

S•S GT•Q

90 | 100 | 110



Operator Manual



an ARBOS Company

SUMMARY

Chapter No.	Description
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2	GENERAL SAFETY RULES
3	TECHNICAL CHARACTERISTICS
4	CONTROLS AND INSTRUMENTS
5	OPERATING INSTRUCTIONS
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 to 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.

All rights reserved. This manual may not be reproduced or copied, in whole or in part, without the prior written permission of the manufacturer.

Note that all brands other than brands owned by the ARBOS GROUP SpA, subsidiaries of the group, licensee companies and companies controlled by the group, and relative to third party products and/or services cited in this document, are the sole property of the respective trademark owners.

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 your 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 conformant with applicable safety regulations.

Modifications made to the machine without the approval of the manufacturer may render the machine no longer conformant 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.



Attention

The injection system and the engine installed on this machine are conformant 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.



Attention

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 your 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 conformant 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 machine;
- 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 safely 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.




















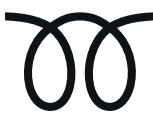


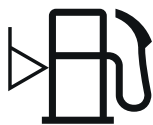


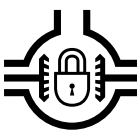



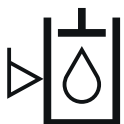


Note









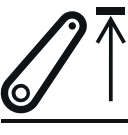




If the tractor changes hands, the manual must always be passed on to the new owner. If the tractor is handed over to the new owner without the operator manual, this may put the new owner at risk as they will have no way of knowing the safety rules for usage and the functions and features of the tractor 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		Horn		Alarm indicator
	High beam headlights indicator		Dipped headlights indicator		Work light indicator
	Rotating beacon indicator		Running lights indicator		Read the instruction manual
	Turn signal indicator		Battery state of charge indicator		Rear screen washer/wiper indicator
	Windscreen wiper indicator		Windscreen wiper/washer indicator		Engine oil pressure indicator
	Engine water temperature indicator		Engine speed indicator		Engine preheat indicator
	Engine fault indicator		Engine air filter clogged indicator		Fuel level indicator
	Fuel system fault indicator		Four wheel drive indicator		Differential lock indicator
	Forward drive selected indicator		Neutral indicator		Reverse drive selected indicator
	Hydraulic fluid level indicator		Brake fluid warning indicator		Parking brake indicator

	Transmission oil pressure indicator		Service indicator; see the technical manual		Rear PTO indicator
	Front PTO indicator	750	Rear PTO 750 rpm mode indicator	540	Rear PTO 540 rpm mode indicator
	Fluid level indicator		Braking system, first trailer or first auxiliary circuit		Braking system, second trailer or second auxiliary circuit
	Lift down indicator		Upper lift limit reached indicator		Lower lift limit reached indicator
	Hydraulic oil filter indicator		Pressure indicator		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
A	Amperes
cm	Centimetres
cm ³	Cubic centimetres
dB(A)	Decibels
g	Grammes
rpm	rpm
h	Hour
kg	Kilogrammes
km/h	Kilometres per hour
kW	Kilowatts
l	Litres
m	Metres
m ³	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

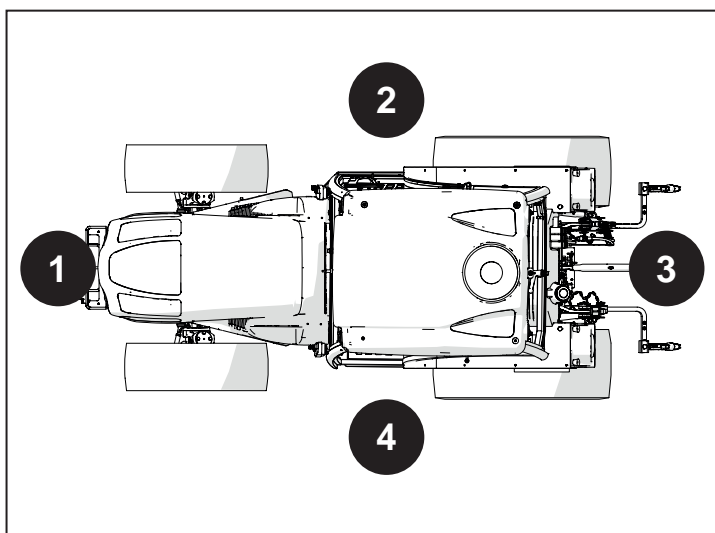


Fig. 1.1

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 on the upper right hand side of the engine, underneath the tractor bonnet.

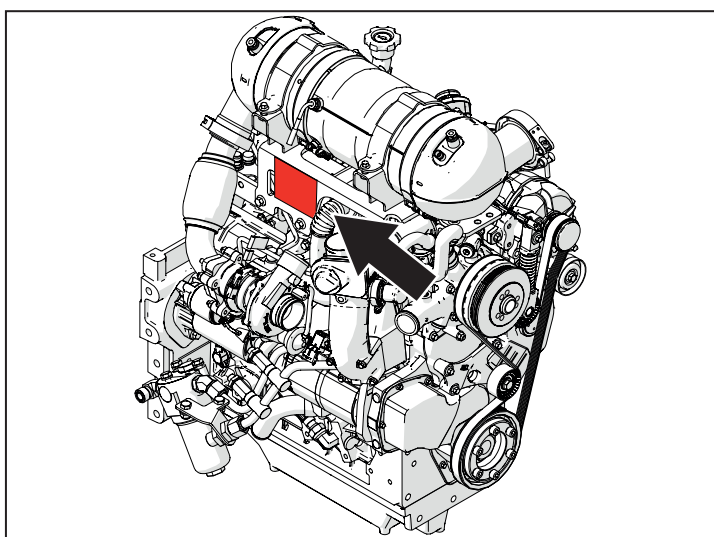


Fig. 1.2

- A - Engine serial number
- B - Dry weight
- C - Engine Type
- D - Family
- E - Model
- F - Version
- G - Maximum power (kW)
- H - Maximum engine speed (rpm)
- I - Homologation
- L - Characteristics of engine lubricant oil

FCA			
FIAT CHRYSLER AUTOMOBILES			
MATRICOLO SERIAL	A	PESO WEIGHT kg	B
MOTORE TIPO ENG. TYPE	C		
FAMIGLIA ENG. FAMILY	D	MODELLO ENG. MODEL	E
VERSIONE ENG. VERSION	F	POT. MAX. MAX. POWER kW	G
		GIRI/MIN R.P.M.	H
OMOLOGAZIONE HOMOLOGATION	I		
	L		

Fig. 1.3

1.5.3 Chassis

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

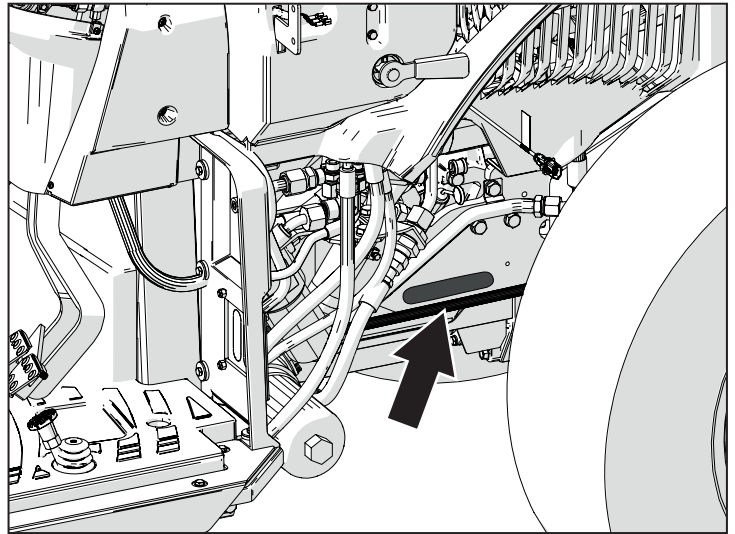


Fig. 1.4

- 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)

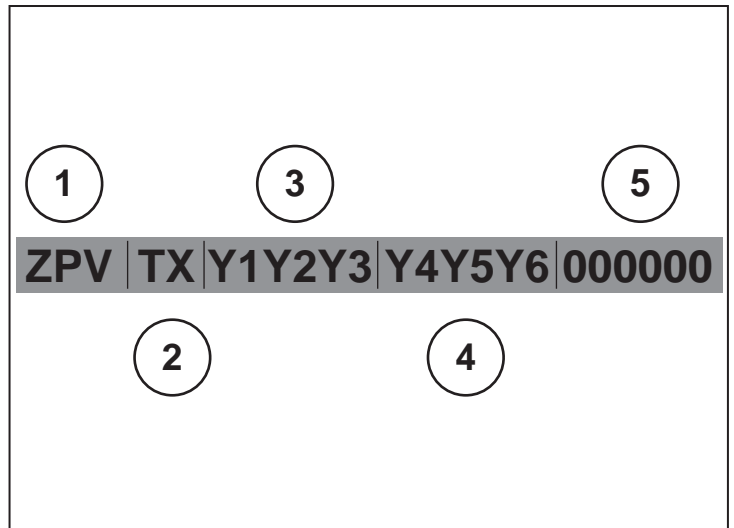


Fig. 1.5

1.5.4 Tractor identification plate

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

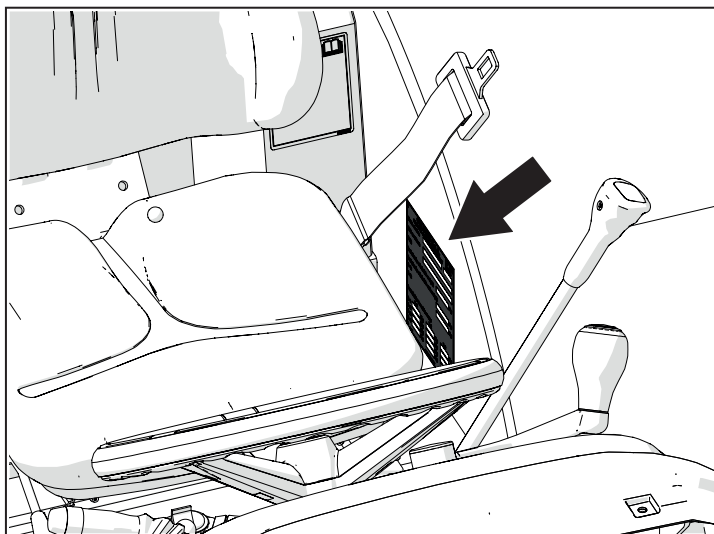


Fig. 1.6

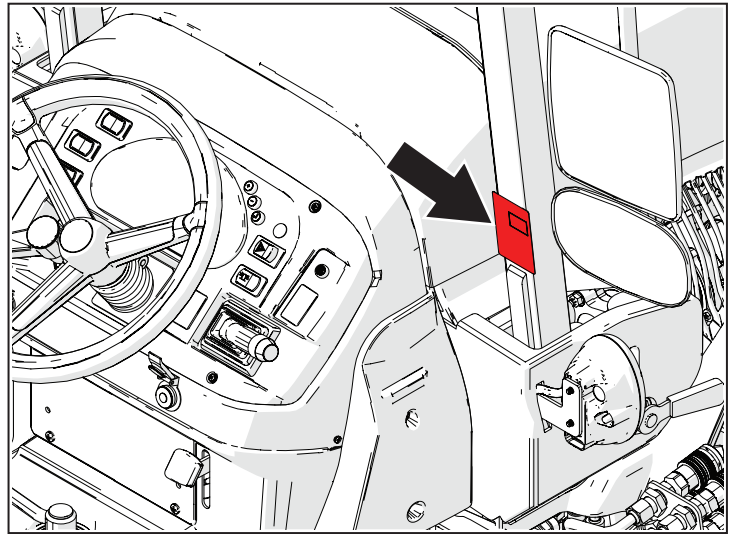
GOLDONI S.p.A.					
Migliarina di Carpi (MODENA) ITALY					
Com. name:				Cat.: <input type="text"/>	
EU type approval: <input type="text"/>					
VIN: <input type="text"/>					
Technically admissible weight:				<input type="text"/> Kg	
Technically admissible axle weight					
A-1:				<input type="text"/> Kg	
A-2:				<input type="text"/> Kg	
Permissible towable mass:					
	T-1		T-2		T-3
B-1	<input type="text"/> Kg		<input type="text"/> Kg		<input type="text"/> Kg
B-2	<input type="text"/> Kg		<input type="text"/> Kg		<input type="text"/> Kg
B-3	<input type="text"/> Kg		<input type="text"/> Kg		<input type="text"/> Kg
B-4	<input type="text"/> Kg		<input type="text"/> Kg		<input type="text"/> Kg
66552		MADE IN ITALY			

Fig. 1.7

1.5.5 Label with type of protective structure

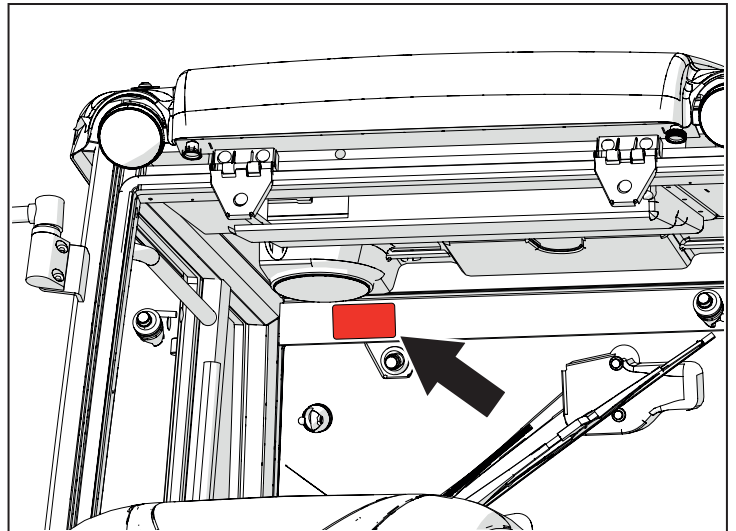
Roll bar

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

**Fig. 1.8**

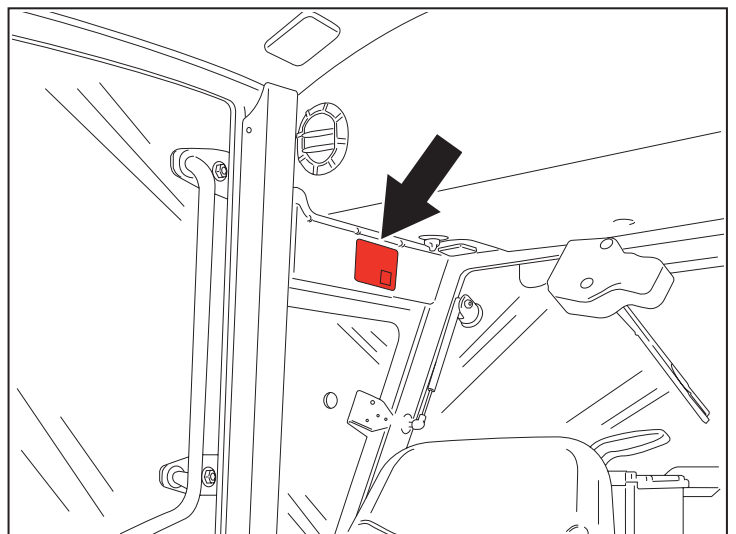
GL cab

The plate is situated at the top near the right hand rear pillar of the cab.

**Fig. 1.9**

SG1 cab

The plate is situated at the top behind the right hand door of the cab.

**Fig. 1.10**

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

Meaning of OCSE/OECD codes:

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

The diagram shows a rectangular label for a protective structure with the following fields and callouts:

- 1** points to the **Make:** field.
- 2** points to the **Trade mark:** field.
- 3** points to the **EEC approval number:** field.
- 4** points to the **OECD approval number** field.
- 5** points to the **Identification number:** field.
- 6** points to the **Protective structure mounted on the following tractors:** section.
- 7** points to the **Type:** field.

Fig. 1.11

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.

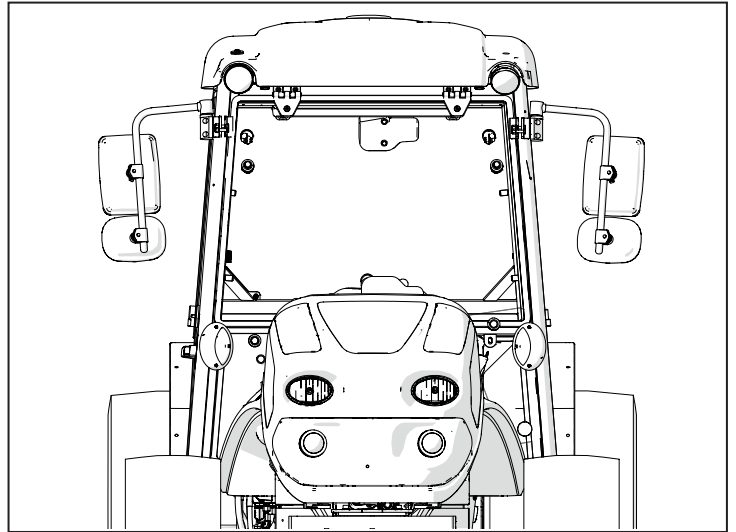


Fig. 1.12

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.

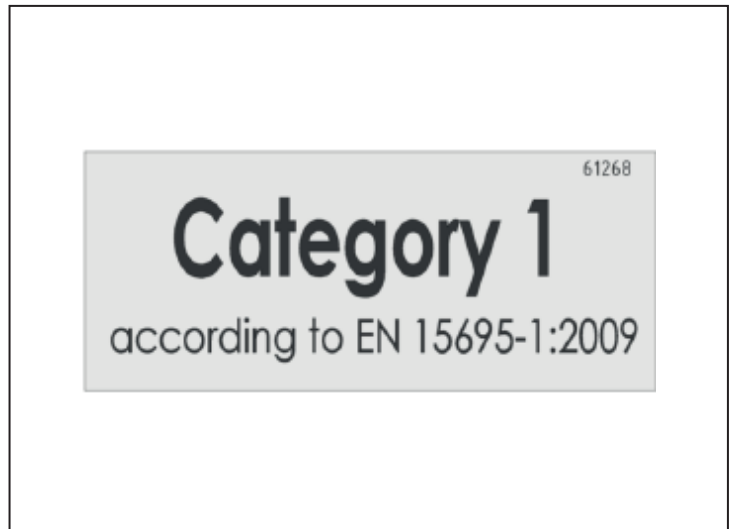


Fig. 1.13

1.7 Type approval types

Version Q

Trade name	TVV
Q90	TWJ004CG
Q90	TWJ014CG
Q90	TWJ024CG
Q100	TWK004CG
Q100	TWK014CG
Q100	TWK024CG
Q110	TWM004CG
Q110	TWM014CG
Q110	TWM024CG

S/S GT version

Trade name	TVV
S90 GT	TSJ003CG
S90	TSJ004CG
S90 GT	TSJ013CG
S90	TSJ014CG
S100 GT	TSK003CG
S100	TSK004CG
S100 GT	TSK013CG
S100	TSK014CG
S110 GT	TSM003CG
S110	TSM004CG
S110 GT	TSM013CG
S110	TSM014CG

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.

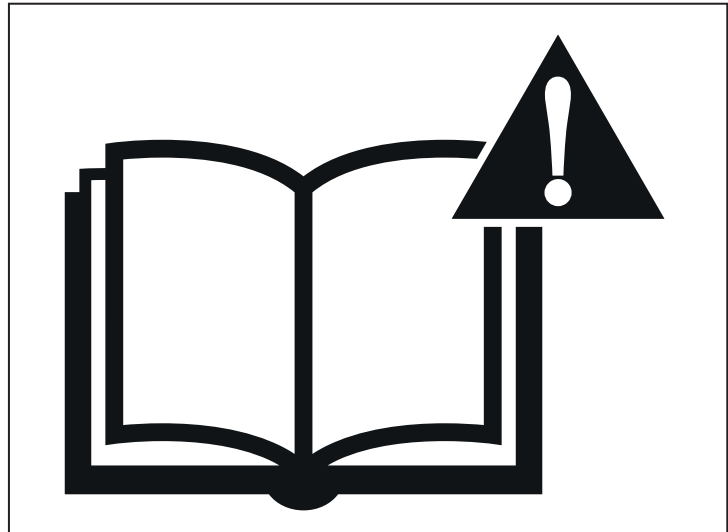


Fig. 2.1

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 ATTENTION 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 your 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

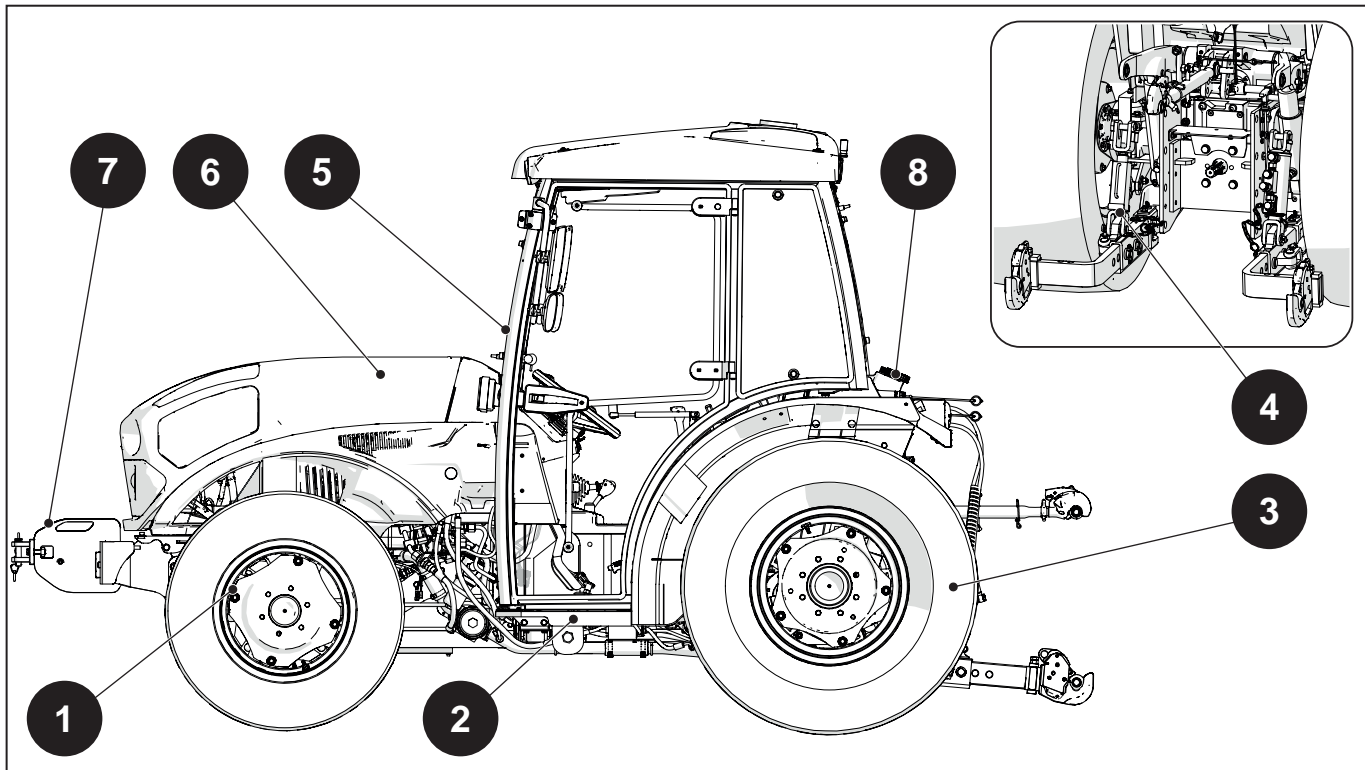


Fig. 2.2

1 - Front wheels	<p>Risk of being run over by parts of moving vehicle.</p> <p>Risk of crushing by tyre.</p> <p>Tyre explosion.</p>
2- Access to driver seat	<p>Fall hazard.</p>
3- Rear wheels	<p>Risk of being run over by parts of moving vehicle.</p> <p>Risk of crushing by tyre.</p> <p>Tyre explosion.</p>
4- Rear implement hitch	<p>Rotating parts hazard (PTO).</p> <p>Risk of crushing caused by implements connected to PTO.</p> <p>Risk of falling suspended loads.</p> <p>High pressure oil leak hazard.</p>
5- Cab	<p>Risk of toxic/harmful substances entering cab.</p> <p>Risk of intrusion of falling objects.</p> <p>Caution: reduced field of vision.</p> <p>Injury caused by failure to use seat belts.</p>
6 - Engine bonnet	<p>Avoid contact with hot parts.</p> <p>Attention, possible contact with live parts.</p> <p>Avoid contact with sharp parts.</p> <p>Rotating parts hazard (e.g. fan).</p>

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.
8 - Refuelling	Avoid fuel spillage. Risk of fire. Avoid contact with hot parts.

2.1.5 Safety warning decals

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

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

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

Never remove or cover safety and instructions decals.

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

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

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

2.1.6 Positions of safety decals

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

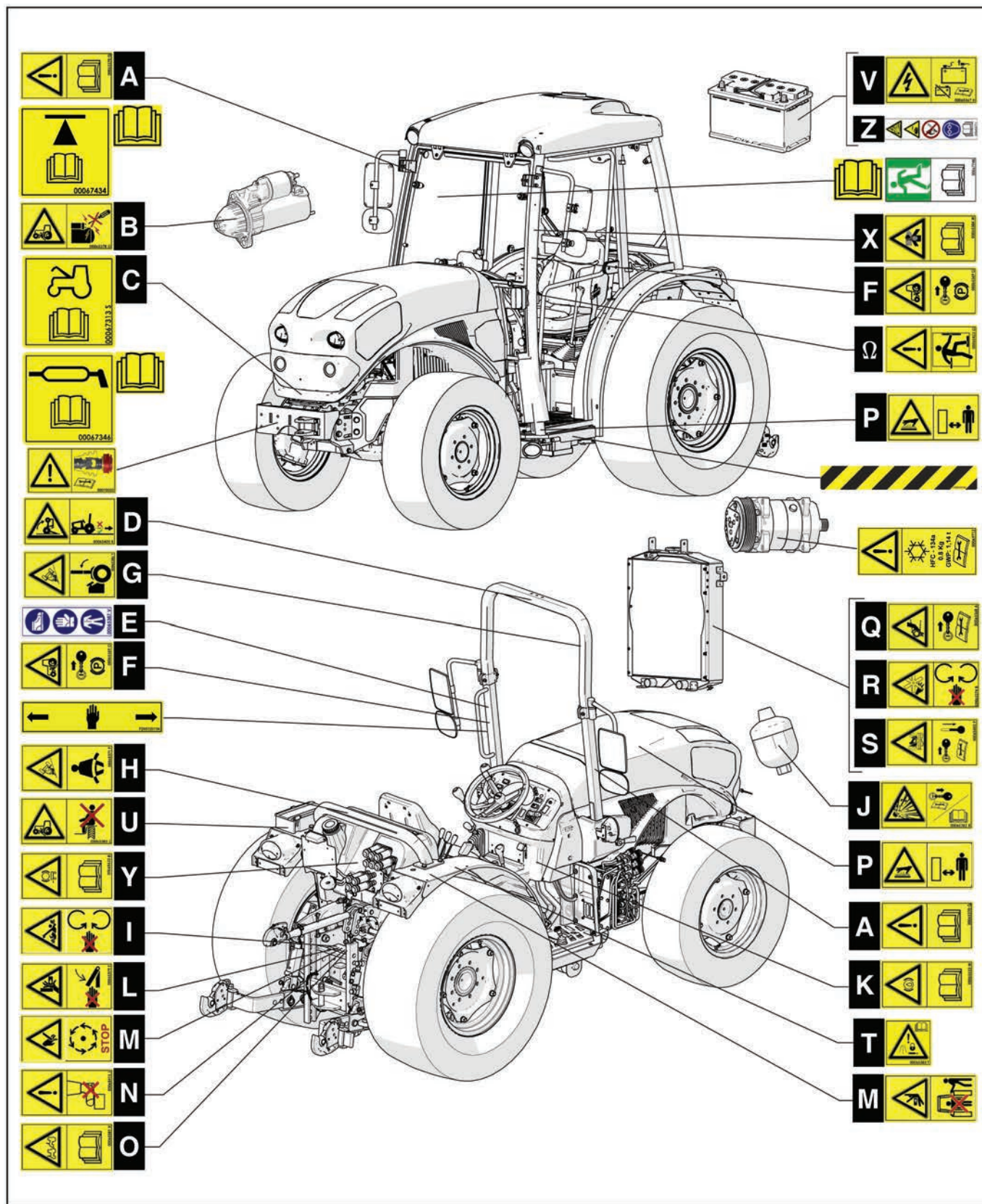


Fig. 2.3

(A) 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 (ROPS Version): right hand pillar



Fig. 2.4

(B) 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. 2.5

(C) 00067313 - Opening the cowl

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

POSITION: Engine bonnet release area.



Fig. 2.6

(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

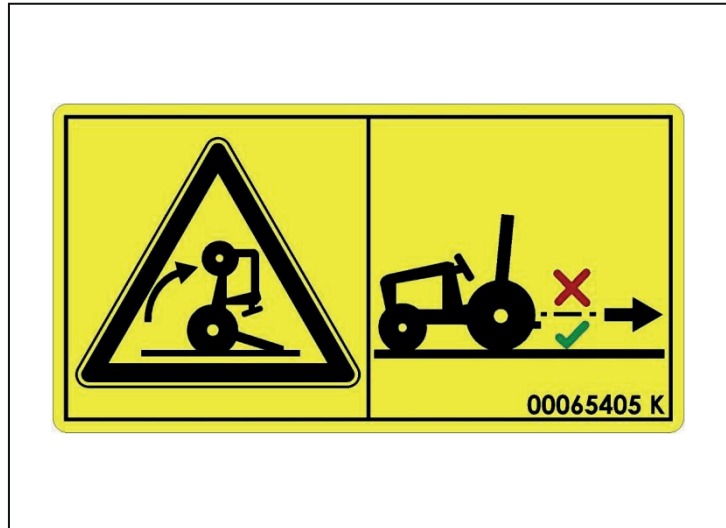


Fig. 2.7

(E) 00065387 - Personal Protective Equipment (PPE)

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

POSITION (Cab Version): left hand side

POSITION (ROPS Version): left hand side

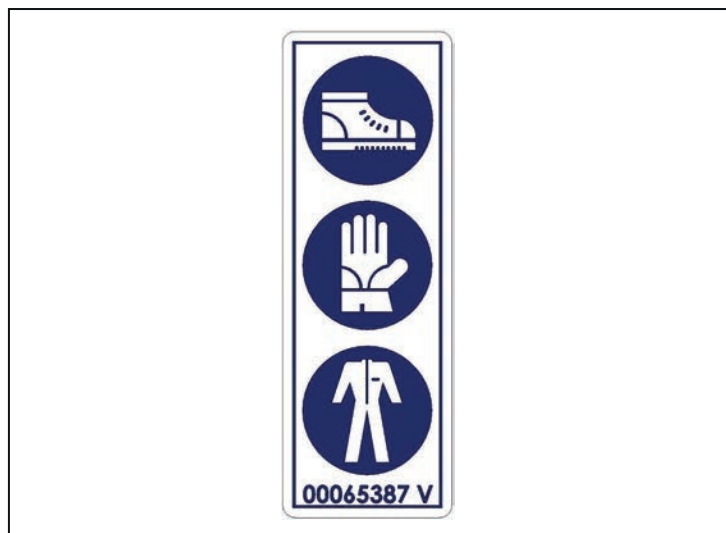


Fig. 2.8

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



Fig. 2.9

(F) 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. 2.10

(G) 00065386 - Always keep the roll bar locked in the raised position

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. 2.11

(H) 00065371 - Machine overturn hazard

WARNING: 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. 2.12

(I) 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. 2.13

(I) 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. 2.14

(J) 00065382 - Explosion hazard

DANGER: Explosion hazard - contents under pressure. Only fill the accumulators with nitrogen - other gases may explode. See the Operation section of the manual for detailed information.

POSITION: Nitrogen accumulator



Fig. 2.15

(K) 00065623 - Brake oil/fluid – Read the Operator Manual

DANGER: Brake oil/fluid – When lit, the red warning lamp on the instrument cluster warns of a braking system fault. Read the specific instructions in the Operator Instruction Manual thoroughly.

POSITION: Brake oil/fluid tank area.



Fig. 2.16

(L) 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 arm area



Fig. 2.17

(L) 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. 2.18

(M) 00065403 - Entanglement and shear hazard

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

POSITION: PTO guards (REAR)



Fig. 2.19

(M) 00065967 - Entanglement and shear hazard

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

POSITION: PTO guards (FRONT)



Fig. 2.20

(N) 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. 2.21

(O) 00065381 - Towing hitch – Read the Operator Manual

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

POSITION: Towing hitch

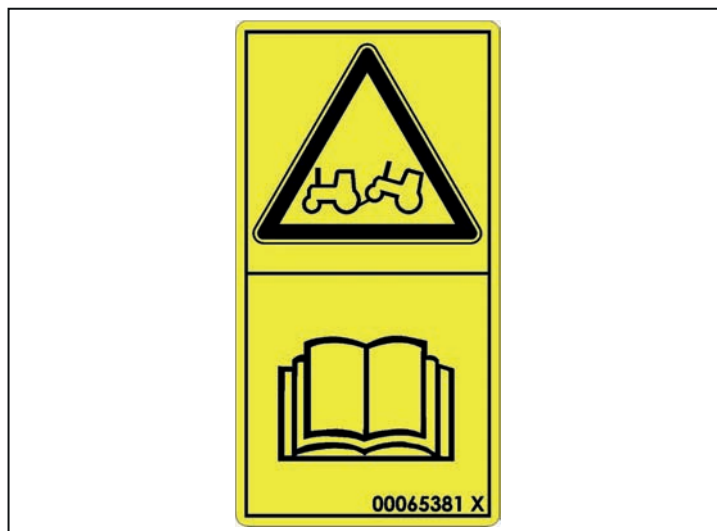


Fig. 2.22

(P) 00065415 - Burn hazard - hot surfaces

WARNING: 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. 2.23

(P) 00065372 - Burn hazard - hot surfaces

WARNING: 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. 2.24

(Q) 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. 2.25

(R) 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. 2.26

(S) 00065402 - Scald hazard

ATTENTION: 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. 2.27

(T) 00065383 - Hydraulic valves

WARNING: 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. 2.28

(U) 00065385 - Run-over hazard

WARNING: 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. 2.29

(V) 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.

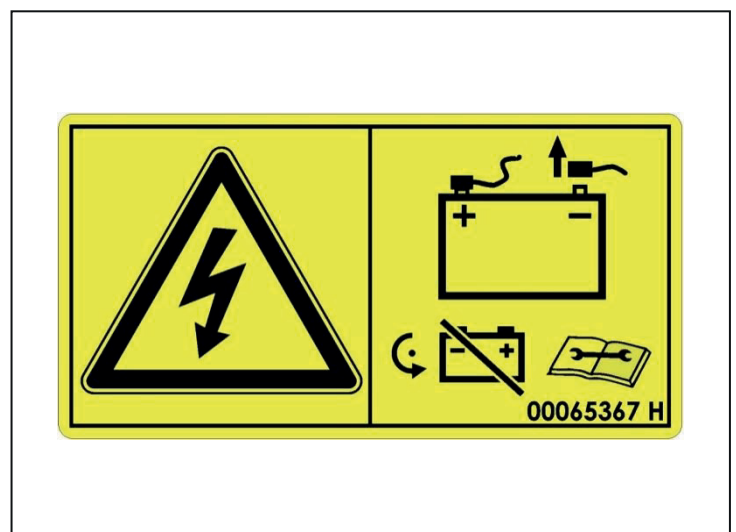


Fig. 2.30

(W) 00065373 - Crush hazard

WARNING: Risk of crushing between tractor and implement. Keep away from the tyre when operating the external controls for the arms and 3-point linkage. Keep out of the space between the tractor and the implement.

POSITION: Version with electronically controlled lift: Rear mudguard, right hand side.



Fig. 2.31

(X) 00065384 - Hazardous environmental conditions

WARNING: Wear protective garments, safety goggles and a respirator when working in areas where crop treatment products are used. Read the instructions in the Operator Manual.

POSITION (Cab Version): left hand front pillar.



Fig. 2.32

(Y) 00065622 - Trailer brake – Read the Operator Manual

WARNING: Trailer brake – When lit, the red warning lamp on the instrument cluster warns that the trailer brake is disengaged and must be checked. Read the specific instructions in the Operator Instruction Manual thoroughly.

POSITION (Versions with trailer brake): Trailer brake control area.



Fig. 2.33

(Z) 00065377 - Hazards associated with batteries

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

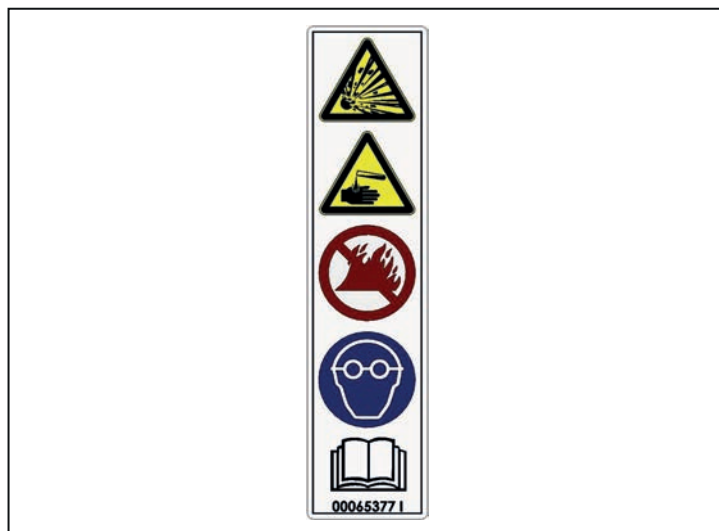


Fig. 2.34

(Ω) 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. 2.35

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.

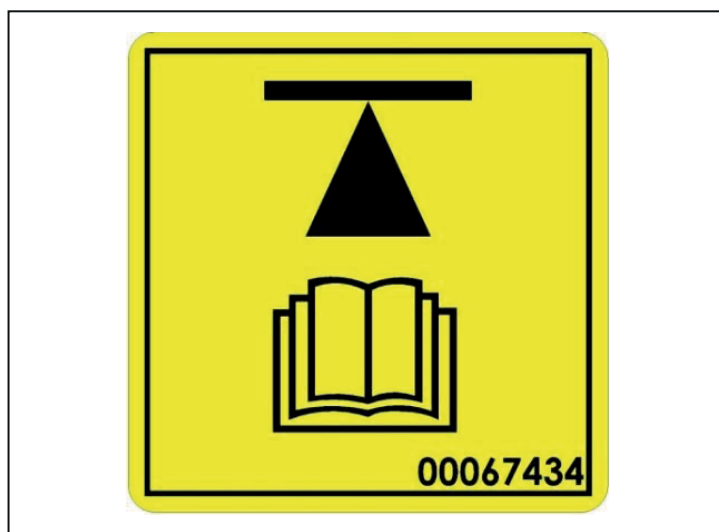


Fig. 2.36

00067346 - Lubricant grease

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

POSITION: Grease nipple area.

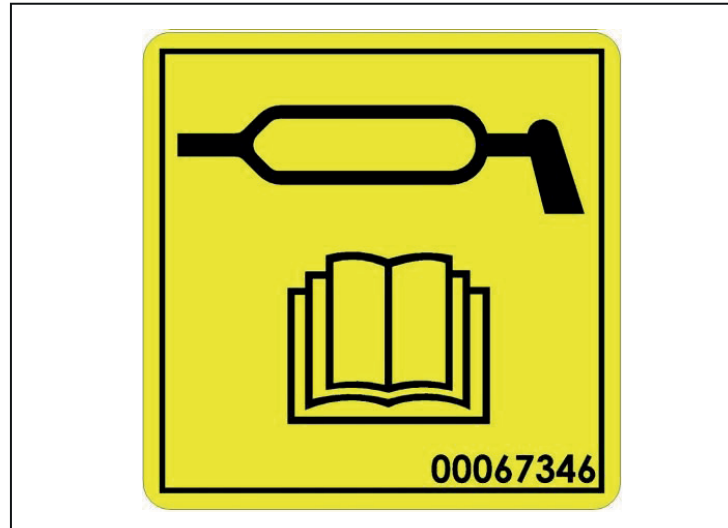


Fig. 2.37

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. 2.38

00069712 - Pressurised refrigerant

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

POSITION: Radiator area above compressor

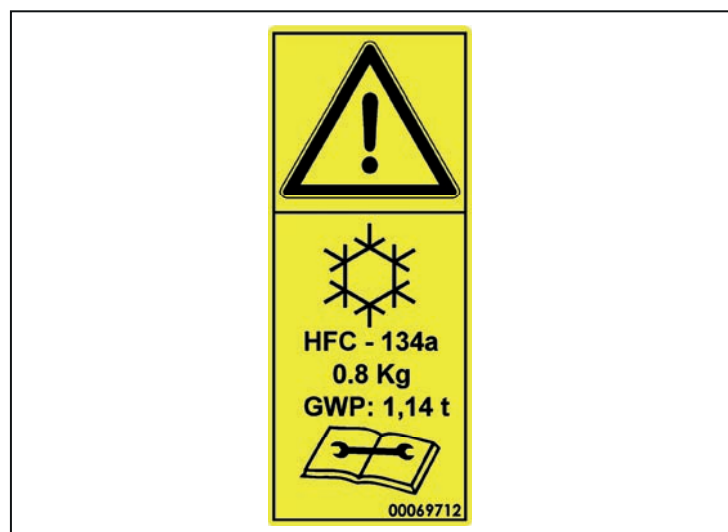


Fig. 2.39

00070020 - Torque limiter

WARNING: Apply the male connector with torque limiter set to 470 Nm max.

POSITION: PTO guards (FRONT)

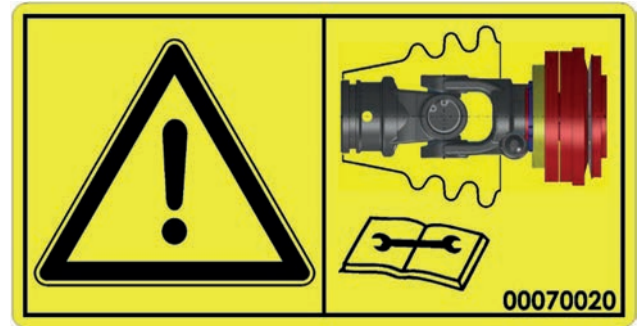


Fig. 2.40

FDM51201104 - Roll-bar grip point

WARNING: -

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



Fig. 2.41

FEM51201102 - Step present

WARNING: -

POSITION: Lefthand footboard



Fig. 2.42

2.1.7 Using the tractor

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

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

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

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

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

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

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

Do not approach bends at high speed.

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

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

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

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

2.1.8 Towing and transporting

Towing

Follow the 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 your 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.

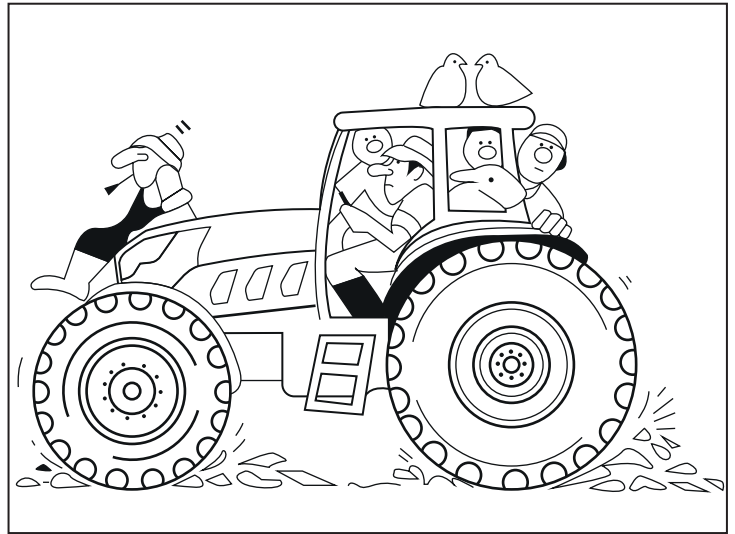


Fig. 2.43



Note

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-axes to prevent the tractor from tilting.

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

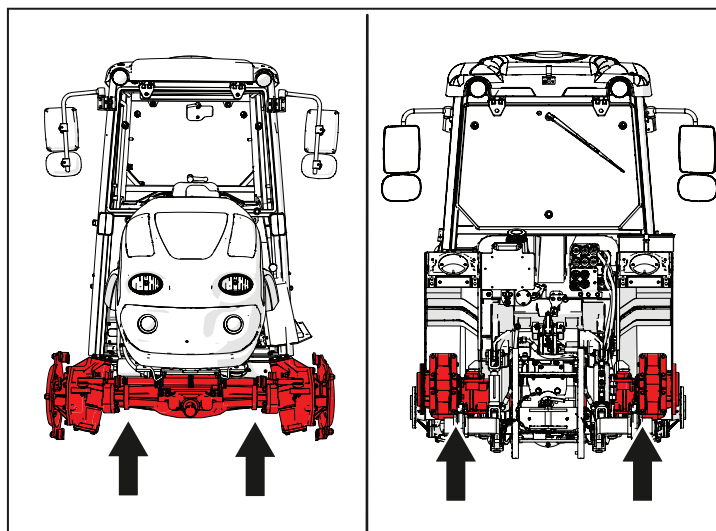


Fig. 2.44

The permitted tractor lift points are listed as follows:

Front axle.

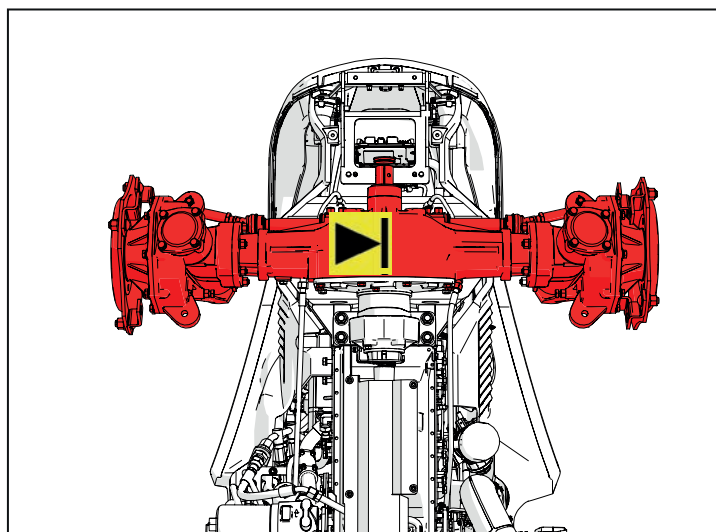


Fig. 2.45

Rear differential casing.

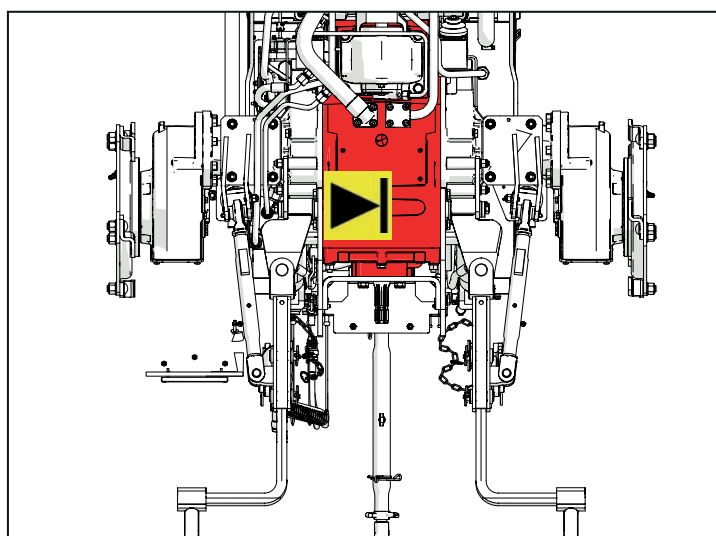


Fig. 2.46

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. 2.47

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. 2.48

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:

- tyre 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.



