion tank, fill up to the maximum level marking.
- See the relative section for the procedure to bleed the system.

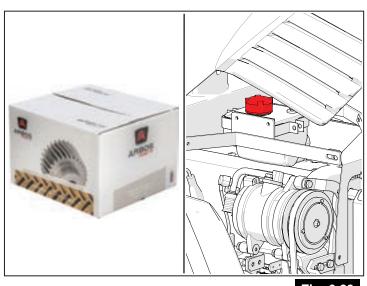


Fig. 6.23



# 6.4 Fuel system maintenance

# 6.4.1 Replacing the fuel filter cartridge

Removing and replacing the fuel filter.



When changing the fuel filter, keep and dispose of the used filter separately from other waste.

After the replacement of the fuel filter vent the circuit

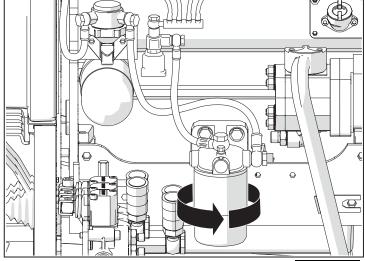
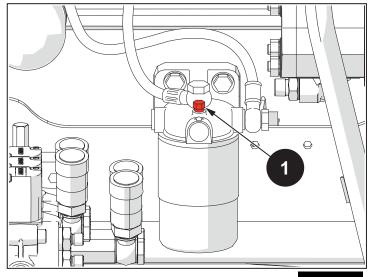


Fig. 6.24

### 6.4.2 Vent the fuel circuit

Undo and remove the screw (1).





Turn the ignition switch into the first position to power the solenoid valve.

Pump fuel by hand using the lever (2) on the fuel pump.



Do not start the engine.



Never use the manual fuel pump lever while the engine is running.

Tighten the screw (1) on the fuel filter after bleeding the circuit.

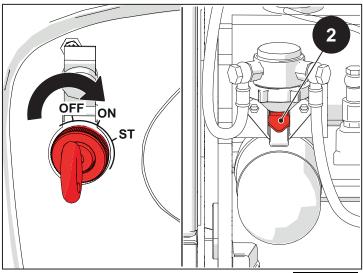


Fig. 6.26

### 6.4.3 Fuel tank maintenance

Park the tractor on level ground, remove the drain plugs under the fuel tank (1) and empty the sediment at the bottom of the tank.



### Danger

The fuel tank must only be drained with the machine switched off and with a cold engine.

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

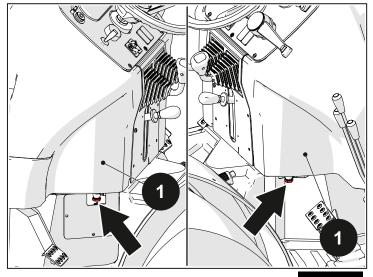


Fig. 6.27

# 6.4.4 Checking and replacing the fuel pipes

Check that there are no leaks from the fuel pipes. If there are leakages, contact an authorised GOLDONI service centre.



#### 6.5 Cab maintenance

#### General cab maintenance

Check for and dry any pooling water in zones covered by mats or seals.

Protect hinges and locks with water-repellent lubricants.

Top the screen wash fluid tank with a specific screen wash product. Use a washer fluid with antifreeze properties in winter.

Keep the windows, screens and mirrors clean at all times to adequate visibility.

#### Cab air conditioner maintenance 6.5.1

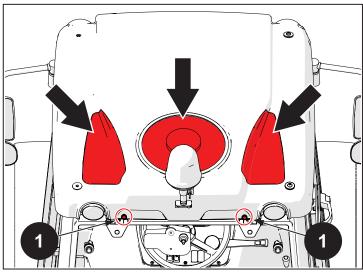
Clean the following with compressed air when needed, in consideration of working conditions (dust, dry conditions etc.), and at least once a week:

- The lateral air grilles of the heat exchanger
- The fan housing/heat exchanger



To facilitate cleaning, undo the fastener knobs (1) and remove or move aside the rear grille.

If the interior of the heat exchanger is excessively fouled and the air conditioning system does not work correctly, contact an authorised service centre.





# 🔼 Warning

Do not attempt to service the air conditioning system yourself. Have the system serviced/repaired only by specialised personnel.



#### **Danger**

Keep naked flames and other heat sources away from the air conditioning system.



#### Danger

The system is under pressure. Do no loosen connections or tamper with pipes.



#### **Danger**

Contact with refrigerant gas may cause freeze burn injuries to the skin and eyes.



#### 6.5.2 Cab air filter maintenance

Undo the knob (1) fastening the guard, remove the guard (2), remove the filter (3) and then clean the filter: carefully tap the filter repeatedly on a hard, flat surface with the perforated side at the bottom. Blow compressed air at a pressure not exceeding 7 bar carefully through each of the pleats, blowing in the opposite direction to the arrows printed on the filter itself.



Replace the filter if necessary or if the indicated replacement interval is reached.

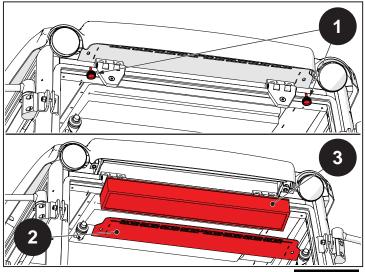


Fig. 6.29

#### Active carbon cab air filter maintenance



# Warning

Replace when needed or at intervals not exceeding 200h of use of the filter itself or 36 months, whichever is reached first.

See the instructions provided by the manufacturer for maintenance instructions.

#### 6.5.3 Windscreen washer system

Top up to the correct level with a specific screen wash/antifreeze product.

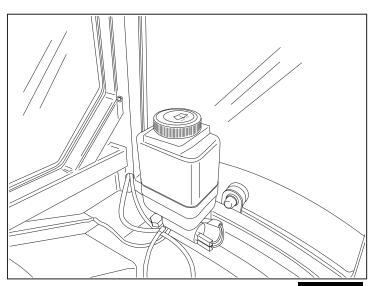


Fig. 6.30



# 6.5.4 Replacing cab windows/screens



The windows and screens of the cab are subject to type approval. In the event of breakage, always replace with an original spare part bearing the same type approval information.

# 6.5.5 Replacing the cab lights



The maintenance tasks are described in the section on maintenance of the electrical system.



# 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 (+).



#### 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

#### Checking condition of maintenance-free battery

#### Installing the battery

The battery is situated in front of the radiator. Open the cowl to access the battery for maintenance.

#### Cleaning the battery

With the engine switched off, wipe the battery with a damp cloth. Clean and tighten the contacts if necessary.

#### Removing 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.

- 1 Disconnect the negative cable first, and then disconnect the positive cable.
- 2 Loosen the bolt (1), then remove the battery.
- 3 Lift the battery slightly to remove from the tractor.

## Specifications for replacement battery

To replace the battery, consult your dealer.

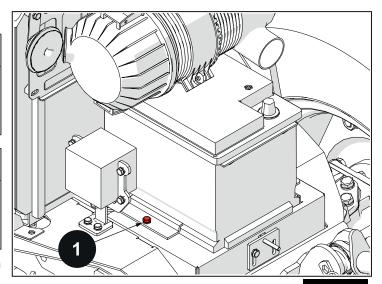
#### **Charge modes**

Charge the battery with a appropriate external battery charger for the type of battery installed.



### Warning

Read the documentation provided by the manufacturer of the battery charger completely before charging.





#### 6.6.2 **Alternator belt check**



# Danger

Only check after isolating the positive battery cable to prevent the risk of the starter motor receiving power and turning due to an accidental short circuit.

Use a commercially available torque wrench to apply a tension of 10 kg. Replace the belt if the resulting deflection exceeds 1 cm.

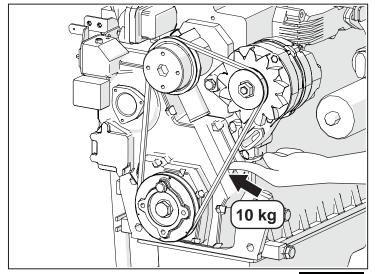
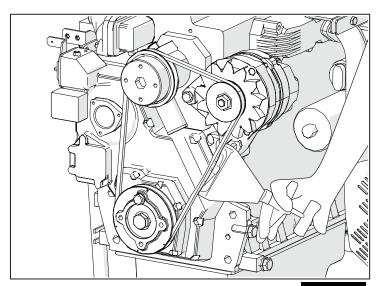


Fig. 6.32

Use a DENSO BTG-2 tension gauge to measure the tension in the position indicated in the figure. The value measured must be between 20 and 25 kg. Tighten the belt if the value measured is less.





Loosen the alternator fastener bolts.

Force the alternator outwards and tighten the fastener bolts to a torque of 40 Nm.

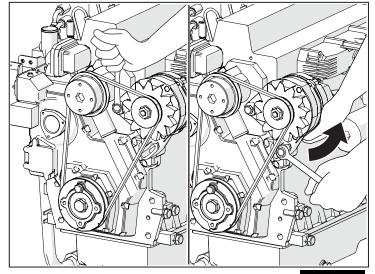
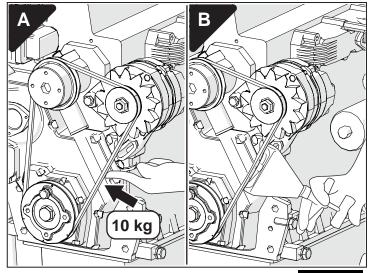


Fig. 6.34

After adjusting, check the belt tension again:

- A Use a commercially available torque wrench to apply a tension of 10 kg. The resulting belt deflection must be less than 1 cm.
- B Use a DENSO BTG-2 tension gauge to measure the tension in the position indicated in the figure. The value measured must be between 20 and 25 kg.





#### 6.6.3 Lights

#### Replacing the low beam headlight bulbs

Proceed as follows.