Attention

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. 2.49

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 or filtering face mask;
- waterproof, close-fitting garments;
- reflective garments;
- safety footwear;

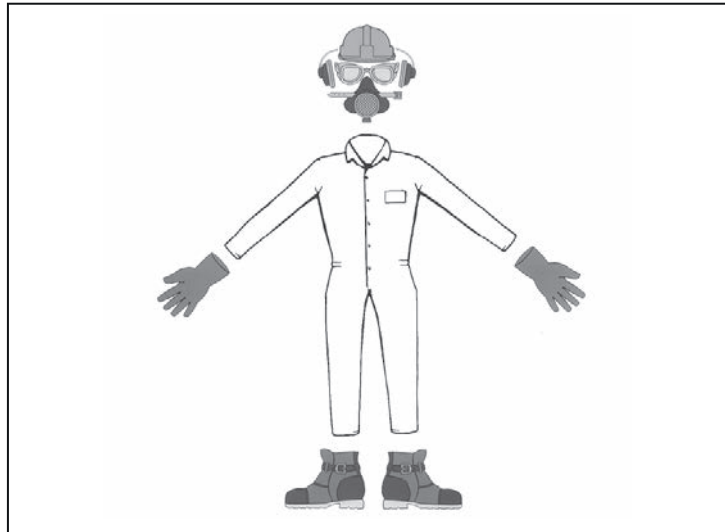


Fig. 2.50

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. 2.51

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;

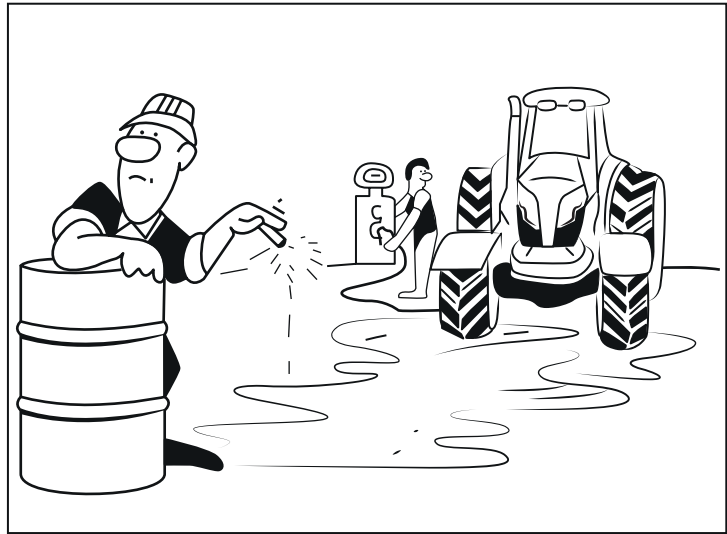


Fig. 2.52

- 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 unearthened fuel container;
 - never fill fuel containers in a vehicle, on a trailer or on a trailer bed with plastic lining. Always place containers on the ground and at a safe distance from the vehicle before filling with fuel;
 - consumable fluids are harmful to the health. Keep out of the reach of children.
- In the event of swallowing of a fluid, seek immediate medical attention to prevent severe damage to the health.
- All consumable fluids and the containers and materials coming into contact with them must be disposed of correctly in accordance with applicable legislation. Authorised service centres have the equipment and facilities necessary to dispose of used fluids and contaminated materials correctly without endangering the environment.
 - The use of additives may void the warranty. Do not use additives for lubricants.

2.1.23 Operations necessary before refuelling

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

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

2.1.24 Safety rules concerning electrical system

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

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

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



Attention

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.



Attention

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

2.1.25 Battery safety rules

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

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



Attention

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.

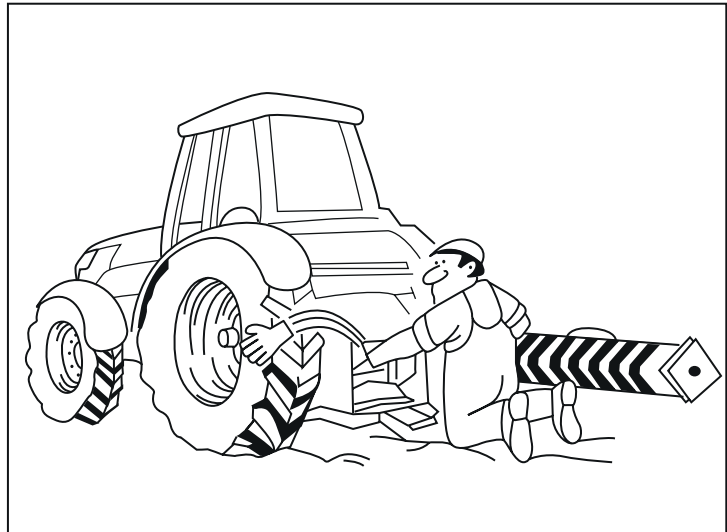


Fig. 2.53

2.1.27 Seat belts

Inspection and maintenance of seat belts:

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

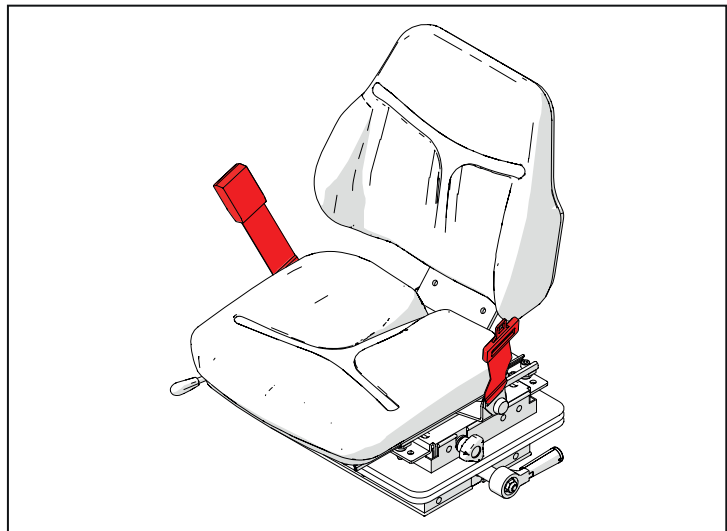


Fig. 2.54

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. These modifications will cause the structure to lose its original 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)



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)



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. 2.55

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 safely 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 allows operators to work safely on the machine.

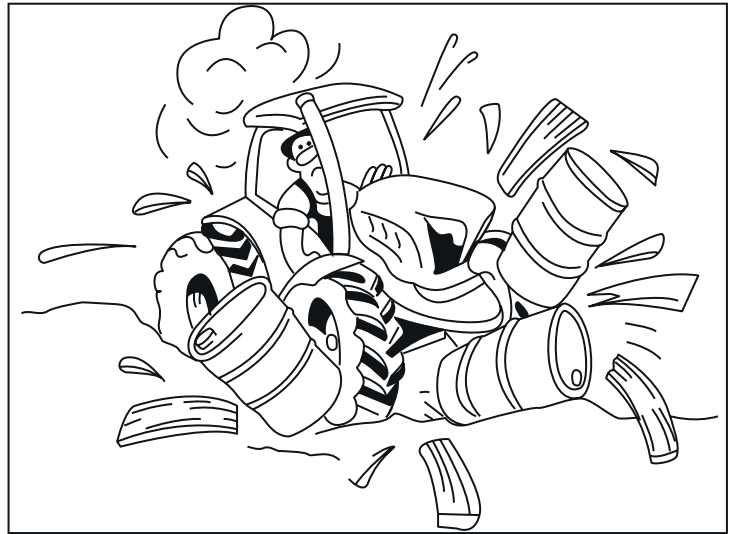


Fig. 2.56

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

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

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

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

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

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

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

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

2.1.38 Climbing onto and off the machine

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

Never jump off the tractor, especially when moving.

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

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

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

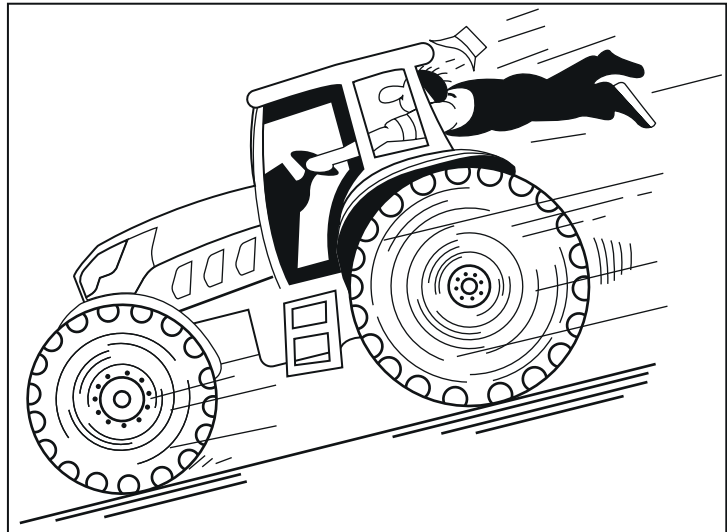


Fig. 2.57

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

 **Attention**

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.

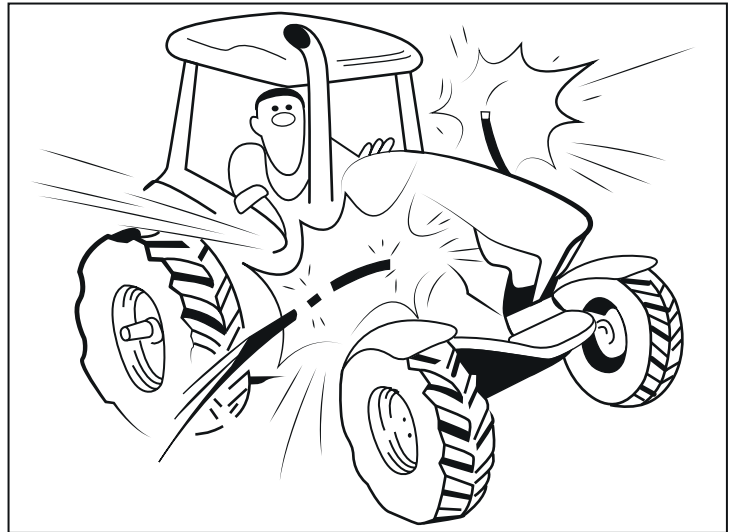


Fig. 2.58

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.

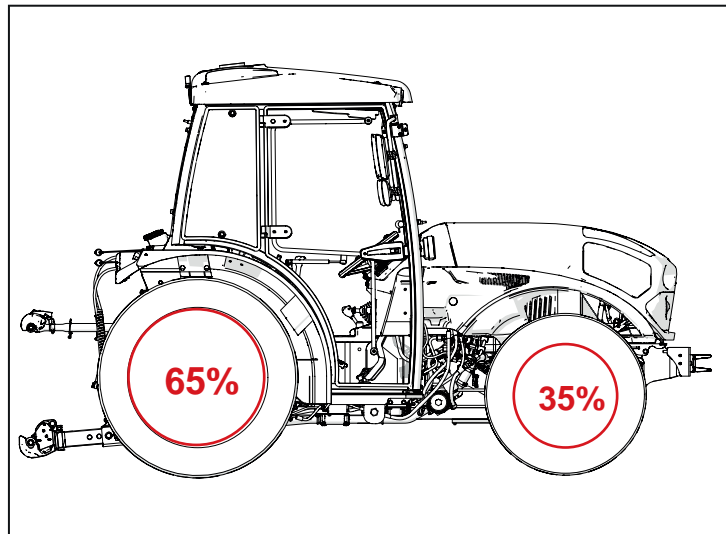


Fig. 2.59



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 be 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.

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3 : Technical characteristics

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3.1 Technical data

3.1.1 Engine

Tractor		Q90 S 90 S 90 GT	Q100 S 100 S 100 GT	Q110 S 110 S 110 GT
Manufacturer		VM	VM	VM
Model		R754 IE417	R754 IE417	R754 IE417
Emissions compliance		Stage 3B	Stage 3B	Stage 3B
Cylinders/Capacity	No./ cm ³	4/2970	4/2970	4/2970
Bore	mm	94	94	94
Stroke	mm	107	107	107
Intake		Turbocharged, intercooled line - Air filter (dry)		
Injection system		Common Rail direct injection with high pressure pump		
Valves		8	8	8
Rated power (ECE R120)	kW (HP)	59 (80,2)	67 (91,1)	76 (102)
Idle speed	rpm	800	800	800
Rated speed	rpm	2300	2300	2300
Maximum torque	Nm	340	380	380
Engine speed at maximum torque	rpm	1100	1100	1100
Torque rise		37%	34%	21%
Cooling		Liquid	Liquid	Liquid
Fuel system		Direct diesel injection	Direct diesel injection	Direct diesel injection
Specific fuel consumption (at max. torque engine speed)	g/kWh	217	212	212
Maximum continuous longitudinal inclination angle	Degrees	30° (with flywheel on uphill side) 35° (with flywheel on downhill side)		
Maximum continuous transverse inclination angle	Degrees	30°	30°	30°
Oil change quantities, inclusive of filter (standard sump)	l (kg)	9,8 (8,7)	9,8 (8,7)	9,8 (8,7)
Tank capacity	l	70	70	70
Dry weight	kg	260	260	260
Engine bonnet		SMC	SMC	SMC

3.1.2 Transmission

Transmission type		Mechanical transmission, four wheel drive
Gearbox type		24+12 synchronised
Shift control system		Mechanical with lateral levers
Clutch		Single plate dry clutch, 11" diameter
Clutch control		Mechanical with pedal
Reverse shuttle type		Mechanical, synchronised
Reverse shuttle control		Lever
Rear differential lock		Electrohydraulic
Front axle		4WD, selectable without disengaging drive
4WD engagement control		Electrohydraulic
Front wheel drive clutch		Multiplate wet clutch
Front differential lock		NO-SPIN (Automatic)
Front axle swing angle	Degrees	12°
Minimum speed	km/h	0,4
Maximum speed (homologated)	km/h	40

3.1.3 Brakes

Rear brake type		Hydraulically operated multi-disc wet brakes
Front brake type		IST (simultaneous 4WD engagement under braking)
Emergency and parking brake		Independently and mechanically controlled. Braking action on rear wheels
Trailer hydraulic braking		Hydraulically operated by pressure pulse in main circuit (Optional, only with EEC-Y / D.43 towing hitch)
Trailer brake mechanical lever mount		Type CUNA

3.1.4 Steering wheel

Steering type		Hydrostatic with load sensing valve
Steering angle	Degrees	57°

3.1.5 Rear power take off

Type		Single shaft, independent and synchronised
PTO speed independent of ground speed	rpm	540-750
Ground speed synchronised		Yes
Direction of rotation (looking at PTO)		Clockwise
Profile		1-3/8" with 6 splines
Clutch		Independent, mechanical dry clutch
Clutch control		Mechanical with lever
Safety		PUSH & START device on PTO selector.

3.1.6 Front Power Take Off

Type		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		Electrohydraulic
Clutch control		Electric

3.1.7 Rear lift

Type		Hydraulic with position and draft control
Lift capacity at lower link ends	kg	1950
3-point linkage category		Category 1 and 2
Mechanical top link arm		Category 1 and 2
Hydraulic top link arm		Category 1 and 2 / 1 and 2 with quick hitch
Lower link arm type		Telescopic with quick hitches
Right hand tie-rod type		Hydraulic

3.1.8 Front lift

Type		up / down
Lift capacity at lower link ends	kg	1200
3-point linkage category		Category 1

3.1.9 Hydraulic System

Type		Open-centre
Pump delivery	l/min	38 + 61 with dual pumps
Rear hydraulic distributors		3 in single block
Front hydraulic distributors		Maximum 3 modular plus 1
Free oil return coupling		1/2 NPTF quick coupler

3.1.10 Electrical system

Battery		12V 850A 95Ah
Safety		Battery master switch
Instrument		Digital / analogue
1-pole socket	Volts	12
7 pole socket	Volts	12
Rear work light		Adjustable
Rotating beacon		Orange

3.1.11 Driver zone

Platform	Full size, suspended
Platform carrier	Silicone variable deformation silent-blocks
Front mudguards	Integrated in bodywork
Rear mudguard protection	Rubber profile
Front mudguard protection	Rubber profile
ROPS	Central fully foldable
Standard cab	Goldoni Overview
Low profile cab	Goldoni LowProfile
Left and right hand rear view mirrors	Adjustable
Seat	With elastic suspension, seat belts and OPS
Seat adjustment	Fore/aft, up/down and driver weight
Toolbox	Yes
Use and maintenance manual	Yes

3.1.12 Cab

Type	Standard profile	Low profile
ROPS homologation	Type GL11	Type SG1/1
Lateral doors	With door pull handle, gas strut and key-operated lock	With door pull handle, gas strut and key-operated lock
Cab air pollen filter	Paper	Paper
Front screen	Opening	Fixed, athermic
Rear screen	Opening	Opening
Windscreen wiper	1 speed	1 speed
Rear wiper	1 speed	1 speed
Windscreen washer	0.5 litres	0.5 litres
Right/left hand rear view mirrors	Adjustable and folding	Adjustable and folding
Front sun shade	With height adjustment	-
Provision for rotating beacon	Switch in cab and external bayonet fitting	Switch in cab and external bayonet fitting
Ventilation and heating system	With electric blower fan	With electric blower fan
Air conditioning system	Condenser with electric blower fan on cab roof	Condenser with electric blower fan on cab roof
Front work light	2	-
Rear work light	2	2
Provision for audio system	Audio head unit housing and mountings for speakers	-

3.1.13 Vehicle's maximum operating inclination

Forward	Degrees	25°
Reversing	Degrees	25°
Left	Degrees	20°
Right	Degrees	20°

3.1.14 Towing devices

Rear towing hitch	Category EEC/EEC-X/EEC-Y, adjustable
SLIDER rear towing hitch	Category EEC/EEC-X/EEC-Y, sliding and with adjustable height
Front towing hitch	Fixed
Drawbar	Swinging drawbar, category EEC/EEC-X

Vertical loads

	Maximum permitted vertical load on hitch (Kg)		max permitted h of hitch (mm)	
	Roll-Bar	Cab	Roll-Bar	Cab
X314 type hitch	1500	1500	334,58	283,05
Y314 type hitch	1780	1650	233,03	231,09
Y277 type hitch	1920	1765	262,06	262,36
X277F type hitch	1500	1500	412,32	357,43
GTF30 064 type hitch	1500	1500	412,32	357,43
023 type hitch	1500	1500	383,68	330,03

3.1.15 Technically permissible masses

Towable masses

Vehicle braking, Trailer and Interchangeable towed equipment categories	Drawbar	Rigid drawbar	Centreline
Unbraked	1020 kg	1020 kg	1020 kg
Inertia braking	6000 kg	6000 kg	6000 kg
Hydraulic braking	20000 kg	20000 kg	20000 kg

Maximum masses of tractor and towed vehicle combination

Vehicle braking, Trailer and Interchangeable towed equipment categories	Drawbar	Rigid drawbar	Centreline
Unbraked	4720 kg	4720 kg	4720 kg
Inertia braking	9700 kg	9700 kg	9700 kg
Hydraulic braking	23700 kg	23700 kg	23700 kg

3.1.16 Ballast weights

Front	204 kg, in 6 suitcase weights of 34 kg each
Water ballast in tyre	With air / water valve

3.2 Weights and dimensions

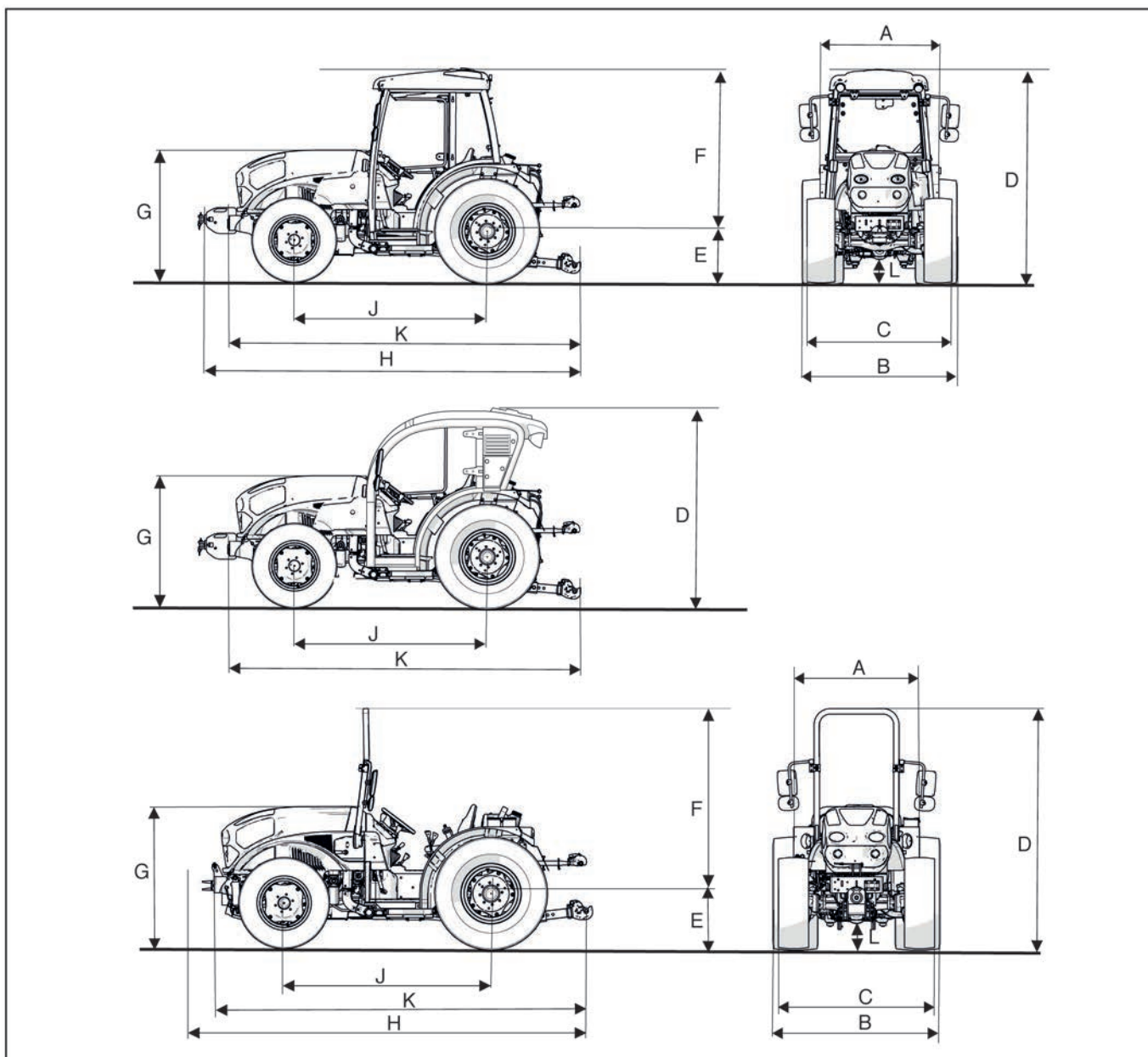


Fig. 3.1

Weight:

Model		Q	S	S GT
Weight, Roll Bar version	kg	2275	2375	2375
Weight, version with GL11 cab	kg	2425	2610	2610
Weight of version with SG1/1 cab	kg	2425	-	-

Permissible technical weight:

Front	kg	1800
Rear	kg	2800
Overall	kg	3700

Version Q

Model		Q90 Q100 Q110
A	Width at mudguards, without extensions	1170 mm
A	Width at mudguards, with extensions	1400 mm
B	Width at rear wheels	1368-1878 mm
C	Width at front wheels	1370-1788 mm
D	Height, GL11 cab version	2075 mm (min) 2150 mm (max)
D	Height, SG1/1 cab version	1804 mm (min) 1879 mm (max)
D	Height, ROPS version	2170 mm (min) 2245 mm (max)
E	ETRTO tyre radius	450 mm (min) 525 mm (max)
F	Overall vehicle height at rear axle midline - GL11 cab version	1625 mm
F	Overall vehicle height at rear axle midline - SG1/1 cab version	1354 mm
F	Overall vehicle height at rear axle midline - ROPS frame version	1720 mm
G	Cowl height	1250 mm (min) 1325 mm (max)
H	Length with ballast weights	3681-3781 mm
K	Length without ballast weights	3421-3521 mm
J	Wheelbase	1923 mm
L	Ground clearance	172 mm (min) 247 mm (max)

Version S

Model		S 90 S 100 S 110	S 90 GT S 100 GT S 110 GT
A	Width at mudguards, without extensions	1190 mm	1190 mm
A	Width at mudguards, with extensions	1420 mm	1420 mm
B	Width at rear wheels	1404-1878 mm	1368-1930 mm
C	Width at front wheels	1443-1737 mm	1360-1788 mm
D	Height, GL11 cab version	2156.5 mm (min) 2206.5 mm (max)	2266 mm (min) 2291 mm (max)
D	Height, ROPS version	2243 mm (min) 2293 mm (max)	2378 mm (min) 2403 mm (max)
E	ETRTO tyre radius	525 mm (min) 575 mm (max)	575 mm (min) 600 mm (max)
F	Overall vehicle height at rear axle midline - GL11 cab version	1631,5 mm	1691,5 mm
F	Overall vehicle height at rear axle midline - ROPS frame version	1718 mm	1778 mm
G	Cowl height	1323 mm (min) 1373 mm (max)	1433 mm (min) 1458 mm (max)
H	Length with ballast weights	3721-3821 mm	3750-3850 mm
K	Length without ballast weights	3471-3571 mm	3490-3590 mm
J	Wheelbase	1973 mm	1992 mm
L	Ground clearance	242 mm (min) 292 mm (max)	352 mm (min) 377 mm (max)

3.3 Lubricants, fuels and coolants

Assembly	Lubricants, fuels and coolants	Capacity	Recommended products	Type	Specifications
Engine	Engine oil	9.8 l	ARBOS ONYX - ENGINE OIL E9 10W/40	SAE 10W-40	ACEA E9-12/E7-12 - API CJ-4/SM
	Fuel	70 l	-	-	DIN EN 590
	Coolant	12 l	ARBOS OPAL ICE RED 40	MONOETHYLENE GLYCOL (1)	ASTM D 3306 TYPE 1
Cab	Screen wash fluid	0.5 l	-	-	-
	Refrigerant (gas)	0.8 kg	-	R134a	-
Transmission	Transmission oil - Rear differential (2)	33 l	ARBOS AMBER STOU GL4 15W/40	UNIVERSAL 15W-40	API GL4
	Transmission oil - Rear final drive units	4 l (Series Q) 5 l (Series S)	ARBOS ZIRCON TRANSMISSION OIL GL5 80W/90	TRW 90	API GL-5
	Front axle oil - Front differential	8,5 l (Series Q) 8 l (Series S)	ARBOS ZIRCON TRANSMISSION OIL GL5 80W/90	TRW 90	API GL-5
Brakes	Brake Oil	0.5 l	ARBOS ZIRCON ATF DEXRON II	ATF	GENERAL MOTORS DEXRON D II 6137 M GENERAL MOTORS DEXRON 6032-M GENERAL MOTORS ATF TYPE A, SUFFIX A MASSEY FERGUSON M-1110 ALLISON C4 FORD M2C 138 CJ M.B. p. 236.7
Other	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.
- (2) - in the versions with front PTO, check the transmission oil level and top up if necessary. See the section "Tractor hydraulic system maintenance", in the chapter "Service procedures".

3.3.1 Fuel

The engine is designed to run with standard fuels available throughout Europe (compliant with DIN EN 590 specifications).

Attention

Do not use fuels with characteristics differing from those indicated.

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.

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.

3.3.1.2 Biodiesel

BIODIESEL (compliant with the specifications of UNI EN 14214) may be used in proportions up to 7% mixed in a standard fuel type available in Europe (as defined by the standard DIN EN 590).

3.3.2 Engine oil

Warning

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

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

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

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

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

Danger

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

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

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

3.3.2.1 SAE oil classification

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

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

3.4 Speed table

3.4.1 Tractor speed (km/h)

3.4.1.1 Q series

Speeds with following tyre type/s: 340/65 R 20"

Radius: 450 mm						Rolling circumference: 2.83 m						
			Engine speed (rpm)									
Mode	Range	Gear	800	1000	1200	1400	1600	1800	2000	2100	2200	2300
Forward - Hi (normal)	L	1	0.17	0.21	0.25	0.29	0.33	0.37	0.41	0.44	0.46	0.48
	L	2	0.27	0.34	0.41	0.48	0.55	0.61	0.68	0.72	0.75	0.79
	L	3	0.48	0.60	0.73	0.85	0.97	1.09	1.21	1.27	1.33	1.39
	L	4	0.63	0.78	0.94	1.09	1.25	1.41	1.56	1.64	1.72	1.80
	M	1	0.59	0.73	0.88	1.03	1.17	1.32	1.47	1.54	1.62	1.69
	M	2	0.97	1.21	1.45	1.69	1.93	2.18	2.42	2.54	2.66	2.78
	M	3	1.71	2.14	2.57	3.00	3.00	3.85	4.28	4.49	4.71	4.92
	M	4	2.22	2.77	3.32	3.88	4.43	4.98	5.54	5.82	6.09	6.37
	V	1	3.10	3.88	4.65	5.43	6.20	6.98	7.75	8.14	8.53	8.92
	V	2	5.11	6.38	7.66	8.94	10.21	11.49	12.77	13.40	14.04	14.68
	V	3	9.04	11.30	13.56	15.82	18.08	20.34	22.60	23.73	24.86	25.99
	V	4	11.70	14.62	17.55	20.47	23.40	26.32	29.25	30.71	32.17	33.63
Forward - Lo (20% underdrive ratios)	L	1	0.13	0.16	0.19	0.22	0.26	0.29	0.32	0.34	0.35	0.37
	L	2	0.21	0.26	0.32	0.37	0.42	0.48	0.53	0.56	0.58	0.61
	L	3	0.37	0.47	0.56	0.66	0.75	0.84	0.94	0.98	1.03	1.08
	L	4	0.48	0.61	0.73	0.85	0.97	1.09	1.21	1.27	1.33	1.39
	M	1	0.46	0.57	0.68	0.80	0.91	1.02	1.14	1.19	1.25	1.31
	M	2	0.75	0.94	1.12	1.31	1.50	1.69	1.87	1.97	2.06	2.15
	M	3	1.33	1.66	1.99	2.32	2.65	2.99	3.32	3.48	3.65	3.81
	M	4	1.72	2.15	2.58	3.00	3.43	3.86	4.29	4.51	4.72	4.94
	V	1	2.40	3.00	3.61	4.21	4.81	5.41	6.01	6.31	6.61	6.91
	V	2	3.96	4.95	5.94	6.93	7.92	8.90	9.89	10.39	10.88	11.38
	V	3	7.01	8.76	10.51	12.26	14.01	15.76	17.52	18.39	19.27	20.14
	V	4	9.07	11.33	13.60	15.87	18.13	20.40	22.67	23.80	24.93	26.07
Reverse	L	1	0.14	0.18	0.22	0.25	0.29	0.33	0.36	0.38	0.40	0.42
	L	2	0.24	0.30	0.36	0.42	0.48	0.54	0.59	0.62	0.65	0.68
	L	3	0.42	0.53	0.63	0.74	0.84	0.95	1.05	1.11	1.16	1.21
	L	4	0.55	0.68	0.82	0.95	1.09	1.23	1.36	1.43	1.50	1.57
	M	1	0.55	0.69	0.83	0.97	1.11	1.24	1.38	1.45	1.52	1.59
	M	2	0.91	1.14	1.37	1.59	1.82	2.05	2.28	2.39	2.50	2.62
	M	3	1.61	2.02	2.42	2.82	3.22	3.63	4.03	4.23	4.43	4.64
	M	4	2.09	2.61	3.13	3.65	4.17	4.69	5.22	5.48	5.74	6.00
	V	1	2.70	3.38	4.05	4.73	5.41	6.08	6.76	7.10	7.43	7.77
	V	2	4.45	5.56	6.67	7.79	8.90	10.01	11.12	11.68	12.24	12.79
	V	3	7.88	9.85	11.82	13.79	15.76	17.73	19.69	20.68	21.66	22.65
	V	4	10.19	12.74	15.29	17.84	20.39	22.94	25.49	26.76	28.03	29.31

Speeds with following tyre type/s: 380/70 R 20"

Radius: 525 mm	Rolling circumference: 3.30 m
----------------	-------------------------------

Mode	Range	Gear	Engine speed (rpm)									
			800	1000	1200	1400	1600	1800	2000	2100	2200	2300
Forward - Hi (normal)	L	1	0,19	0.24	0.29	0.34	0.39	0.44	0.48	0.51	0.53	0.56
	L	2	0,32	0.40	0.48	0.56	0.64	0.72	0.80	0.84	0.88	0.92
	L	3	0,56	0.71	0.85	0.99	1.13	1.27	1.41	1.48	1.55	1.62
	L	4	0.73	0.91	1.09	1.28	1.46	1.64	1.82	1.92	2.01	2.10
	M	1	0.69	0.86	1.03	1.20	1.37	1.54	1.71	1.80	1.88	1.97
	M	2	1.13	1.41	1.69	1.97	2.26	2.54	2.82	2.96	3.10	3.24
	M	3	2.00	2.50	3.00	3.50	3.99	4.49	4.99	5.24	5.49	5.74
	M	4	2.58	3.23	3.88	4.52	5.17	5.82	6.46	6.78	7.11	7.43
	V	1	3.62	4.52	5.43	6.33	7.24	8.14	9.05	9.50	9.95	10.40
	V	2	5.96	7.45	8.94	10.43	11.92	13.40	14.89	15.64	16.38	17.13
	V	3	10.55	13.18	15.82	18.46	21.09	23.73	26.37	27.69	29.01	30.32
	V	4	13.65	17.06	20.47	23.88	27.30	30.71	34.12	35.83	37.53	39.24
Forward - Lo (20% underdrive ratios)	L	1	0.15	0.19	0.22	0.26	0.30	0.34	0.37	0.39	0.41	0.43
	L	2	0.25	0.31	0.37	0.43	0.49	0.56	0.62	0.65	0.68	0.71
	L	3	0.44	0.55	0.66	0.77	0.87	0.98	1.09	1.15	1.20	1.26
	L	4	0.57	0.71	0.85	0.99	1.13	1.27	1.41	1.48	1.56	1.63
	M	1	0.53	0.66	0.80	0.93	1.06	1.19	1.33	1.39	1.46	1.53
	M	2	0.87	1.09	1.31	1.53	1.75	1.97	2.19	2.30	2.40	2.51
	M	3	1.55	1.93	2.32	2.71	3.10	3.48	3.87	4.06	4.26	4.45
	M	4	2.00	2.50	3.00	3.51	4.01	4.51	5.01	5.26	5.51	5.76
	V	1	2.80	3.51	4.21	4.91	5.61	6.31	7.01	7.36	7.71	8.06
	V	2	4.62	5.77	6.93	8.08	9.23	10.39	11.54	12.12	12.70	13.27
	V	3	8.17	10.22	12.26	14.30	16.35	18.39	20.44	21.46	22.48	23.50
	V	4	10.58	13.22	15.87	18.51	21.15	23.80	26.44	27.77	29.09	30.41
Reverse	L	1	0.17	0.21	0.25	0.30	0.34	0.38	0.42	0.44	0.46	0.48
	L	2	0.28	0.35	0.42	0.49	0.56	0.62	0.69	0.73	0.76	0.80
	L	3	0.49	0.61	0.74	0.86	0.98	1.11	1.23	1.29	1.35	1.41
	L	4	0.64	0.80	0.95	1.11	1.27	1.43	1.59	1.67	1.75	1.83
	M	1	0.65	0.81	0.97	1.13	1.29	1.45	1.61	1.69	1.77	1.86
	M	2	1.06	1.33	1.59	1.86	2.12	2.39	2.66	2.79	2.92	3.05
	M	3	1.88	2.35	2.82	3.29	3.76	4.23	4.70	4.94	5.17	5.41
	M	4	2.43	3.04	3.65	4.26	4.87	5.48	6.08	6.39	6.69	7.00
	V	1	3.15	3.94	4.73	5.52	6.31	7.10	7.88	8.28	8.67	9.07
	V	2	5.19	6.49	7.79	9.08	10.38	11.68	12.98	13.63	14.28	14.93
	V	3	9.19	11.49	13.79	16.08	18.38	20.68	22.98	24.13	25.27	26.42
	V	4	11.89	14.87	17.84	20.81	23.79	26.76	29.73	31.22	32.71	34.19

Speeds with following tyre type/s: 360/70 R 20", 420/65R20"

Radius: 500 mm	Rolling circumference: 3.14 m
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Mode	Range	Gear	Engine speed (rpm)									
			800	1000	1200	1400	1600	1800	2000	2100	2200	2300
Forward - Hi (normal)	L	1	0.18	0.23	0.28	0.32	0.37	0.41	0.46	0.48	0.51	0.53
	L	2	0.30	0.38	0.46	0.53	0.61	0.68	0.76	0.80	0.83	0.87
	L	3	0.54	0.67	0.81	0.94	1.07	1.21	1.34	1.41	1.48	1.54
	L	4	0.70	0.87	1.04	1.22	1.39	1.56	1.74	1.82	1.91	2.00
	M	1	0.65	0.82	0.98	1.14	1.31	1.47	1.63	1.71	1.79	1.88
	M	2	1.07	1.34	1.61	1.88	2.15	2.42	2.69	2.82	2.95	3.09
	M	3	1.90	2.38	2.85	3.33	3.80	4.28	4.76	4.99	5.23	5.47
	M	4	2.46	3.08	3.69	4.31	4.92	5.54	6.15	6.46	6.77	7.08
	V	1	3.45	4.31	5.17	6.03	6.89	7.75	8.62	9.05	9.48	9.91
	V	2	5.67	7.09	8.51	9.93	11.35	12.77	14.18	14.89	15.60	16.31
	V	3	10.05	12.56	15.07	17.58	20.09	22.60	25.11	26.37	27.62	28.88
	V	4	13.00	16.25	19.50	22.75	26.00	29.25	32.50	34.12	35.75	37.37
Forward - Lo (20% underdrive ratios)	L	1	0.14	0.18	0.21	0.25	0.29	0.32	0.36	0.37	0.39	0.41
	L	2	0.24	0.29	0.35	0.41	0.47	0.53	0.59	0.62	0.65	0.68
	L	3	0.42	0.52	0.62	0.73	0.83	0.94	1.04	1.09	1.14	1.20
	L	4	0.54	0.67	0.81	0.94	1.08	1.21	1.35	1.41	1.48	1.55
	M	1	0.51	0.63	0.76	0.89	1.01	1.14	1.26	1.33	1.39	1.45
	M	2	0.83	1.04	1.25	1.46	1.67	1.87	2.08	2.19	2.29	2.39
	M	3	1.47	1.84	2.21	2.58	2.95	3.32	3.69	3.87	4.05	4.24
	M	4	1.91	2.38	2.86	3.34	3.82	4.29	4.77	5.01	5.25	5.48
	V	1	2.67	3.34	4.01	4.67	5.34	6.01	6.68	7.01	7.35	7.68
	V	2	4.40	5.50	6.60	7.70	8.79	9.89	10.99	11.54	12.09	12.64
	V	3	7.78	9.73	11.68	13.62	15.57	17.52	19.46	20.44	21.41	22.38
	V	4	10.07	12.59	15.11	17.63	20.15	22.67	25.18	26.44	27.70	28.96
Reverse	L	1	0.16	0.20	0.24	0.28	0.32	0.36	0.40	0.42	0.44	0.46
	L	2	0.26	0.33	0.40	0.46	0.53	0.59	0.66	0.69	0.73	0.76
	L	3	0.47	0.59	0.70	0.82	0.94	1.05	1.17	1.23	1.29	1.35
	L	4	0.61	0.76	0.91	1.06	1.21	1.36	1.51	1.59	1.67	1.74
	M	1	0.61	0.77	0.92	1.08	1.23	1.38	1.54	1.61	1.69	1.77
	M	2	1.01	1.26	1.52	1.77	2.02	2.28	2.53	2.66	2.78	2.91
	M	3	1.79	2.24	2.69	3.13	3.58	4.03	4.48	4.70	4.93	5.15
	M	4	2.32	2.90	3.48	4.06	4.64	5.22	5.79	6.08	6.37	6.66
	V	1	3.00	3.75	4.50	5.26	6.01	6.76	7.51	7.88	8.26	8.63
	V	2	4.94	6.18	7.42	8.65	9.89	11.12	12.36	12.98	13.60	14.21
	V	3	8.75	10.94	13.13	15.32	17.51	19.69	21.88	22.98	24.07	25.17
	V	4	11.33	14.16	16.99	19.82	22.65	25.49	28.32	29.73	31.15	32.56

3.4.1.2 Series S and S GT

Speeds with following tyre type/s: 380/70-20", 320/70R24"

Radius: 525 mm						Rolling circumference: 3.30 m						
			Engine speed (rpm)									
Mode	Range	Gear	800	1000	1200	1400	1600	1800	2000	2100	2200	2300
Forward - Hi (normal)	L	1	0.17	0.21	0.25	0.29	0.34	0.38	0.42	0.44	0.46	0.48
	L	2	0.28	0.35	0.41	0.48	0.55	0.62	0.69	0.73	0.76	0.79
	L	3	0.49	0.61	0.73	0.86	0.98	1.10	1.22	1.28	1.35	1.41
	L	4	0.63	0.79	0.95	1.11	1.27	1.43	1.58	1.66	1.74	1.82
	M	1	0.59	0.74	0.89	1.04	1.19	1.34	1.49	1.56	1.64	1.71
	M	2	0.98	1.22	1.47	1.71	1.96	2.20	2.45	2.57	2.69	2.81
	M	3	1.73	2.17	2.60	3.03	3.47	3.90	4.33	4.55	4.77	4.98
	M	4	2.24	2.80	3.36	3.92	4.49	5.05	5.61	5.89	6.17	6.45
	V	1	3.14	3.93	4.71	5.50	6.28	7.07	7.85	8.24	8.64	9.03
	V	2	5.17	6.46	7.75	9.05	10.34	11.63	12.92	13.57	14.22	14.86
	V	3	9.15	11.44	13.73	16.02	18.31	20.59	22.88	24.03	25.17	26.31
	V	4	11.84	14.80	17.77	20.73	23.69	26.65	29.61	31.09	32.57	34.05
Forward - Lo (20% underdrive ratios)	L	1	0.13	0.16	0.20	0.23	0.26	0.29	0.33	0.34	0.36	0.37
	L	2	0.21	0.27	0.32	0.37	0.43	0.48	0.54	0.56	0.59	0.62
	L	3	0.38	0.47	0.57	0.66	0.76	0.85	0.95	1.00	1.04	1.09
	L	4	0.49	0.61	0.74	0.86	0.98	1.10	1.23	1.29	1.35	1.41
	M	1	0.46	0.58	0.69	0.81	0.92	1.04	1.15	1.21	1.27	1.33
	M	2	0.76	0.95	1.14	1.33	1.52	1.71	1.90	1.99	2.09	2.18
	M	3	1.34	1.68	2.01	2.35	2.69	3.02	3.36	3.53	3.69	3.86
	M	4	1.74	2.17	2.61	3.04	3.48	3.91	4.35	4.56	4.78	5.00
	V	1	2.43	3.04	3.65	4.26	4.87	5.48	6.08	6.39	6.69	7.00
	V	2	4.01	5.01	6.01	7.01	8.01	9.01	10.02	10.52	11.02	11.52
	V	3	7.09	8.87	10.64	12.41	14.19	15.96	17.73	18.62	19.51	20.39
	V	4	9.18	11.47	13.77	16.06	18.36	20.65	22.95	24.09	25.24	26.39
Reverse	L	1	0.15	0.18	0.22	0.26	0.29	0.33	0.37	0.38	0.40	0.42
	L	2	0.24	0.30	0.36	0.42	0.48	0.54	0.60	0.63	0.66	0.69
	L	3	0.43	0.53	0.64	0.75	0.85	0.96	1.07	1.12	1.17	1.23
	L	4	0.55	0.69	0.83	0.97	1.10	1.24	1.38	1.45	1.52	1.59
	M	1	0.56	0.70	0.84	0.98	1.12	1.26	1.40	1.47	1.54	1.61
	M	2	0.92	1.15	1.38	1.61	1.84	2.07	2.30	2.42	2.54	2.65
	M	3	1.63	2.04	2.45	2.86	3.26	3.67	4.08	4.28	4.49	4.69
	M	4	2.11	2.64	3.17	3.70	4.22	4.75	5.28	5.54	5.81	6.07
	V	1	2.74	3.42	4.10	4.79	5.47	6.16	6.84	7.18	7.53	7.87
	V	2	4.50	5.63	6.76	7.88	9.01	10.14	11.26	11.83	12.39	12.95
	V	3	7.98	9.97	11.96	13.96	15.95	17.94	19.94	20.94	21.93	22.93
	V	4	10.32	12.90	15.48	18.06	20.64	23.22	25.80	27.09	28.38	29.67

Speeds with following tyre type/s: 360/70-24"

Radius: 550 mm	Rolling circumference: 3.46 m
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Mode	Range	Gear	Engine speed (rpm)									
			800	1000	1200	1400	1600	1800	2000	2100	2200	2300
Forward - Hi (normal)	L	1	0.18	0.22	0.26	0.31	0.35	0.40	0.44	0.46	0.48	0.51
	L	2	0.29	0.36	0.43	0.51	0.58	0.65	0.72	0.76	0.80	0.83
	L	3	0.51	0.64	0.77	0.90	1.03	1.15	1.28	1.35	1.41	1.47
	L	4	0.66	0.83	1.00	1.16	1.33	1.49	1.66	1.74	1.82	1.91
	M	1	0.62	0.78	0.93	1.09	1.25	1.40	1.56	1.64	1.71	1.79
	M	2	1.03	1.28	1.54	1.79	2.05	2.31	2.56	2.69	2.82	2.95
	M	3	1.82	2.27	2.72	3.18	3.63	4.09	4.54	4.77	4.99	5.22
	M	4	2.35	2.94	3.52	4.11	4.70	5.29	5.87	6.17	6.46	6.76
	V	1	3.29	4.11	4.93	5.76	6.58	7.40	8.22	8.64	9.05	9.46
	V	2	5.42	6.77	8.12	9.48	10.83	12.19	13.54	14.22	14.89	15.57
	V	3	9.59	11.99	14.38	16.78	19.18	21.57	23.97	25.17	26.37	27.57
	V	4	12.41	15.51	18.61	21.71	24.82	27.92	31.02	32.57	34.12	35.67
Forward - Lo (20% underdrive ratios)	L	1	0.14	0.17	0.20	0.24	0.27	0.31	0.34	0.36	0.37	0.39
	L	2	0.22	0.28	0.34	0.39	0.45	0.51	0.56	0.59	0.62	0.65
	L	3	0.40	0.50	0.60	0.70	0.79	0.89	0.99	1.04	1.09	1.14
	L	4	0.51	0.64	0.77	0.90	1.03	1.16	1.29	1.35	1.41	1.48
	M	1	0.48	0.60	0.72	0.84	0.97	1.09	1.21	1.27	1.33	1.39
	M	2	0.79	0.99	1.19	1.39	1.59	1.79	1.99	2.09	2.19	2.29
	M	3	1.41	1.76	2.11	2.46	2.81	3.17	3.52	3.69	3.87	4.05
	M	4	1.82	2.28	2.73	3.19	3.64	4.10	4.55	4.78	5.01	5.24
	V	1	2.55	3.19	3.82	4.46	5.10	5.74	6.37	6.69	7.01	7.33
	V	2	4.20	5.25	6.30	7.35	8.39	9.44	10.49	11.02	11.54	12.07
	V	3	7.43	9.29	11.15	13.00	14.86	16.72	18.58	19.51	20.44	21.36
	V	4	9.62	12.02	14.42	16.83	19.23	21.64	24.04	25.24	26.44	27.65
Reverse	L	1	0.15	0.19	0.23	0.27	0.31	0.34	0.38	0.40	0.42	0.44
	L	2	0.25	0.32	0.38	0.44	0.50	0.57	0.63	0.66	0.69	0.73
	L	3	0.45	0.56	0.67	0.78	0.89	1.01	1.12	1.17	1.23	1.28
	L	4	0.58	0.72	0.87	1.01	1.16	1.30	1.45	1.52	1.59	1.66
	M	1	0.59	0.73	0.88	1.03	1.17	1.32	1.47	1.54	1.61	1.69
	M	2	0.97	1.21	1.45	1.69	1.93	2.17	2.41	2.54	2.66	2.78
	M	3	1.71	2.14	2.56	2.99	3.42	3.85	4.27	4.49	4.70	4.92
	M	4	2.21	2.77	3.32	3.87	4.43	4.98	5.53	5.81	6.08	6.36
	V	1	2.87	3.58	4.30	5.02	5.73	6.45	7.17	7.53	7.88	8.24
	V	2	4.72	5.90	7.08	8.26	9.44	10.62	11.80	12.39	12.98	13.57
	V	3	8.36	10.44	12.53	14.62	16.71	18.80	20.89	21.93	22.98	24.02
	V	4	10.81	13.51	16.22	18.92	21.62	24.33	27.03	28.38	29.73	31.08

Speeds with following tyre type/s: 380/70-24"

Radius: 575 mm	Rolling circumference: 3.61 m
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Mode	Range	Gear	Engine speed (rpm)									
			800	1000	1200	1400	1600	1800	2000	2100	2200	2300
Forward - Hi (normal)	L	1	0.18	0.23	0.28	0.32	0.37	0.41	0.46	0.48	0.51	0.53
	L	2	0.30	0.38	0.45	0.53	0.61	0.68	0.76	0.79	0.83	0.87
	L	3	0.54	0.67	0.80	0.94	1.07	1.21	1.34	1.41	1.47	1.54
	L	4	0.69	0.87	1.04	1.21	1.39	1.56	1.73	1.82	1.91	1.99
	M	1	0.65	0.81	0.98	1.14	1.30	1.47	1.63	1.71	1.79	1.87
	M	2	1.07	1.34	1.61	1.88	2.14	2.41	2.68	2.81	2.95	3.08
	M	3	1.90	2.37	2.85	3.32	3.80	4.27	4.75	4.98	5.22	5.46
	M	4	2.46	3.07	3.68	4.30	4.91	5.53	6.14	6.45	6.76	7.06
	V	1	3.44	4.30	5.16	6.02	6.88	7.74	8.60	9.03	9.46	9.89
	V	2	5.66	7.08	8.49	9.91	11.32	12.74	14.16	14.86	15.57	16.28
	V	3	10.02	12.53	15.04	17.54	20.05	22.55	25.06	26.31	27.57	28.82
	V	4	12.97	16.21	19.46	22.70	25.94	29.19	32.43	34.05	35.67	37.29
Forward - Lo (20% underdrive ratios)	L	1	0.14	0.18	0.21	0.25	0.29	0.32	0.36	0.37	0.39	0.41
	L	2	0.23	0.29	0.35	0.41	0.47	0.53	0.59	0.62	0.65	0.67
	L	3	0.42	0.52	0.62	0.73	0.83	0.93	1.04	1.09	1.14	1.19
	L	4	0.54	0.67	0.81	0.94	1.08	1.21	1.34	1.41	1.48	1.55
	M	1	0.50	0.63	0.76	0.88	1.01	1.14	1.26	1.33	1.39	1.45
	M	2	0.83	1.04	1.25	1.45	1.66	1.87	2.08	2.18	2.29	2.39
	M	3	1.47	1.84	2.21	2.57	2.94	3.31	3.68	3.86	4.05	4.23
	M	4	1.90	2.38	2.86	3.33	3.81	4.28	4.76	5.00	5.24	5.47
	V	1	2.67	3.33	4.00	4.66	5.33	6.00	6.66	7.00	7.33	7.66
	V	2	4.39	5.49	6.58	7.68	8.78	9.87	10.97	11.52	12.07	12.62
	V	3	7.77	9.71	11.65	13.60	15.54	17.48	19.42	20.39	21.36	22.34
	V	4	10.05	12.57	15.08	17.59	20.11	22.62	25.13	26.39	27.65	28.90
Reverse	L	1	0.16	0.20	0.24	0.28	0.32	0.36	0.40	0.42	0.44	0.46
	L	2	0.26	0.33	0.40	0.46	0.53	0.59	0.66	0.69	0.73	0.76
	L	3	0.47	0.58	0.70	0.82	0.93	1.05	1.17	1.23	1.28	1.34
	L	4	0.60	0.76	0.91	1.06	1.21	1.36	1.51	1.59	1.66	1.74
	M	1	0.61	0.77	0.92	1.07	1.23	1.38	1.53	1.61	1.69	1.76
	M	2	1.01	1.26	1.51	1.77	2.02	2.27	2.52	2.65	2.78	2.90
	M	3	1.79	2.23	2.68	3.13	3.58	4.02	4.47	4.69	4.92	5.14
	M	4	2.31	2.89	3.47	4.05	4.63	5.20	5.78	6.07	6.36	6.65
	V	1	3.00	3.75	4.50	5.24	5.99	6.74	7.49	7.87	8.24	8.62
	V	2	4.93	6.17	7.40	8.63	9.87	11.10	12.33	12.95	13.57	14.19
	V	3	8.74	10.92	13.10	15.29	17.47	19.65	21.84	22.93	24.02	25.11
	V	4	11.30	14.13	16.95	19.78	22.61	25.43	28.26	29.67	31.08	32.50

Speeds with following tyre type/s: 420/70-24", 360/70R28

Radius: 600 mm	Rolling circumference: 3.77 m
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Mode	Range	Gear	Engine speed (rpm)									
			800	1000	1200	1400	1600	1800	2000	2100	2200	2300
Forward - Hi (normal)	L	1	0.19	0.24	0.29	0.34	0.38	0.43	0.48	0.50	0.53	0.55
	L	2	0.32	0.39	0.47	0.55	0.63	0.71	0.79	0.83	0.87	0.91
	L	3	0.56	0.70	0.84	0.98	1.12	1.26	1.40	1.47	1.54	1.61
	L	4	0.72	0.90	1.09	1.27	1.45	1.63	1.81	1.90	1.99	2.08
	M	1	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.78	1.87	1.95
	M	2	1.12	1.40	1.68	1.96	2.24	2.52	2.80	2.94	3.08	3.22
	M	3	1.98	2.48	2.97	3.47	3.96	4.46	4.95	5.20	5.45	5.69
	M	4	2.56	3.20	3.84	4.49	5.13	5.77	6.41	6.73	7.05	7.37
	V	1	3.59	4.49	5.38	6.28	7.18	8.08	8.97	9.42	9.87	10.32
	V	2	5.91	7.39	8.86	10.34	11.82	13.29	14.77	15.51	16.25	16.99
	V	3	10.46	13.08	15.69	18.31	20.92	23.54	26.15	27.46	28.77	30.07
	V	4	13.54	16.92	20.30	23.69	27.07	30.45	33.84	35.53	37.22	38.91
Forward - Lo (20% underdrive ratios)	L	1	0.15	0.19	0.22	0.26	0.30	0.33	0.37	0.39	0.41	0.43
	L	2	0.24	0.31	0.37	0.43	0.49	0.55	0.61	0.64	0.67	0.70
	L	3	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.14	1.19	1.25
	L	4	0.56	0.70	0.84	0.98	1.12	1.26	1.40	1.47	1.54	1.61
	M	1	0.53	0.66	0.79	0.92	1.05	1.19	1.32	1.38	1.45	1.51
	M	2	0.87	1.08	1.30	1.52	1.73	1.95	2.17	2.28	2.38	2.49
	M	3	1.54	1.92	2.30	2.69	3.07	3.45	3.84	4.03	4.22	4.41
	M	4	1.99	2.48	2.98	3.48	3.97	4.47	4.97	5.21	5.46	5.71
	V	1	2.78	3.48	4.17	4.87	5.56	6.26	6.95	7.30	7.65	8.00
	V	2	4.58	5.72	6.87	8.01	9.16	10.30	11.45	12.02	12.59	13.16
	V	3	8.11	10.13	12.16	14.19	16.21	18.24	20.27	21.28	22.29	23.31
	V	4	10.49	13.11	15.74	18.36	20.98	23.60	26.23	27.54	28.85	30.16
Reverse	L	1	0.17	0.21	0.25	0.29	0.33	0.38	0.42	0.44	0.46	0.48
	L	2	0.28	0.34	0.41	0.48	0.55	0.62	0.69	0.72	0.76	0.79
	L	3	0.49	0.61	0.73	0.85	0.97	1.10	1.22	1.28	1.34	1.40
	L	4	0.63	0.79	0.95	1.10	1.26	1.42	1.58	1.66	1.73	1.81
	M	1	0.64	0.80	0.96	1.12	1.28	1.44	1.60	1.68	1.76	1.84
	M	2	1.05	1.32	1.58	1.84	2.11	2.37	2.63	2.77	2.90	3.03
	M	3	1.87	2.33	2.80	3.26	3.73	4.20	4.66	4.90	5.13	5.36
	M	4	2.41	3.02	3.62	4.22	4.83	5.43	6.03	6.34	6.64	6.94
	V	1	3.13	3.91	4.69	5.47	6.25	7.04	7.82	8.21	8.60	8.99
	V	2	5.15	6.44	7.72	9.01	10.30	11.58	12.87	13.51	14.16	14.80
	V	3	9.11	11.39	13.67	15.95	18.23	20.51	22.79	23.93	25.07	26.21
	V	4	11.79	14.74	17.69	20.64	23.59	26.54	29.49	30.96	32.44	33.91

3.5 Noise levels

External noise levels at engine speed of 2300 rpm:

	dB(A)
In motion	80 dB(A)
With vehicle stationary	84 dB(A)

Driver-perceived noise levels at engine speed of 2300 rpm.:

	dB(A) (1)
Version with protective structure	90 dB(A)
Cab version, closed	89 dB(A)
Cab version, rear screen open	88.5 dB(A)

(1) - Measurements made in accordance with test method 1 defined in section 2 of annexe XIII of EU Commission Delegated Regulation 1322/2014.