- Lift the bonnet.
- Disconnect wiring connector (1).
- Undo the nut (2) and remove the complete headlight unit from the cowl.



#### Caution

The nuts (2) also hold compressed springs in place, which may be projected unexpectedly during removal. Wear eye protection during removal and take care not to lose the springs.

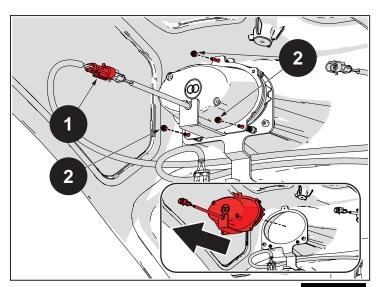


Fig. 6.36

- Undo the screws (3) and remove the cover
- Detach the clip (5) and then turn the cover anticlockwise (6).
- Replace the old bulb with an new original component and then refit and tighten the cover (6) and fasten the clip (5).
- Fit the cover (4) and fasten by tightening the screws (3).
- Fit the complete headlight unit on the cowl and tighten the nuts (2) to fasten it in place.
- Close and lock the bonnet.

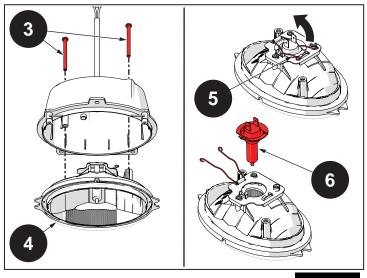


Fig. 6.37

#### Calibrating 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 high beam headlight bulbs (if available)

Proceed as follows.

- Lift the bonnet.
- Disconnect wiring connector (1).
- Turn the cover (2) anticlockwise to remove the bulb.
- Replace the old bulb with an new original component and then refit and tighten the cover (2) and reconnect the connector (1).
- Close and lock the bonnet.

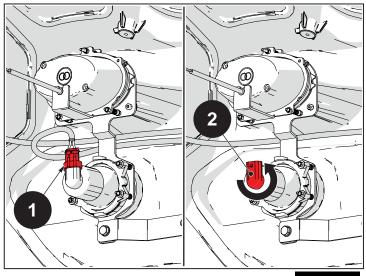
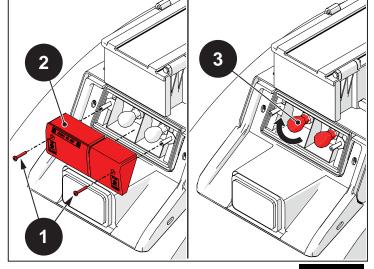


Fig. 6.38

### Replacing the tail light, rear turn indicator and brake light

Proceed as follows.

- 1 Undo the screws (1) and remove the cover lens (2).
- 2 Turn the bulb (3) anticlockwise by 1/4 turn to remove.
- 3 Fit the new bulb, pushing into the bulb holder and turning clockwise by 1/4 of a turn.
- 4 Refit the cover lens (2) and tighten the screws (1) to fix it.
- 5 Check that it works.





### Replacement of the daytime running lights and turn indicators

Proceed as follows.

- 1 Remove the headlight guard removing the screws (1).
- 2 Remove the cover lens.
- 3 Turn the bulb (2) anticlockwise by 1/4 turn to remove.
- 4 Fit the new bulb, pushing into the bulb holder and turning clockwise by 1/4 of a turn.
- 5 Widen the lugs (4) to remove the bulb (3) and fit the new bulb.
- 6 Refit the glass and guard back on.
- 7 Check that it works.

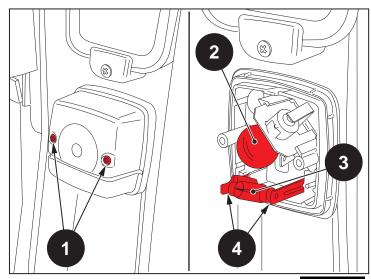


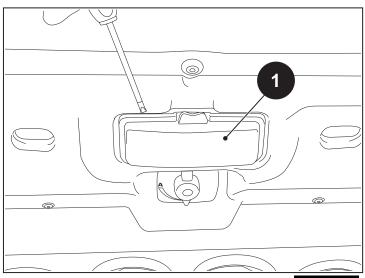
Fig. 6.40

### Replacing the ceiling light bulb



This maintenance procedure is valid for tractor versions with a cab.

Prise off the cover lens (1) of the light unit carefully with a screwdriver, replace the bulb, test the light to make sure that it works and then refit the cover lens.





### Replacing a rear work light bulb of the platform

Note

This procedure is applicable for tractor versions with no cab.

#### Proceed as follows.

- 1 Remove the bulb holder (1) from the housing (2).
- 2 Detach the clip (3) and remove the bulb.
- 3 Replace the bulb with an new original component, and then fasten the clip (3) to secure the bulb in its fitting.
- 4 Fit the bulb holder (1) in the housing (2). Ensure that the rubber casing fits correctly around the full circumference of the bulb holder.

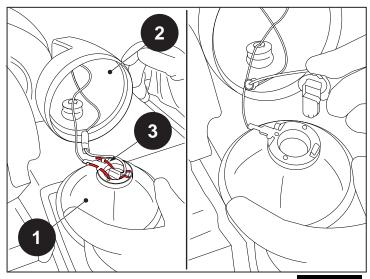


Fig. 6.42

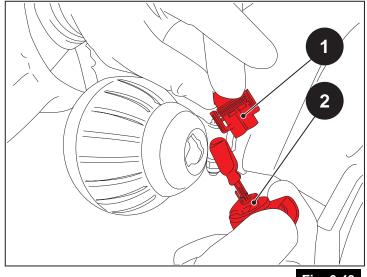
### Replacing a cab work light bulb



This maintenance procedure is valid for tractor versions with a cab.

#### Proceed as follows.

- 1 Disconnect wiring connector (1).
- 2 Turn the cover (2) anticlockwise to remove the bulb.
- 3 Replace the old bulb with an new original component and then refit and tighten the cover (2) and reconnect the connector (1).







# **Warning**

On machines with the cab, wiring harness-bulb connector is situated under the roof panel. Undo the 4 fastener screws of the roof panel and lift the panel in order to disconnect the wiring harness connector and replace the bulb.

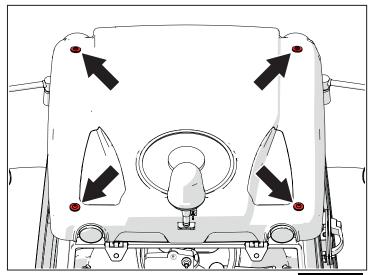


Fig. 6.44

### Replacing the license plate light bulb

Proceed as follows.

- 1 Remove the light unit cover.
- 2 Turn the bulb anticlockwise by 1/4 turn to remove.
- 3 Fit the new bulb, pushing into the bulb holder and turning clockwise by 1/4 of a turn.
- 4 Refit the light unit cover.
- 5 Check that it works.

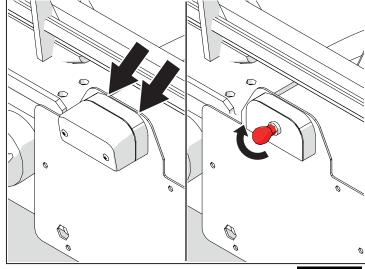


Fig. 6.45



# 6.6.4 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. See Position and functions of Controller and Dashboard for specifications.



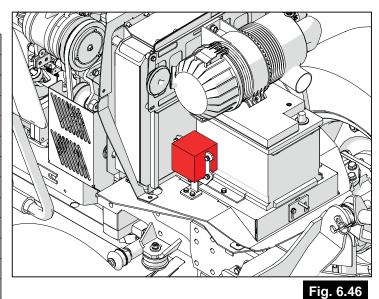
Identify and resolve the cause of the short circuit before replacing a fuse.

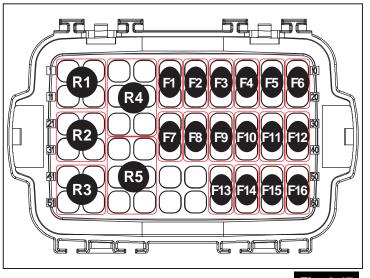


Do not replace the old fuse with a new one with a higher rated value. This may damage the machine. If the fuse with the correct specifications maintains the same power load but continues to burn, ask your dealer to check the electrical system.