3.6 Tyres

3.6.1 General information on tyres

Marking

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

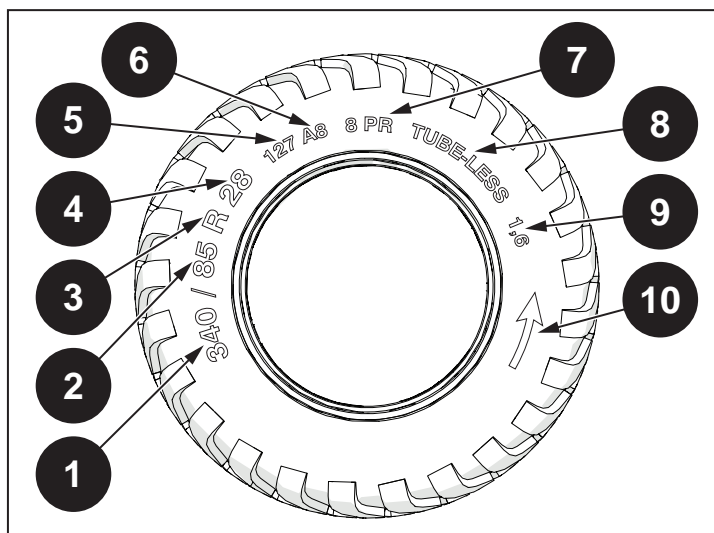



Fig. 3.2

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

Load index

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

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

Speed code

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

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

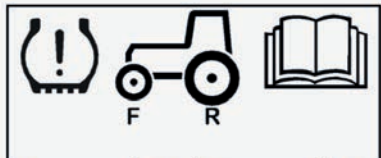
3.6.2 Available tyres

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

Q series

Front	Load index	Pressure (bar)	Rear	Load index	Pressure (bar)
280/70 R18	116 A8	2,4	380/70 R20	132 A8	1,6
320/65 R18	109 A8	1,6	420/65 R20	119 A8	1,2
280/70 R16	116 A8	2,4	340/65 R20	114 A8	1,6
280/70 R18	114 A8	2,4	360/70 R20	120 A8	1,6
260/70 R16	109 A8	2,4	340/65 R20	119 A8	1,6
400/55 17.5	108 A8	1,2	560/45 22.5	125 A8	1,2
250/80 - 16	125 A8	1,6	320/70 R20	113 A8	1,6
280/70 R20	116 A8	2,4	320/70 R24	116 A8	1,6
280/70 R18	114 A8	2,4	320/85 R20	119 A8	1,6
300/65 R18	116 A8	2,4	420/65 R20	119 A8	1,2

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



F	bar	R	bar
280/70 R18	2,4	380/70 R20	1,6
320/65 R18	1,6	420/65 R20	1,2
280/70 R16	2,4	340/65 R20	1,6
280/70 R18	2,4	360/70 R20	1,6
260/70 R16	2,4	340/65 R20	1,6
400/55 17.5	1,2	560/45 22.5	1,2
250/80 - 16	1,6	320/70 R20	1,6
280/70 R20	2,4	320/70 R24	1,6
280/70 R18	2,4	320/85 R20	1,6
300/65 R18	2,4	420/65 R20	1,2

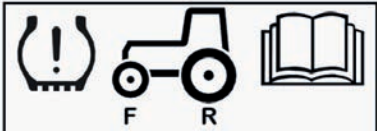
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Fig. 3.3

S series

Front	Load index	Pressure (bar)	Rear	Load index	Pressure (bar)
280/70 R18	114 A8	2,4	420/70 R24	130 A8	1,6
280/70 R16	112 A8	1,6	380/70 R24	125 A8	1,2
280/70 R20	116 A8	2,4	320/70 R24	116 A8	1,6
280/70 R18	114 A8	2,4	360/70 R28	125 A8	1,2
240/70 R16	104 A8	2,4	320/70 R24	116 A8	1,6
260/70 R16	109 A8	1,6	360/70 R24	122 A8	1,6
240/70 R16	104 A8	2,4	320/70 R24	116 A8	1,6
240/70 R16	104 A8	2,4	380/70 R20	122 A8	1,6
280/70 R16	112 A8	2,4	340/85 R24	125 A8	1,6
280/70 R16	112 A8	2,4	320/85 R24	122 A8	1,6
280/70 R16	112 A8	2,4	380/70 R24	125 A8	1,6

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



F	bar	R	bar
280/70 R18	2,4	420/70 R24	1,6
280/70 R16	1,6	380/70 R24	1,2
280/70 R20	2,4	320/70 R24	1,6
280/70 R18	2,4	360/70 R28	1,2
240/70 R16	2,4	320/70 R24	1,6
260/70 R16	1,6	360/70 R24	1,6
240/70 R16	2,4	380/70 R20	1,6
280/70 R16	2,4	340/85 R24	1,6
280/70 R16	2,4	320/85 R24	1,6
280/70 R16	2,4	380/70 R24	1,6

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Fig. 3.4

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal grey lines across its entire width, providing a guide for handwriting or typing. The background is a clean, solid white color.

4 : Controls and instruments

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4.1 General list of controls

4.1.1 Driver zone controls

This paragraph provides an overview of all of the instruments and controls inside the cab. 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 Dashboard controls

- 1 - Multifunction instrument
- 2 - Reverse shuttle Forward-Reverse
- 3 - Lights selector stalk with horn button
- 4 - Ignition switch

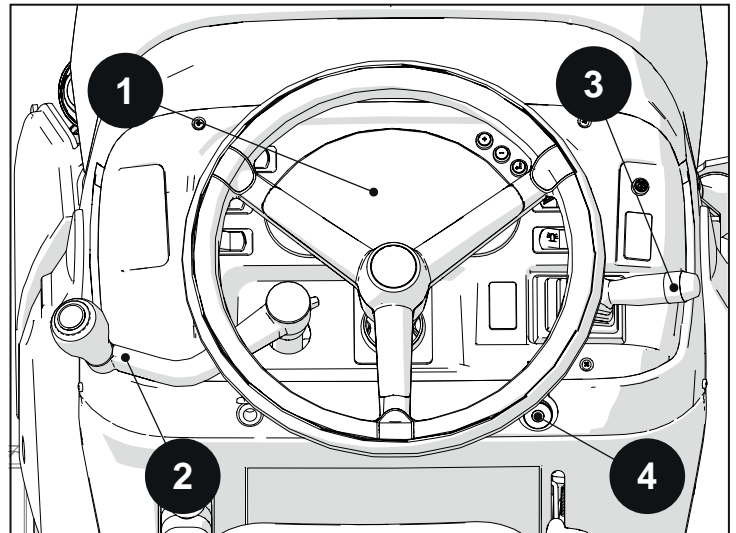


Fig. 4.1

- 5 - Regeneration function switch
- 6 - Differential lock switch
- 7 - Dual traction switch
- 8 - Steering wheel adjustment lever
- 9 - 12V power socket

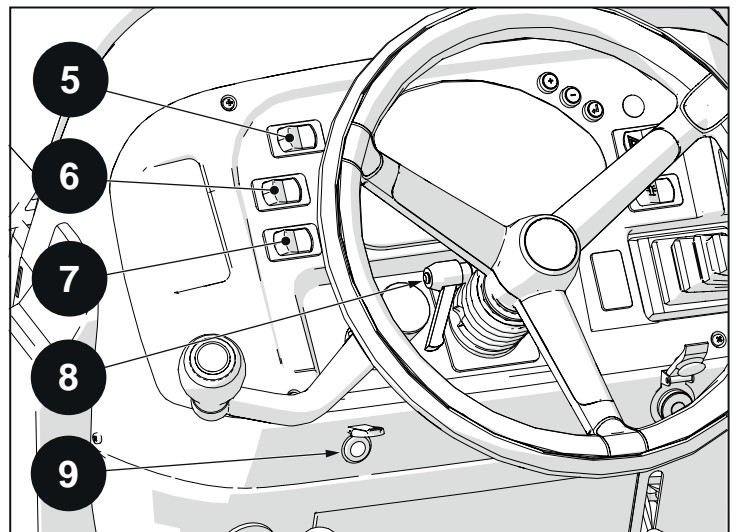


Fig. 4.2

- 10 - Multifunction instrument controller button
- 11 - Hazard warning light switch
- 12 - PTO enable switch (safety switch)
- 13 - Beacon light switch
- 14 - Front PTO switch (if present)
- 15 - Neutral switch cap
- 16 - Trailer brake button (if present)

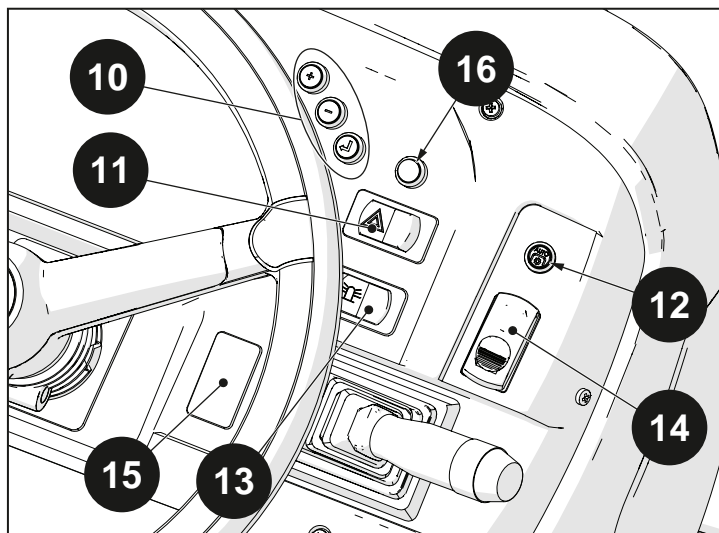


Fig. 4.3

4.1.1.2 Front controls

- 1 - Clutch pedal
- 2 - Left hand brake pedal
- 3 - Right hand brake pedal
- 4 - Foot throttle pedal
- 5 - Parking brake lever
- 6 - CAN diagnostic port

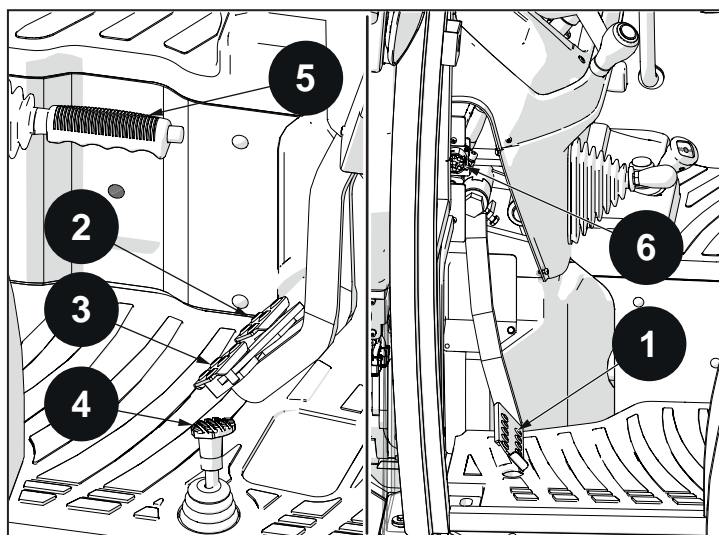


Fig. 4.4

- 7 - Hand throttle
- 8 - PTO clutch lever.
- 9 - Hi-Lo mode selector lever

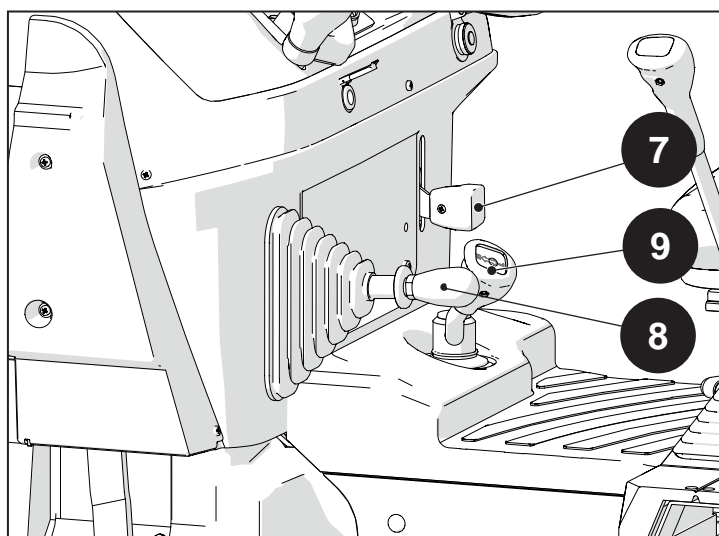


Fig. 4.5

- 10 - Rear auxiliary distributor control levers
- 11 - Gear selector lever
- 12 - Rear lift draft control lever
- 13 - Rear lift position control lever
- 14 - Groundspeed/independent PTO mode selector lever
- 15 - Range selector lever

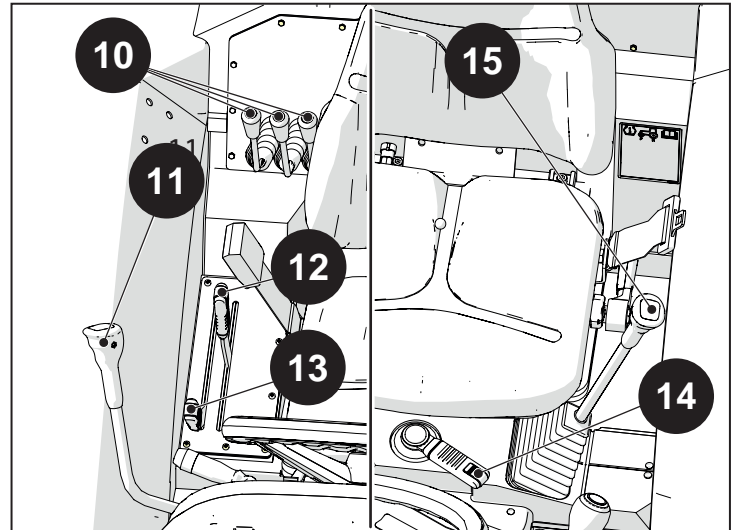


Fig. 4.6

4.1.1.3 Joystick controls (is available)

- 1 - Front distributor activation button (green)
- 2 - Front distributor activation button (blue)
- 3 - Front distributor activation button (black)
- 4 - Front distributor control scroll wheel
- 5 - Rear distributor control scroll wheel
- 6 - Rear distributor activation button (yellow)
- 7 - Rear distributor activation button (grey)
- 8 - Hydraulic engine scroll wheel
- 9 - Hydraulic motor activation button

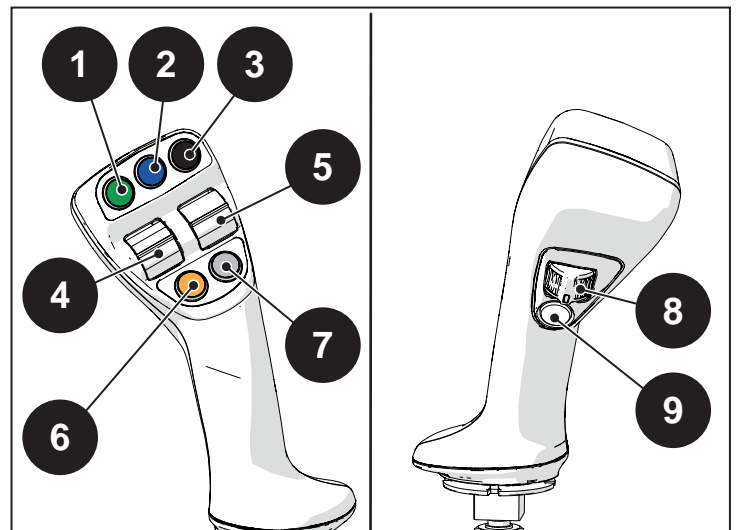


Fig. 4.7

4.1.1.4 GL11 cab controls

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

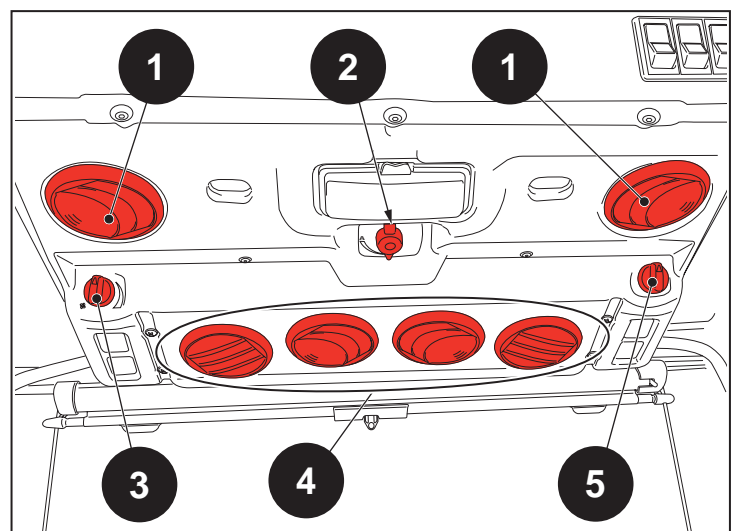


Fig. 4.8

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

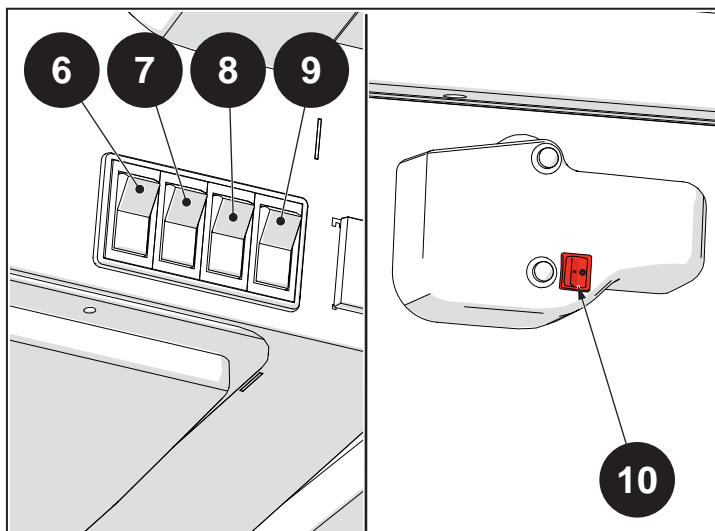


Fig. 4.9

4.1.1.5 SG1/1 cab controls

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

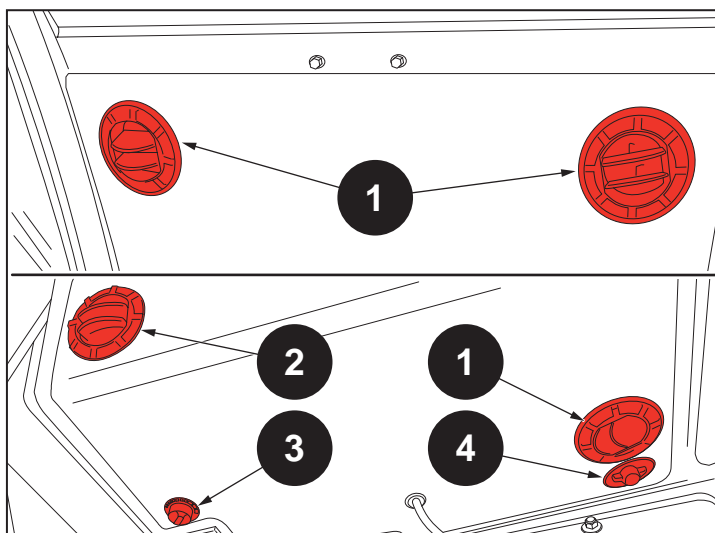


Fig. 4.10

- 5 - Blower speed selector
- 6 - Rear wiper switch
- 7 - Screen wash pump switch
- 8 - Windscreen wiper switch
- 9 - Work lights switch
- 10 - Beacon light switch

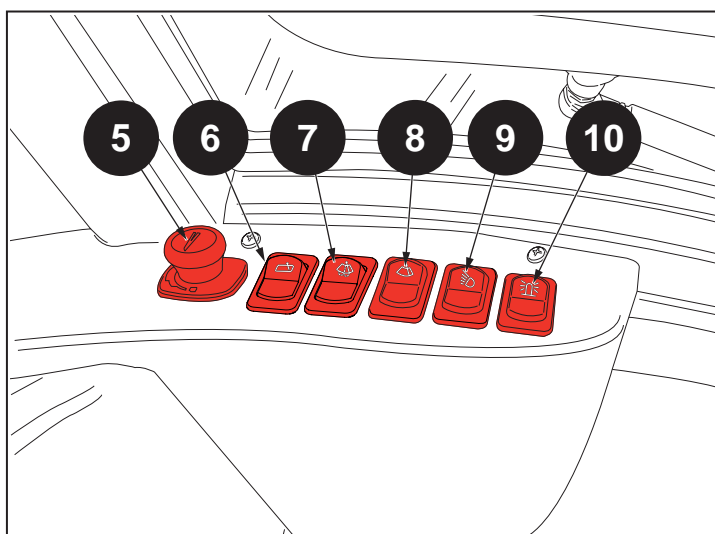


Fig. 4.11

4.1.2 External controls

1 - Battery master switch

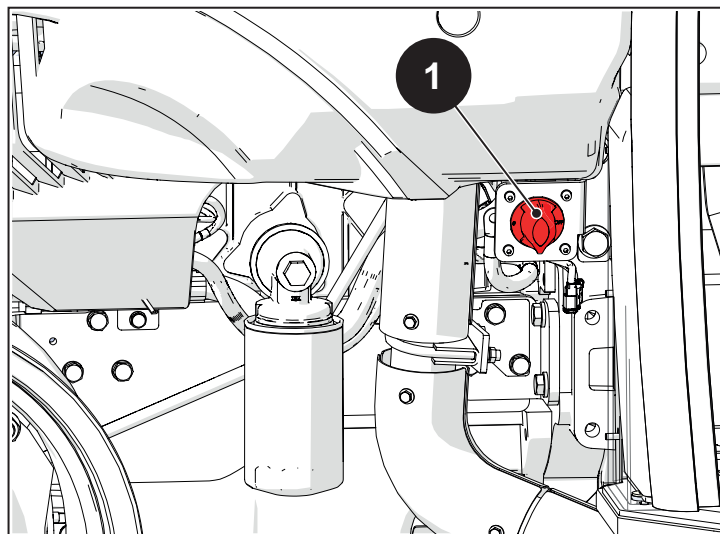


Fig. 4.12

2 - External 12V power socket
3 - 7 pole socket for trailer
4 - Rear distributor quick couplings
5 - PTO speed mode selector lever.

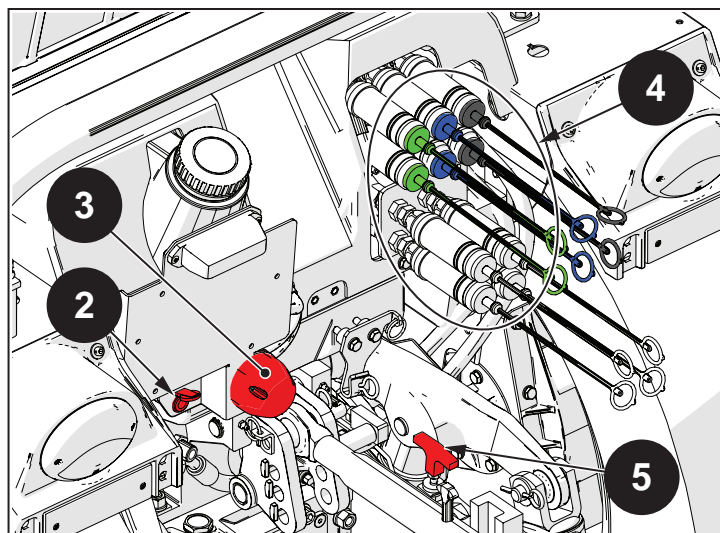


Fig. 4.13

6 - Front distributor quick couplings (if present)
7 - Pair of front push pull connectors (if present)

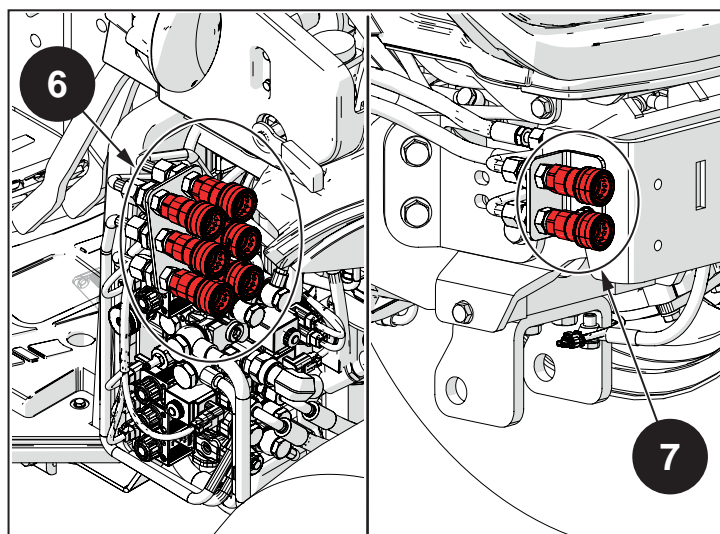


Fig. 4.14

8 - Front lift tap (if present)

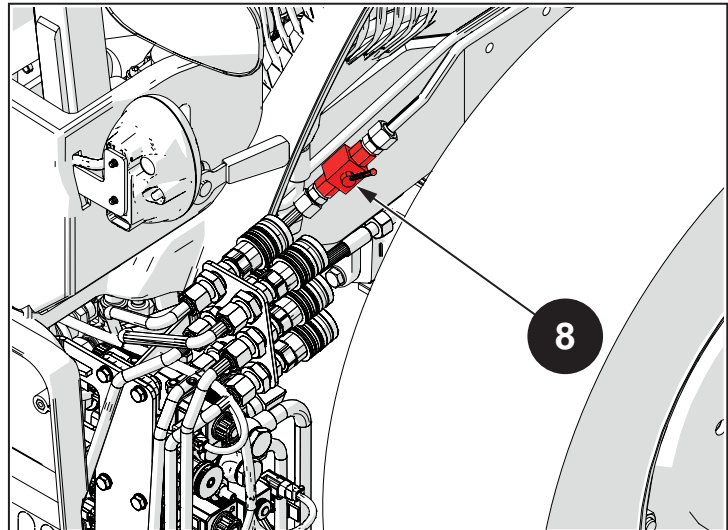


Fig. 4.15

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

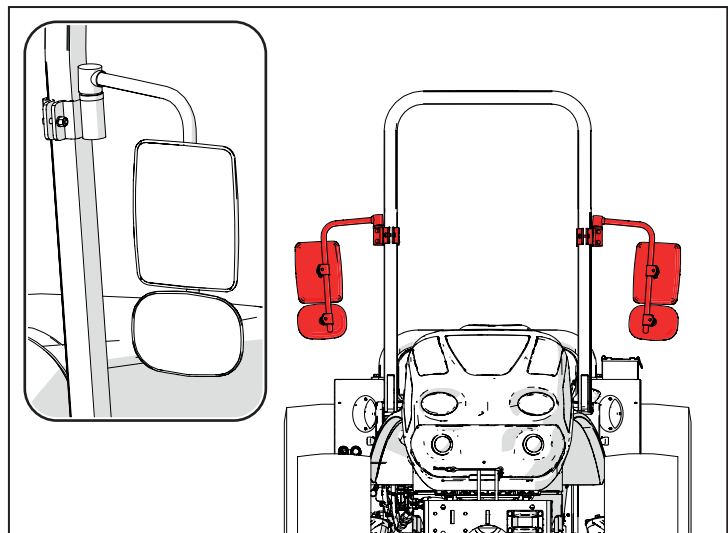


Fig. 4.16

GL11 cab

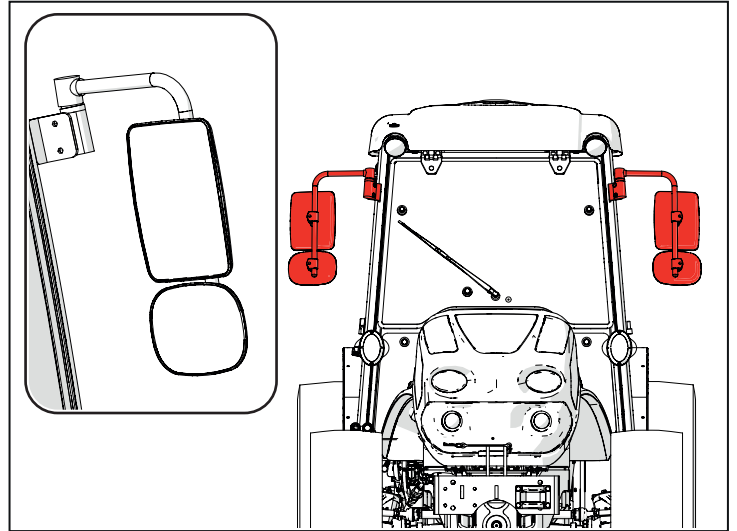


Fig. 4.17

SG1/1 cab

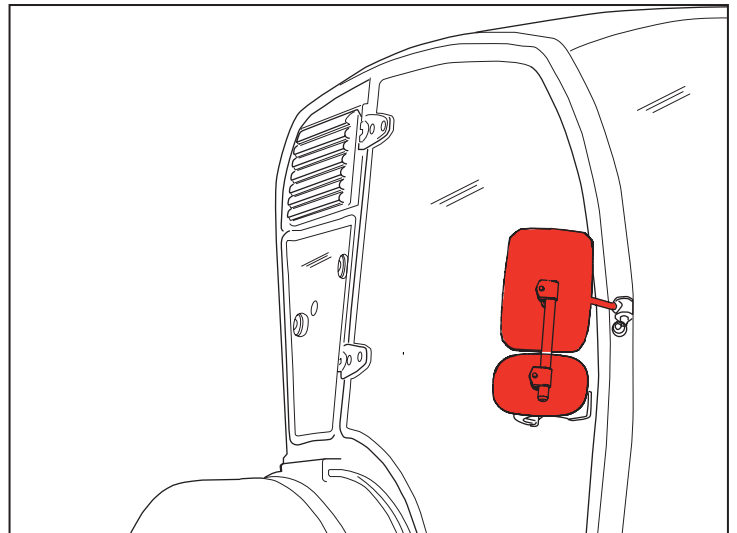


Fig. 4.18

4.2.2 Toolbox

The toolbox is situated between the left hand footboard and the front wheel, on the left hand side of the tractor.

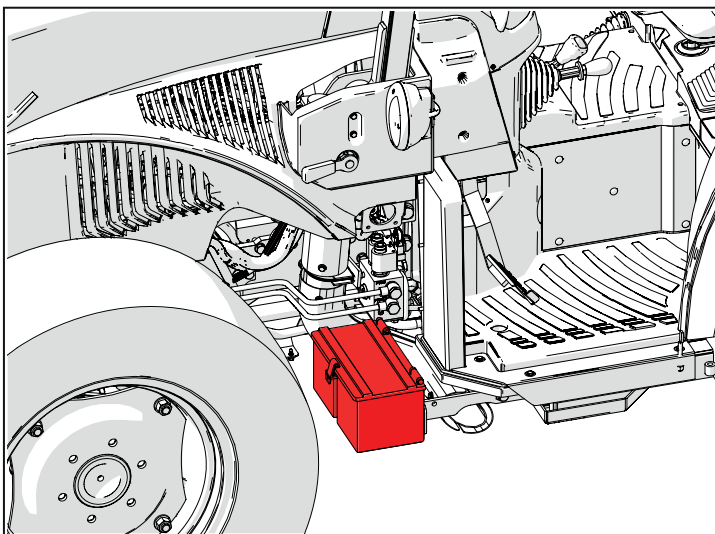


Fig. 4.19

4.2.3 Seat



Danger

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



Danger

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

4.2.3.1 Standard seat

Seat controls:

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

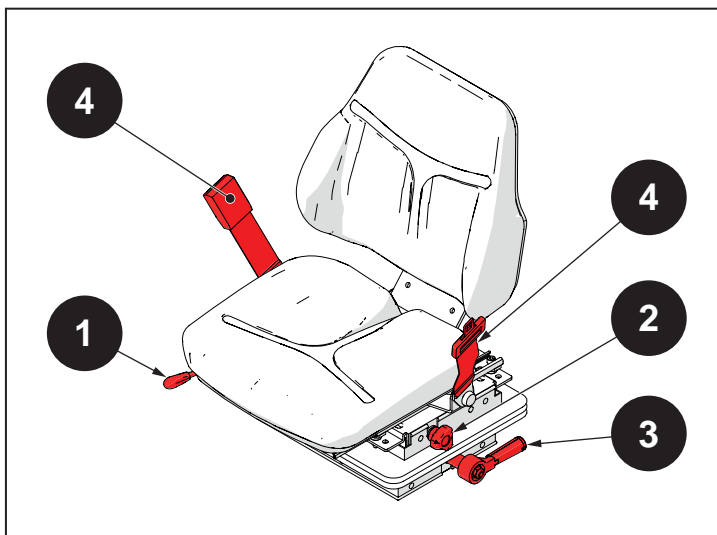


Fig. 4.20

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.

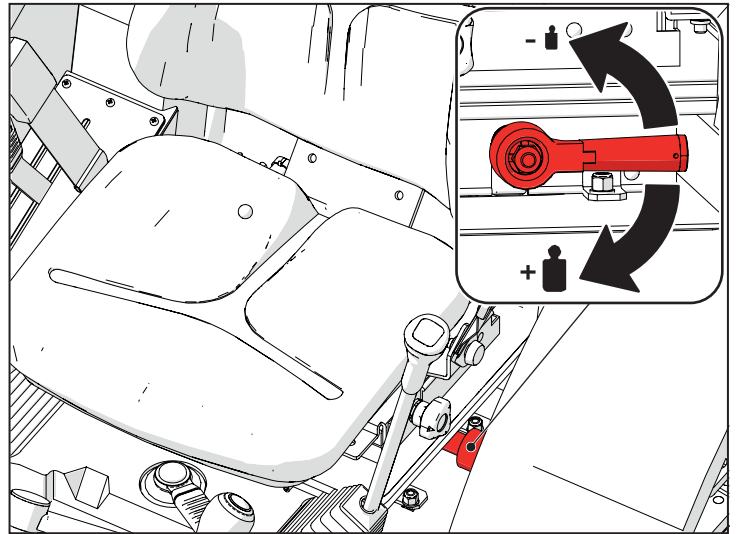


Fig. 4.21



Note

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

Height adjustment (limiter)

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

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

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

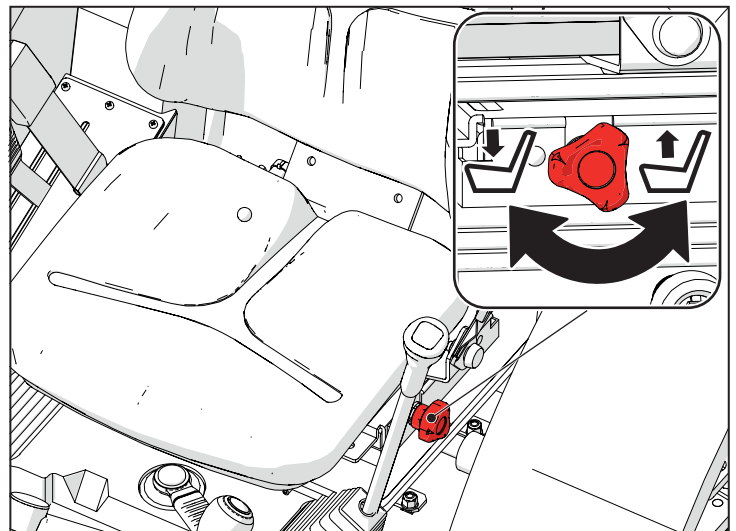


Fig. 4.22



Note

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

Longitudinal adjustment

Push the adjuster lever to the right to unlock the seat guide rails. 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.

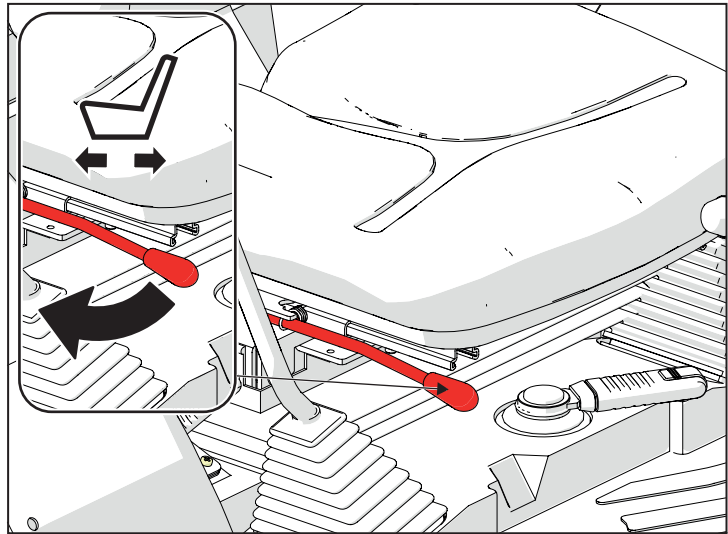


Fig. 4.23

4.2.3.2 SG1/1 cab seat

Seat controls:

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

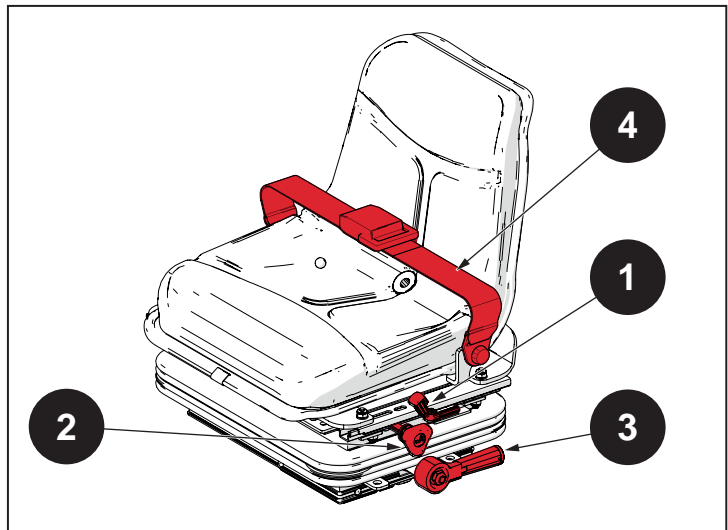


Fig. 4.24

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.

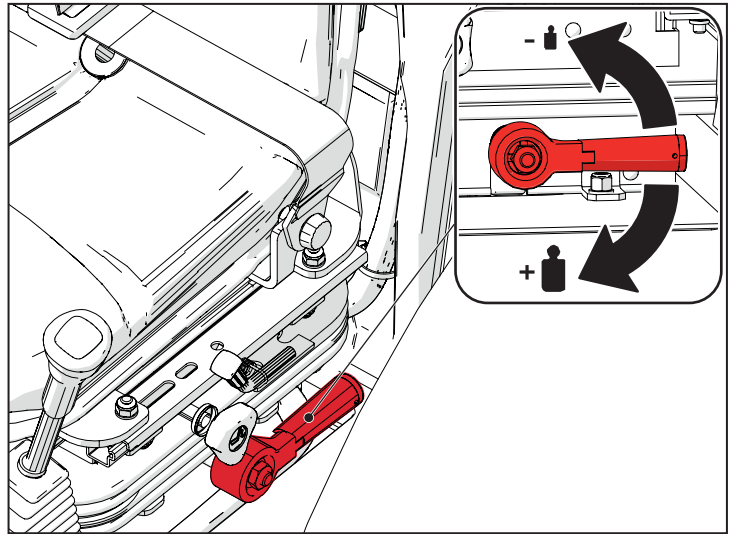


Fig. 4.25



Note

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

Height adjustment (limiter)

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

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

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

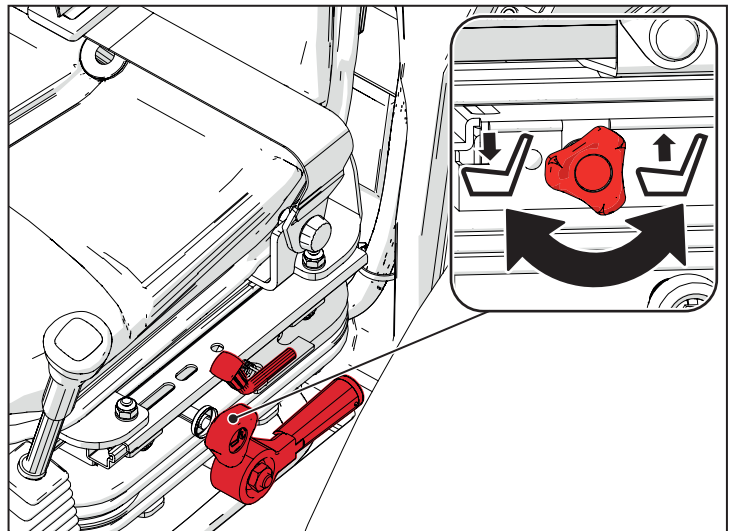


Fig. 4.26



Note

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

Longitudinal adjustment

Push the adjuster lever to the left to unlock the seat guide rails. 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.

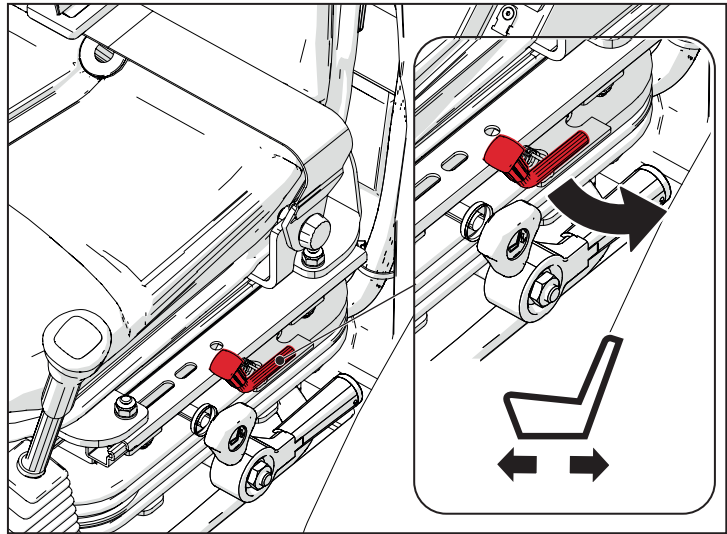


Fig. 4.27

4.2.3.3 Document holder (if present)

Type	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 (flip-open)*	To open the holder, move the cover towards the rear of the seat after detaching the two lateral tabs from their slots

* may be padlocked.

4.2.3.4 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.