#### **Fuse valves**

F1 Key-on power feed for dashboard F2 Brake lights F3 Turn indicator lights F4 Key-on power feed for ECU F5 Sensors F6 Key-on power feed for VCU F7 Trailer socket F8 Horn F9 Beacon light F10 High beam headlights F11 Low beam headlights F12 Daytime running lights F13 Hazard warning lights F14 Diagnostic port F15 Dashboard power supply F16 VCU power supply F17 R1 Dashboard LED relay F18 PTO relay. F19 R2 Glow plug relay F10 R4 Glow plug relay F10 R5 Trailer socket relay F10 R2 PTO relay F11 R2 PTO relay F12 PTO relay F13 Fill valve relay F14 Glow plug relay F15 Trailer socket relay F16 Trailer socket relay F17 PTO relay F18 PTO relay F19 PTO relay F10 PT			
F3 Turn indicator lights F4 Key-on power feed for ECU F5 Sensors F6 Key-on power feed for VCU F7 Trailer socket F8 Horn F9 Beacon light F10 High beam headlights F11 Low beam headlights F12 Daytime running lights F13 Hazard warning lights F14 Diagnostic port F15 Dashboard power supply F16 VCU power supply F17 R1 Dashboard LED relay F18 PTO relay F19 PTO relay F19 PTO relay F10 PTO relay F10 PTO relay F11 PTO relay F12 PTO relay F13 PTO relay F14 Diagnostic port F15 Dashboard LED relay F16 PTO relay F17 PTO relay F18 PTO relay F19 PTO relay F19 PTO relay F19 PTO relay F10 PTO relay F10 PTO relay F11 PTO relay F12 PTO relay F13 PTO relay F14 PTO relay F15 PTO relay F16 PTO relay F17 PTO relay F18 PTO relay F19 PTO relay F10	F1	Key-on power feed for dashboard	5A
F4 Key-on power feed for ECU  F5 Sensors  10A  F6 Key-on power feed for VCU  5A  F7 Trailer socket  20A  F8 Horn  10A  F9 Beacon light  10A  F10 High beam headlights  10A  F11 Low beam headlights  10A  F12 Daytime running lights  10A  F13 Hazard warning lights  10A  F14 Diagnostic port  10A  F15 Dashboard power supply  F16 VCU power supply  R1 Dashboard LED relay  R2 PTO relay.  R3 Fill valve relay  R4 Glow plug relay	F2	Brake lights	10A
F5 Sensors 10A  F6 Key-on power feed for VCU 5A  F7 Trailer socket 20A  F8 Horn 10A  F9 Beacon light 10A  F10 High beam headlights 10A  F11 Low beam headlights 10A  F12 Daytime running lights 10A  F13 Hazard warning lights 10A  F14 Diagnostic port 10A  F15 Dashboard power supply 5A  F16 VCU power supply 10A  R1 Dashboard LED relay -  R2 PTO relay  R3 Fill valve relay -  R4 Glow plug relay -	F3	Turn indicator lights	10A
F6 Key-on power feed for VCU 5A F7 Trailer socket 20A F8 Horn 10A F9 Beacon light 10A F10 High beam headlights 10A F11 Low beam headlights 10A F12 Daytime running lights 10A F13 Hazard warning lights 10A F14 Diagnostic port 10A F15 Dashboard power supply 5A F16 VCU power supply 10A R1 Dashboard LED relay - R2 PTO relay R3 Fill valve relay - R4 Glow plug relay -	F4	Key-on power feed for ECU	10A
F7 Trailer socket  F8 Horn  F9 Beacon light  F10 High beam headlights  F11 Low beam headlights  F12 Daytime running lights  F13 Hazard warning lights  F14 Diagnostic port  F15 Dashboard power supply  F16 VCU power supply  R1 Dashboard LED relay  R2 PTO relay.  R3 Fill valve relay  R4 Glow plug relay	F5	Sensors	10A
F8 Horn 10A F9 Beacon light 10A F10 High beam headlights 10A F11 Low beam headlights 10A F12 Daytime running lights 10A F13 Hazard warning lights 10A F14 Diagnostic port 10A F15 Dashboard power supply 5A F16 VCU power supply 10A R1 Dashboard LED relay - R2 PTO relay R3 Fill valve relay - R4 Glow plug relay -	F6	Key-on power feed for VCU	5A
F9 Beacon light 10A F10 High beam headlights 10A F11 Low beam headlights 10A F12 Daytime running lights 10A F13 Hazard warning lights 10A F14 Diagnostic port 10A F15 Dashboard power supply 5A F16 VCU power supply 10A R1 Dashboard LED relay - R2 PTO relay R3 Fill valve relay - R4 Glow plug relay -	F7	Trailer socket	20A
F10 High beam headlights 10A F11 Low beam headlights 10A F12 Daytime running lights 10A F13 Hazard warning lights 10A F14 Diagnostic port 10A F15 Dashboard power supply 5A F16 VCU power supply 10A R1 Dashboard LED relay - R2 PTO relay R3 Fill valve relay - R4 Glow plug relay -	F8	Horn	10A
F11 Low beam headlights 10A F12 Daytime running lights 10A F13 Hazard warning lights 10A F14 Diagnostic port 10A F15 Dashboard power supply 5A F16 VCU power supply 10A R1 Dashboard LED relay - R2 PTO relay R3 Fill valve relay - R4 Glow plug relay -	F9	Beacon light	10A
F12 Daytime running lights 10A F13 Hazard warning lights 10A F14 Diagnostic port 10A F15 Dashboard power supply 5A F16 VCU power supply 10A R1 Dashboard LED relay - R2 PTO relay R3 Fill valve relay - R4 Glow plug relay -	F10	High beam headlights	10A
F13 Hazard warning lights 10A F14 Diagnostic port 10A F15 Dashboard power supply 5A F16 VCU power supply 10A R1 Dashboard LED relay - R2 PTO relay R3 Fill valve relay - R4 Glow plug relay -	F11	Low beam headlights	10A
F14 Diagnostic port 10A F15 Dashboard power supply 5A F16 VCU power supply 10A R1 Dashboard LED relay - R2 PTO relay R3 Fill valve relay - R4 Glow plug relay -	F12	Daytime running lights	10A
F15 Dashboard power supply 5A F16 VCU power supply 10A R1 Dashboard LED relay - R2 PTO relay R3 Fill valve relay - R4 Glow plug relay -	F13	Hazard warning lights	10A
F16 VCU power supply 10A R1 Dashboard LED relay - R2 PTO relay R3 Fill valve relay - R4 Glow plug relay -	F14	Diagnostic port	10A
R1 Dashboard LED relay - R2 PTO relay R3 Fill valve relay - R4 Glow plug relay -	F15	Dashboard power supply	5A
R2 PTO relay R3 Fill valve relay - R4 Glow plug relay -	F16	VCU power supply	10A
R3 Fill valve relay - R4 Glow plug relay -	R1	Dashboard LED relay	-
R4 Glow plug relay -	R2	PTO relay.	-
	R3	Fill valve relay	-
R5 Trailer socket relay -	R4	Glow plug relay	-
	R5	Trailer socket relay	-







### Main fuses

The machine is equipped with main fuses. These fuses protect the entire electrical system.