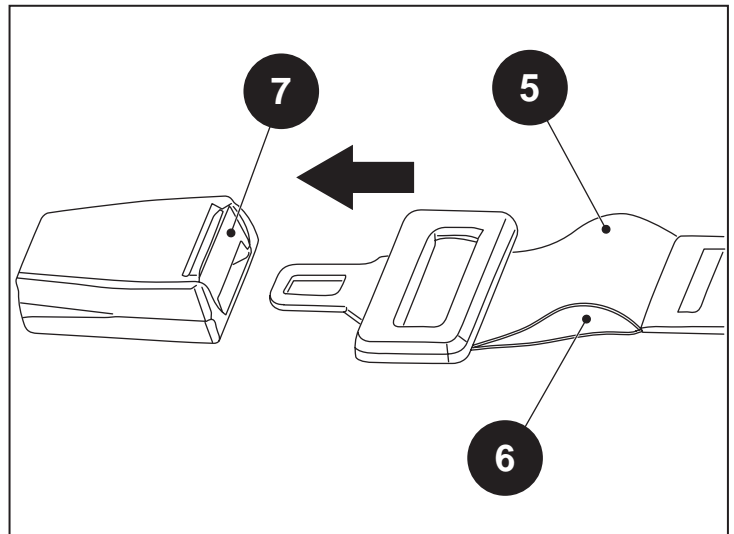


Fig. 4.28

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.

4.2.3.5 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.



Danger

Risk of injury caused by backrest springing forwards! When cleaning the upholstery of the backrest, restrain the backrest with one hand before releasing the lock mechanism.



Warning

Do not 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 Steering wheel

The machine is equipped with a height-adjustable steering wheel. The steering wheel and steering column are set to the standard position before delivery.

To adjust the position of the steering wheel, lift the steering wheel lock mechanism and raise or lower the steering wheel into the desired position. After setting the position, push the lock mechanism down again to lock the steering wheel.



Danger

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

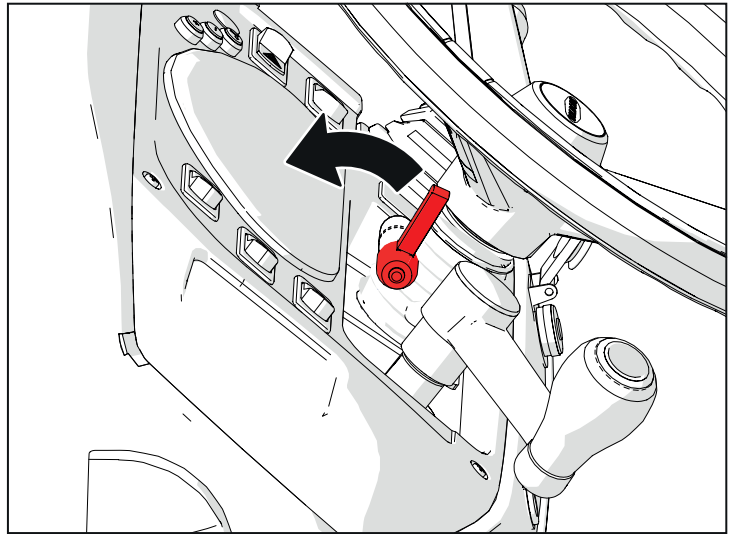


Fig. 4.29

4.2.5 Horn

Press the horn button at the end of the lights selector stalk. to sound the horn.

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



Note

The horn works in any lights selector stalk position.

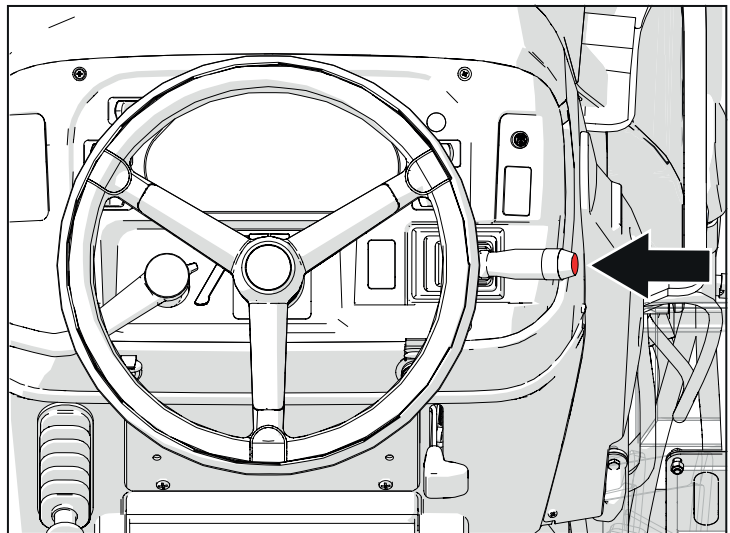


Fig. 4.30

4.2.6 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.

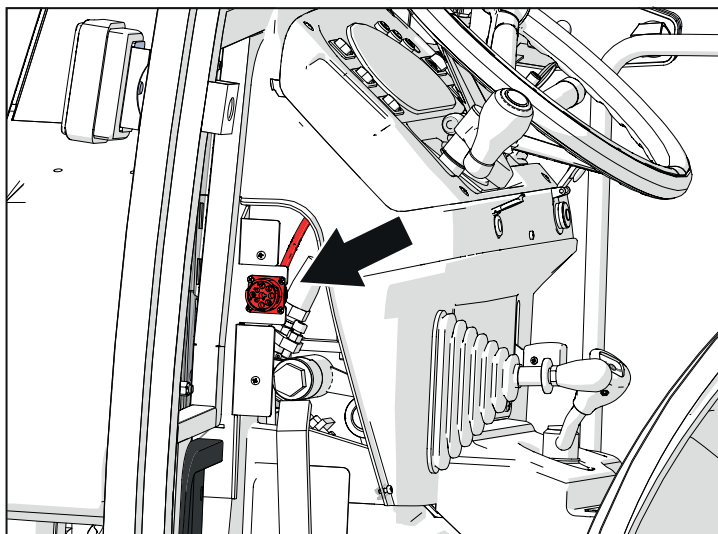


Fig. 4.31

4.2.7 ROPS

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

 **Danger**

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.

 **Danger**

Do not modify the structural components of the ROPS in any case whatsoever by welding on additional parts, drilling holes, grinding, etc. Failure to comply with these recommendations may compromise the rigidity of the ROPS, thus reducing the level of protection ensured by the original equipment.

 **Danger**

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

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 spring pin again and rotate it 90° vertically to lock it.

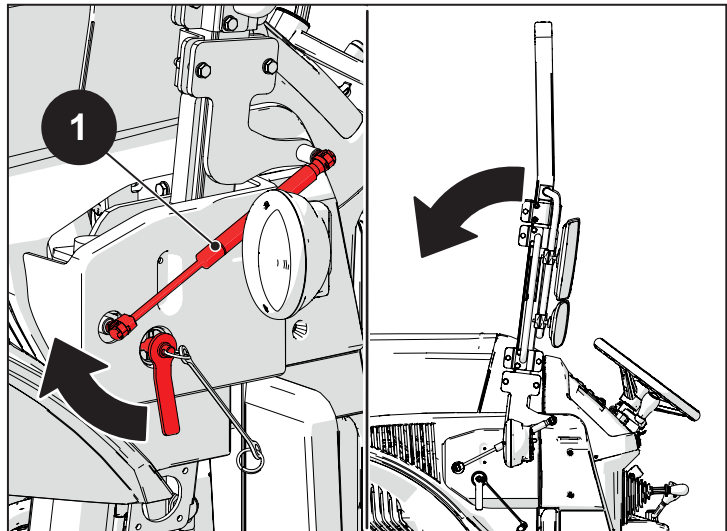


Fig. 4.32

4.3 Cab controls

4.3.1 Windscreen wiper

Only works with the ignition switch turned to ON.

Press the switch (1) to turn the windscreen wiper on.



Note

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

GL11 cab

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

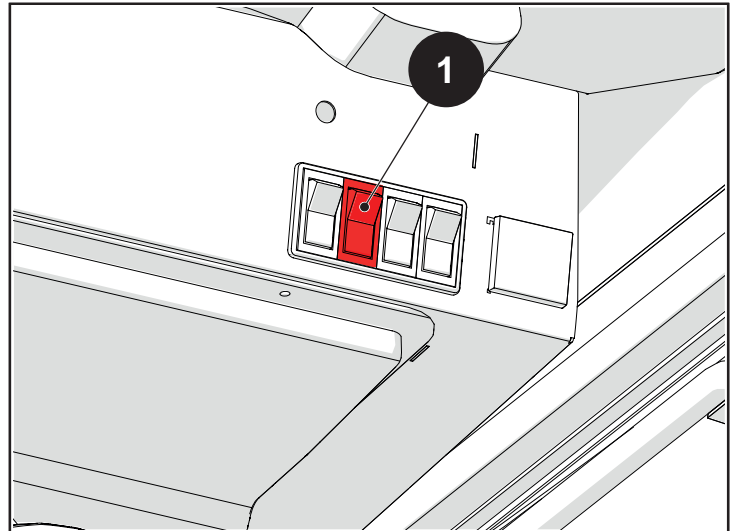


Fig. 4.33

SG1/1 cab

The switch is situated on the left hand console.

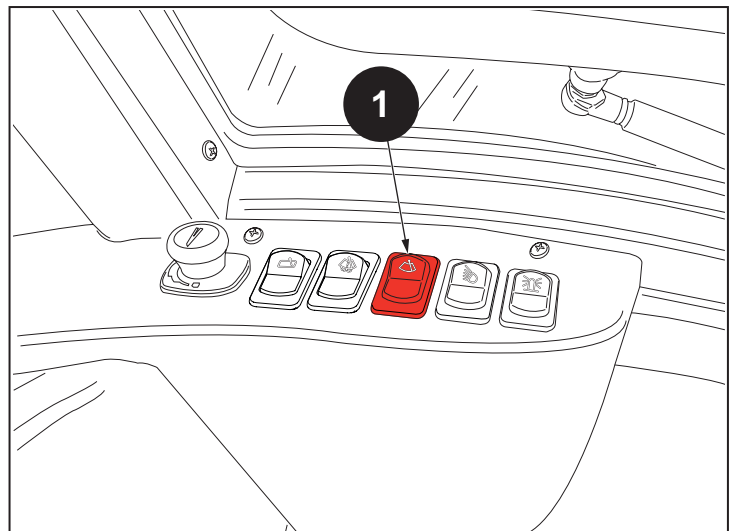


Fig. 4.34

4.3.2 Rear wiper

Only works with the ignition switch turned to ON.

Press the switch (1) to turn the rear screen wiper on.

GL11 cab

The switch is situated on the wiper motor.

Position 1 = on

Position 0 = off

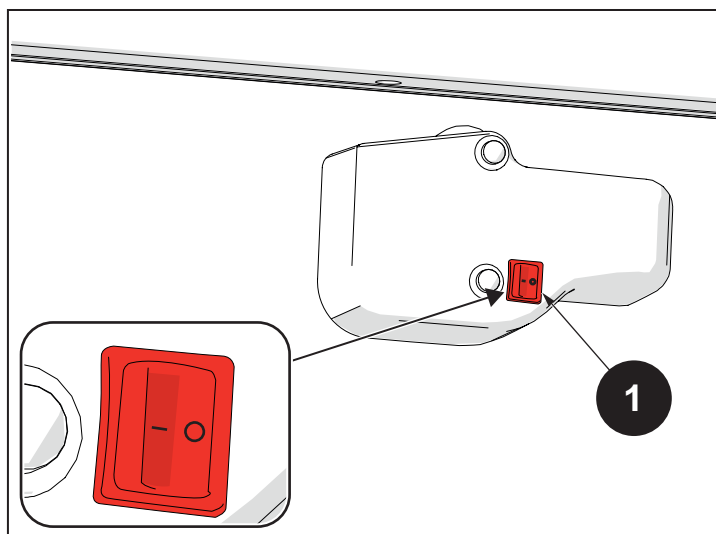


Fig. 4.35

SG1/1 cab

The switch is situated on the left hand console.

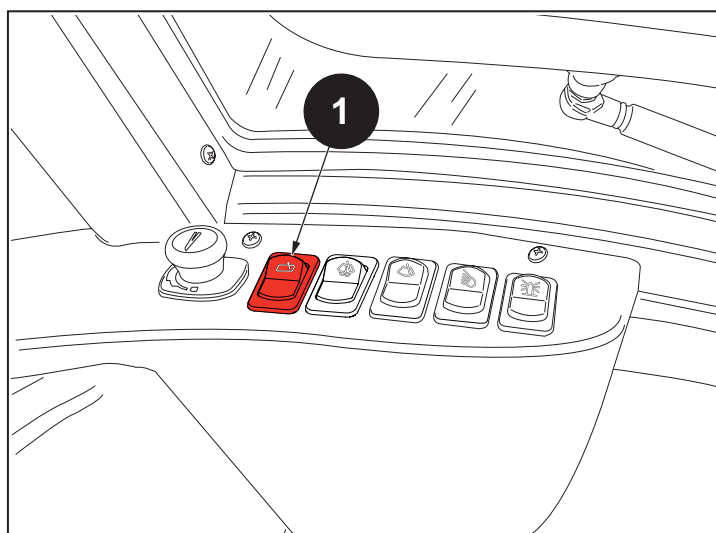


Fig. 4.36

4.3.3 Sun shades (GL11 cab)

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 extend 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.



Note

The sun shade is only available for the GL11 cab (high profile roof).

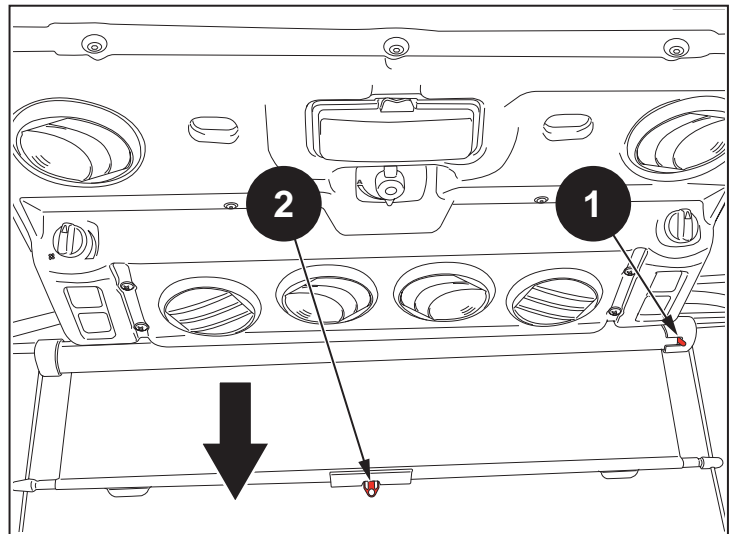


Fig. 4.37

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.



Warning

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.

GL11 cab

The button is situated on the upper cab panel.

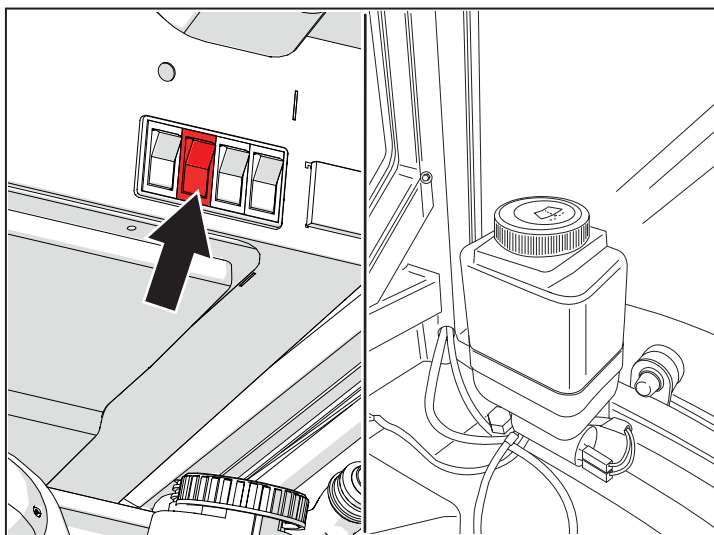


Fig. 4.38

SG1/1 cab

The button is situated on the left hand console.

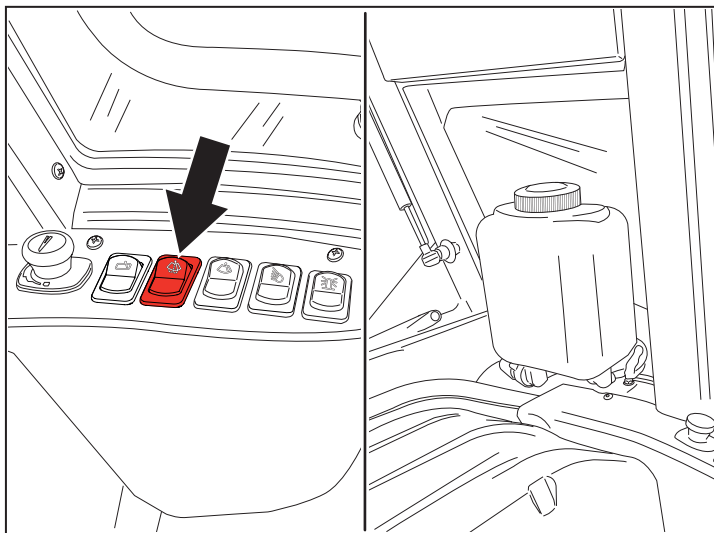


Fig. 4.39

4.3.5 Doors

Both doors can be opened from the outside by pressing the relative button (1) and from the inside by pressing the lever (2).

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

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

GL11 cab

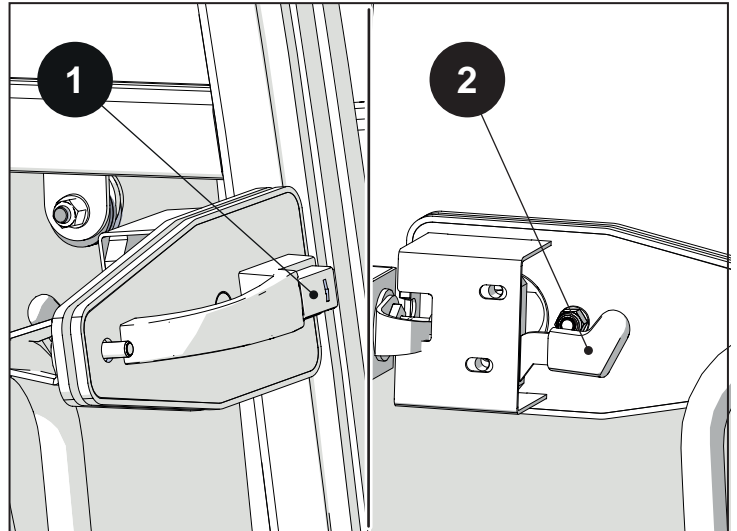


Fig. 4.40

SG1/1 cab

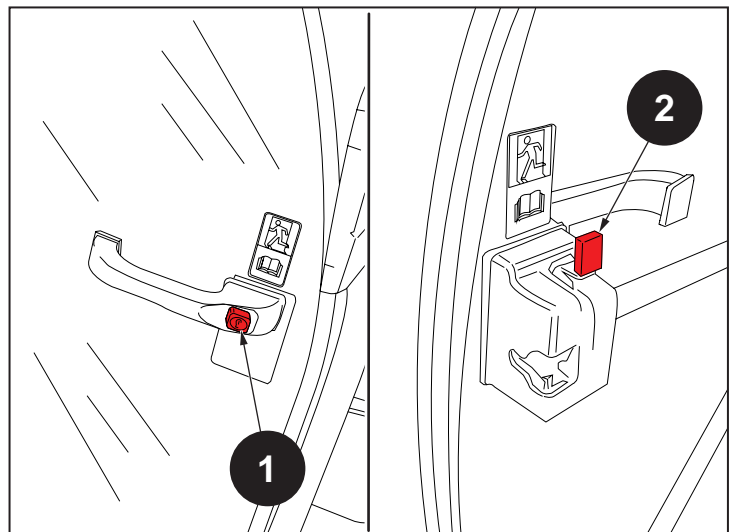


Fig. 4.41

4.3.6 Windows

To open from inside the cab, turn the lever anticlockwise and push the screen outward. The rear window is held in the open or closed position by gas struts.

GL11 cab

- A - Windscreen
- B - Rear screen

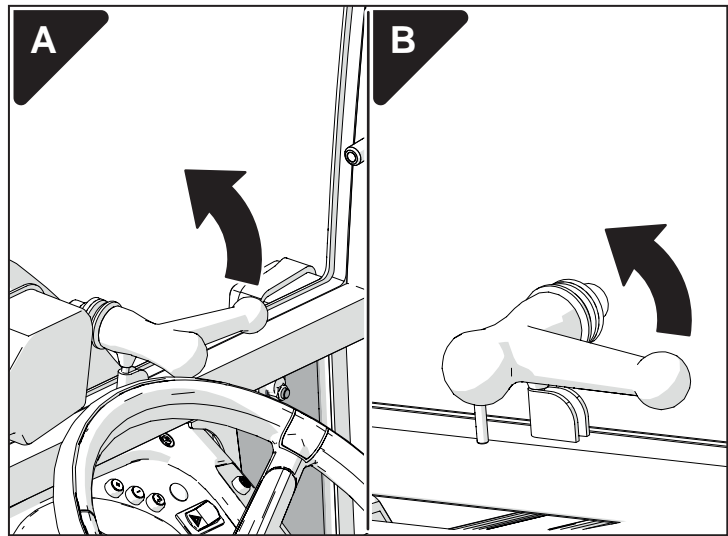


Fig. 4.42

SG1/1 cab



Note

The windscreen is fixed and does not open.

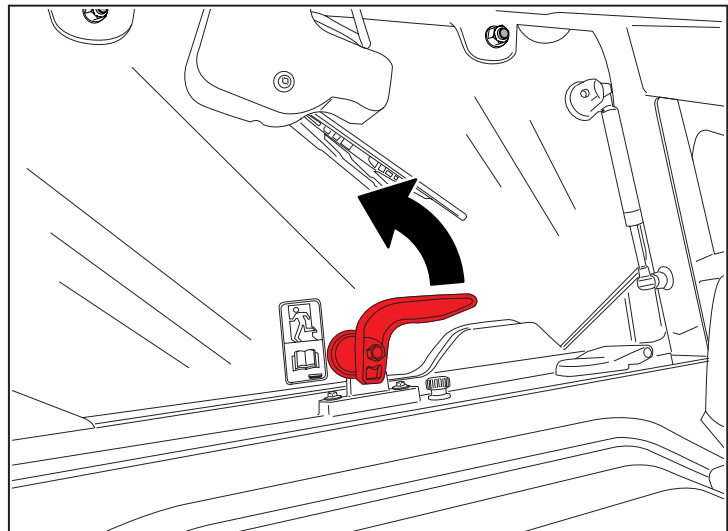


Fig. 4.43

4.3.7 Emergency exit

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

GL11 cab

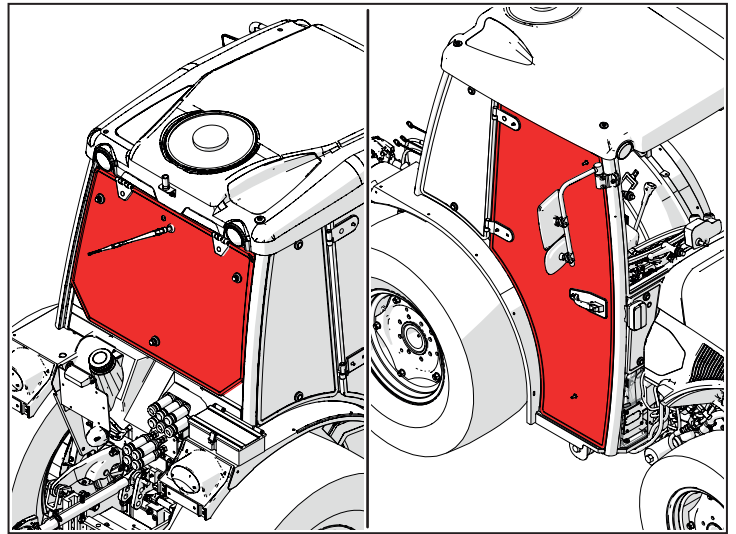


Fig. 4.44

SG1/1 cab

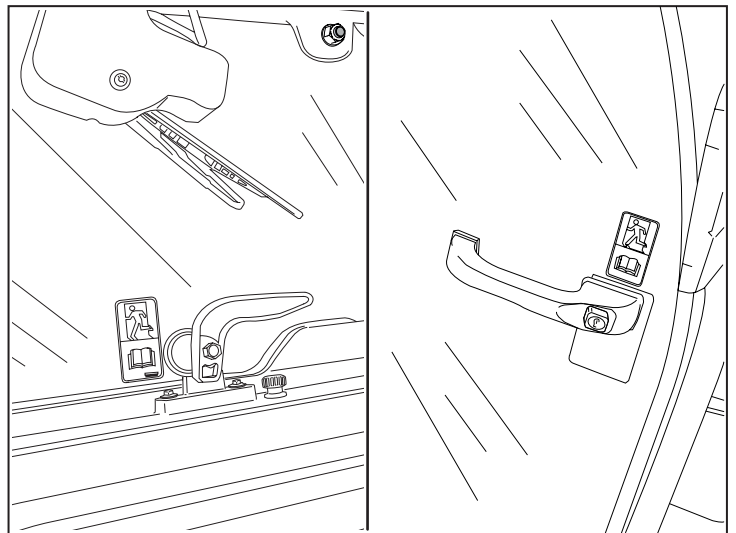


Fig. 4.45

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.

Version for models without trailer turn indicator activated

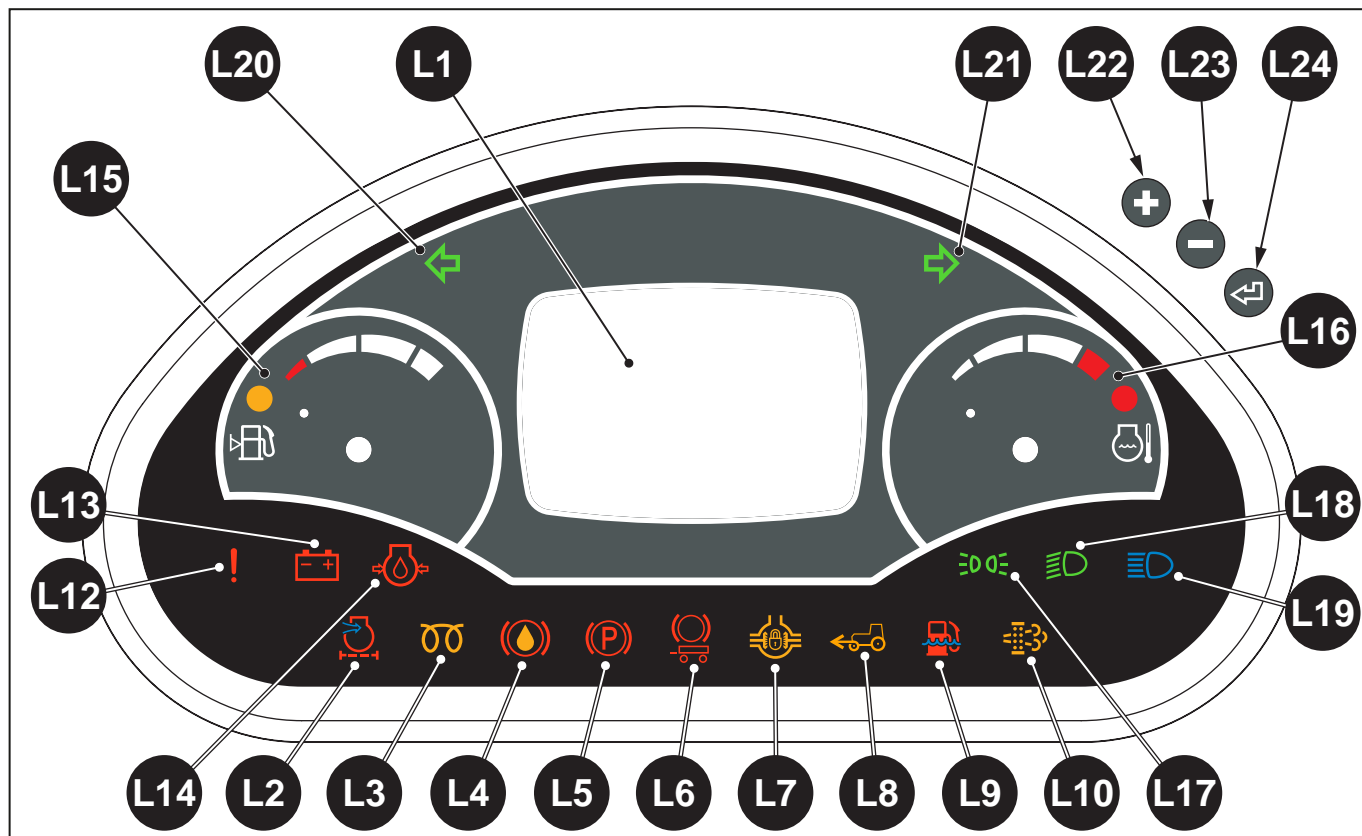


Fig. 4.46

Version for models with trailer turn indicator activated

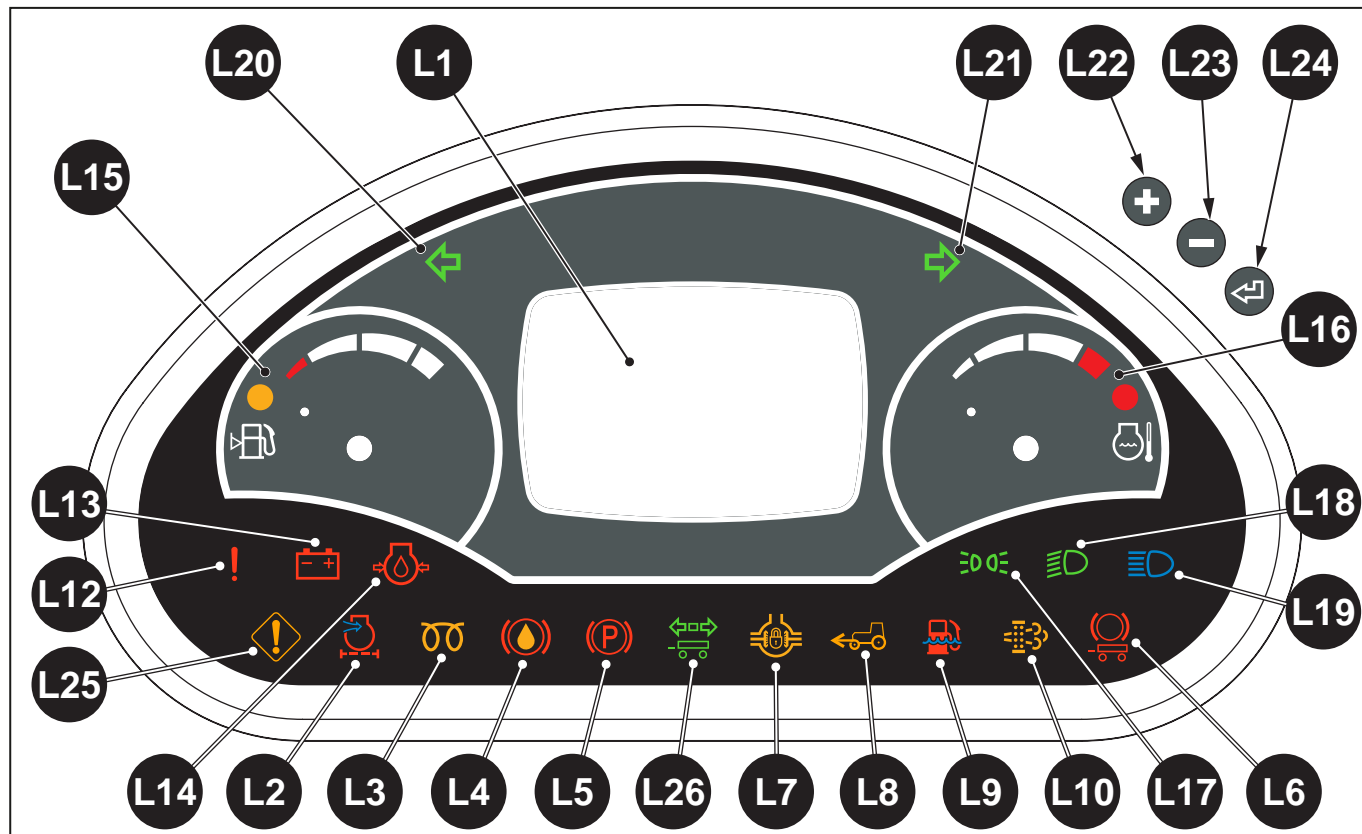


Fig. 4.47

- L1 - Digital information display
- L2 - Engine air filter clogged
- L3 - Glow plug pre-heat
- L4 - Low brake oil level
- L5 - Parking brake engaged
- L6 - Trailer brake pressure fault
- L7 - Differential lock engaged
- L8 - 4WD engaged
- L9 - Water in fuel
- L10 - DPF warning lamp
- L12 - General alarm warning lamp
- L13 - Alternator fault
- L14 - Low engine oil pressure
- L15 - Fuel reserve indicator lamp
- L16 - Engine temperature alarm
- L17 - Running lights
- L18 - Low beam headlights
- L19 - High beam headlights
- L20 - Left turn indicator
- L21 - Right turn indicator
- L22 - + button
- L23 - - button
- L24 - Confirm/Enter button
- L25 - Operator alert
- L26 - Trailer turn indicator activated

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

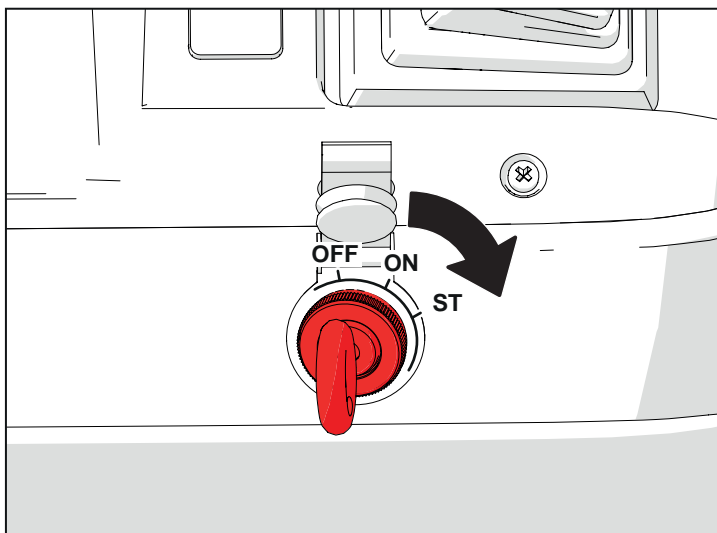


Fig. 4.48

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

- L22 - Forward button
- L23 - Back button
- L24 - Confirm button

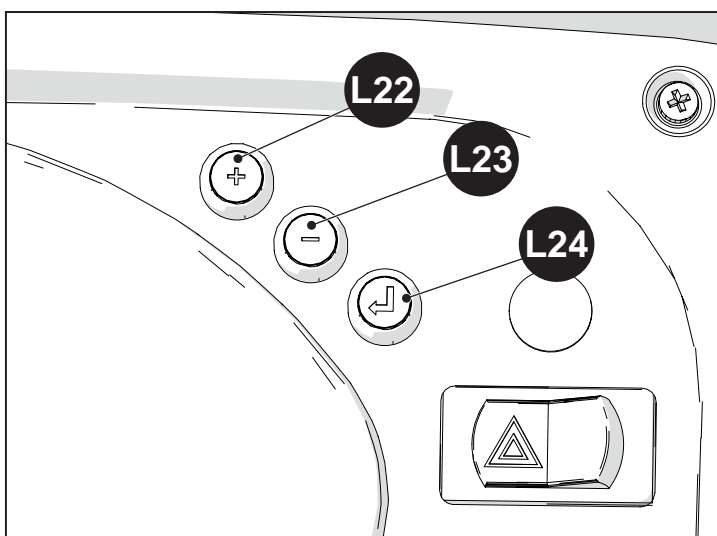


Fig. 4.49

Alarm warning lamp and buzzer

Each time the system detects an error, the warning lamp (L12) on the dashboard illuminates and a buzzer sounds.

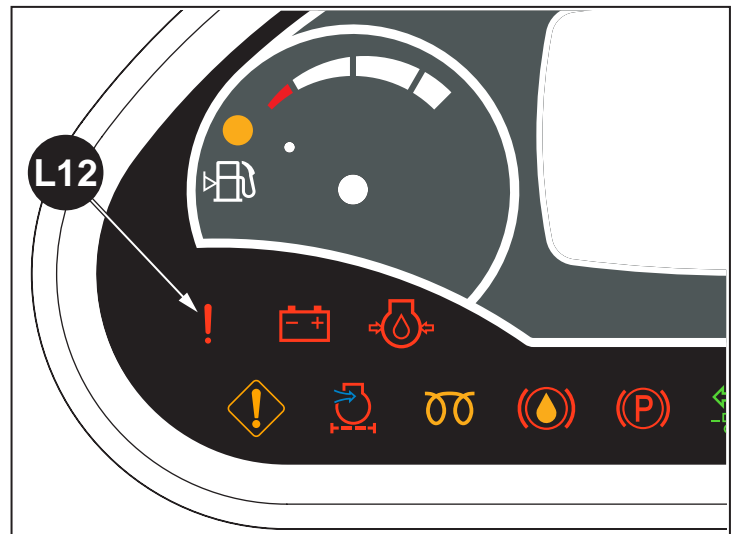


Fig. 4.50

The situations in which the warning lamp (L12) and the buzzer are activated are indicated in the following table; the warning lamp extinguishes and the buzzer stops when normal operating conditions are restored.

Condition	LED	Buzzer
No CAN BUS line connection with engine control unit	on	on
Engine fault	on	on
Engine alarm	on	on
Operator seated and parking brake disengaged	on	on for 15 seconds
Vehicle ECU fault	on	on
Particulate filter clogged	on	on
Action necessary for engine start	off	one flash
Service required	off	one flash

4.4.1 Welcome screen

The Goldoni logo is displayed for 2.5 seconds when the instrument panel is switched on.



Fig. 4.51

The following screen then appears for the next 2.5 seconds:

(A) - Operating hours. The current operating hour count is shown in this area of the dashboard.

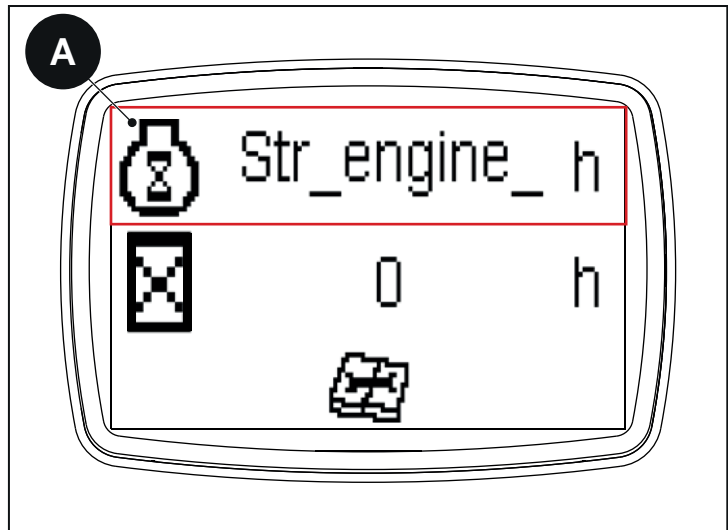


Fig. 4.52

(B) - Hours Remaining to Next Service. The number of engine operating hours remaining until the next service interval is shown in this area of the dashboard.

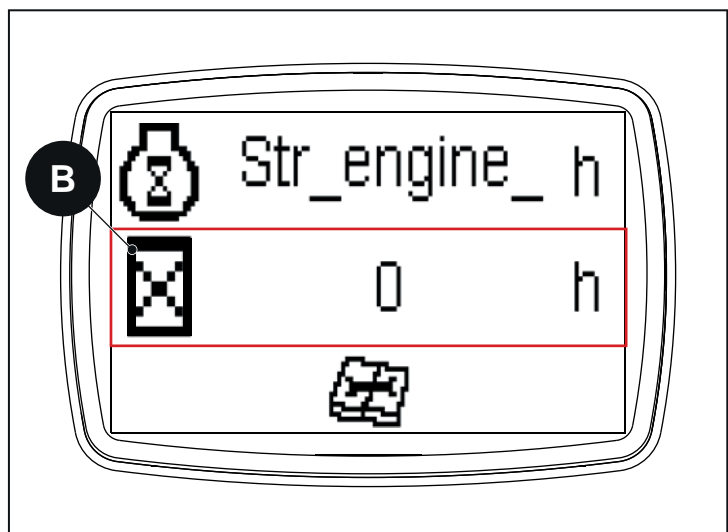


Fig. 4.53

(C) - Service indicator. When applicable, the service required indicator is shown in this area of the dashboard. This indicator is also accompanied by an audible signal. This indicator is cleared with a specific CAN message from the diagnostic tool once the required service has been completed.

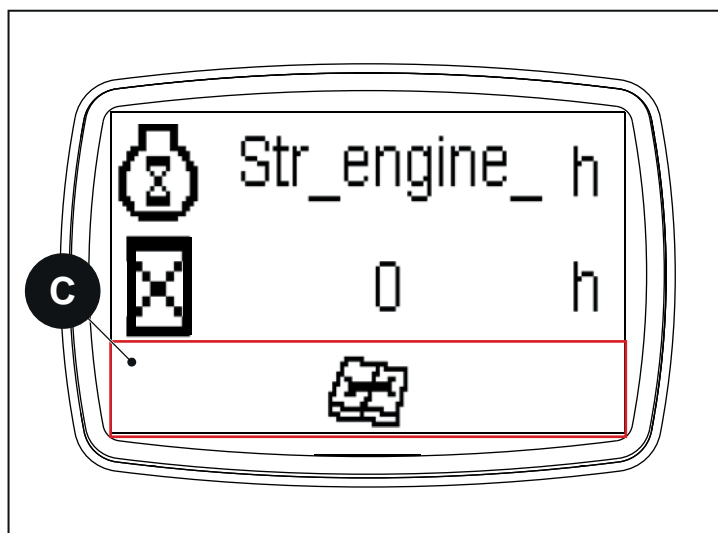


Fig. 4.54

During the 5 second period during which the welcome screen is active, the dial gauges perform a sweep from zero to full scale and all the LED indicators illuminate simultaneously and then extinguish as an instrument test cycle allowing the operator to quickly and easily identify any instrument faults.

! Note

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

4.4.2 Main screen

The following information is displayed in the main screen:

(A) - Vehicle speed

The vehicle speed, expressed to one decimal in km/h or mph, is displayed in this area of the dashboard.

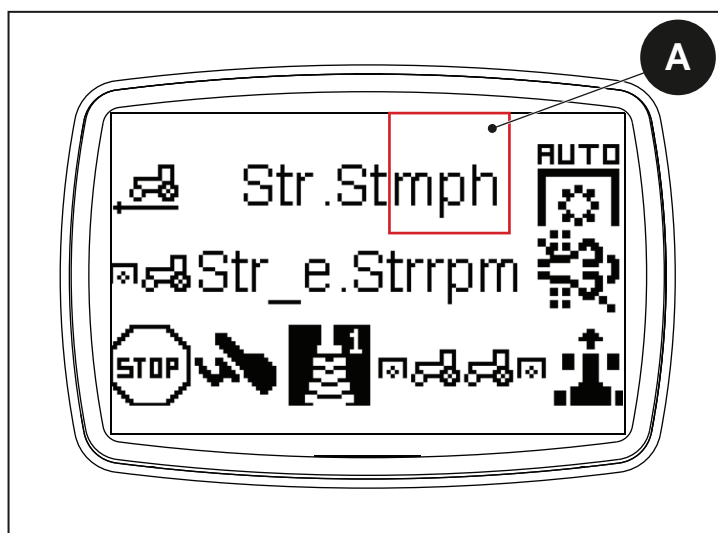


Fig. 4.55

(B) - Engine speed / PTO speed.

The speed value is displayed in area (B) of the dashboard, together with the respective icon and unit of measurement.

Engine speed is displayed by default. Press and hold the Enter button (L24, shown in figure 4.46) down to display the rear PTO speed value, with the relative icon, if the PTO is engaged. Press and hold the Enter button to display the front PTO speed value, with the relative icon, if the PTO is engaged.

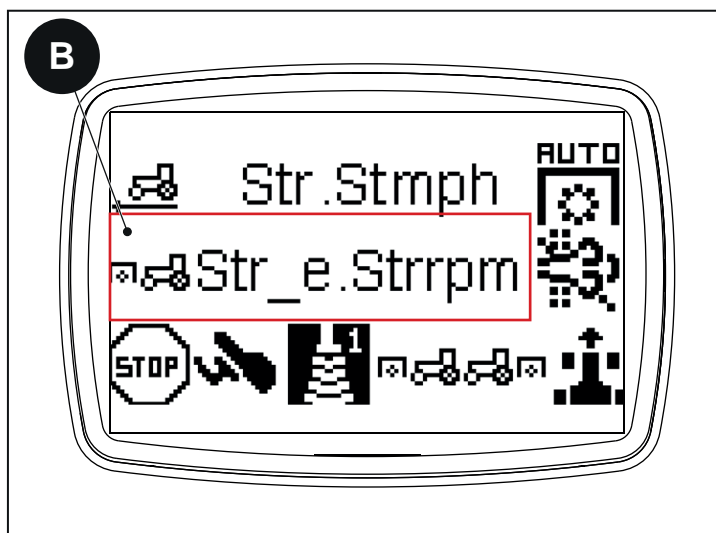


Fig. 4.56

(C) - Active error type

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
	This icon is accompanied by a continuous warning tone. SWITCH THE ENGINE OFF IMMEDIATELY. CONTACT THE GOLDONI TECHNICAL SUPPORT SERVICE.
	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.

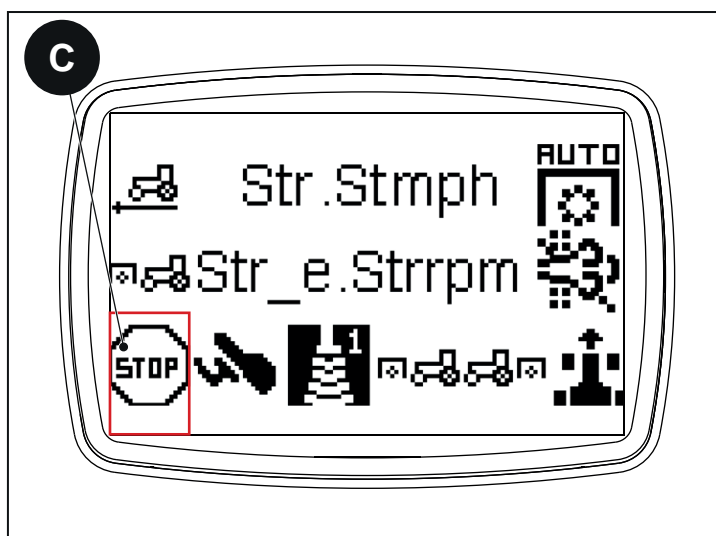


Fig. 4.57

(J) - Engine start interlock

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.

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

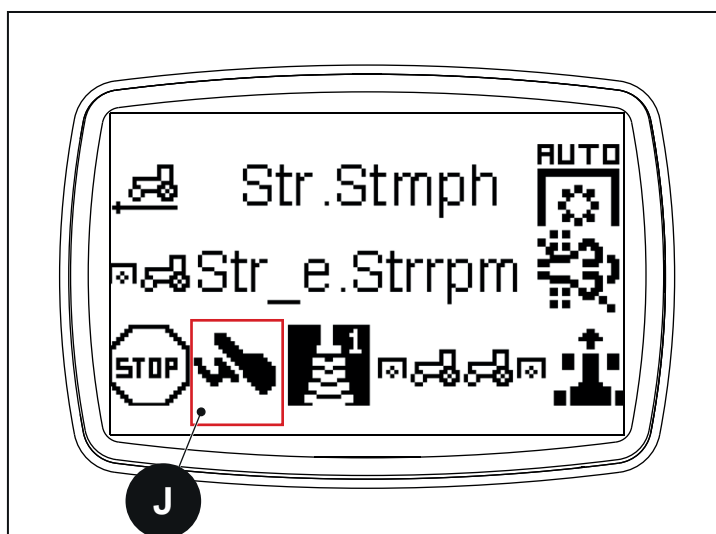














Fig. 4.58

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		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		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 to Neutral or Groundspeed mode
Parking brake engaged sensor		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	Press the clutch pedal

(D) - Electrohydraulic distributors (if present)

The status of the electrohydraulic distributors is displayed in area (D). The following icons are displayed:

Icon	Description
	Distributor 1 selected/coupled
	Distributor 2 selected/coupled
	Distributor 3 selected/coupled
	Distributor 4 selected/coupled
	Distributor 5 selected/coupled
	Distributor 6 selected
	Distributor 1 selected and in float/detent mode

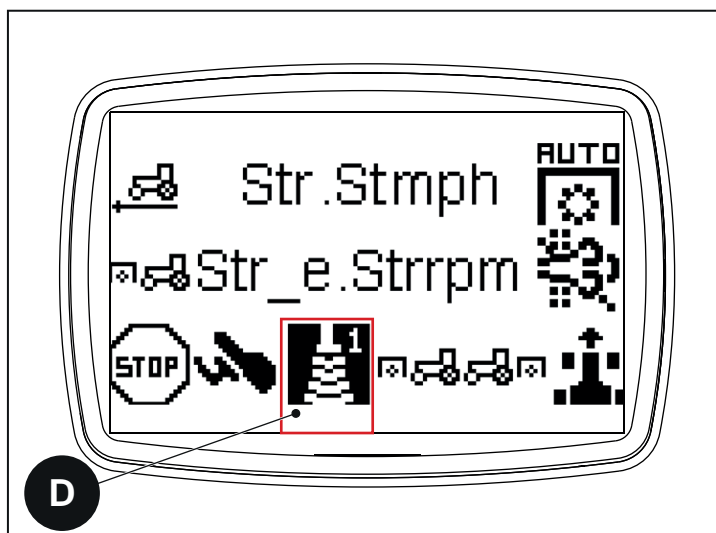



Fig. 4.59

(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
	Front PTO engaged

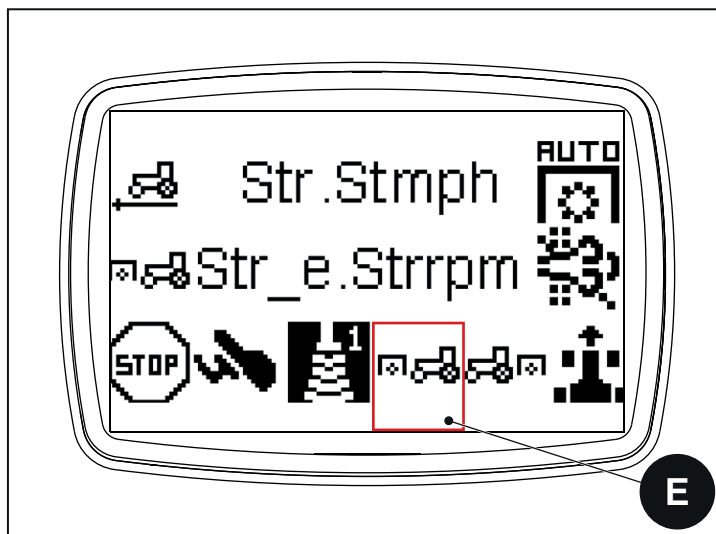




Fig. 4.60

(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
	Rear PTO engaged with speed mode 540
	Rear PTO engaged with speed mode 540E

The icon (F1) is displayed when the rear PTO is disengaged.

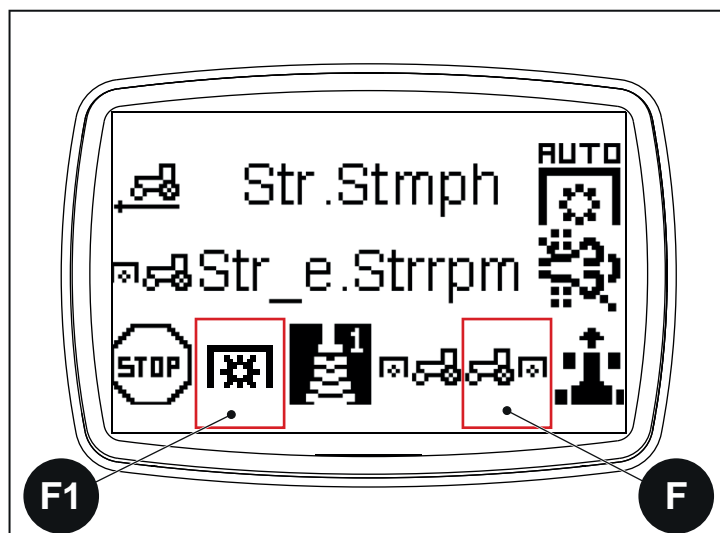





Fig. 4.61

(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
	Reverse shuttle in Neutral
	Reverse shuttle in Forward
	Reverse shuttle in Reverse

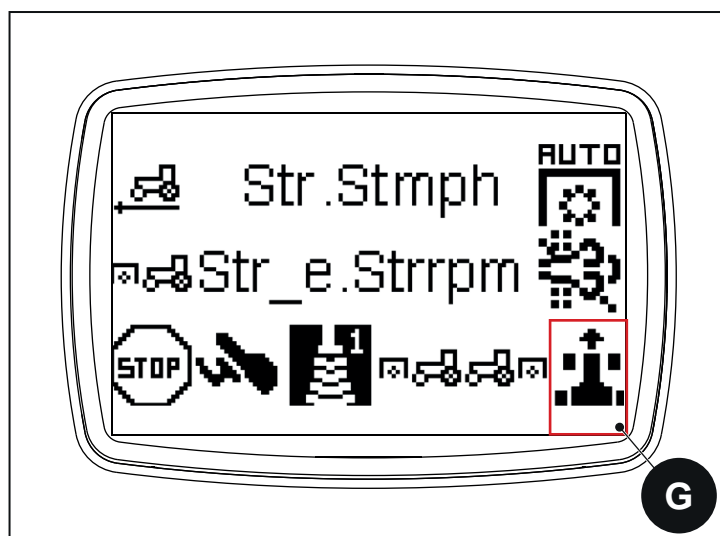



Fig. 4.62

(H) - PTO Auto Mode

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

Icon	Description
	PTO Auto Mode engaged

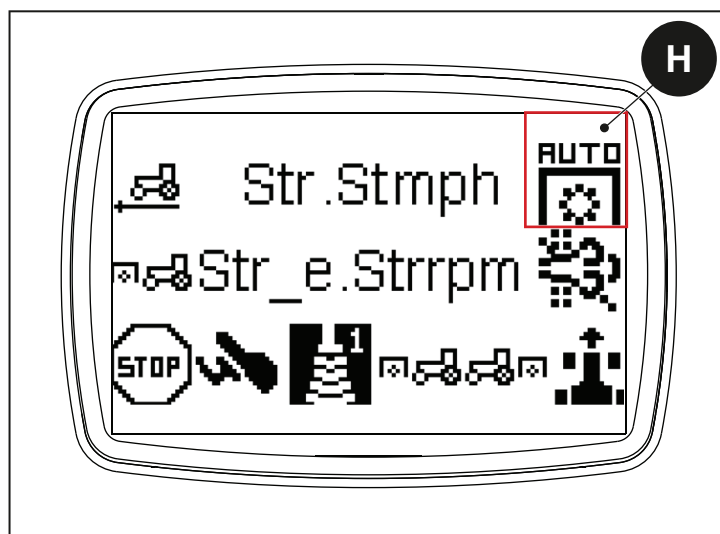




Fig. 4.63

(I) - Regeneration Active/Disabled

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

Icon	Description
	Regeneration disabled
	Regeneration active

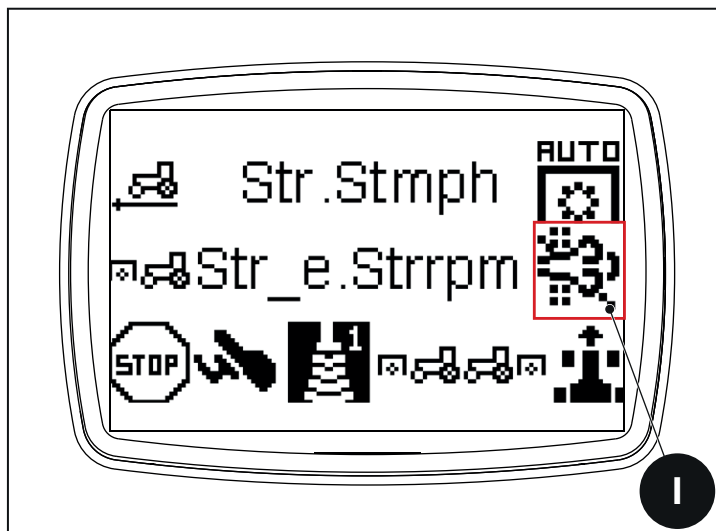


Fig. 4.64

(M) - Unit of measurement

Press and hold the "+" and "-" dashboard buttons simultaneously to toggle between km/h and mph. The selection will be maintained after subsequent key-off and key-on.

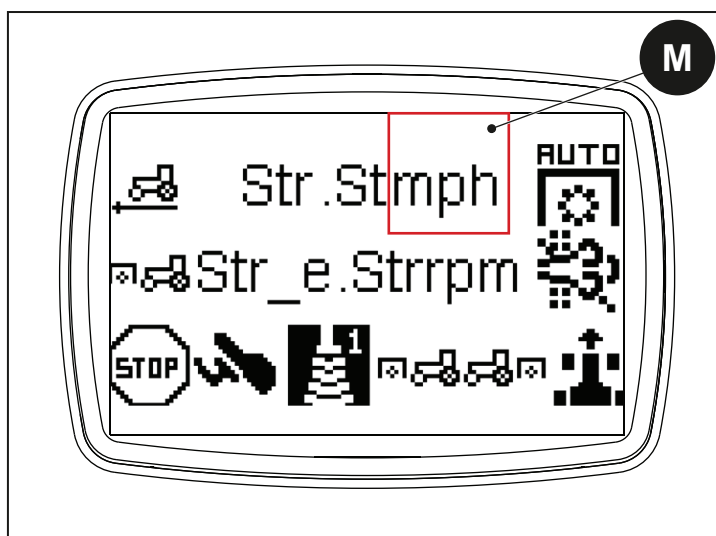


Fig. 4.65

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.

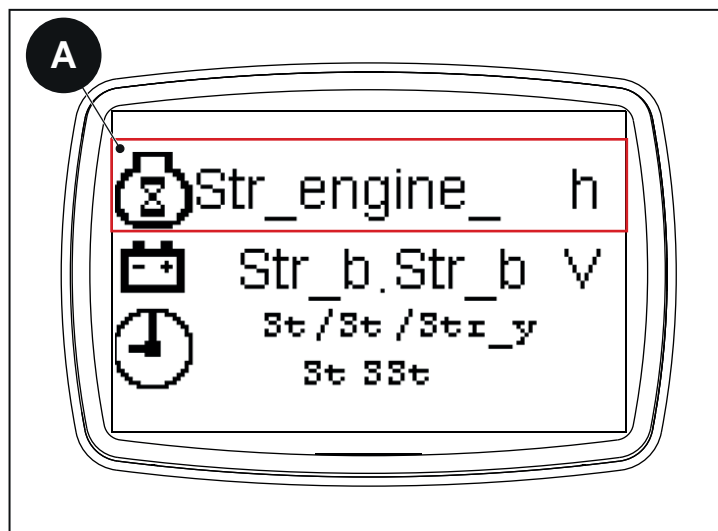


Fig. 4.66

(B) - Battery information

The battery voltage is displayed in this area.

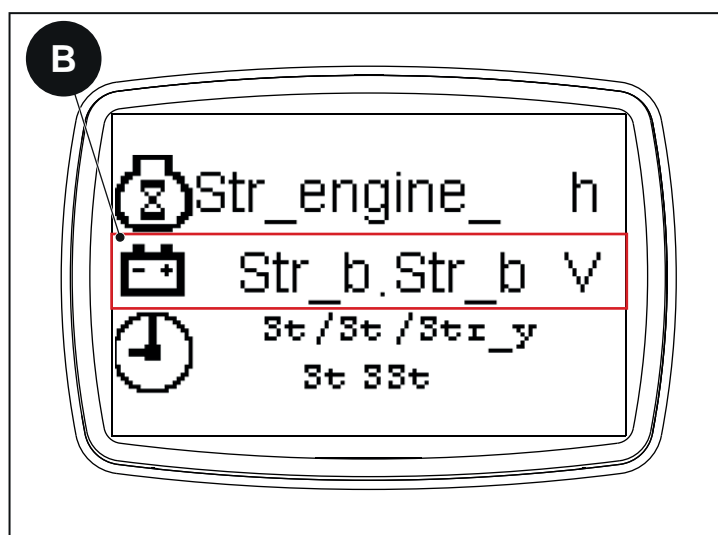


Fig. 4.67

(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.

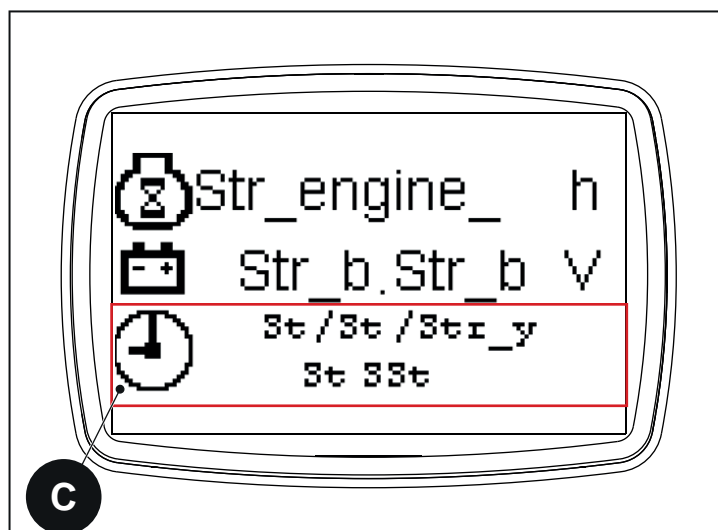


Fig. 4.68

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.

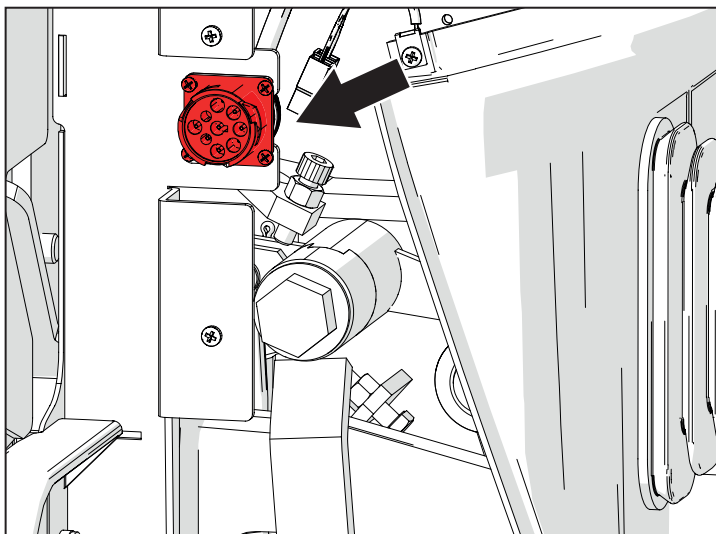


Fig. 4.69

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).

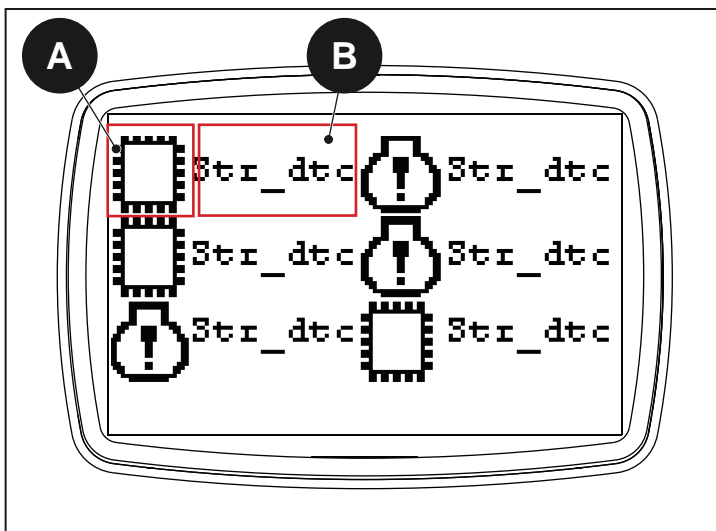


Fig. 4.70



Note

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. The icon of the ECU not communicating with the system (A) is displayed, together with the STOP icon (B). A continuous warning tone also sounds.

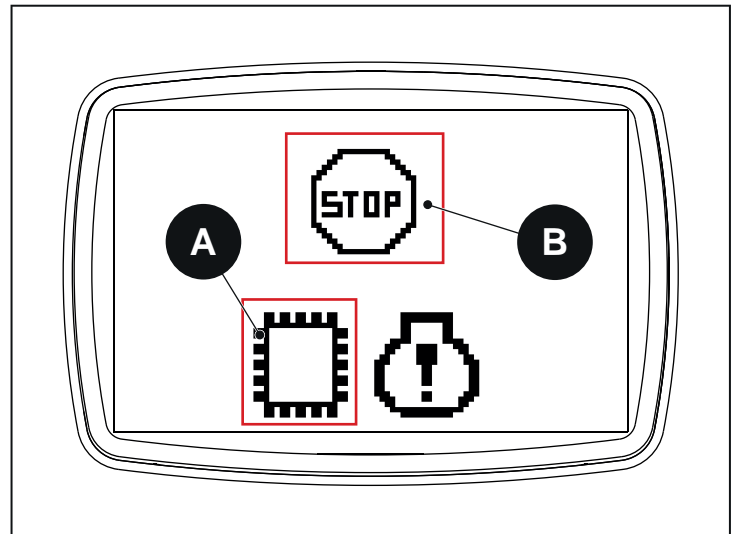
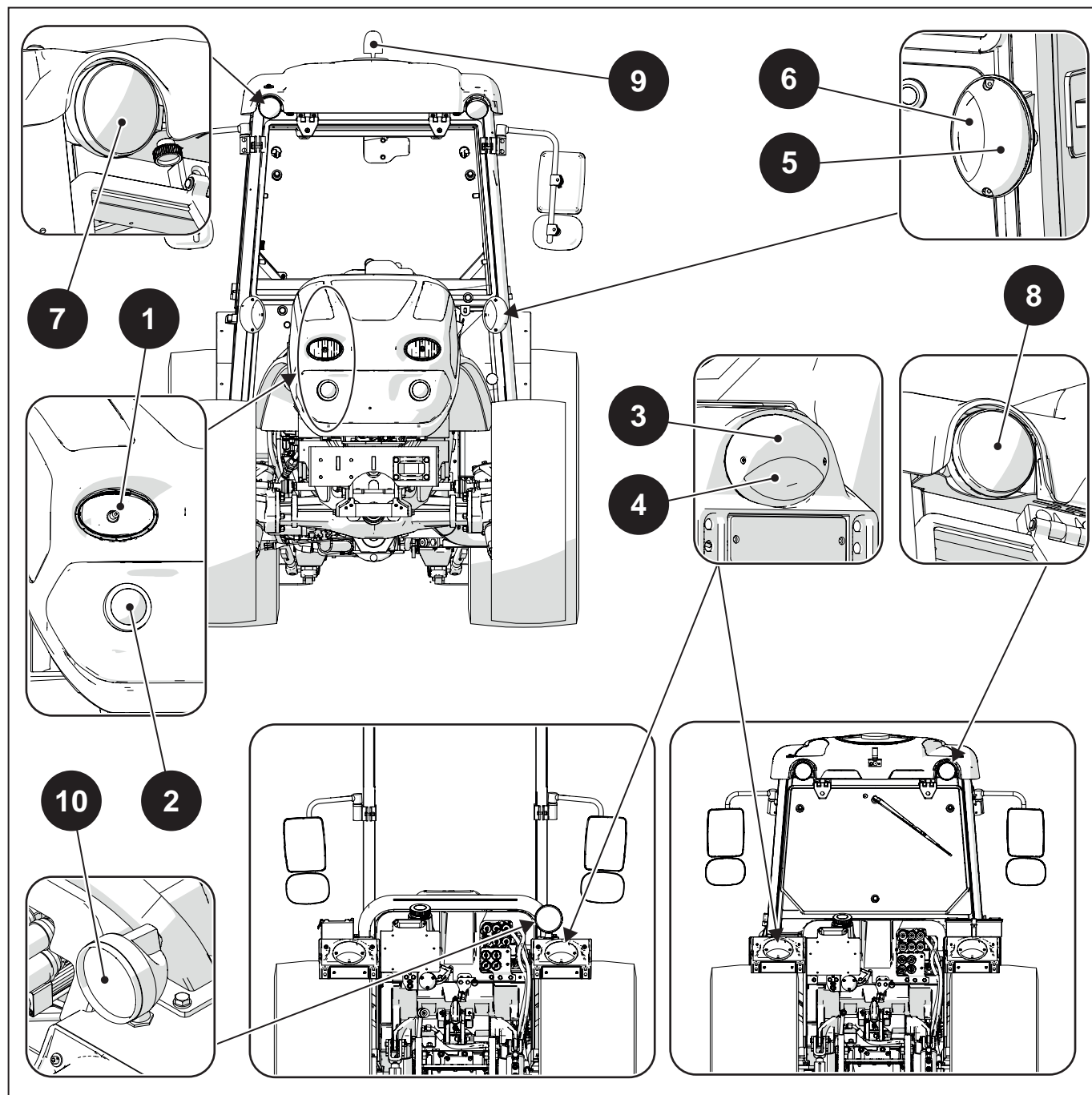


Fig. 4.71

4.5 Lights


Fig. 4.72

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

4.5.1 Running lights, high and low beam headlights

Set the lights selector stalk to position (0) to switch on the running lights.

Set the lights selector stalk to position (1) to switch on the right and left hand running lights.

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

Push the lights selector stalk forwards to switch on the high beam headlights. The relative high beam headlights indicator lamp illuminates on the dashboard.

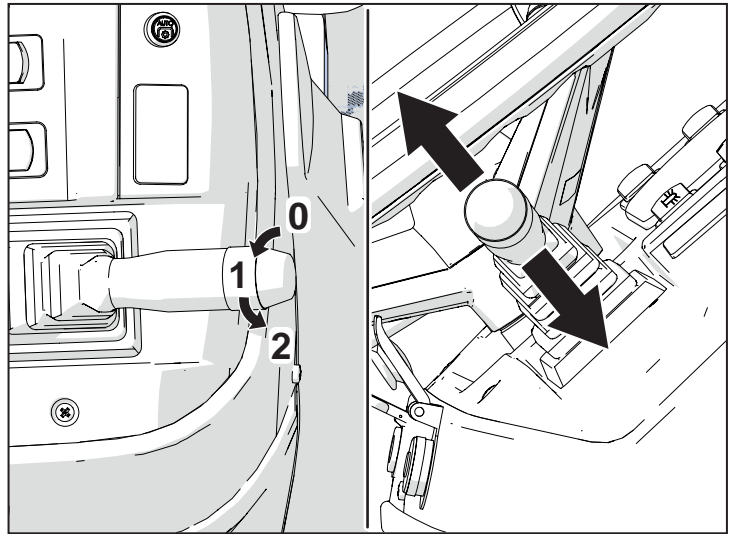


Fig. 4.73

4.5.2 Turn indicator lights

Push the lights selector stalk down to switch on the left hand turn indicators. Pull the stalk up to switch on the right hand turn indicators. The relative indicator lamp on the instrument panel for the turn signal selected flashes.

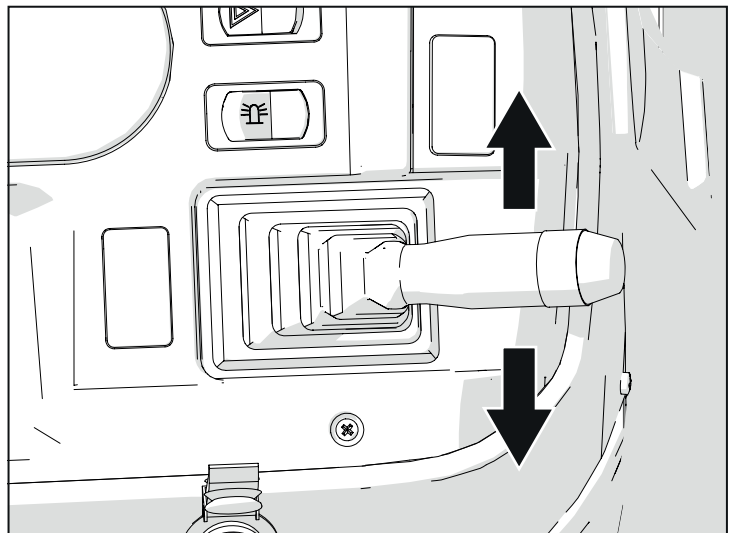


Fig. 4.74

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.

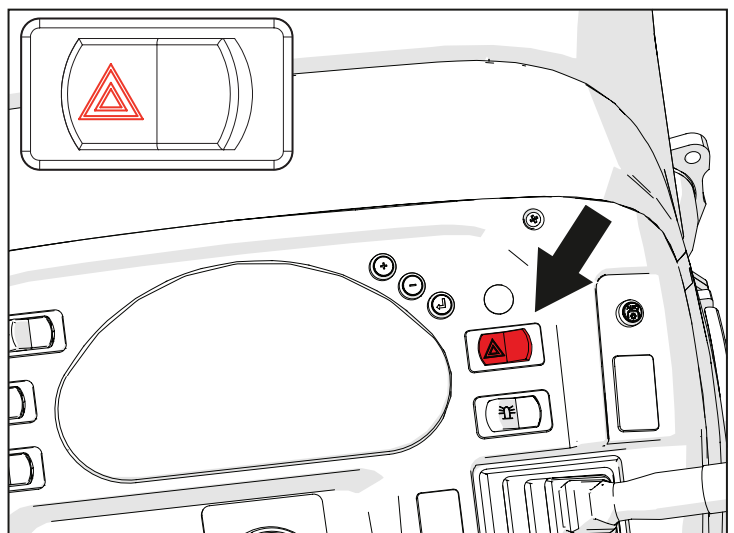


Fig. 4.75

4.5.4 Work lights

The work lights are directional and may be adjusted to illuminate the area required.

Press the respective switch to turn on the work lights. Only works with the ignition switch turned to ON.

ROPS

- 1 - Work light switch

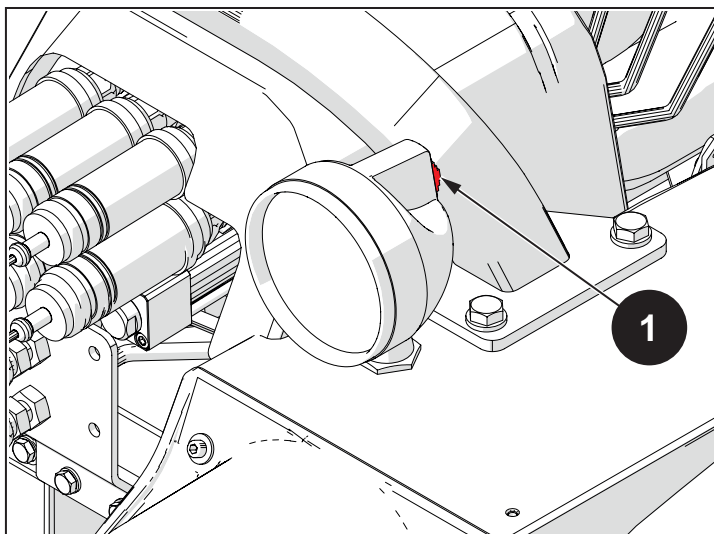


Fig. 4.76

GL11 cab

- 1 - Front work lights switch
- 2 - Rear work lights switch

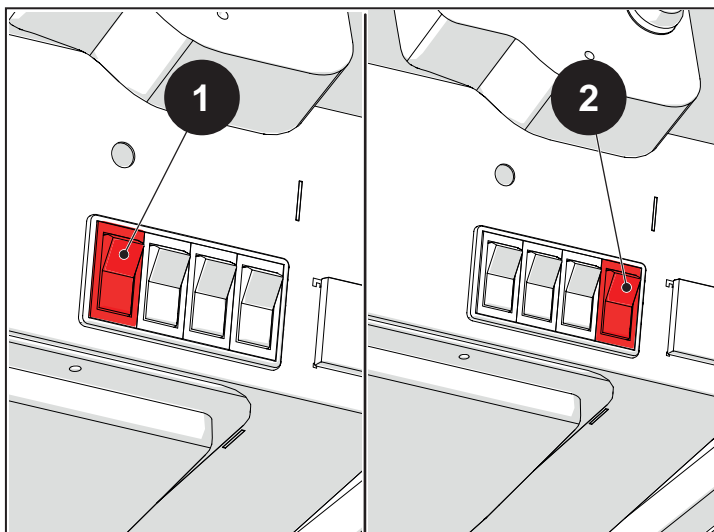


Fig. 4.77

SG1/1 cab

1 - Rear work lights switch



Note

The SG1/1 cab is not equipped with front work lights.

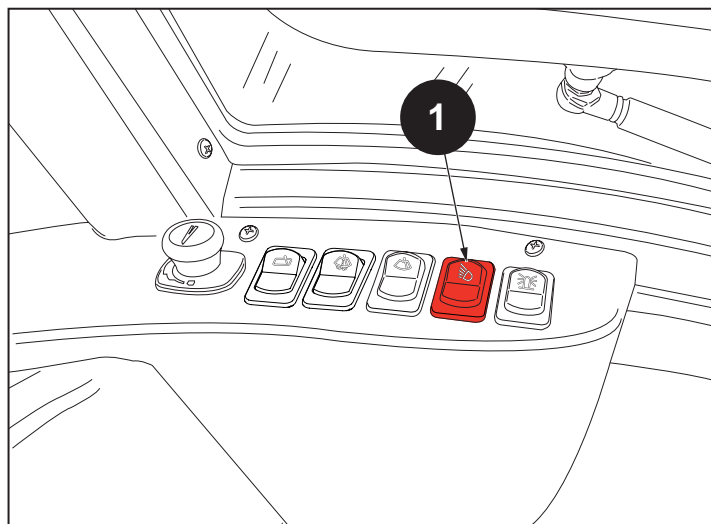


Fig. 4.78

4.5.5 Rotating beacon

Press the button (1) to turn the rotating beacon on.

- A - Roll-bar
- B - GL11 cab
- C - SG1/1 cab

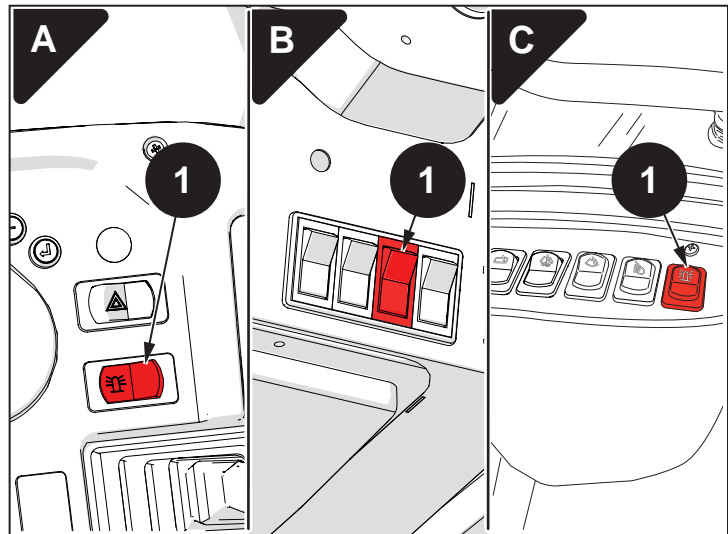


Fig. 4.79

4.5.6 Cabin light unit and switch

Press the indicated switch to turn the cabin light on.



Note

As the cabin light unit is powered directly from the battery, it can be switched on even when the ignition switch is turned off.

- A - GL11 cab
- B - SG1/1 cab

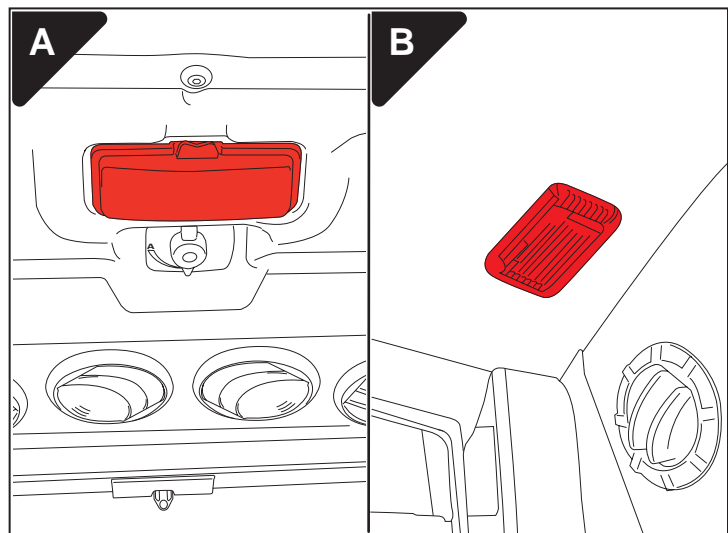


Fig. 4.80

4.6 Air conditioning

4.6.1 Air conditioning controls

The air conditioning control panel consists of the following:

- 1 - blower speed selector dial (electric fan)
- 2 - heating selector dial
- 3 - air conditioning on/off switch (cool air)

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.

GL11 cab

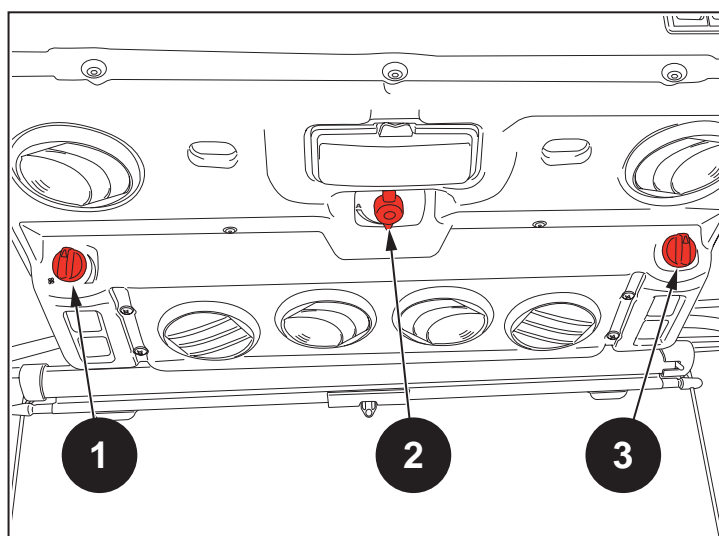


Fig. 4.81

SG1/1 cab

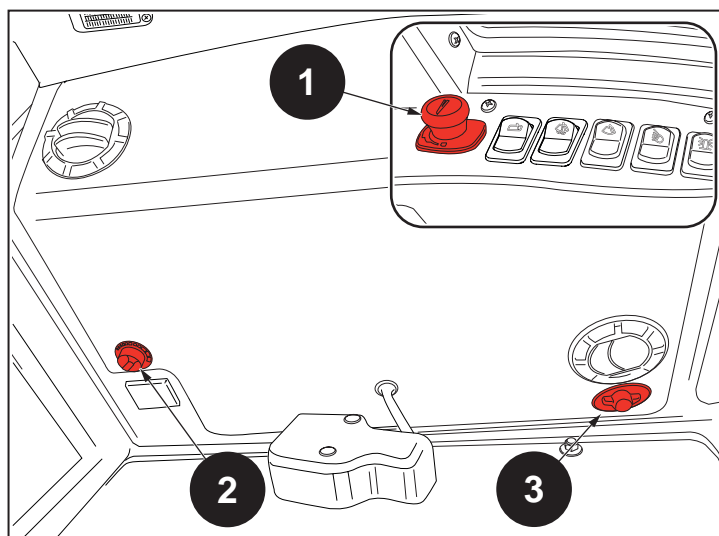


Fig. 4.82



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.



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



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



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.



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 vents
- 5 - and air inlets

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.

GL11 cab

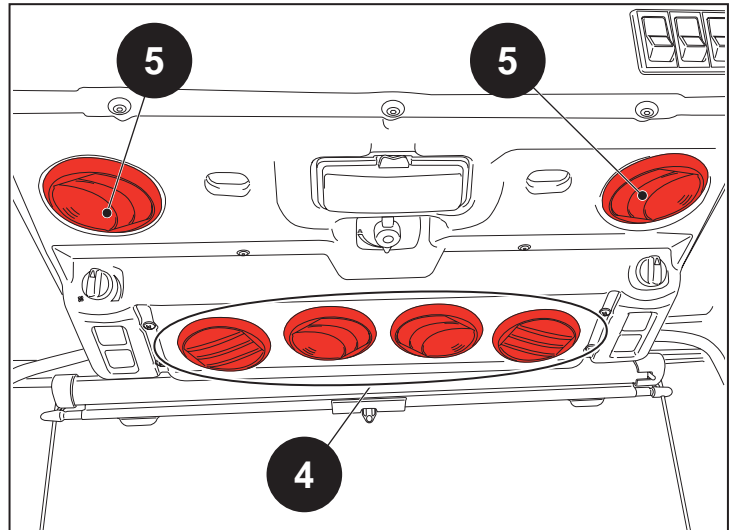


Fig. 4.83

SG1/1 cab

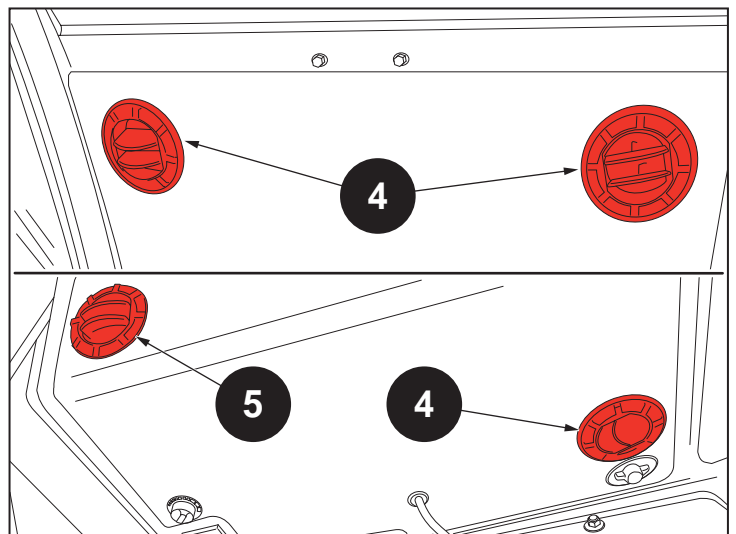


Fig. 4.84

[illegible]

5 : Operating instructions

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5.1 Starting and stopping the engine

5.1.1 Engine start safety systems






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

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



Note

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		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		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 to Neutral or Groundspeed mode
Parking brake engaged sensor		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	Press 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.



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 seat position, as described in the previous chapter.
- Familiarise yourself with the location of all the tractor controls.
- **fasten the seat belt.**

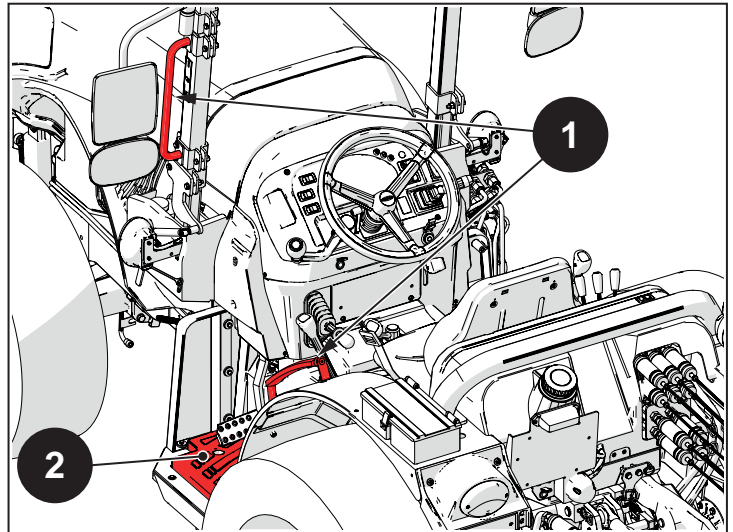


Fig. 5.1

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



Note

The figure shows the cab GL11 (high profile) but the indications are also valid for the cab SG1/1 (low profile), as it has similar points of purchase.

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.



Danger

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 seat position, as described in the previous chapter.
- Familiarise yourself with the location of all the tractor controls.
- **fasten the seat belt.**

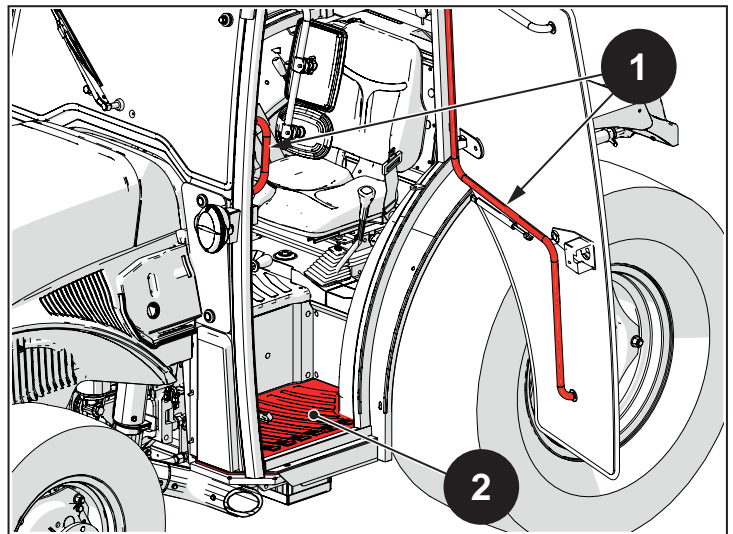


Fig. 5.2

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 parking 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.



Warning

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

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

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

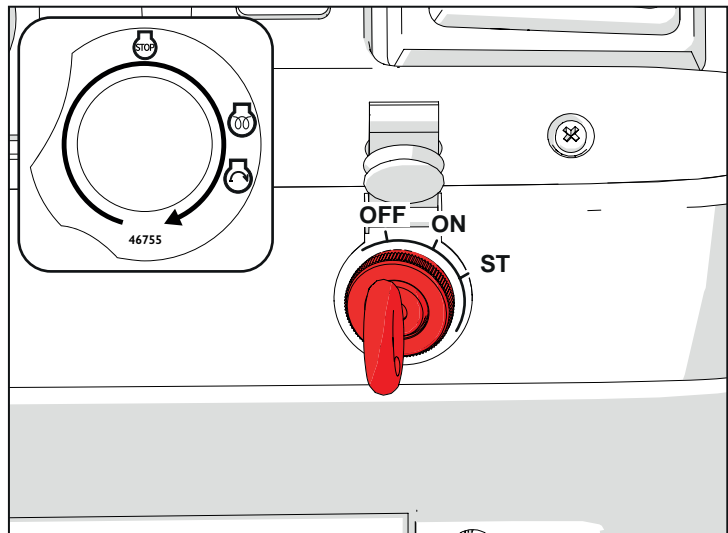


Fig. 5.3

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

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

 **Warning**

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

 **Warning**

Do not run the starter motor for more than 20 consecutive seconds. If the engine 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.

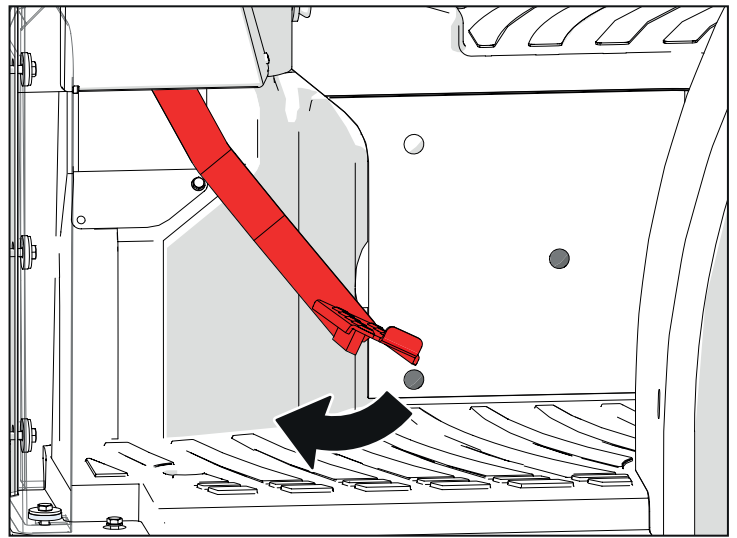


Fig. 5.4

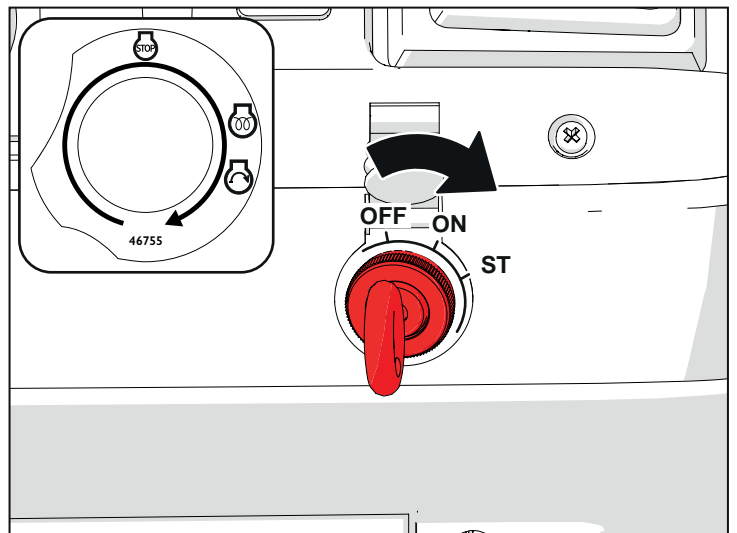


Fig. 5.5

5.1.4.1 Starting the engine at low external temperatures

 **Attention**

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

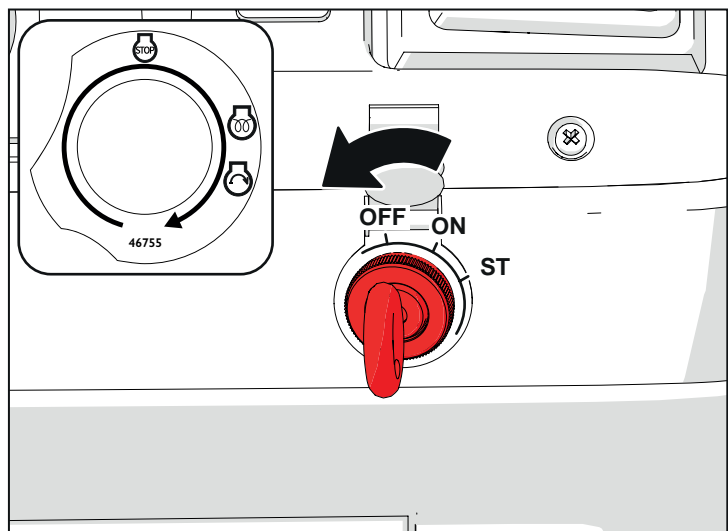


Fig. 5.6

5.1.6 Starting the tractor



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.



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.



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 bypass the start safety switch when starting the tractor. If this component does not work correctly, it must be repaired by the qualified personnel of your dealer.



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



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.).



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



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;

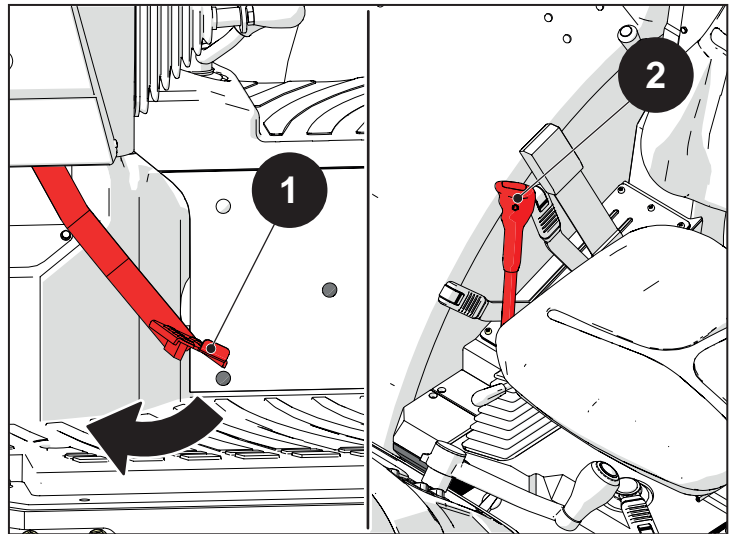


Fig. 5.7

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

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

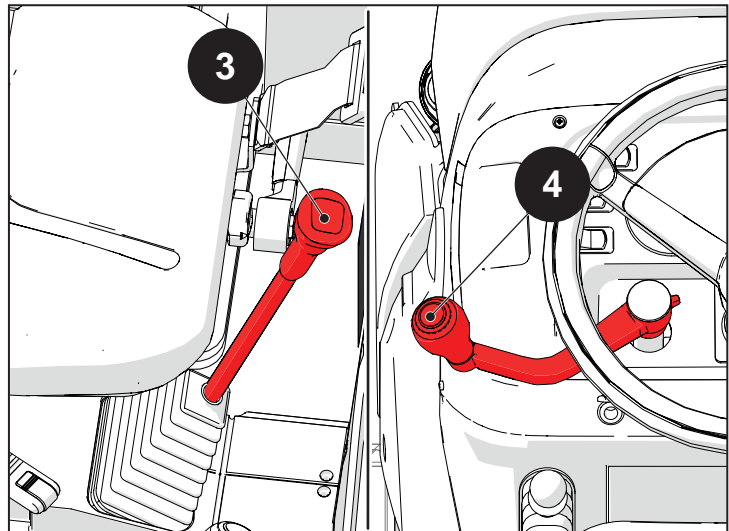


Fig. 5.8

Release the parking brake (5);

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

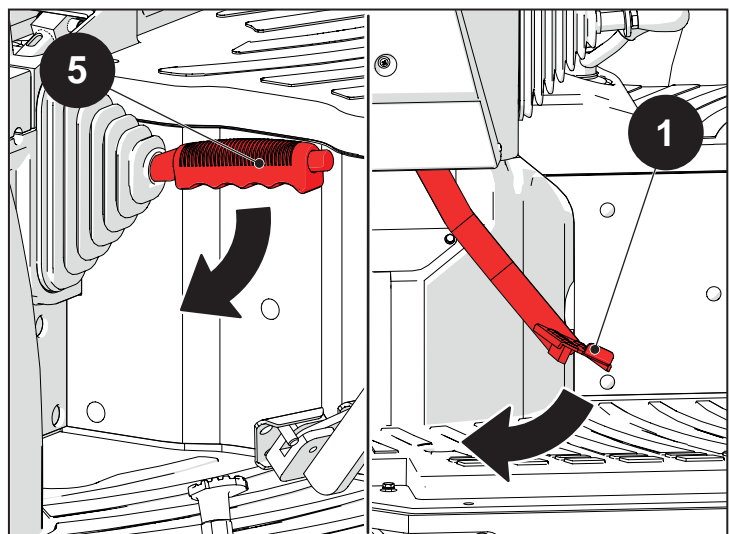


Fig. 5.9

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.