Α	General electrical system protection 50A	
	General cab electrical system protection Only for machines fitted with cab	40A

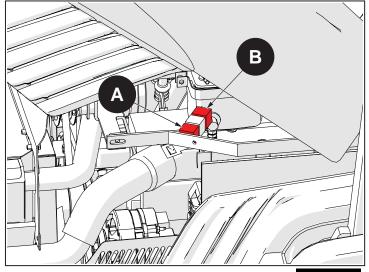


Fig. 6.48

#### Fuse holder in cab

The fuses for the cab are located in the ceiling of the cabin itself, on the right side. The system is protected by a maxi general fuse of 40A.

Α	Windscreen wiper/washer	7.5A
В	Ceiling unit fan switch	20A
С	Work light	15A
D	Fan housing	25A
	Heat exchanger	
Е	Rear lights	10A
F	Rotary beacon	20A

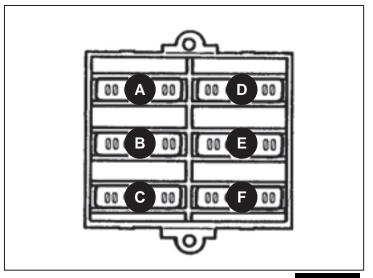


Fig. 6.49

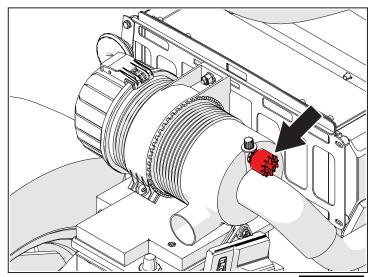


# 6.6.5 Engine air filter clogging sensor



If the protection is positioned incorrectly, this could cause serious damage to the engine air intake circuit.

Check to make sure that the engine air filter clogging sensor is in the right position. If servicing is required, make sure that the sensor is assembled correctly and protected against adverse weather conditions.





# 6.7 Tractor hydraulic system maintenance

#### 6.7.1 Shift system, rear differential and lift

#### Checking oil level



# Warning

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



## Note

Keep clean the zone surrounding the plug with dipstick.

After refilling, check the dipstick (1) and make sure the oil level is below the upper marking. Run the tractor engine for 5 minutes, then check the oil level again. If necessary, top up to the maximum level with the plug closed.

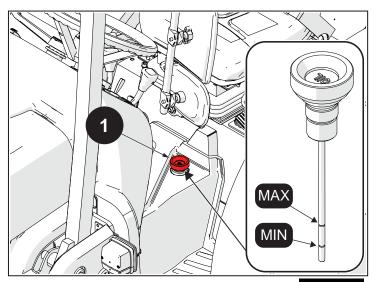


Fig. 6.51

#### Changing the oil

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

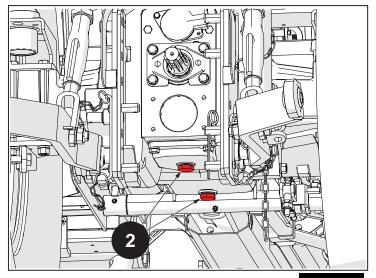
Lower the outer lift arm to drain the oil from the cylinder.

Remove the plugs (2) to drain the oil.



#### Note

Dispose of waste oil in accordance with the laws and regulations in force.







# **Warning**

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



#### Note

Keep clean the zone surrounding the plug with dipstick.

Open the cap (1) and pour hydraulic fluid into the gearbox/hydraulic system via the filler neck.

After refilling, check the dipstick and make sure the oil level is below the upper marking. Run the tractor engine for 5 minutes, then check the oil level again. Top up to the correct level if necessary.

Every time the transmission oil is changed, the following is also required:

- Cleaning of suction transmission oil filter.
- Change of the internal cartridge of the delivery transmission oil filter.

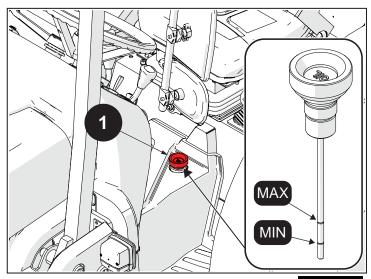


Fig. 6.53

#### Transmission oil suction line filter maintenance 6.7.2

The suction line filter is situated on the right hand side of the tractor, between the gearbox and the clutch housing.