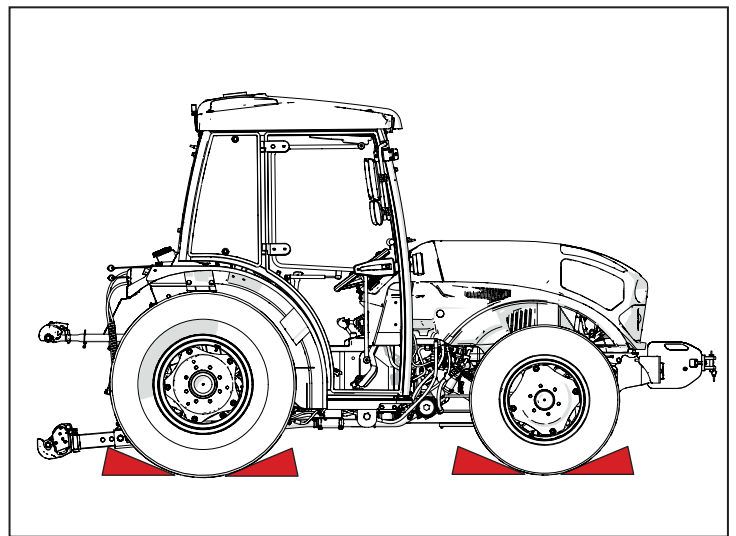


Fig. 5.10

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.

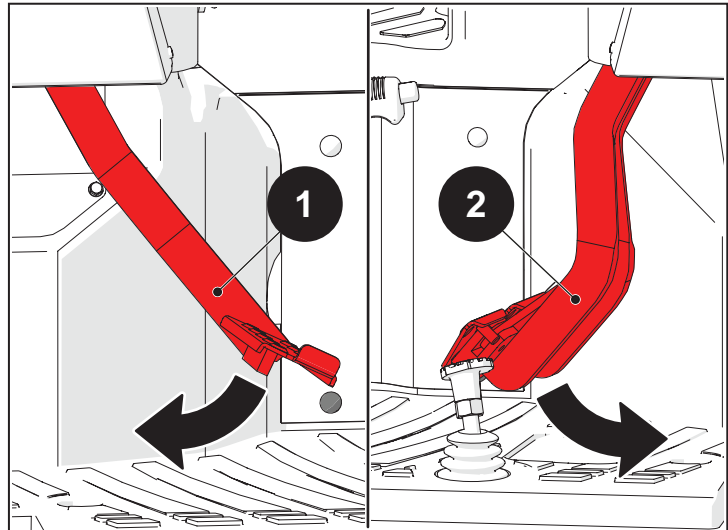


Fig. 5.11

Release the clutch pedal (1);

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

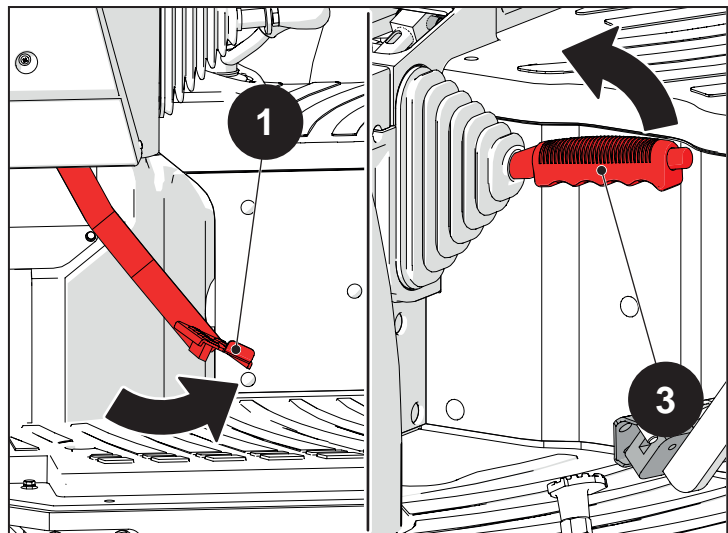


Fig. 5.12

Turn the ignition switch to OFF.

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

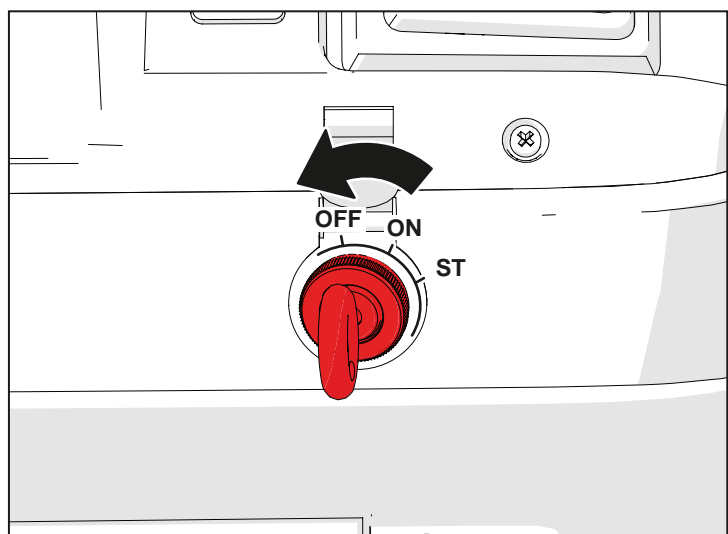


Fig. 5.13

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: this may result in excessive oil consumption and/or oil in the exhaust.

5.2 Diesel particulate filter (DPF) regeneration

5.2.1 Diesel particulate filter regeneration

The diesel particulate filter (DPF) is a device intended to remove harmful particulate from the exhaust of a diesel engine.

This exhaust gas aftertreatment system uses a special filter to capture and retain unburnt particulate. The accumulated particulate in the filter is eliminated at intervals by combustion in "regeneration" cycles.

The duration of the regeneration cycle is approximately between 15 and 30 minutes and depends on the type of engine and the quantity of particulate accumulated in the DPF.

The diesel particulate filter regeneration cycle may be launched automatically or manually.

The diesel particulate filter regeneration switch has three positions:

- Position (A): manual DPF regeneration, requested by the operator when the indicator (1) appears on the display. Keep the button pressed in position (A) until manual regeneration starts; the button automatically returns to position (B) when released.
- Position (B): automatic DPF regeneration.
- Position (C): DPF regeneration disabled.

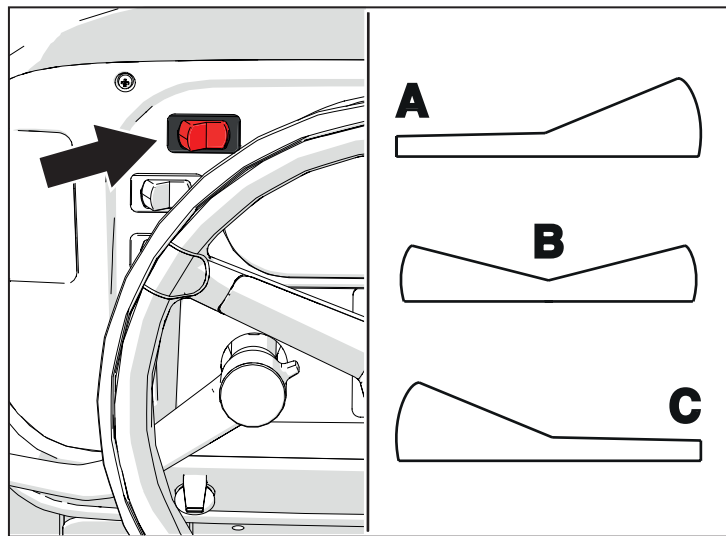


Fig. 5.14

A symbol on the LCD display of the instrument panel notifies the operator when the automatic regeneration cycle starts. The purpose of this is to warn the operator of the high temperatures reached by the exhaust during the process.

The automatic regeneration cycle does not affect engine performance. The operator may continue to use the vehicle as normal while the regeneration cycle is in progress.

Certain situations may prevent the automatic regeneration cycle from completing (e.g. in the event of repeated engine stops and restarts or prolonged periods at idle speed). In these cases, the procedure must be repeated.

If automatic or manual regeneration mode is selected, the symbol (1) on the LCD display appears when a regeneration cycle is started.

The symbol disappears once the procedure is complete.

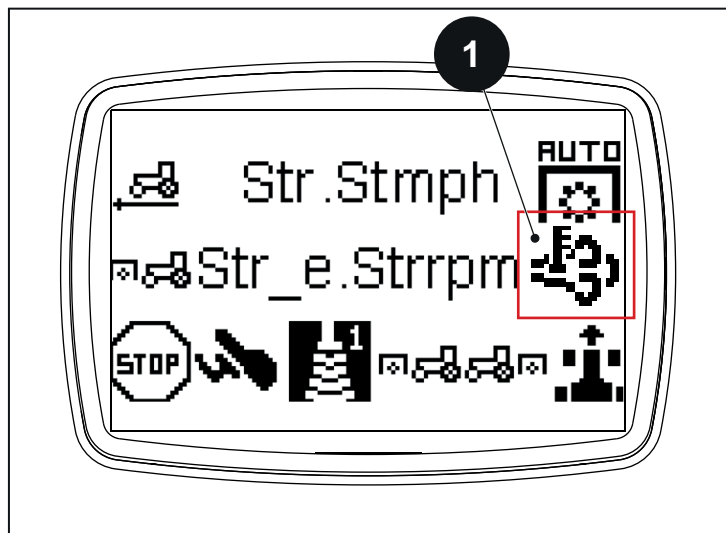


Fig. 5.15



Warning

The operator may continue to drive the vehicle as normal while regeneration is in progress.

Warning

If the filter regeneration process is not completed successfully automatically or performed manually when requested, the functionality of the filter itself may be compromised. If the regeneration cycle request is ignored repeatedly, engine power will be significantly reduced and the filter itself will be damaged beyond repair, and will have to be replaced with a new component by the dealer.

Danger

Extremely hot gases are expelled from the exhaust during the regeneration cycle, These gases may cause damage to property and/or personal injury. Regeneration must always be performed outdoors at a safe distance from any potentially flammable materials (e.g. hay, straw, dry leaves) and from persons or animals.

Keep the undercowl area clean at all times, removing all potentially flammable debris and materials (hay, straw, dry leaves etc.).

If regeneration is started in an unsafe location, the cycle may be disabled by setting the switch to (C), see figure 5.14. The symbol (2) appears on the LCD display if regeneration is disabled.

Launch the regeneration cycle as soon as the vehicle is in a safe place.

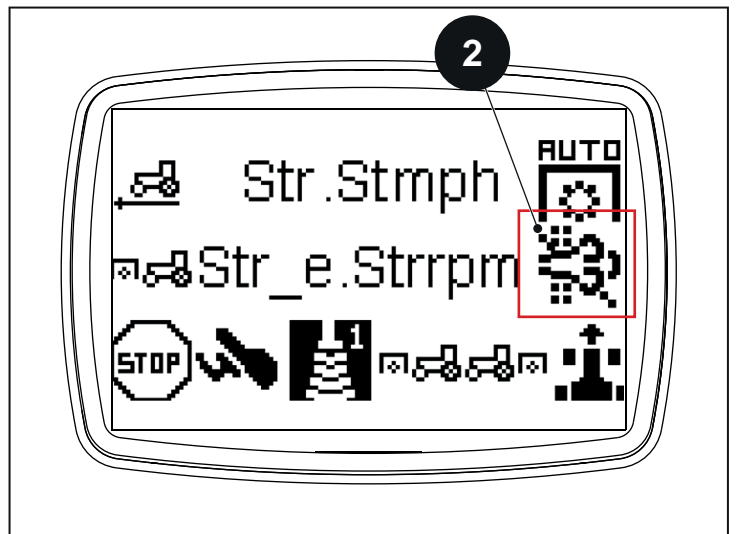


Fig. 5.16

Continuing to use the tractor with regeneration disabled will eventually clog the DPF, resulting in reduced engine performance. This condition is indicated by the symbol (3) on the instrument panel, accompanied by an audible warning signal.

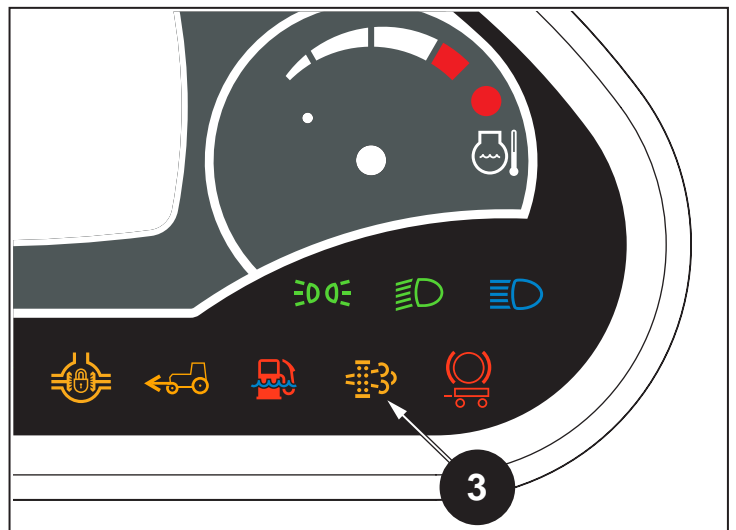


Fig. 5.17

! Note

If an excessive number of regeneration cycles are performed, it will be necessary to change the engine oil at a shorter interval than indicated in the maintenance schedule.

The necessity to change the oil is indicated by the alarm symbol on the instrument panel display. This situation does not result in derated engine power, however.

The regeneration cycle may be launched by pressing and holding the button in position (A) until the regeneration starts; the button automatically returns to position (B) when released. This is the "Manual regeneration" cycle.

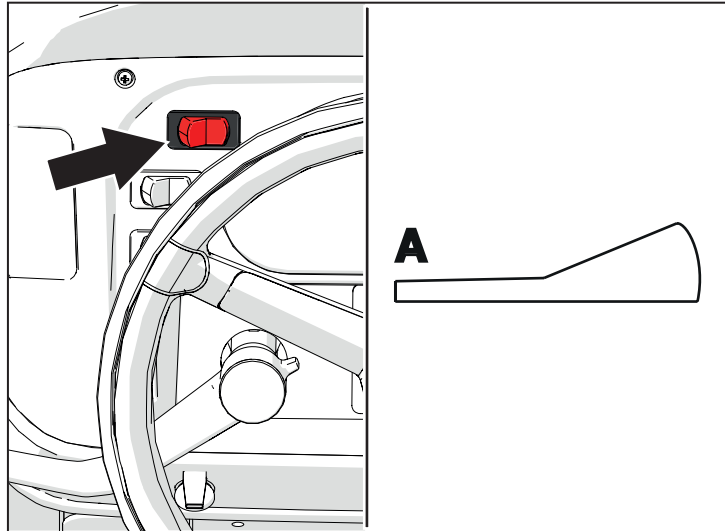


Fig. 5.18

! Danger

Manual regeneration cycles must be performed with the machine stationary. Park the tractor outdoors at a safe distance from any potentially flammable materials (e.g. hay, straw, dry leaves) and from persons or animals.

Do not remain on board the tractor during manual regeneration.

Never leave the machine unattended for any reason during the cycle.

! Danger

Only run the engine in a well ventilated area to prevent the risk of exhaust gas inhalation. The engine exhaust is poisonous.

! Danger

The exhaust produced during regeneration becomes extremely hot and constitute a fire hazard if they come into contact with flammable materials. The machine must be parked outdoors during the procedure.

! Danger

The diesel particulate filter regeneration cycle must not be performed with the tractor parked on surfaces with flammable materials which could catch fire in the event of contact with parts of the exhaust system.

! Danger

The silencer becomes extremely hot during the regeneration cycle. The silencer must be at a safe distance from objects and persons during the cycle. Do not use exhaust gas extraction systems applied to the silencer.

! Note

The coolant temperature must be at least 65°C.

Engine speed will increase automatically to approximately 2000 rpm during the cycle.

The engine returns to idle speed once the DPF regeneration cycle is complete.

Turn the engine off and on again once the manual regeneration cycle is complete.

5.2.2 DPF regeneration cycle strategy

5.2.2.1 DPF operating thresholds



Note

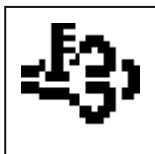
Allowing the regeneration cycle to complete will reduce the mass of particulate in the filter to a value below the minimum threshold.

Particulate mass below 85%

Particulate accumulation starts.

Particulate mass between 85% and 100%

Automatic regeneration requested; if regeneration starts, the relative indicator illuminates:



Particulate mass between 100% and 130%

The following indicator illuminates:

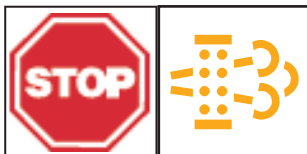


The operator must deactivate the regeneration disable function to permit launch of automatic regeneration. Automatic regeneration requested; if regeneration starts, the relative indicator illuminates:



Particulate mass over 130%

Error code "3014" is generated and the following indicators illuminate:



Engine torque is limited. Automatic regeneration is disabled. The operator must launch the service regeneration cycle manually as soon as possible.



Warning

Continuing to use the tractor without performing a regeneration cycle may damage the diesel particulate filter.

If the engine fault warning indicator remains lit after the regeneration cycle is complete, contact an authorised GOLDONI service centre.

5.2.2.2 Automatic regeneration

Regeneration cycle duration: 15 to 30 min., depending on usage conditions of vehicle.

Conditions required to permit regeneration cycle:

- Coolant temperature > 25°C
- Engine running for a least 10s
- Engine speed > 950 rpm.

The automatic regeneration cycle is interrupted if any of the following conditions occur:

- Engine at idle speed for more than 90s
- Overrun time > 180s (driving in throttle closed state, such as when coasting: downhill)
- DPF inlet side temperature > 700°C
- Regeneration disable button (optional)

Regeneration is disabled for 2 hours if the duration of the regeneration cycle exceeds 30 min. (e.g. in the case of very heavy usage).

5.2.2.3 Manual service regeneration cycle

Regeneration cycle duration: 15 to 20 min. at 2000 rpm.

Manual regeneration launched by the operator is permitted if the following conditions are met:

- Coolant temperature > 65°C
- Vehicle speed = 0 km/h
- Throttle pedal = 0%
- No ancillary utility connected (also switch off air conditioner).
- Parking brake engaged
- Transmission in neutral
- Idling

Press and hold the relative button for 2 seconds to launch regeneration.



Note

Contact an authorised GOLDONI service centre if the regeneration cycle does not start.

The manual regeneration cycle is interrupted if any of the following conditions occur:

- Coolant temperature < 65°C
- Vehicle speed > 0
- Throttle pedal > 0%
- Any auxiliary utility operating
- Clutch disengaged
- Engine speed > 2100 rpm.
- Fuel temperature > 100°C
- DPF inlet side temperature > 700°C
- Regeneration cycle duration > 1500s
- After 300s, if DPF inlet side temperature < 520°C
- After 300s, if DOC inlet side temperature < 250°C

5.3 Transmission controls

5.3.1 Hand throttle



Warning

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 (1) lets the operator manually set 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.

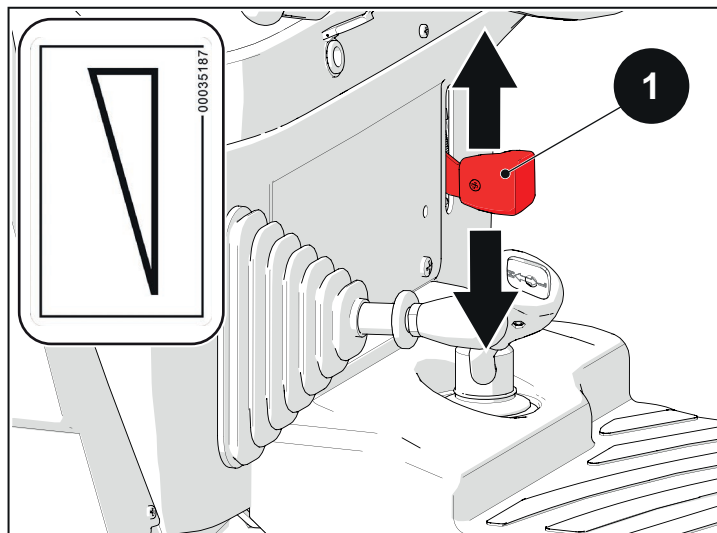


Fig. 5.19

5.3.2 Foot throttle pedal



Warning

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.

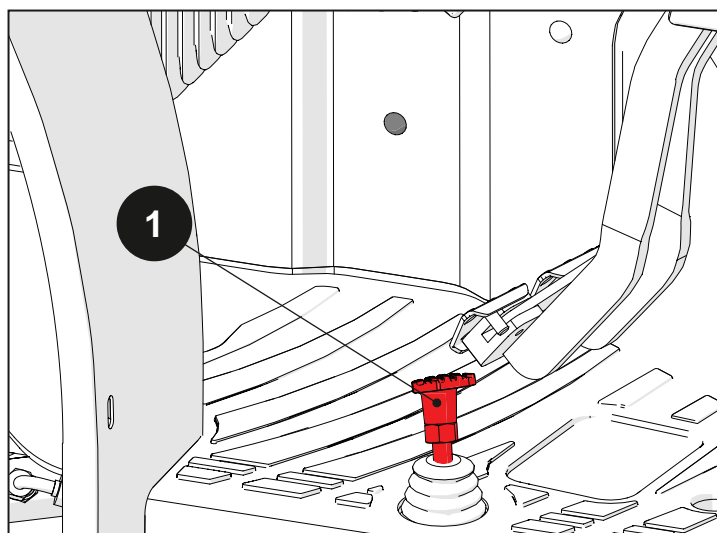


Fig. 5.20

5.3.3 Clutch pedal



Danger

NEVER travel along any slope with the clutch disengaged.



Warning

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



Warning

Lengthy clutch disengagements could wear out the thrust bearing.

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

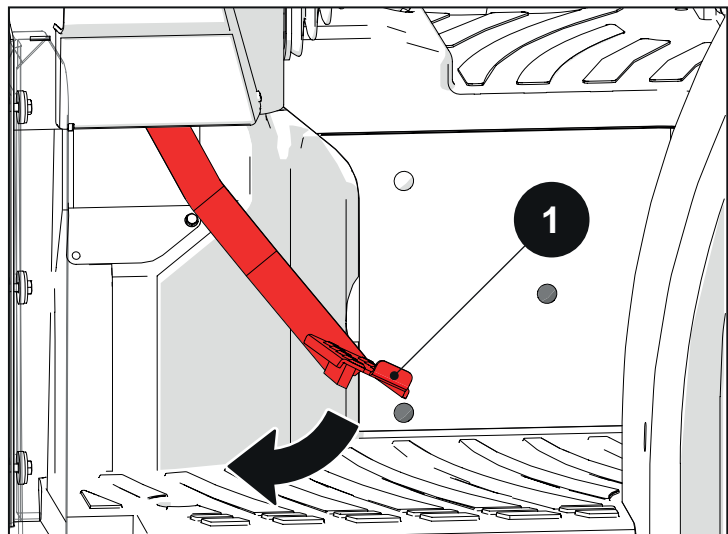


Fig. 5.21

5.3.4 Reverse shuttle lever

This lever is used to select the drive direction of the tractor:

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

To select the drive direction: stop the machine, press the clutch pedal, select the required drive direction and then gradually release the clutch pedal.

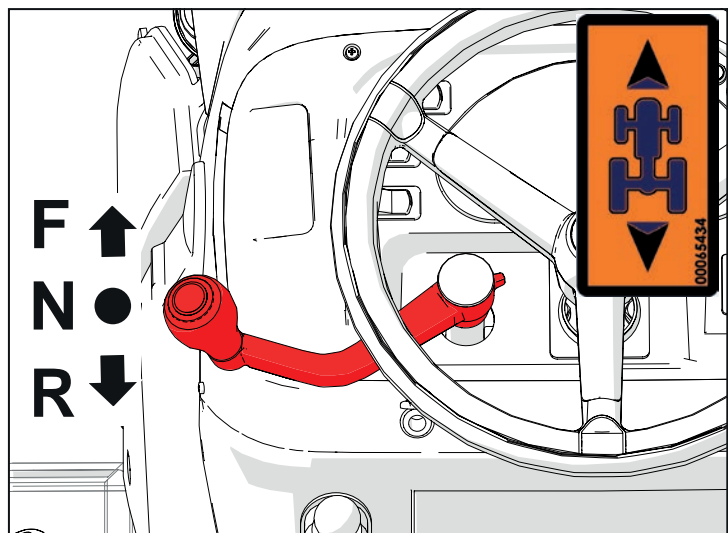


Fig. 5.22







Attention

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

5.3.5 Range selector lever

The range selector lever (1) 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: stop the machine, press the clutch pedal to disengage the transmission clutch, select the required range with the lever and then gradually release the clutch pedal.

	Slow
	Medium
	Fast
	Neutral

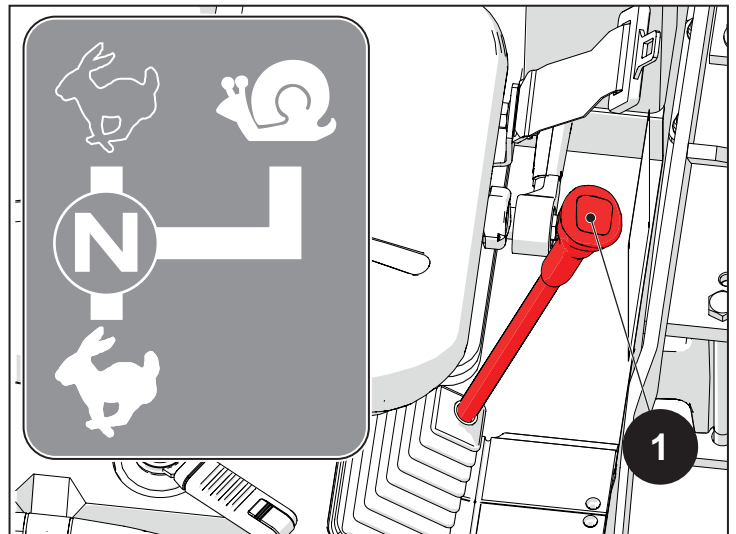


Fig. 5.23

5.3.6 Gear lever

The gear lever lets the driver select from four different synchronised speeds in both forward and reverse drive directions. The positions of the gears are identified by numbers on the gear knob.

To change gear, press the clutch pedal to disengage the transmission clutch, select the required gear and then gradually release the clutch pedal.

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

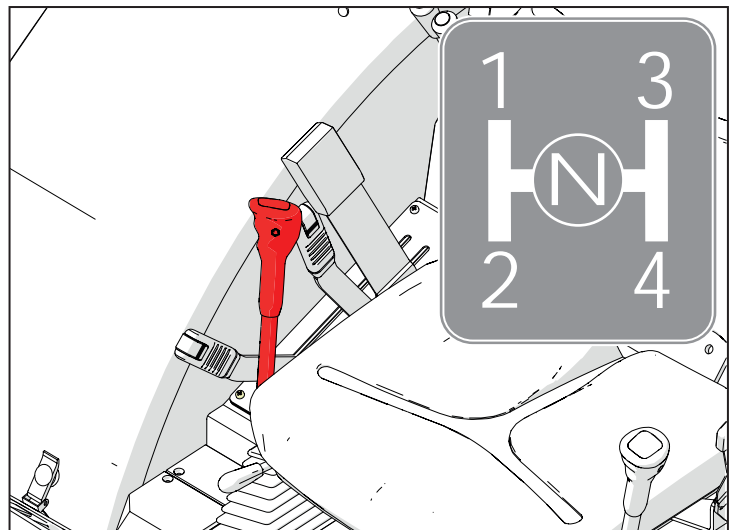


Fig. 5.24

5.3.7 Mode selector

This model offers two transmission modes:

- H - High - normal gears
- L - Low - low range gears (-20%)

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

Push the lever (1) forwards to select L mode (Low - low range gears).

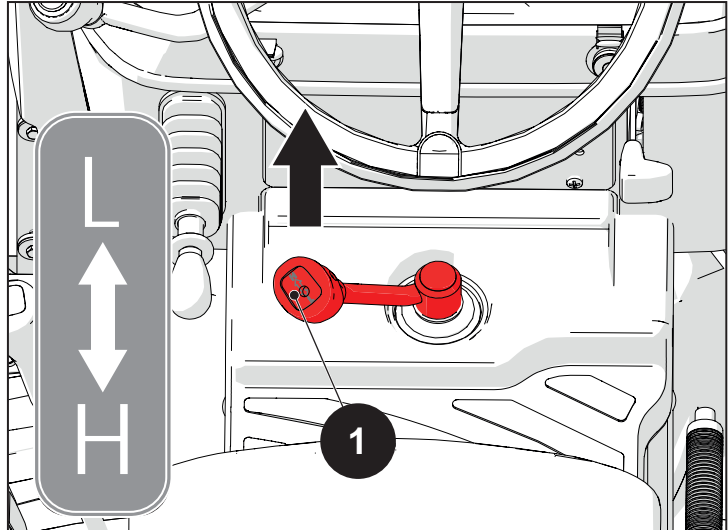


Fig. 5.25

Pull the lever (1) back to select H mode (High - normal gears).

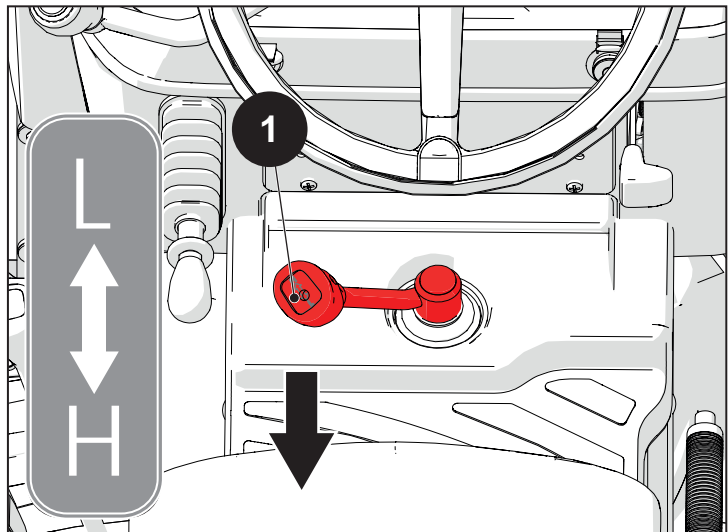


Fig. 5.26



Note

The 20% underdrive mode is only selectable in forward drive (reverse shuttle disengaged).

5.3.8 Differential lock

The differential lock system consists of differential locks installed in the front and rear axles of the vehicle and 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 10 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 button (1) on the left hand side of the dashboard.

Press the button (1) to engage. The relative symbol (2) flashes on the display.

Note

The differential lock function may **only** be engaged, by pressing the button (1), at ground speeds below 9 km/h.

If engaged, the differential lock is automatically disengaged if the ground speed exceeds 10 km/h; press the button (1) again to re-engage the function.

Press the button (1) again to disengage the differential lock. The symbol (2) on the display extinguishes.

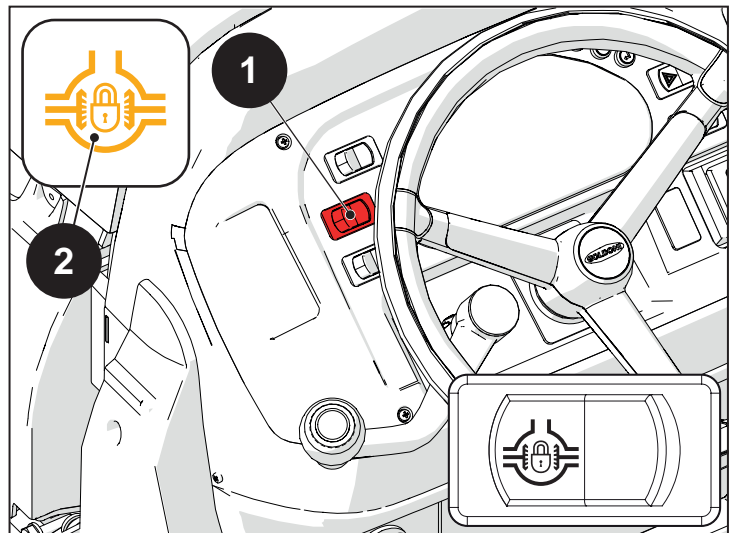


Fig. 5.27

The differential lock is automatically disengaged if the driver presses the brake pedals (3). Press the button (1) again to re-engage the function.

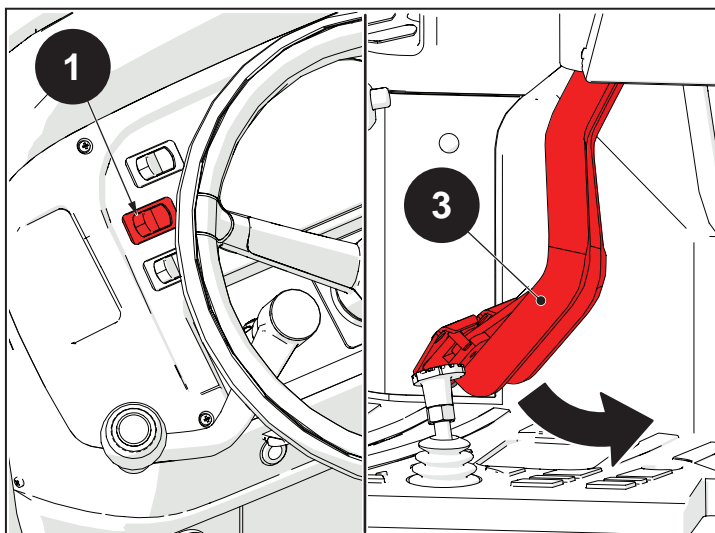


Fig. 5.28

5.3.9 Four-wheel drive

Use four wheel drive to increase traction.

Note

For safety, four wheel drive is engaged by default when the tractor is switched off, when the tractor is held in a stationary position by the parking brake engaged, or when the service brake pedals are pressed.

When the tractor is started, the four wheel drive remains engaged or is disengaged according to the operating mode that has been set.

Danger

To engage four wheel drive, ALWAYS depress the clutch pedal, bring the tractor to a standstill (wheels not turning) and reduce engine speed to idle.

Danger

The four wheel drive system allows the vehicle to negotiate steeper terrain. Working on steeper gradients significantly increases the risk of overturning. Use the tractor and choose your manoeuvres with extreme caution.

Warning

Using four wheel drive considerably increases tyre wear. It is not recommended when driving on roads or on particularly hard terrain.

Four wheel drive (version with 2 functions)

The 4WD system is controlled from the button (1) on the left hand side of the dashboard.

To engage, press the clutch pedal (3) and then press the four wheel drive button (1). Release the clutch pedal (3) slowly. The relative symbol (2) illuminates on the display.

To disengage 4WD, press the clutch pedal (3) and then press the button (1) again. The symbol (2) on the display extinguishes.

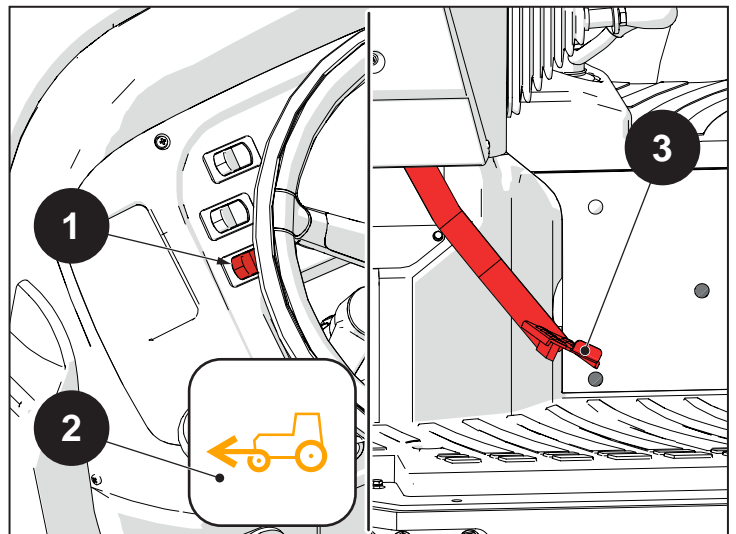


Fig. 5.29

Four wheel drive (version with 3 functions)

The four wheel drive system has a number of operating modes. The button (1), situated on the left hand side of the dashboard, controls which mode has been selected: press it to scroll through the operating modes available and select the one you want.

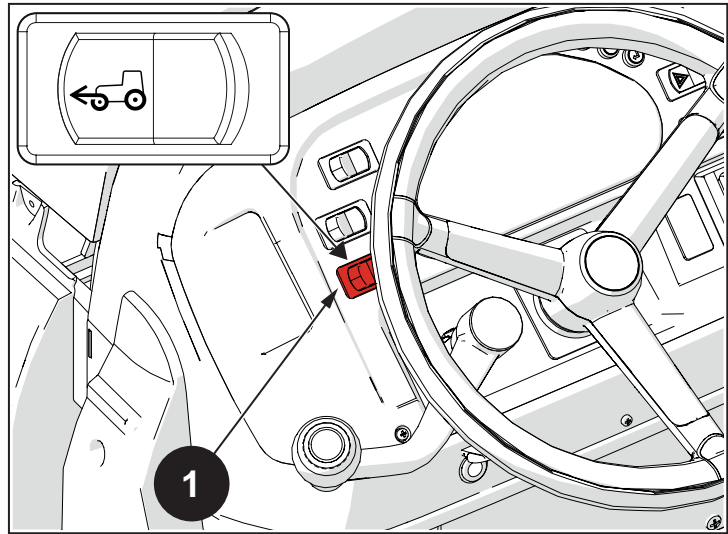


Fig. 5.30

The 4WD modes available are summarised in the following table.

Order	Operating mode	Description	Instrument cluster indicator	Icon on display
1	DISABLED (2 wheel drive)	Not engaged	Off	Off
2	PERMANENT	Engaged permanently at any ground speed	On	Off
3	AUTO	Engages automatically at ground speeds between 0 and 12 km/h, and disengages automatically when ground speed exceeds 25 km/h. Once disengaged, 4WD engages again automatically only once ground speed returns to 12 km/h or lower.	On while 4WD is engaged; otherwise off.	On
-	-	In any mode, 4WD engages automatically when the brake pedals are pressed together; 4WD is not engaged automatically if only one brake pedal is pressed.	On while 4WD is engaged	Off

Four wheel drive selection procedure.

- When the tractor is not in operation, the four wheel drive is always engaged. When the ignition key is turned to ON, the DISABLED operating mode is automatically selected.
- Depress and hold down the clutch pedal (2).
- Press button (1) to select the PERMANENT operating mode.
- Press button (1) again to go to AUTO operating mode.
- Finally, press button (1) once more to go back to the DISABLED operating mode in a cyclic sequence.
- Slowly release the clutch pedal (2) once you have selected the desired mode.

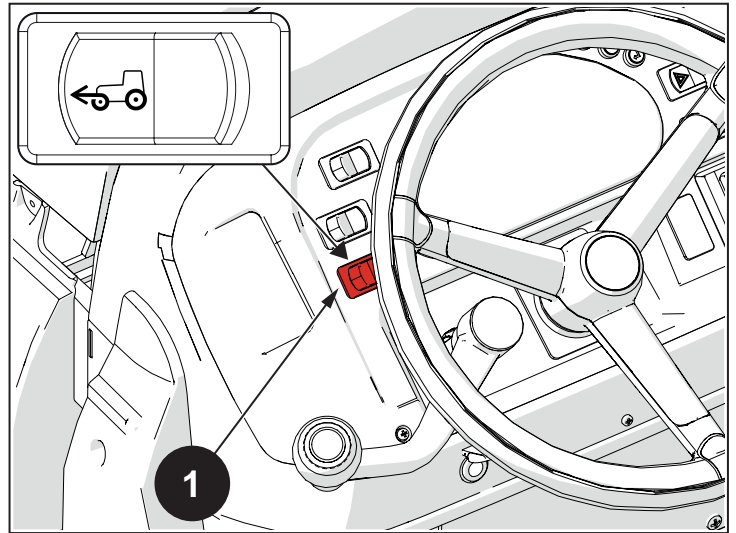


Fig. 5.31

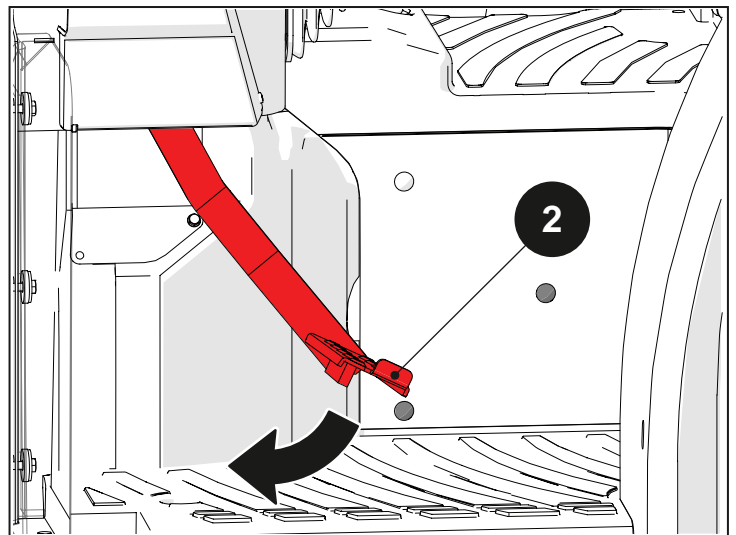


Fig. 5.32

5.4 Braking system

5.4.1 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.

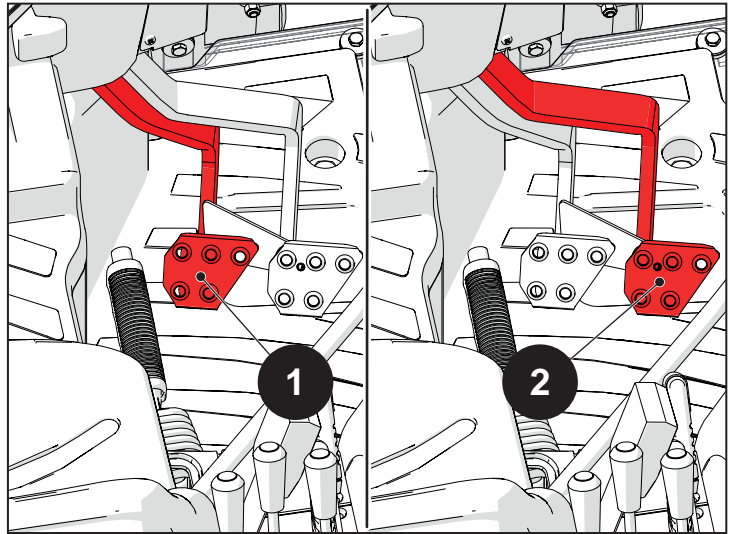


Fig. 5.33

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

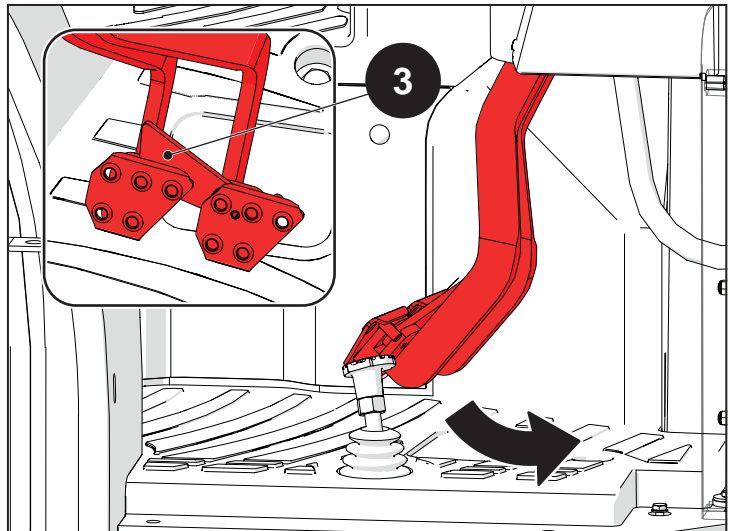


Fig. 5.34

Note

Avoid sudden braking unless in an emergency.

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

Warning

Pressing the brake pedals automatically activates the IST (Simultaneous Front Wheel Drive Engage) function, which deactivates once the brake pedals are released.

Danger

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

Danger

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

Danger

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

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 rectify the fault, have the problem corrected immediately by an authorised GOLDONI service centre.

There must be sufficient oil in the brake circuit for the brakes to work correctly as intended. . Before starting any work, check that the oil level is above the minimum level as shown in the figure.

Top the reservoir up with new oil if the level is too low. Before operating the tractor, check that there are no leaks from the brake oil circuit.

The reservoir is situated behind the right hand dashboard cover panel.

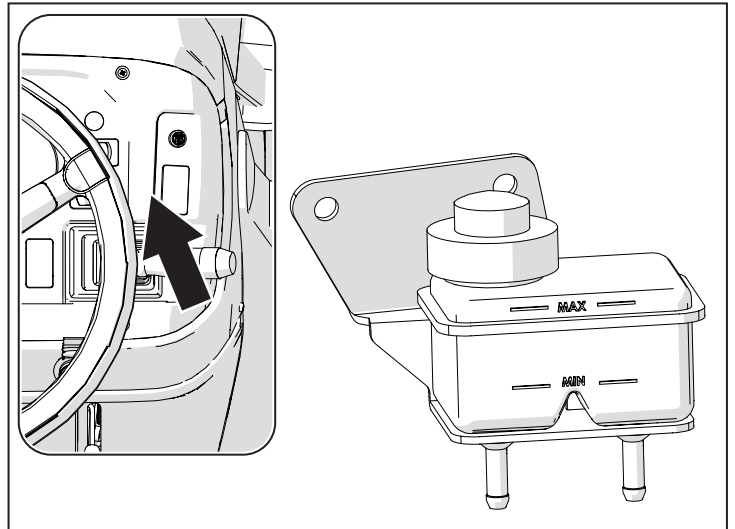


Fig. 5.35

5.4.2 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.

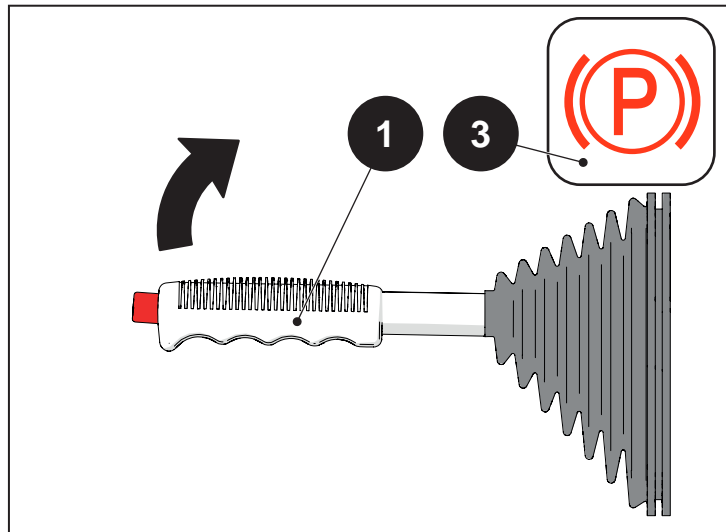


Fig. 5.36

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.

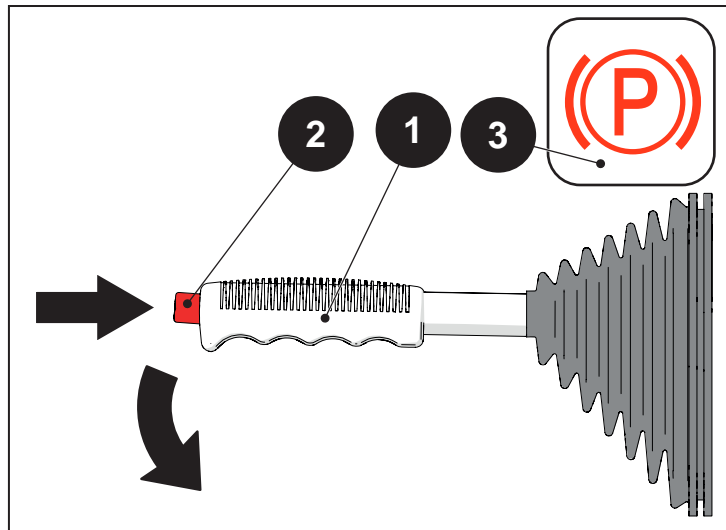


Fig. 5.37

Danger

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

Danger

Always engage the parking brake before leaving the driver seat.

Warning

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

5.5 Power Take Off

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



Note

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



Warning

When not using the rear PTO, move the mode selector lever to Neutral. 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 joint shaft drive with a freewheel mechanism should preferably be used. This prevents drive from being transmitted by inertia from the implement to the machine, and ensures that the tractor stops immediately when the clutch is depressed.

5.5.1 Rear power take off

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

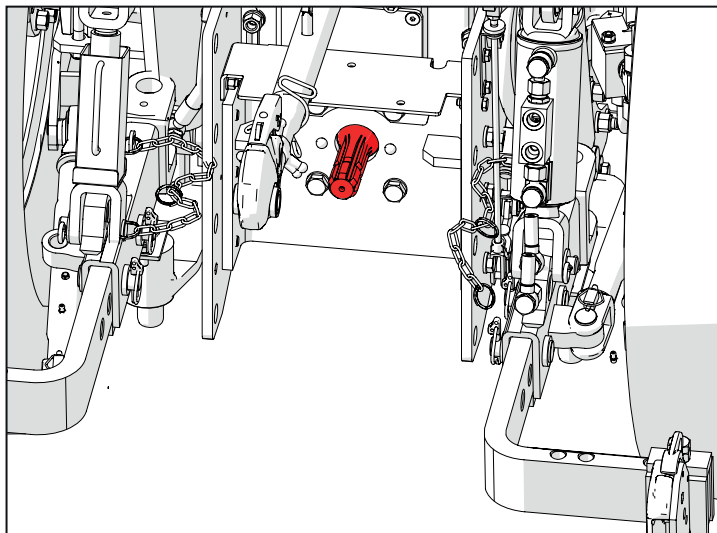


Fig. 5.38

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.

⚠ Warning

The lever 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.

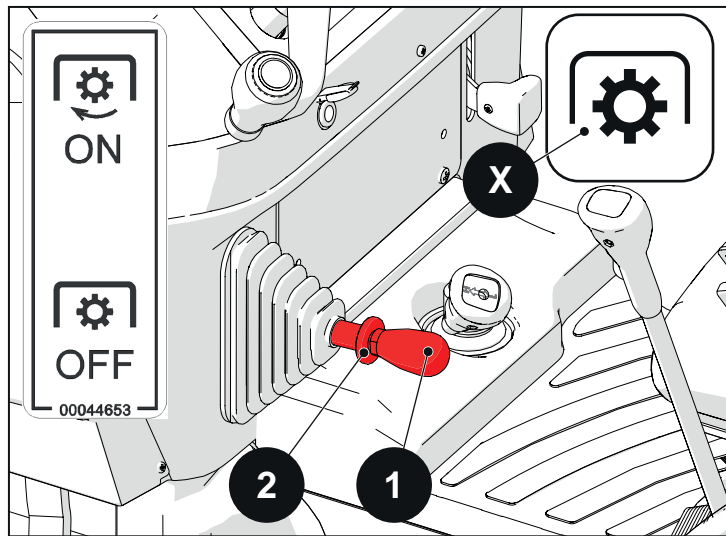


Fig. 5.39

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

- Groundspeed - lever turned to right (S);
- Neutral - lever in centre;
- Independent - lever turned to left (I).

Push the lever (3) to the right to select Groundspeed mode. Push the lever (3) to the left to select Independent mode.

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

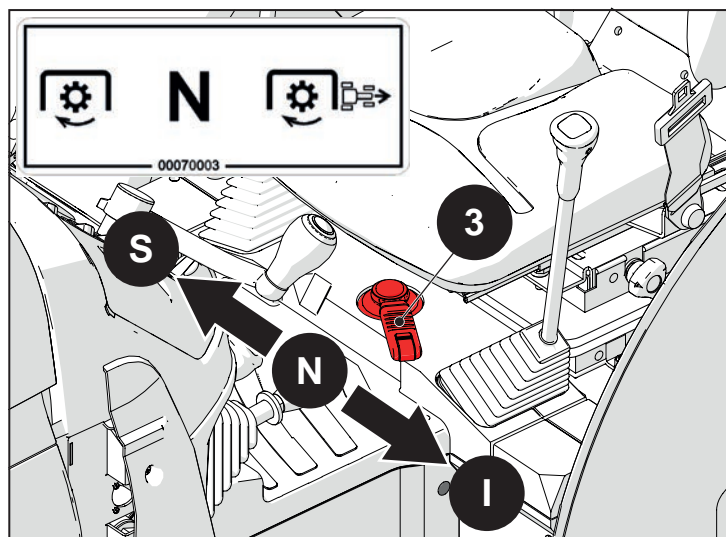


Fig. 5.40

PTO speed selector lever (4) has 2 positions:

- fast 750 rpm - lever up (A).
- slow 540 rpm - lever down (B);

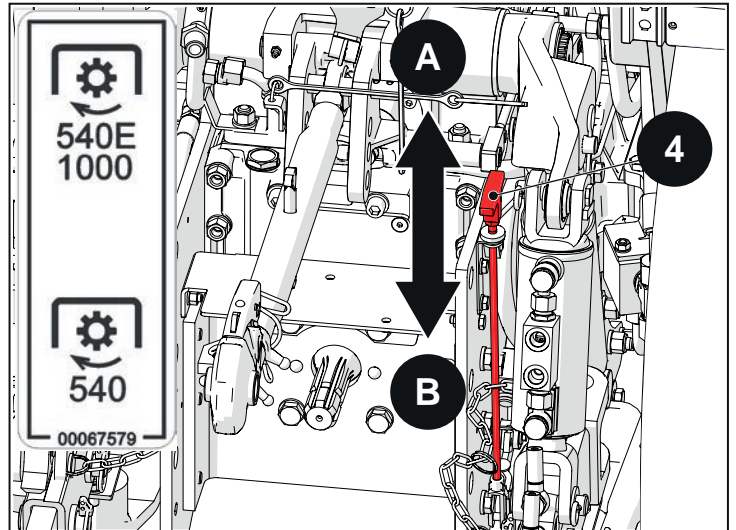


Fig. 5.41

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 emitted and the PTO warning light (7) on the dashboard starts to flash: if the operator sits down again within 2 seconds, the warning light (7) and the buzzer go out; 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.

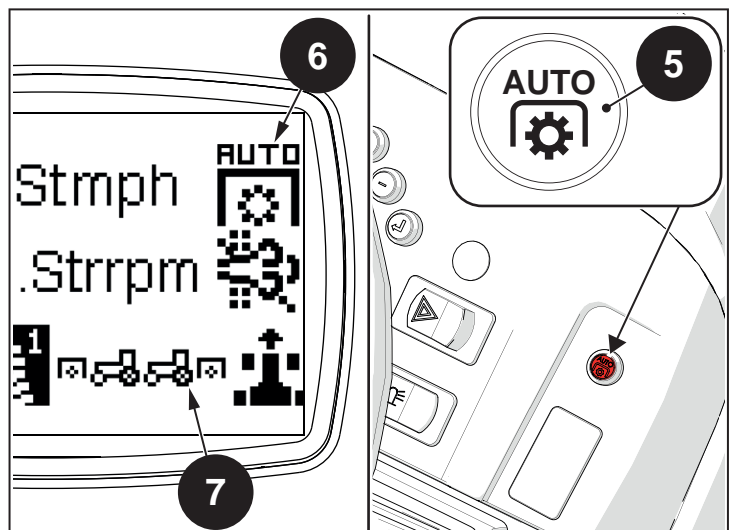


Fig. 5.42

The rear PTO is equipped with a safety cover (8). Turn the cover clockwise to release and then remove the cover. Refit the cover (8), aligning the holes with the lock pins (9) and then turning the cover anticlockwise to lock in place.

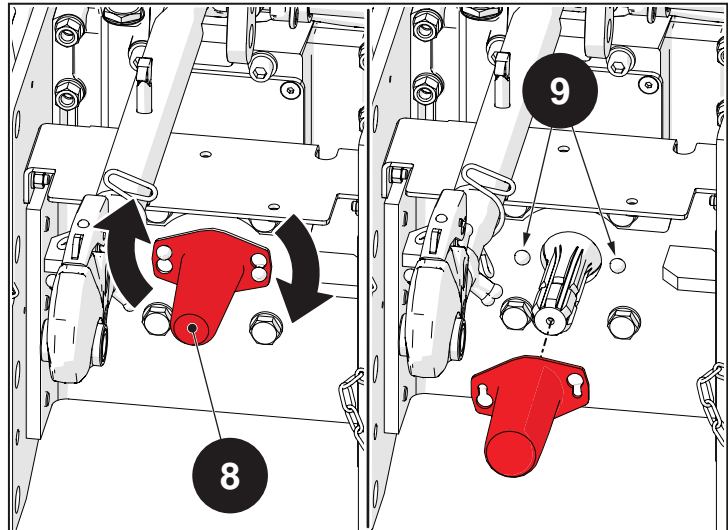


Fig. 5.43

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.

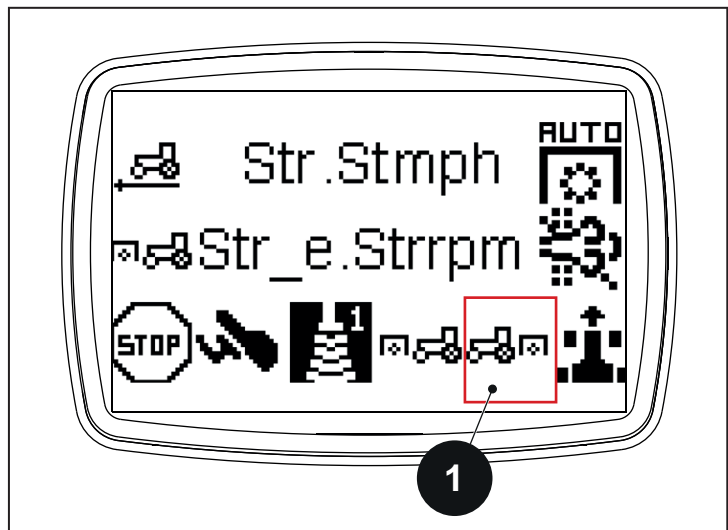


Fig. 5.44

5.5.2 Front Power Take Off (if present)

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

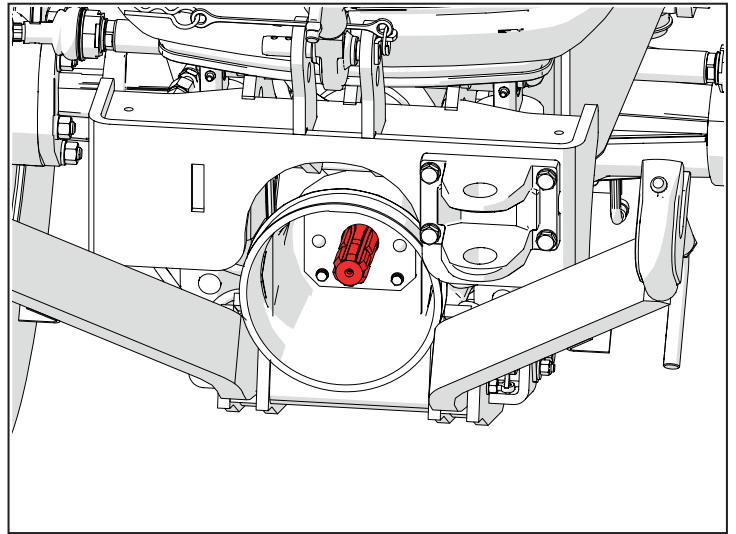


Fig. 5.45

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

Engaging the PTO: press the lock ring (2) upwards then press the switch (1) into position (A).

Disengaging the PTO: press switch (1) into position (B).

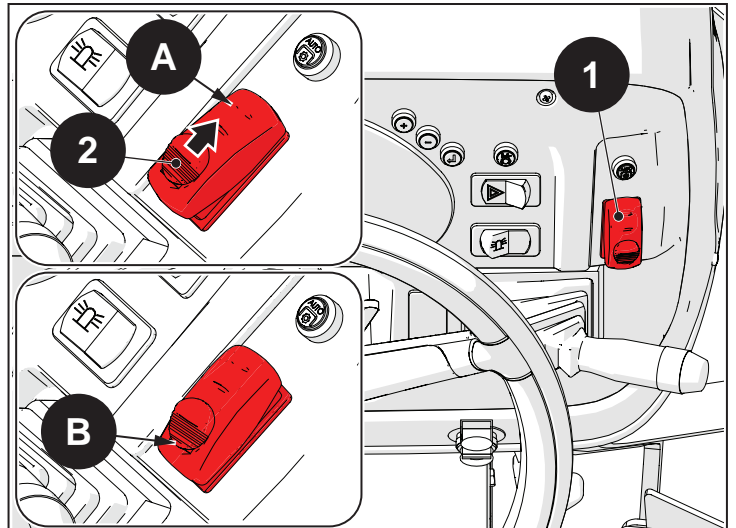


Fig. 5.46

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 emitted and the PTO warning light (5) on the dashboard starts to flash: if the operator sits down again within 2 seconds, the warning light (5) and the buzzer go out; if not, the PTO stops within 7 seconds, the buzzer cuts out but the warning light (5) 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 (3) twice within 2 seconds** after engaging the PTO; the icon (4) is shown on the display. "PTO Auto" is automatically deactivated when the operator sits again.

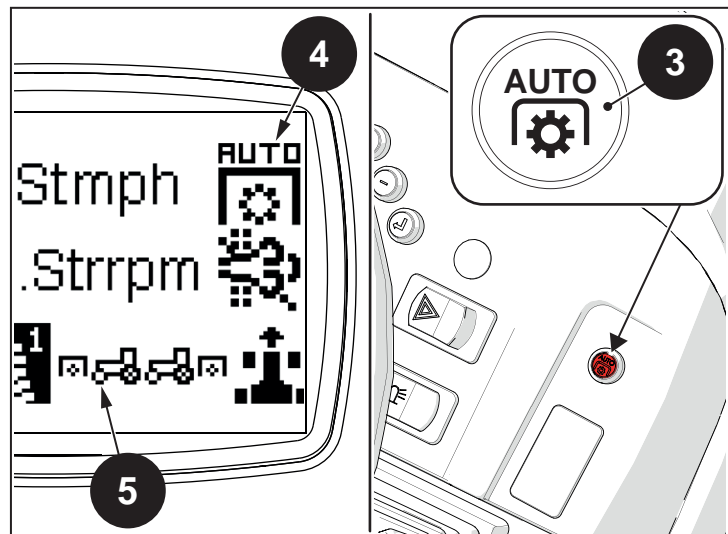


Fig. 5.47

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.

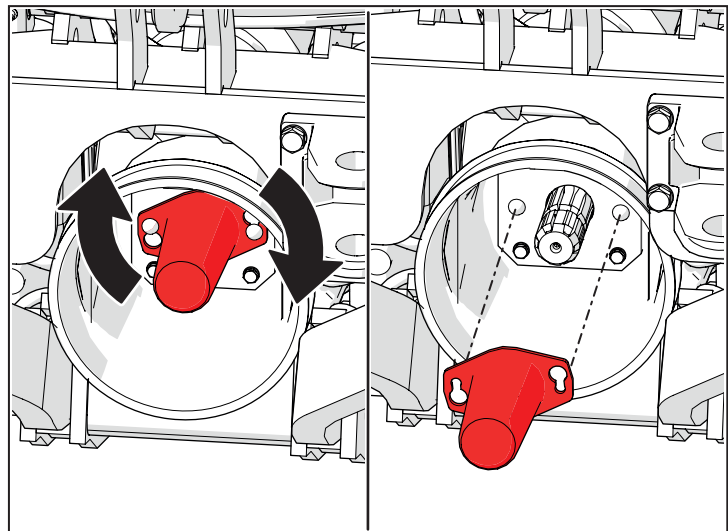


Fig. 5.48

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.

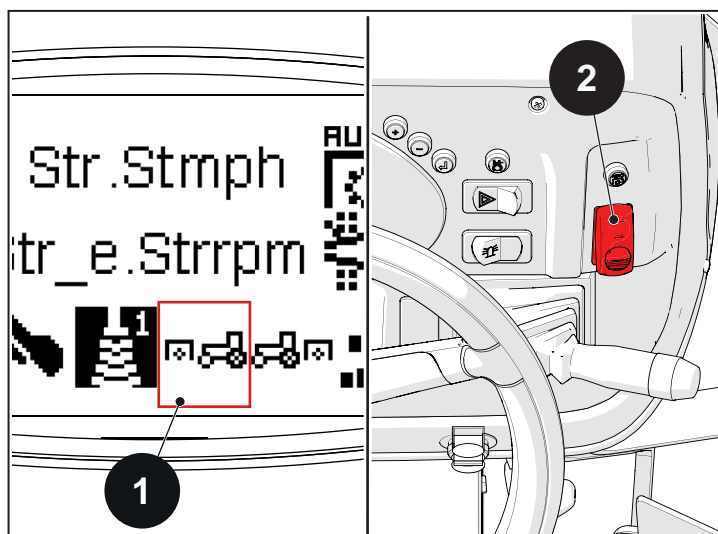


Fig. 5.49

5.5.3 Power Take Off speed

Rear power take off

Direction of rotation: clockwise

PTO speed (rpm)	Engine speed (rpm)
540	2160
750 (540 Eco)	1591,5

Front Power Take Off

Direction of rotation: anticlockwise

PTO speed (rpm)	Engine speed (rpm)
1000	2300

5.5.4 Universal joint

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

Warning

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

Danger

Only use universal joints with adequate protective measures.

5.6 Mechanical rear lift

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 (Fig. 5.50):

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

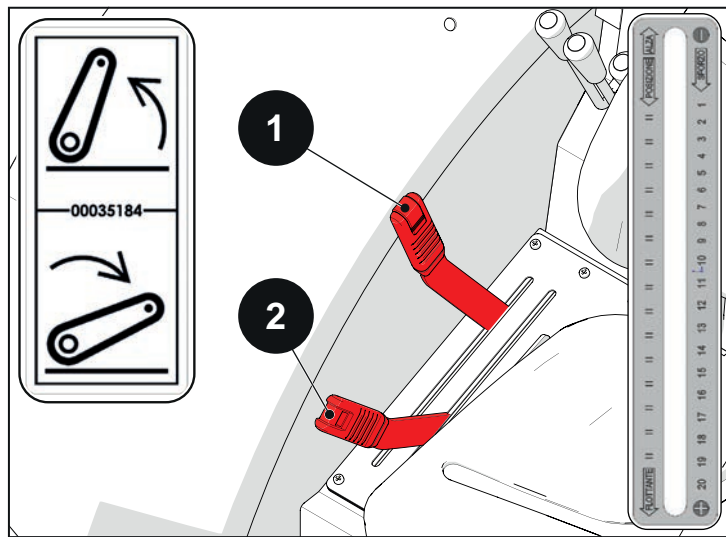


Fig. 5.50

5.6.1 Using position control mode

The position control function 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.

- Move the draft control lever (2) completely forwards to the end stop.
- Move the position control lever (1) to set the required height. The position assumed by the implement is proportional to the position of the lever.

Pull the lever (1) completely back to set the maximum lift height. Push the lever (1) completely forwards to lower the lift completely.

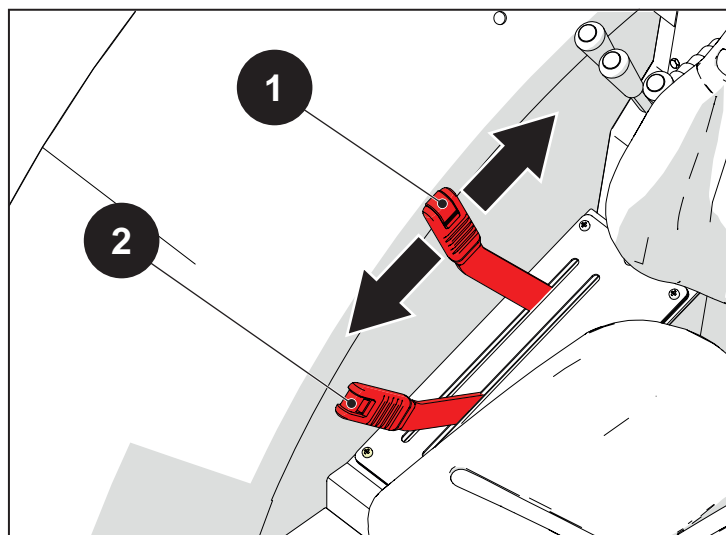


Fig. 5.51

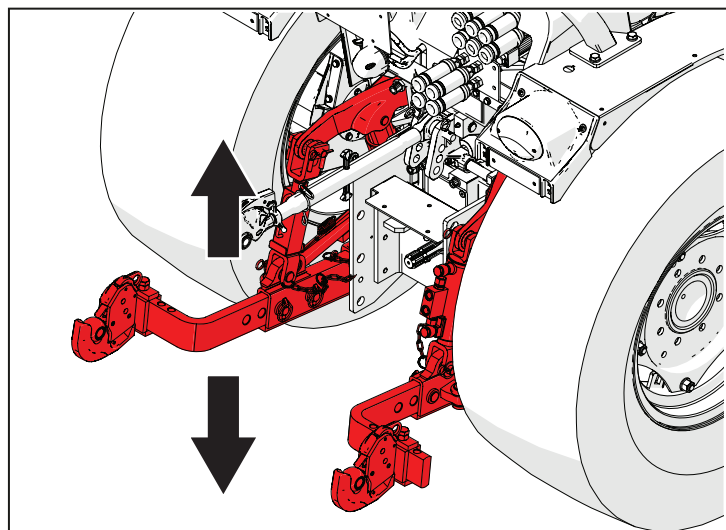


Fig. 5.52

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

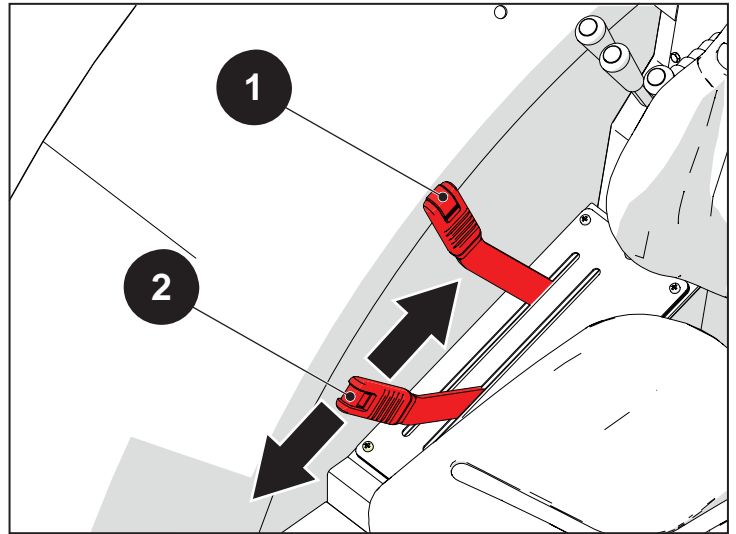


Fig. 5.53



Note

The working depth attained by the implement is proportional to 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.

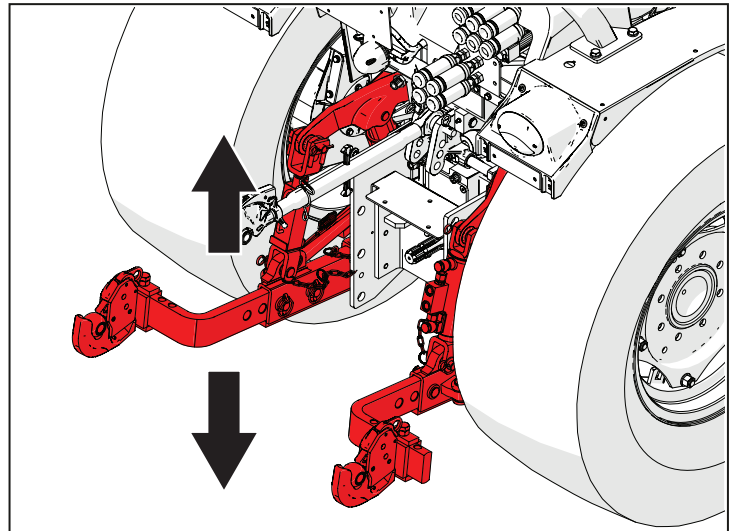


Fig. 5.54

When working in draft control mode, the drop rate of the lift may be set with the lift lock adjuster (3).

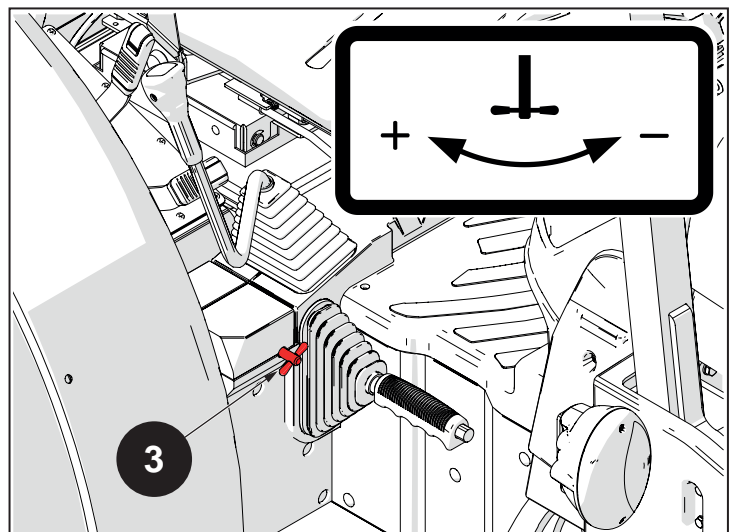


Fig. 5.55

5.6.3 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 position control lever (1) completely forwards.
- Set the required draft setting with the draft control lever (2).
- Raise or lower the lift with the lift position control lever (1).
- Once the implement stabilises at the desired depth, move the position control lever (1) backwards until the lift arms start to rise.

Use the lift position control lever (1) only to lift and engage the implement in the soil.

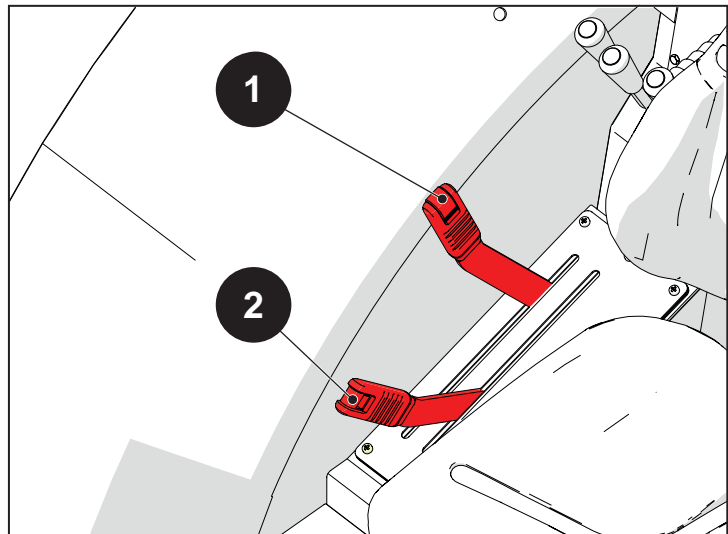


Fig. 5.56

5.6.4 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.

Push both the position (1) and draft (2) control levers completely forwards.

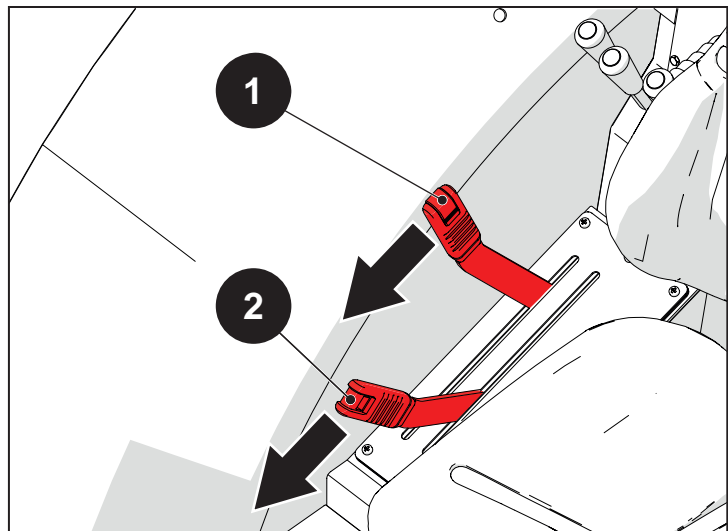


Fig. 5.57

5.6.5 Speed adjustment and lift sensitivity

Tighten the adjuster valve (3) to reduce lift drop rate.
Loosen the adjuster valve to increase drop rate.

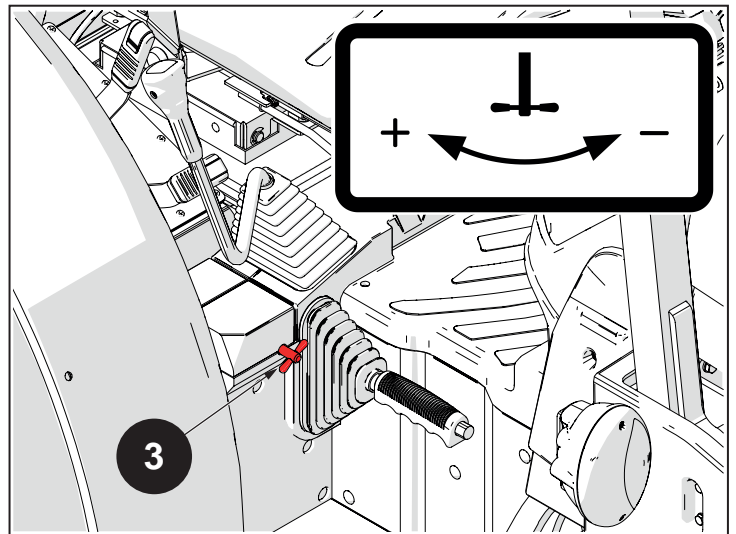


Fig. 5.58

5.6.6 Driving on the road

When driving on roads with an implement connected to the tractor:

- tighten the lift arm drop rate setting valve (3) completely to lock the arms in position;
- raise the lift completely, pulling the position control lever (1) all the way back.

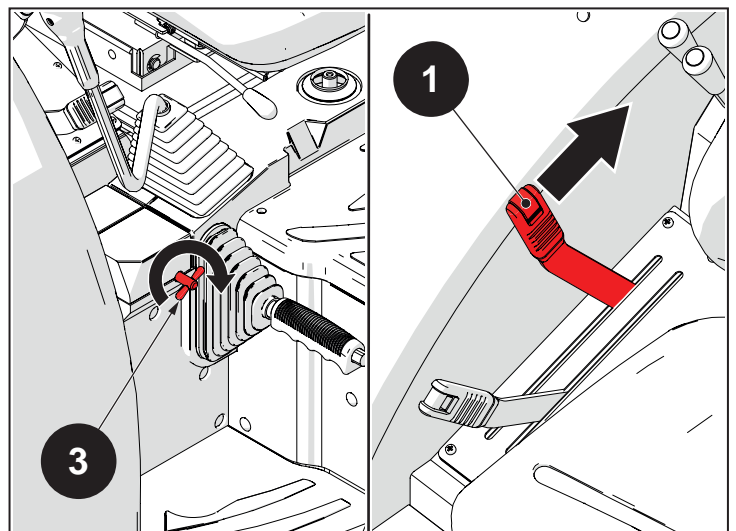


Fig. 5.59

5.7 Front lift (if present)

This is a lift/lower type 3 point hydraulic front lift controlled from a hydraulic distributor. The lift is controlled from a lever that varies according to the configuration of the tractor.

5.7.1 Front lift with rear distributor

In this configuration, you must turn on the tap on the front right hand side next to the wheel to use the front lift.



Warning

When the front lift is not in use, turn off the tap.

- To turn on the tap, move it to position (A)
- To turn off the tap, move it to position (B)

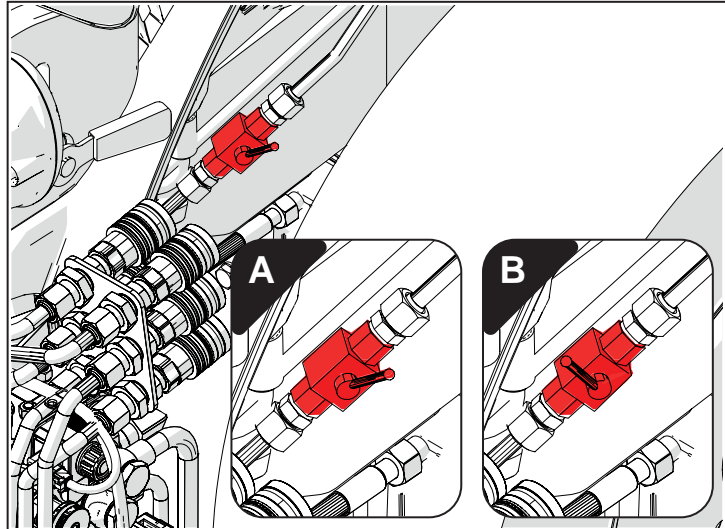


Fig. 5.60

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

- Lever forward - lower implement
- Lever back - raise implement
- Lever fully forward - float mode position, implement free to follow the contours of the terrain

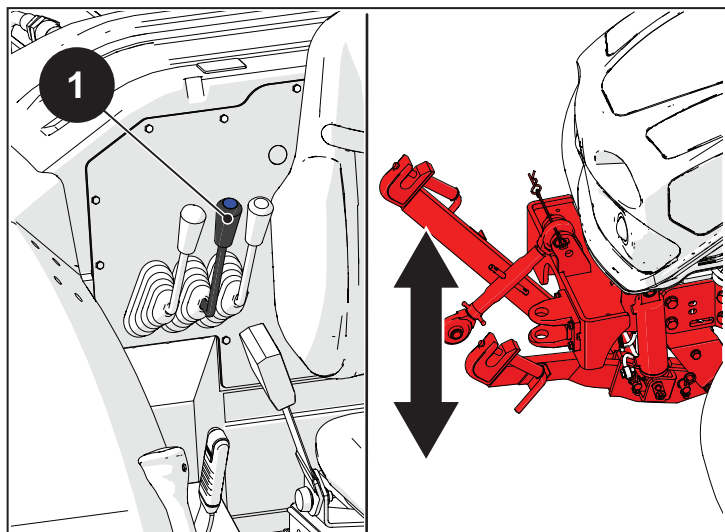


Fig. 5.61

5.7.2 Front lift with front distributor

The lift system is operated using a joystick. Press the button (1) to select the lift system control distributor, then move Scroll wheel (2) to activate it:

- Scroll wheel (2) up - raise implement
- Scroll wheel (2) down - lower implement

Float mode: The distributor has a float function. For instructions on how to activate the function, see the "Joystick" section.



Note

See the "Joystick" section for a detailed description of how the joystick works.

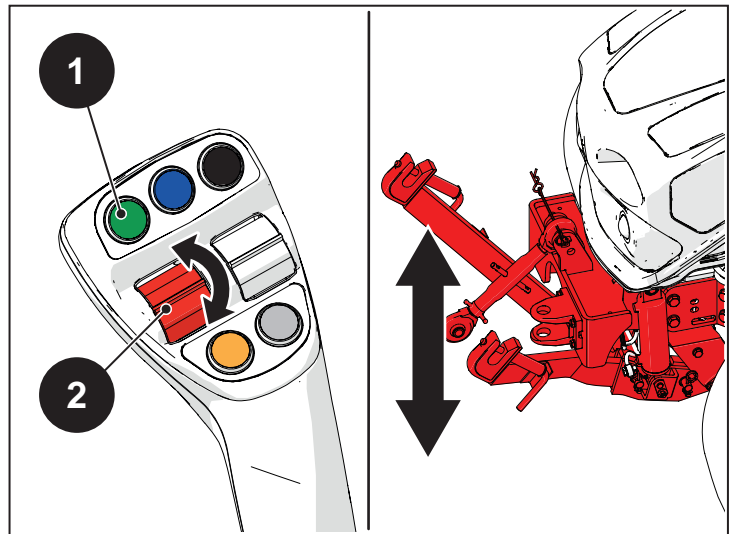


Fig. 5.62

5.8 Joystick (if present)

The joystick is used to control the front and rear electronic distributors and the front lift (if present).

The joystick functions are only activated when the engine is switched on.

5.8.1 Using the joystick

! Note

In the roll bar version tractor, the joystick does not have buttons with LEDs. It operates in the same way with the exception of how the LEDs behave.

To identify the selected distributor, refer to the number (A) on the icon on the display.

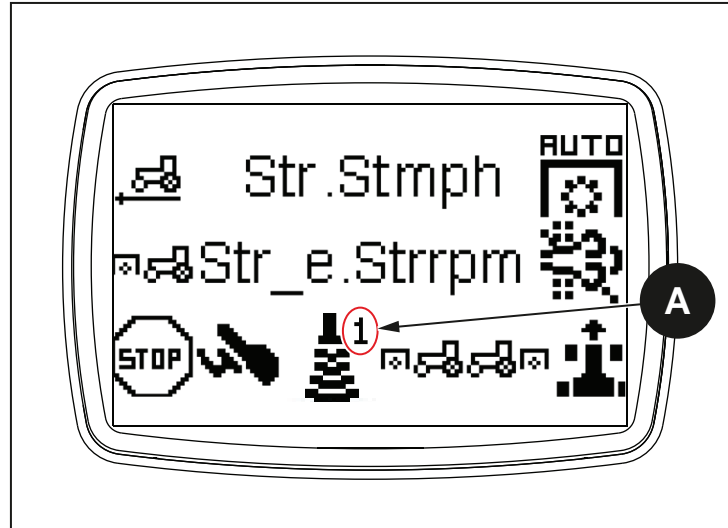


Fig. 5.63

How to use the joystick

1 - Hold the joystick

! Warning

The joystick is equipped with a sensor that detects the user's hand and must therefore be held in order to use it.

2 - Select the distributor

Buttons (1)–(6) activate the relative distributor. Press **the button once** to activate the desired distributor.

- The icon (X) for the activated distributor appears on the display.
- The LED on the pressed button (if present) lights up permanently, with the exception of button (6).
- The LED on the selected distributor scroll wheel (A)–(B) starts to flash. Scroll wheel (C) does not have a LED.

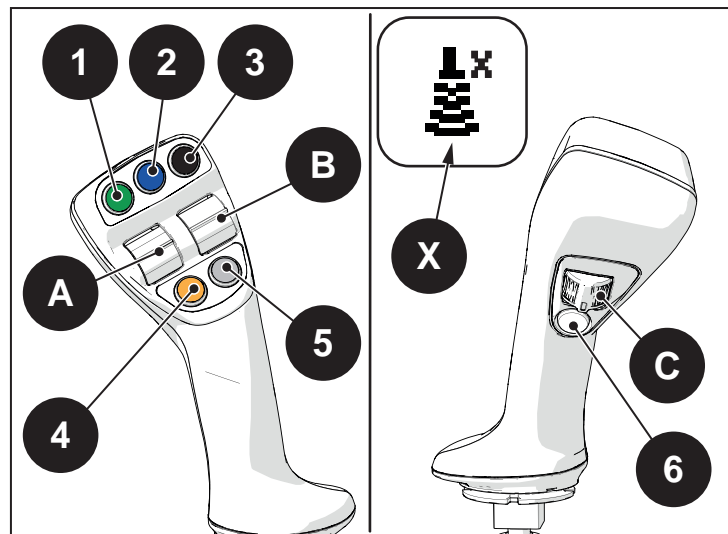


Fig. 5.64

! Note

If the button for another distributor is pressed, the previous distributor is deselected. Button (6) is an exception and can be selected at the same time as another one. The icons (X) for the two selected distributors flash alternatively on the display.

! Note

If distributors are not installed, the buttons for the missing distributors do not work.

3 - Operate the activated distributor

Move the activated scroll wheel up or down; the movement of the scroll wheel must be sufficient to correctly issue the command.

- The LED on the scroll wheel lights up permanently to indicate that the command has been received. When the scroll wheel is released, the LED flashes again



Note

The scroll wheel (C) moves left/right rather than up/down like (A) and (B).

4 - Conclude use of the distributor

Release the joystick to deactivate the distributor and all the LEDs and icons on the display will go out. Alternatively, press the button of the activated distributor again: after 2 seconds, all the LEDs and icons go out and the joystick is deactivated.

5.8.1.1 Detent function - Keeping the selection of the distributor active

You can set an oil flow for a distributor and keep it active even if the joystick is released. Carry out the following procedure.

- Hold the joystick and hold down the distributor selection button (1)–(6) for at least 1.5 seconds.
 - The button LED (if present) lights up permanently.
- Within 2.5 seconds of pressing the button, define the oil flow by pressing the active scroll wheel (A)–(C) up or down as required. Once the function has been activated, you can release the scroll wheel.
 - The button LED (if present) flashes once the scroll wheel has been pressed.
 - The button LED on the scroll wheel lights up permanently.
- Release the joystick. The distributor continues to operate as preset and the oil flow remains constant on the hydraulic socket.



Note

The detent mode can only be activated for one distributor at a time; if another distributor is used in the same position, the oil supply is automatically cut off.

The hydraulic motor, activated by button (6), is an exception. It can be used in continuous flow with any other front or rear distributor.

- To deactivate the distributor, press the same selection button (1)–(6) pressed at the beginning or press a different button to select a different distributor.
 - The button LED stops flashing when the distributor is deactivated.

5.8.1.2 Float function

The float function can be set for the front distributor shown in green. Carry out the following procedure.

- Select the distributor (1), following the instructions previously given in stages 1 and 2.
- Press scroll wheel (B) upwards for at least 2 seconds to activate the float function.
 - Icon (X) for the distributor activated in float mode appears on the display (white on black background).
 - The LEDs on scroll wheels (A) and (B) start flashing.

Once the function has been activated, you can release the scroll wheel.

- When the joystick is released, the function remains active.
- To deactivate the function, press button (1) again or select another distributor following the instructions previously given in stages 1 and 2.

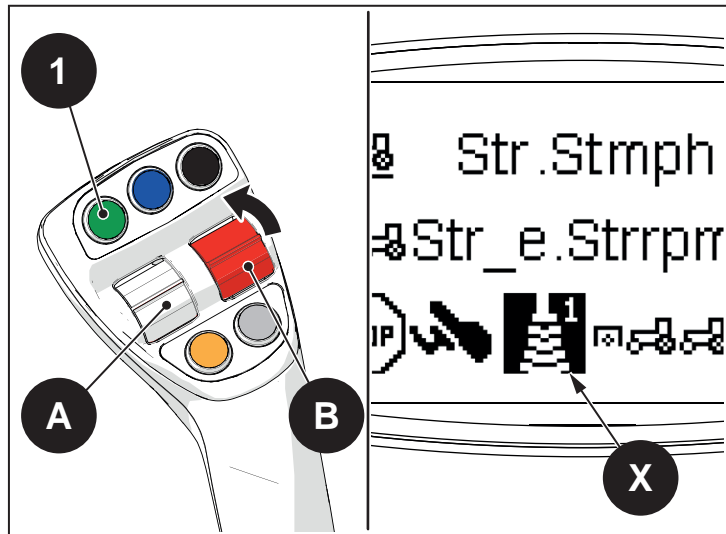


Fig. 5.65

5.9 Towing hitch and drawbar

5.9.1 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

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



Warning

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



Warning

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



Warning

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

5.9.2 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.

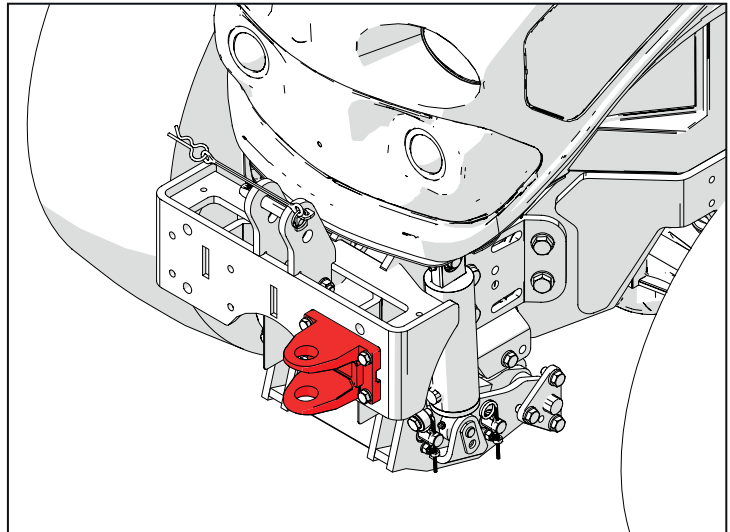


Fig. 5.66



Attention

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.



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;
- four wheel drive is disengaged;
- the parking brake is disengaged.

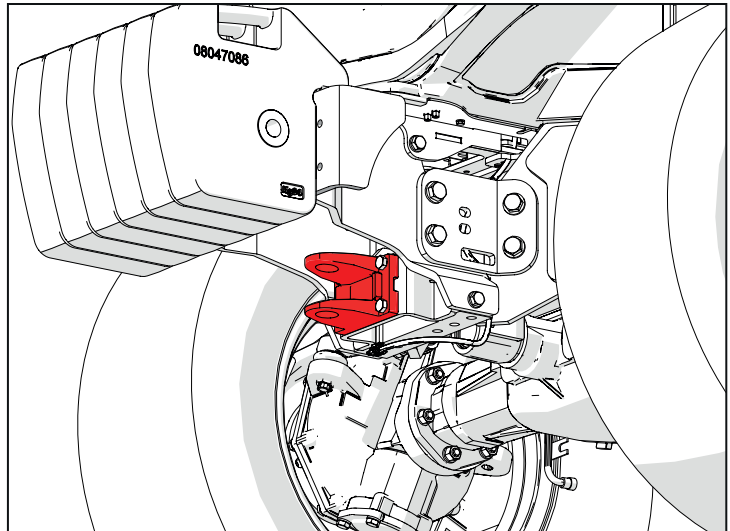


Fig. 5.67

5.9.3 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.