Service as follows:

- Place a suitably sized pan for collecting oil underneath the filter.
- Undo the clamps and remove the filter (1).
- Clean the filter seat and the surrounding area.
- Apply some oil to the seal ring of the new filter to improve the sealing effect.
- Insert the filter (1) and tighten the clamps to fix it.

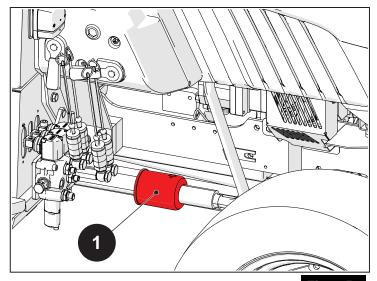


Fig. 6.54



# 6.7.3 Maintenance of the front differential system

### Checking oil level

Loosen the plug with dipstick (1) to check the oil level and make sure it is between the two notches of MIN and MAX level.

If necessary, top up with the recommended oil type.



### Note

Keep clean the zone surrounding the plug with dipstick.

To restore the oil level, pour the hydraulic fluid in the plug hole (1).

Allow the oil to settle before checking the level again.

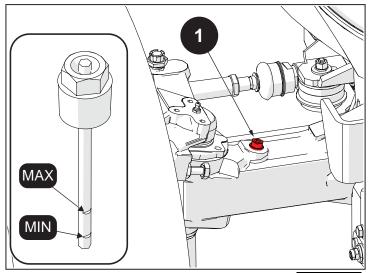


Fig. 6.5<u>5</u>

### Changing the oil

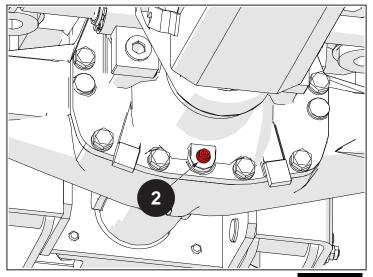
Place a suitably sized plug for collecting oil underneath the casing.



# Note

Dispose of waste oil in accordance with the laws and regulations in force.

Remove the plug (2) located in the centre of the front axle to drain the oil.





Loosen the plugs (3), located on the two side reducers to facilitate the oil leakage.

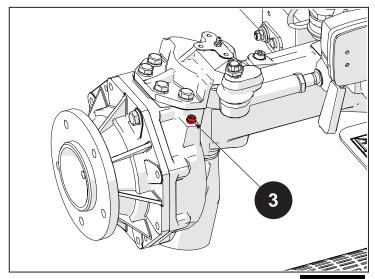


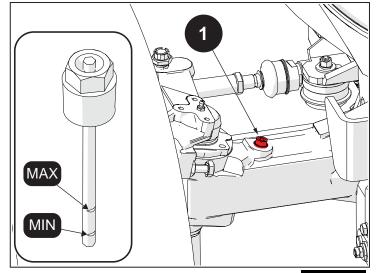
Fig. 6.57



Keep clean the zone surrounding the plug with dipstick.

Pour the hydraulic fluid in the plug hole (1).

Allow the oil to settle before checking the level again.





# 6.7.4 Front PTO maintenance (optional)

## **Checking oil level**

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

Check the oil level by means of the control plug (2); the oil must reach the lower edge of the hole.

If necessary, top up through the plug (1) with the recommended oil type.

Allow the oil to settle before checking the level again.

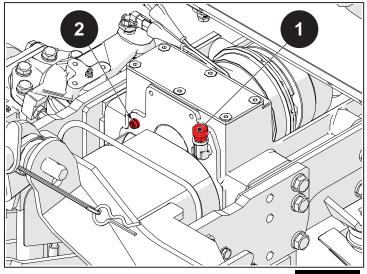


Fig. 6.59

### Changing the oil

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



Dispose of waste oil in accordance with the laws and regulations in force.

Remove the drain plug (3) to drain the oil.

Pour oil via the plug hole (1).

Allow the oil to settle before checking the level again.

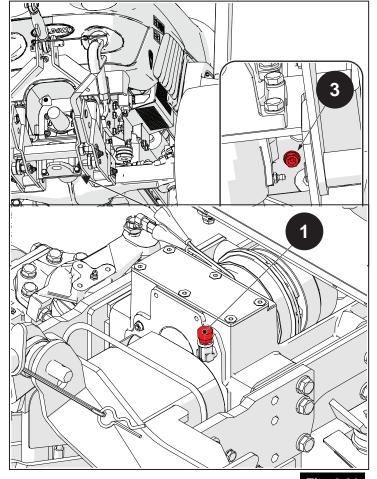


Fig. 6.61



# 6.8 Lubrication and grease points

Note

Use recommended lubricant grease.

### Rear lift lubrication (Version Up/down)

Whenever needed or at least every 50 operating hours, grease the rear lift via grease nipples (A).



Lower the lift before lubricating the components.

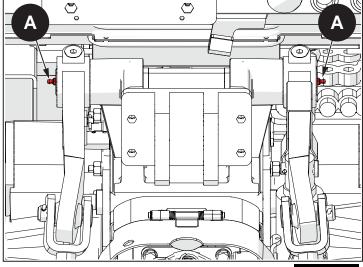


Fig. 6.62

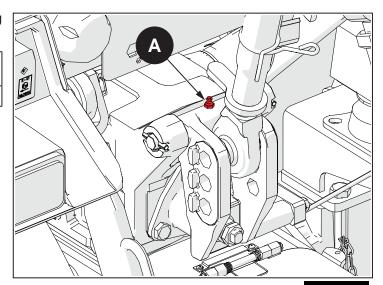
### Rear lift lubrication (Version draft control)

Whenever needed or at least every 50 operating hours, grease the rear lift via grease nipple (A).



Note

Lower the lift before lubricating the components.





### Lubricating the front axle

Whenever needed or at least every 50 operating hours, add new grease to the sleeve (B) and (C) of the front axle centre swing pin.

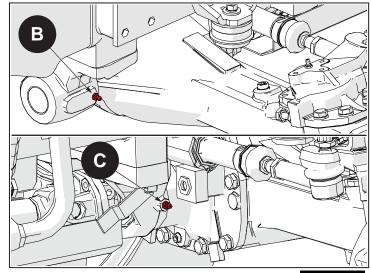


Fig. 6.64

Whenever needed or at least every 50 operating hours add new grease on the pins (D) of the side reducers.

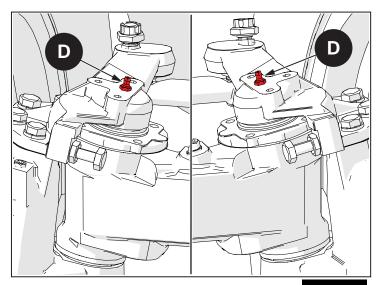
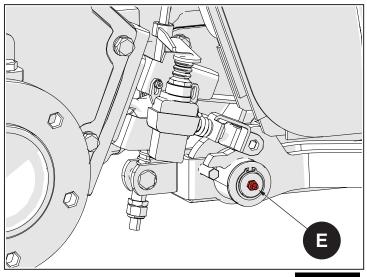


Fig. 6.65

### Lubricating the brake linkages

Whenever needed or at least every 50 operating hours, add new grease to brake control linkage pivot (E). The grease nipples are placed under the tractor.





# 6.9 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 tank, radiator overflow hose, 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.
- Drain the coolant from the radiator and engine.
- 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
- 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.
- Check the coolant level. If necessary, top up or change 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 main-
- 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.
- Switch off the engine and check again that the engine oil and coolant levels are correct.



#### 🔼 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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#### **Troubleshooting** 7.1

The following information is given to facilitate the identification and rectification of faults and malfunctions which may occur during use.

While some of these problems may be resolved by the user, all others require specific technical skills and may only be performed by qualified personnel with proven experience in the specific field.



# Caution

An active visual and/or audible warning signal indicates that a fault or malfunction has been identified. In this case, switch the engine off immediately and consult the documentation provided.

#### Faults, causes and solutions

Problem	Probable cause
Does not start	No fuel
	Flat battery
	Tank cap breather vent obstructed
	Fuel filter clogged
	Air or water in fuel circuit
	Pipes obstructed
	Starter motor faulty
	Preheating glow plugs fuse burned
	Glow plugs preheating control relay defect
	Ignition switch faulty
Starts and stops	No fuel
	• Idle speed too low
	Fuel filter clogged
	Tank cap breather vent obstructed
	Air or water in fuel circuit
	Pipes obstructed
	Air filter clogged
	Overload
Engine will not accelerate	Air filter clogged
	Overload
	Fuel filter clogged
	Tank cap breather vent obstructed
	Air or water in fuel circuit
Fluctuating engine speed	• Idle speed too low
	Oil level too high
	Pipes obstructed
	Air or water in fuel circuit
	Fuel filter clogged

# **POSSIBLE FAULTS AND SOLUTIONS**



Problem	Probable cause
Black smoke	Overload
	Air filter clogged
	• Idle speed too low
White smoke	Prolonged operation at idle speed
	Running-in not completed
	Air or water in fuel circuit
	Oil level too high
	Defective thermostat valve
Low oil pressure	Oil suction pipe to sump obstructed
	Air in oil suction line
Engine overheats	Coolant level too low
	Defective thermostat valve
	Leaking coolant from radiator, hoses, crankcase or water pump
	Overload
	Oil level too high
	Oil level too low
	Radiator heat exchange surface fouled
	Oil suction pipe to sump obstructed
Loss of power	Air filter clogged
	Pipes obstructed
	Fuel filter clogged
	Running-in not completed
	Air or water in fuel circuit
	Tank breather vent obstructed
	Oil level too high
	Oil level too low
Excessive oil consumption	Prolonged operation at idle speed
	Running-in not completed
	Overload
	Oil level too high



### **POSSIBLE FAULTS AND SOLUTIONS**

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