Sliding towing hitch mounting frame

Category	-
Vertical adjustment	-
Pin diameter (mm)	-

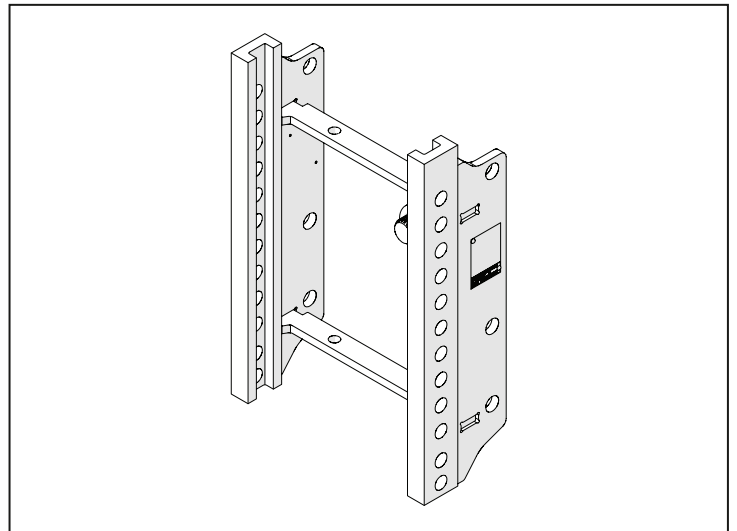


Fig. 5.68

EEC-X sliding rear towing hitch (D.28)

Category	EEC-X
Vertical adjustment	Slider
Pin diameter (mm)	28

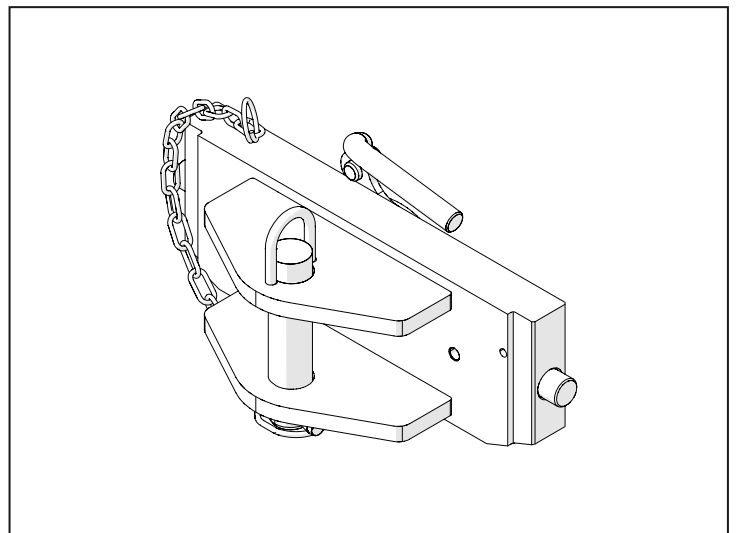


Fig. 5.69

EEC-Y sliding rear towing hitch (D.43)

Category	EEC-Y
Vertical adjustment	Slider
Pin diameter (mm)	43

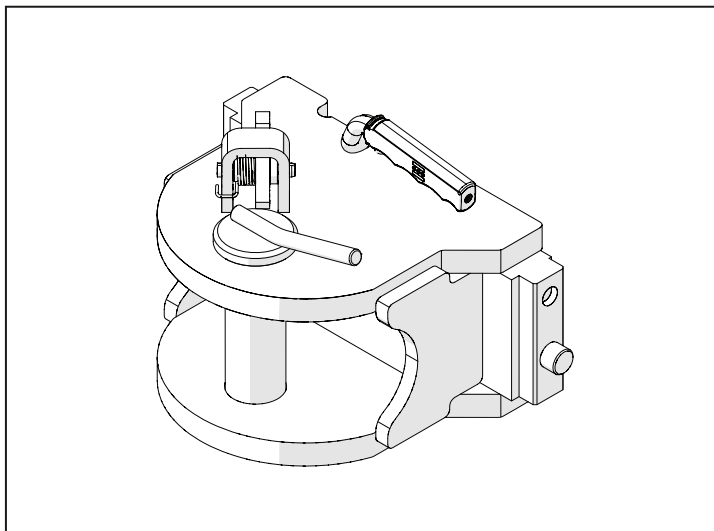


Fig. 5.70

EEC sliding rear towing hitch (D.31)

Category	EEC
Vertical adjustment	Slider
Pin diameter (mm)	31

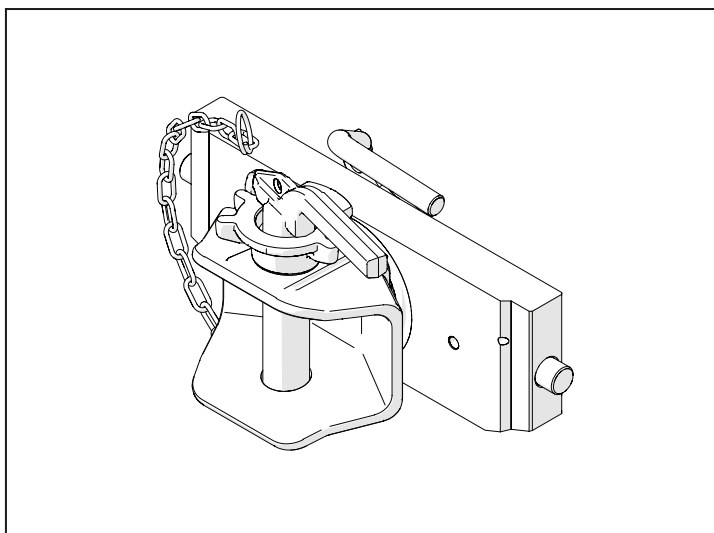


Fig. 5.71

EEC fixed rear towing hitch (D.31)

Category	EEC
Vertical adjustment	Pins
Pin diameter (mm)	31

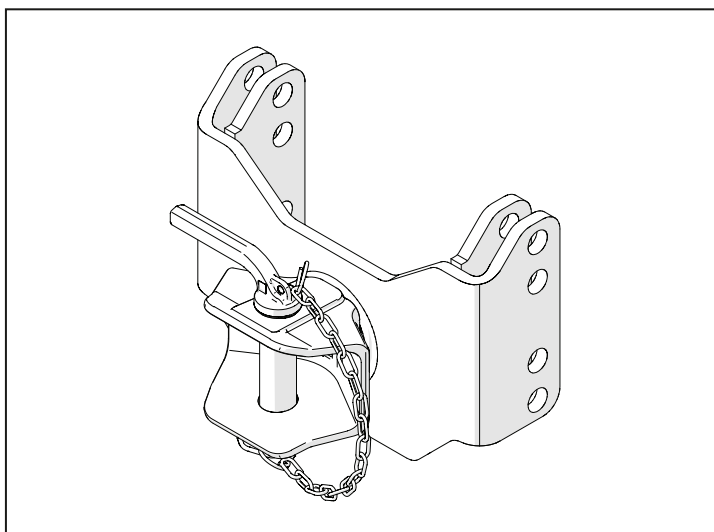


Fig. 5.72

EEC-X fixed rear towing hitch (D.28)

Category	EEC-X
Vertical adjustment	Pins
Pin diameter (mm)	28

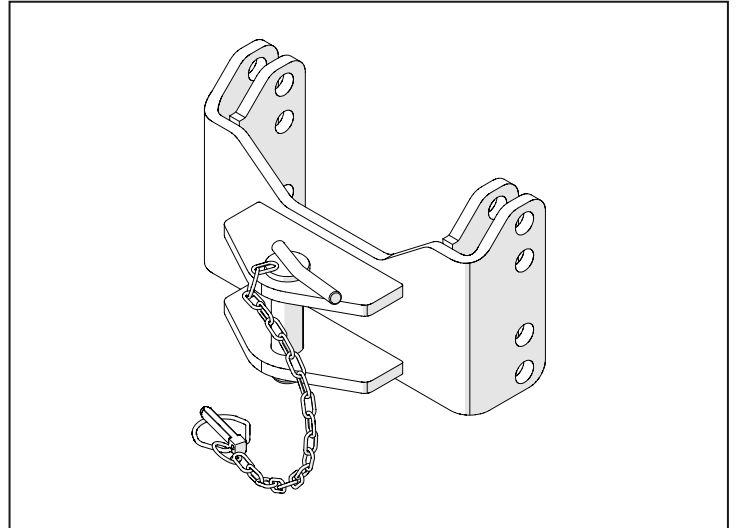


Fig. 5.73

EEC-Y fixed rear towing hitch (D.43)

Category	EEC-Y
Vertical adjustment	Pins
Pin diameter (mm)	43

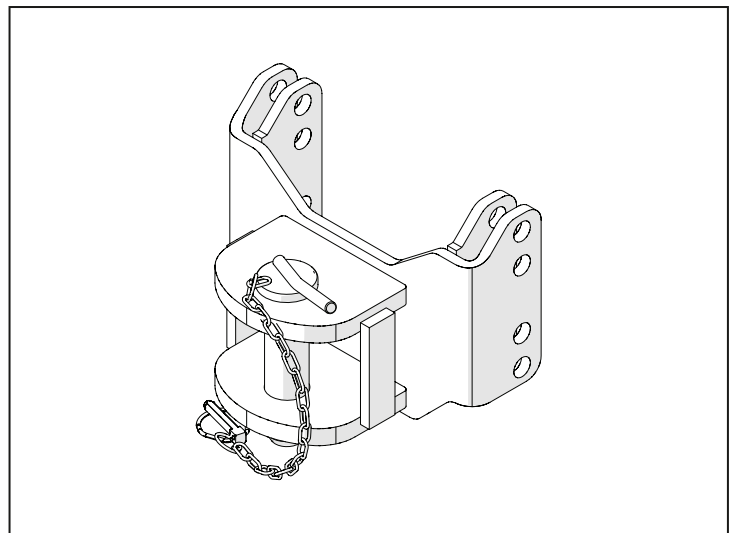


Fig. 5.74

5.9.4 Drawbars

EEC-X rear drawbar (D.28)

Category	EEC-X
Length (mm)	850
Pin diameter (mm)	28

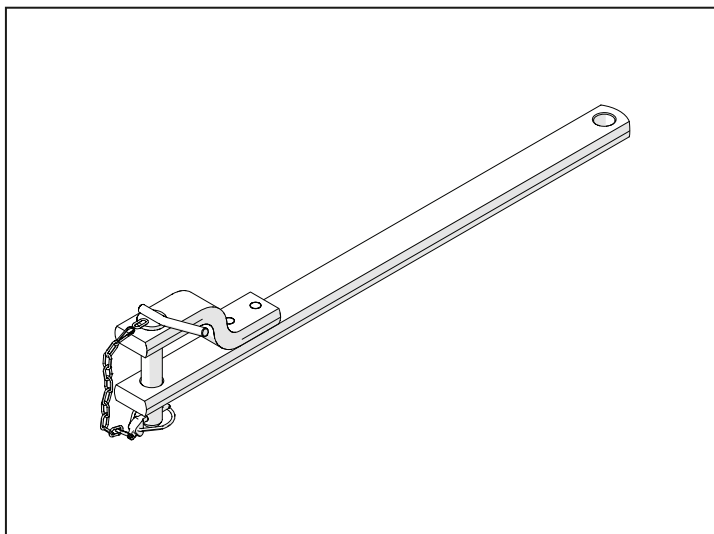


Fig. 5.75

EEC rear drawbar (D.31)

Category	EEC
Length (mm)	850
Pin diameter (mm)	31

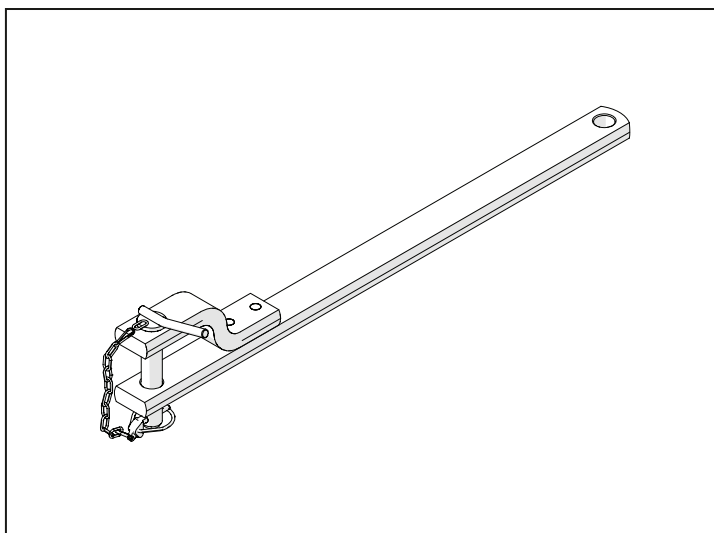


Fig. 5.76

5.10 Towing trailers



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



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.



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.



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.



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.



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.

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

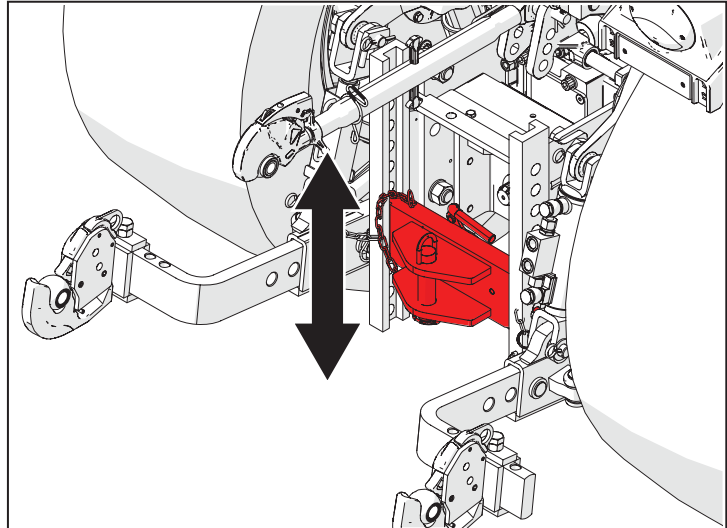


Fig. 5.77

5.10.1 7 pole socket for trailer

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.

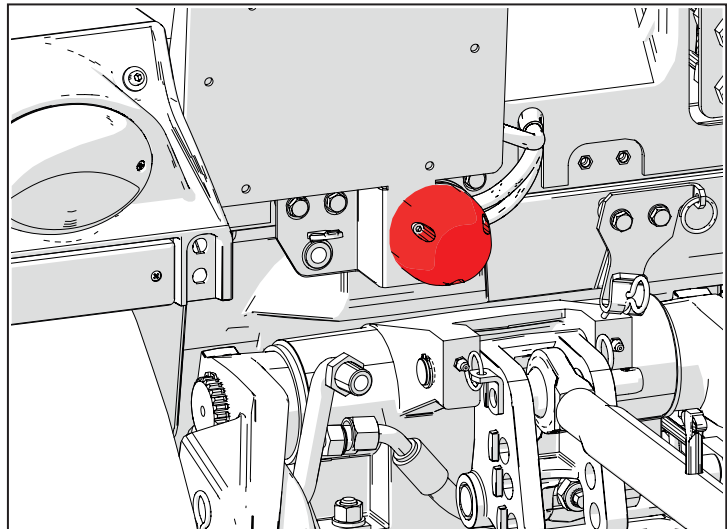


Fig. 5.78

 **Warning**

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

5.11 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.



Attention

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 of the rear lift must be set in the highest hole when driving on the road to prevent damage to the swinging drawbar carrier.

The machine is equipped with a three-point hitch.

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

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

5.11.1 Rear three-point linkage

The three point linkage consists of the following components:

- 1 - Top link arm
- 2 - Mechanical/hydraulic adjustable tie-rod
- 3 - Lateral stabiliser
- 4 - Lower lift arm
- 5 - Adjustable implement coupling end

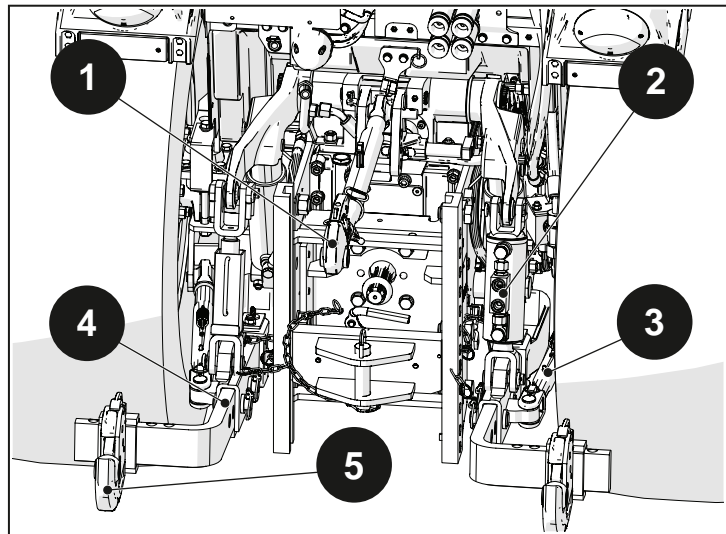


Fig. 5.79

5.11.1.1 Adjusting the three point linkage

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 (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).

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).

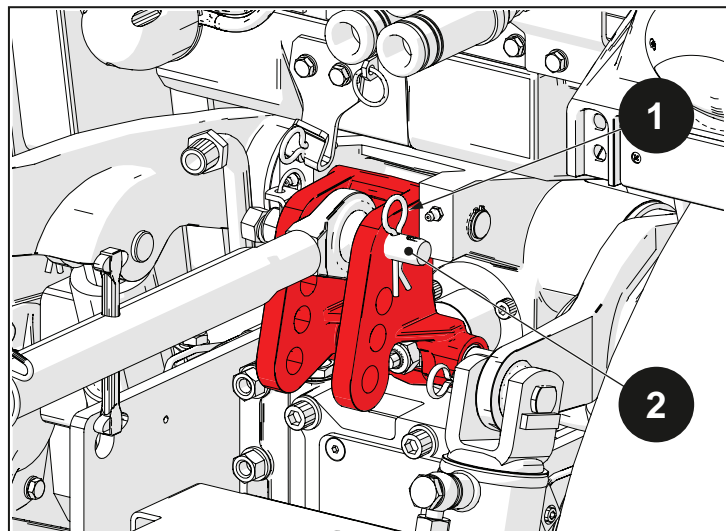


Fig. 5.80



Danger

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

5.11.1.2 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 (3);
- 2 - adjust the length of the arm by turning lever (1);
- 3 - securely tighten ring nut (3) to secure the arm.

The implement link end ball (2) has two holes for use as a category 1 or category 2 device.

Implement hitching lever (4).

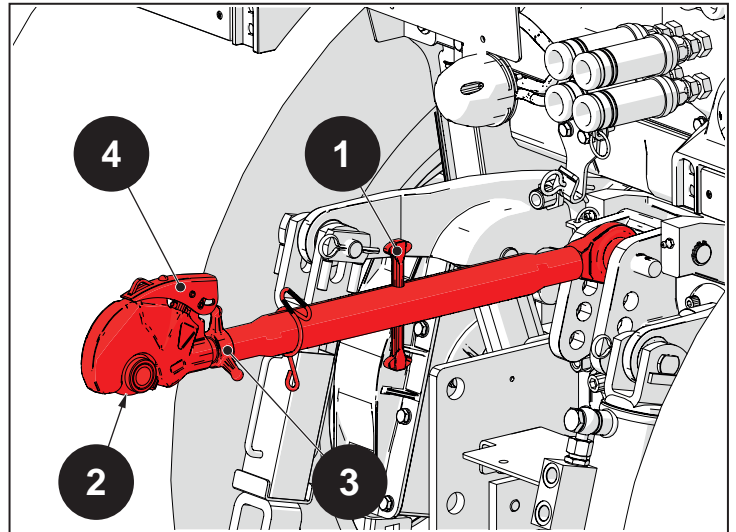


Fig. 5.81

When the top link is not in use, attach the clip (5) to fixed bracket (6).

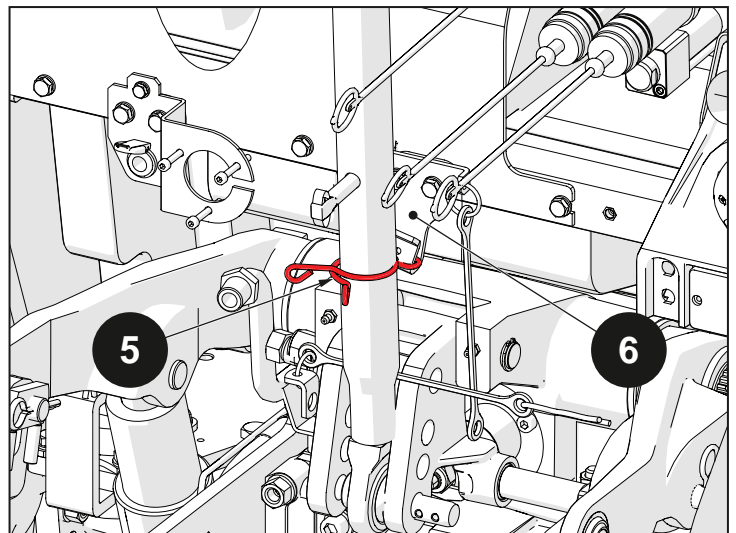


Fig. 5.82

5.11.1.3 Hydraulic adjustable top link arm (if present)

Adjust the top link arm (1) to the desired length using the rear distributor lever it is connected to:

- Lever forward = lengthen arm
- Lever back = shorten arm

The hydraulic adjustable top link arm (1) comes in two different configurations:

- Hydraulic adjustable top link arm, category 1-2
- Hydraulic adjustable top link arm, with quick hitch

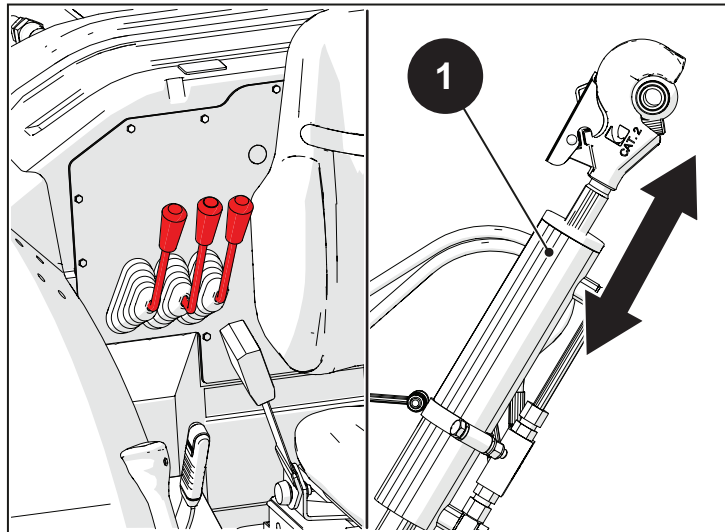


Fig. 5.83

5.11.1.3.1 Hydraulic adjustable top link arm, category 1-2

The implement link end ball (1) has two holes for use as a category 1 or category 2 device.

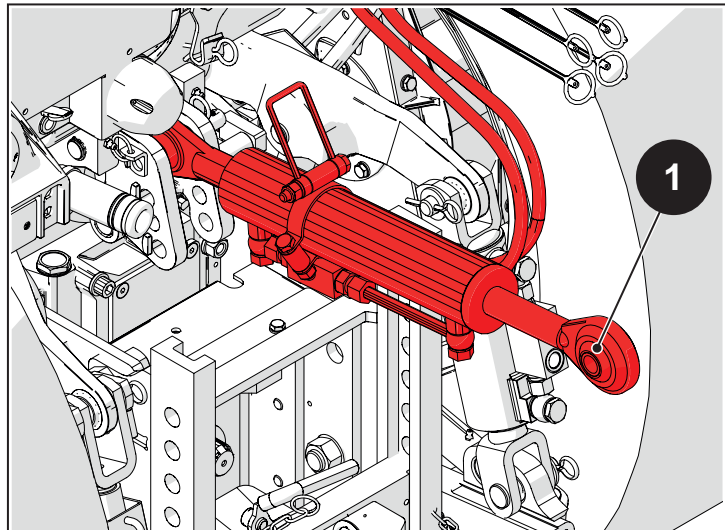


Fig. 5.84

5.11.1.3.2 Hydraulic adjustable top link arm, with quick hitch

The implement link end ball (1) has two holes for use as a category 1 or category 2 device.

Implement hitching lever (2).

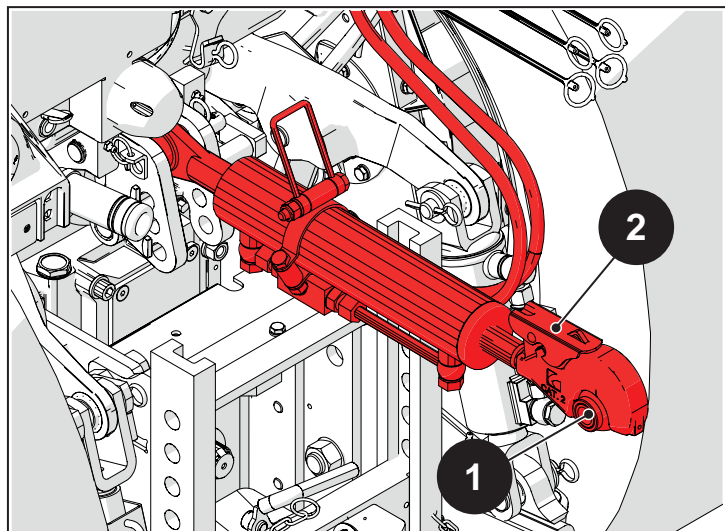


Fig. 5.85

5.11.1.4 Adjustable vertical tie rods

Turn the adjustable tie-rod (1) to level and align the lower lift arms in the correct position for the implement used and the task.

To adjust the tie-rod, lift the sleeve, turn it as needed to set the required length and then return the sleeve to its original 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.

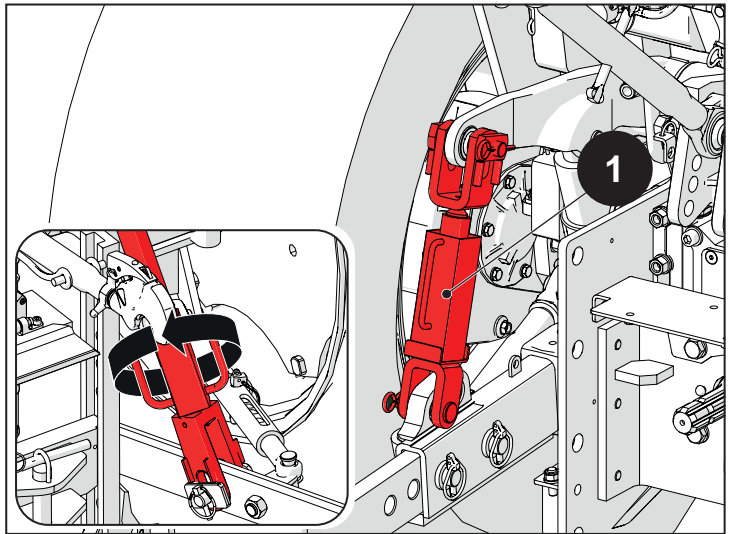


Fig. 5.86

5.11.1.5 Hydraulic adjustable right hand vertical tie-rod (if present)

Adjust the tie-rod to the desired length using the rear distributor lever it is connected to:

- Lever forward = lengthen tie-rod
- Lever back = shorten tie-rod

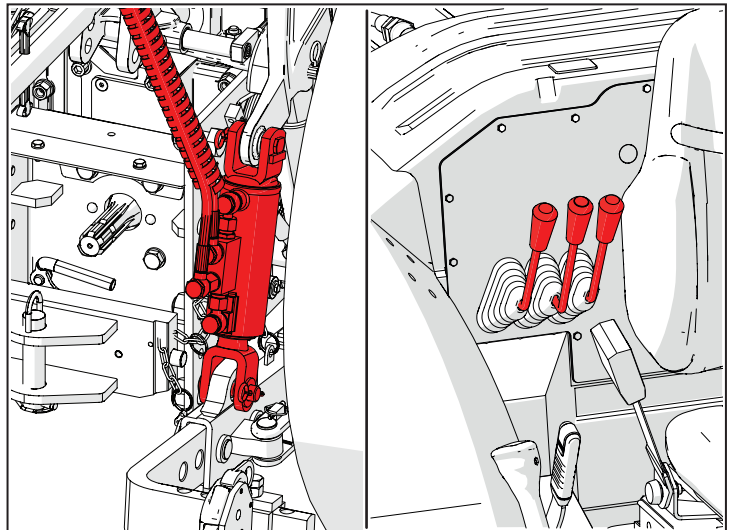


Fig. 5.87

5.11.1.6 Lateral stabiliser

Adjust the lateral stabilisers (1) to limit the lateral movement of the lower lift arms. Tighten or loosen the stabiliser with the handle to set the required amount of lateral swing.

- 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).

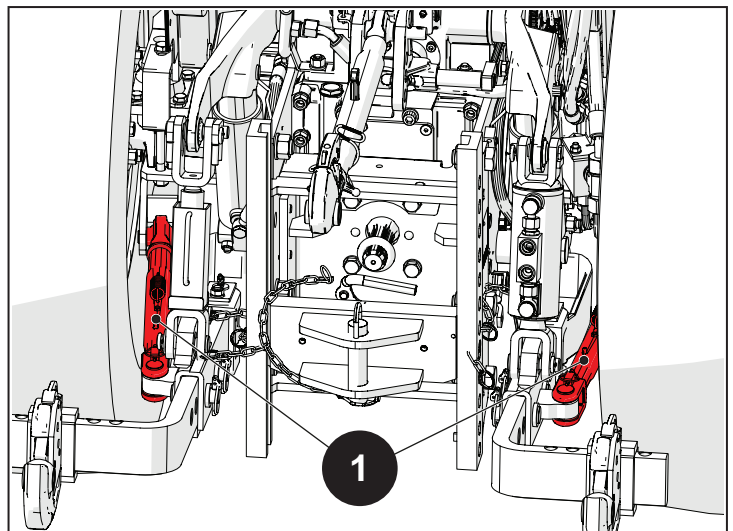


Fig. 5.88

5.11.1.7 Adjustable lower arms

To adjust the lower arms (1), remove the two safety pins from the two pins and adjust the arms to the correct length. Once the arms are adjusted correctly, engage the two pins and refit the relative two safety pins (1) to fasten them in place.

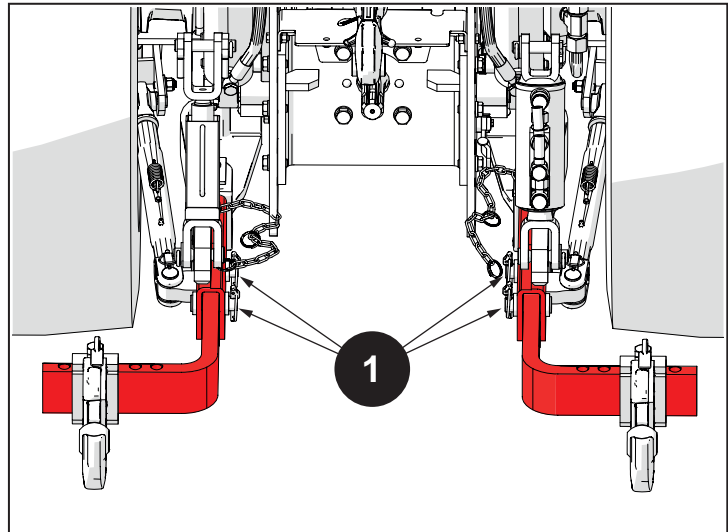


Fig. 5.89

5.11.1.8 Adjustable implement coupling end

To adjust the width of the coupling ends (1), loosen the bolts (3), move the ends to the appropriate holes on the lower arms to attain the required width and then tighten the bolts (3) to secure the ends in the new positions.

The lower link end balls (2) are equipped with an adapter permitting use as either a category 1 or category 2 device.

Implement hitching lever (4).

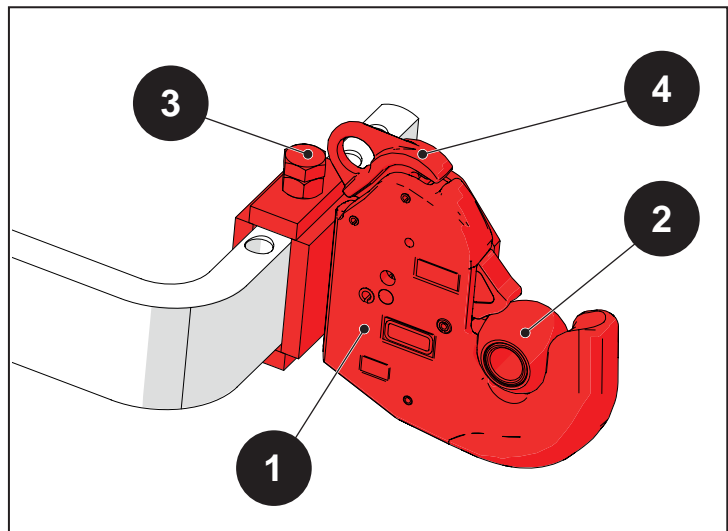


Fig. 5.90

5.11.2 Front three point linkage (if present)

The three point linkage consists of the following components:

- 1 - Top link arm
- 2 - Implement coupling end

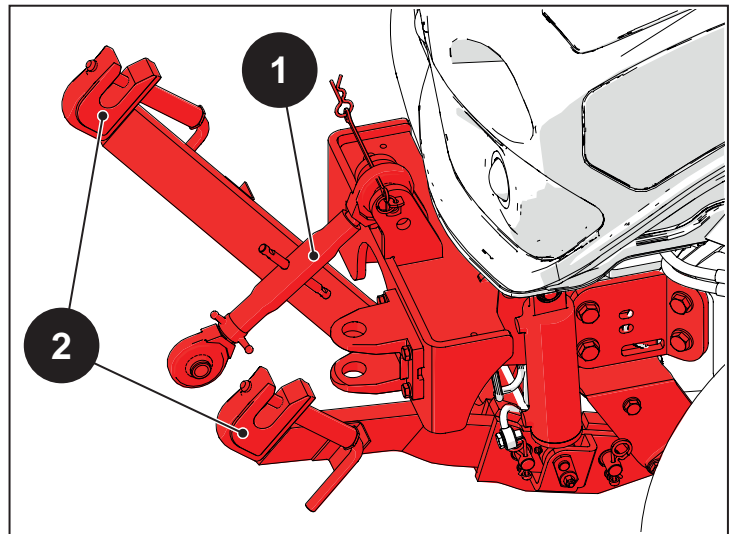


Fig. 5.91

5.11.2.1 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.

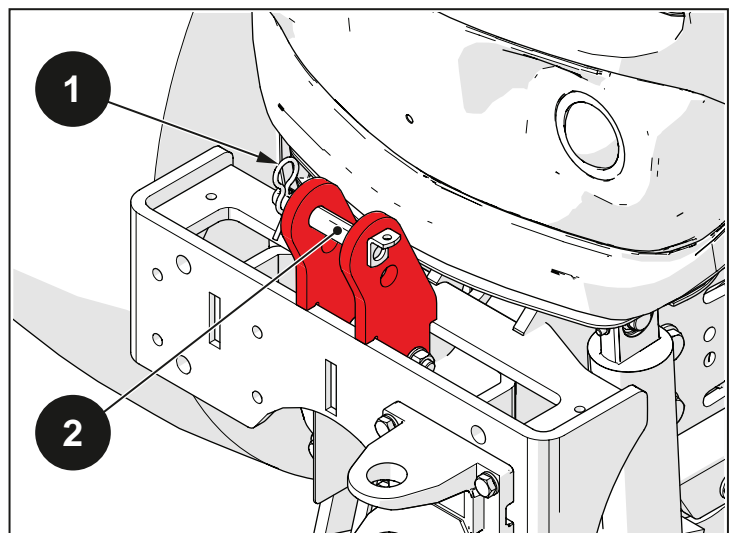


Fig. 5.92

5.11.2.2 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.

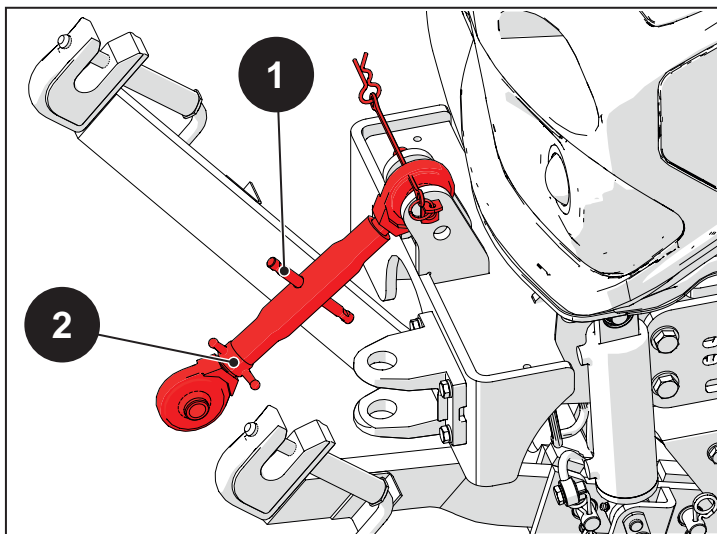


Fig. 5.93

5.11.2.3 Implement coupling end

Implement hitching pin (1).

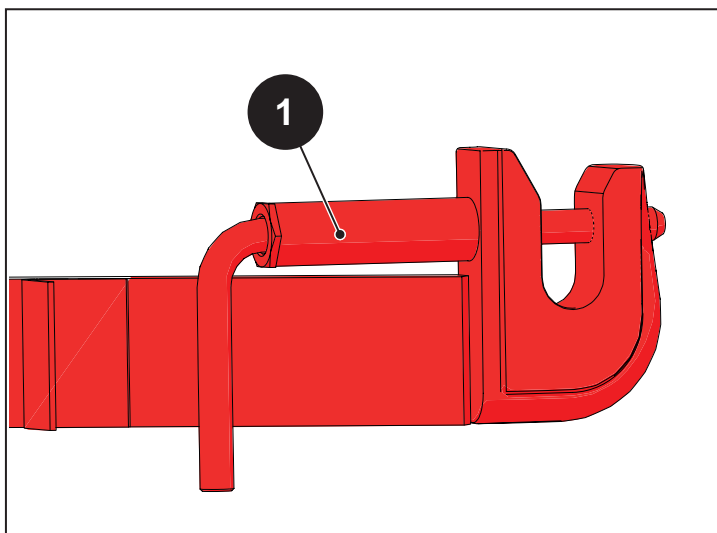


Fig. 5.94

5.12 Auxiliary hydraulic distributors



Danger

Use extreme caution when detaching and reconnecting implements.



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. Failure to do so may result in severe infection or dermatological reactions. Never check for a fluid leak with your hands. Use a piece of 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.

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 or front 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 mechanical distributors (1) are situated to the right of the driver seat and control the hydraulic couplers (2) on the rear right of the tractor.

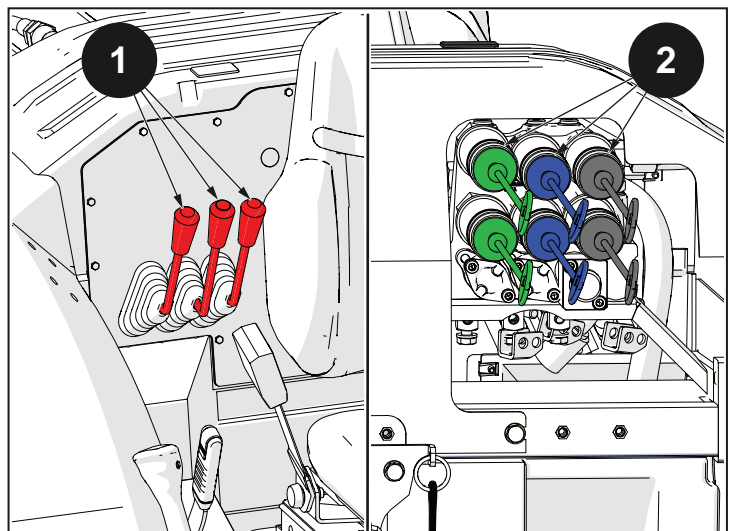


Fig. 5.95

The joystick (3), situated on the gear lever, controls the hydraulic sockets:

- Rear (4) - situated on the right hand rear side.

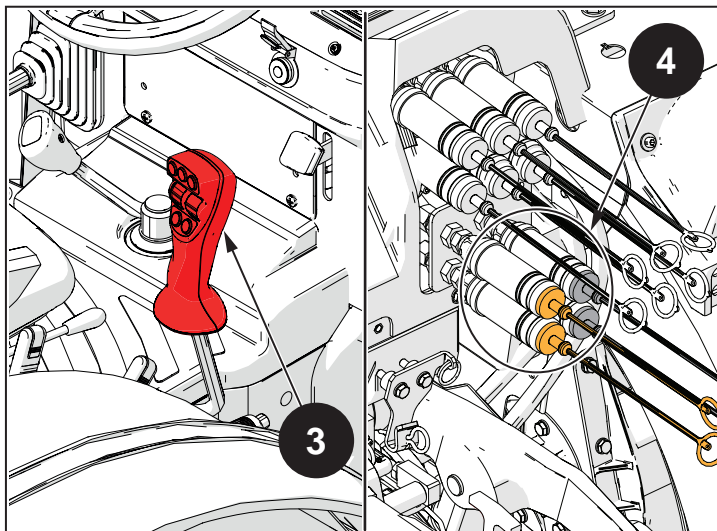


Fig. 5.96

- Front (5) - situated on the right hand front side of the platform (or cab).
- Front-facing (6) - situated on the right hand side of the engine.

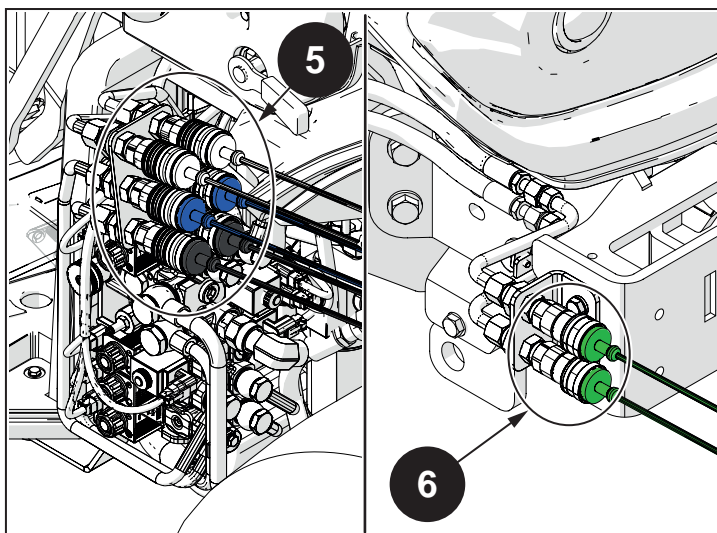


Fig. 5.97

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.



Warning

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.

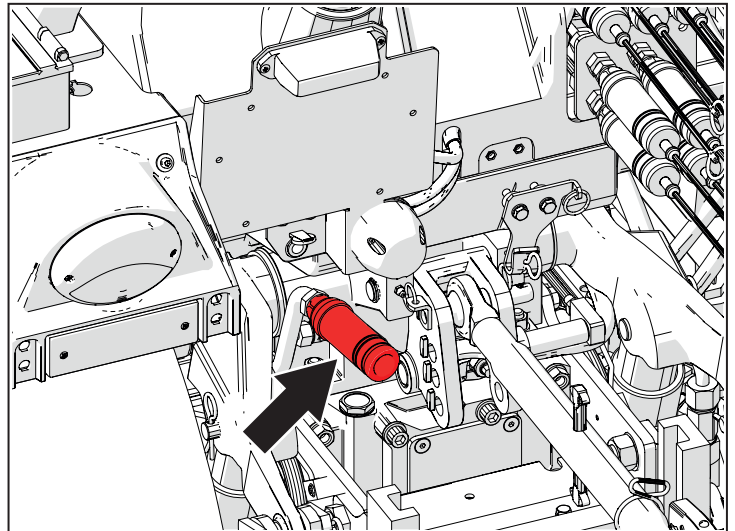


Fig. 5.98

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

5.12.1 Available configurations

5.12.1.1 Rear auxiliary mechanical distributors

These tractor models are equipped with three distributors in a single block.

Position	Type
A	Double acting with detent and KICK-OUT
B	Double acting with fourth float mode position
C	Double acting

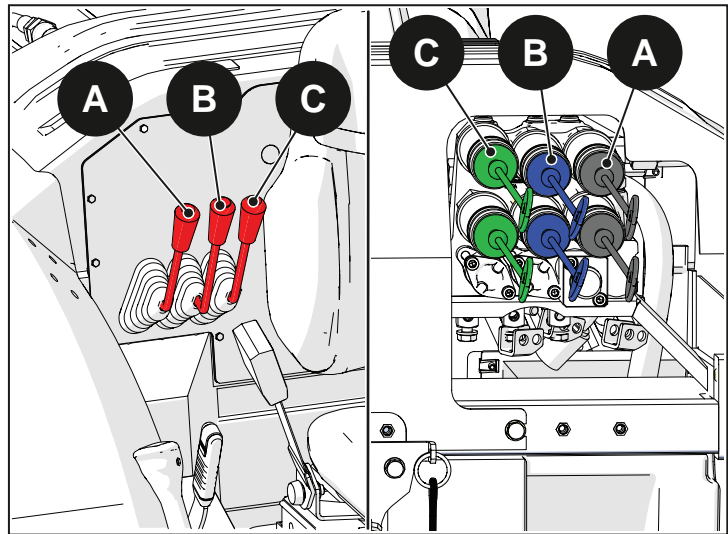


Fig. 5.99

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

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

Pulling the lever (A) downwards sends oil to the quick coupler (A2) so that the cylinder can be retracted.

The detent function may be used to hold the distributor lever in position. The KICK-OUT function automatically disables (releases) the detent function by moving the lever to the neutral position once the maximum set pressure has been reached.

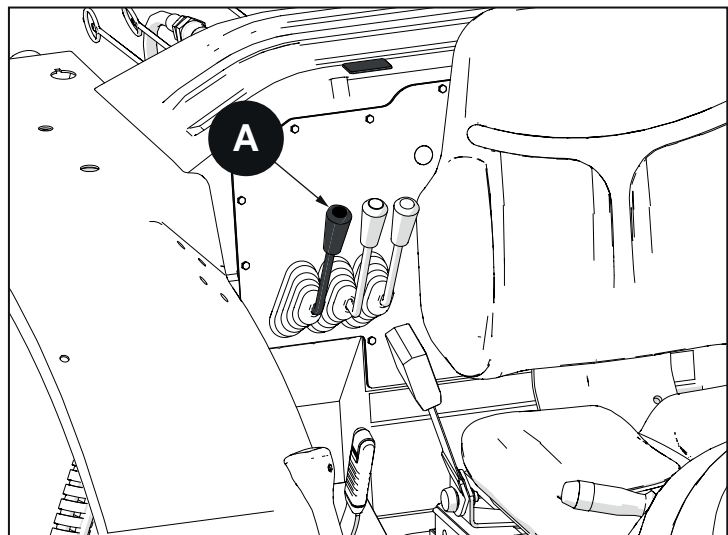


Fig. 5.100

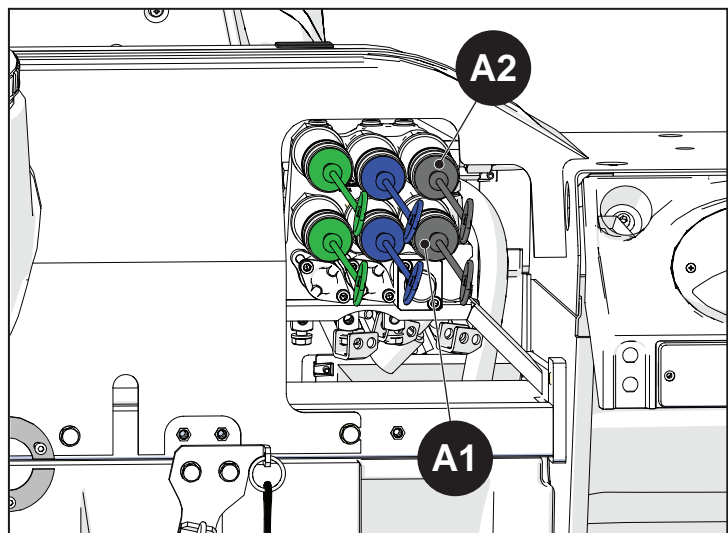


Fig. 5.101

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

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

Pulling the lever (B) downwards sends oil to the quick coupler (B2) so that the cylinder can be retracted.



Note

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

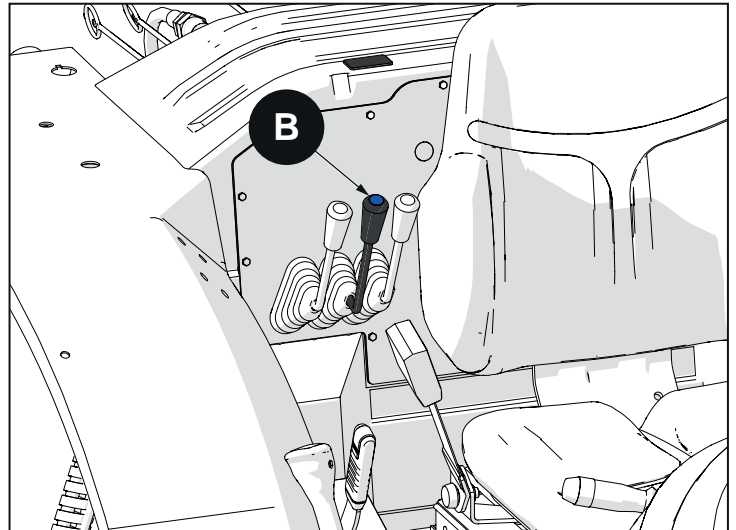


Fig. 5.102

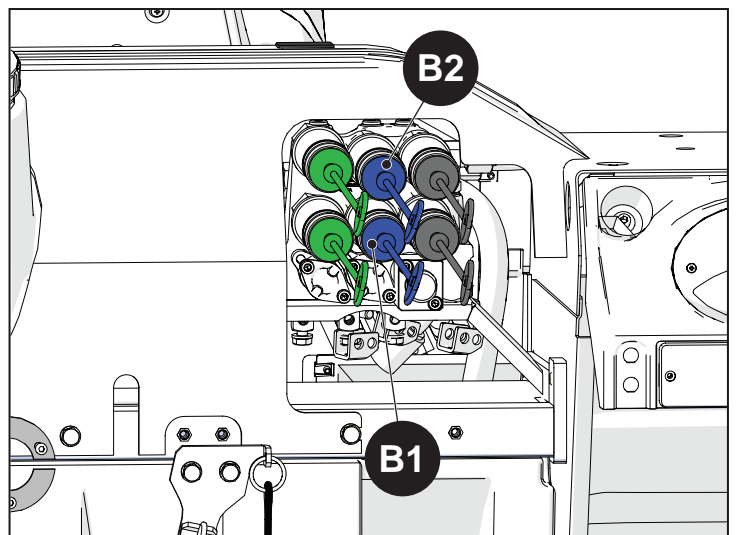
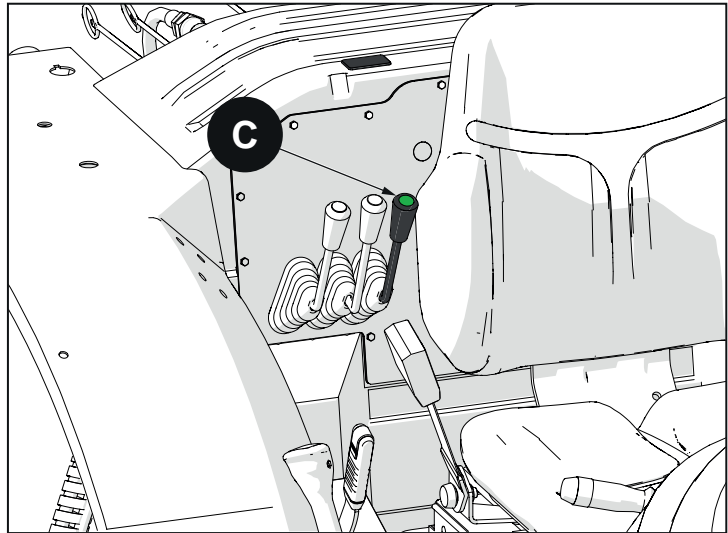
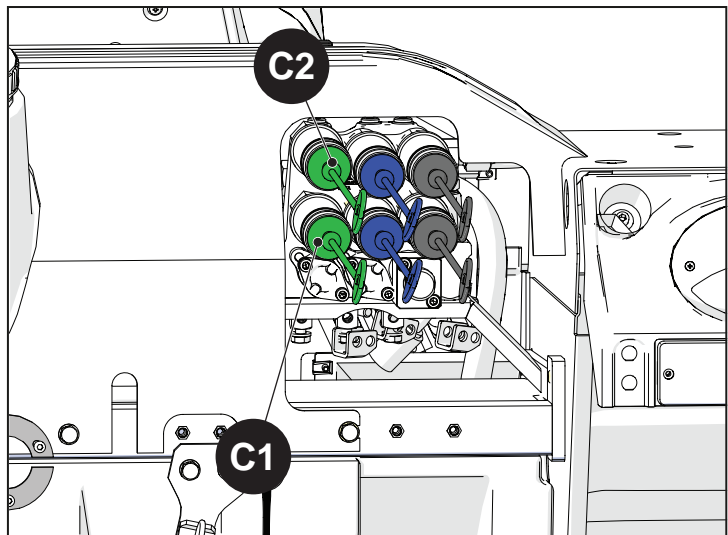


Fig. 5.103

The green lever (C) controls the rear distributor with green quick couplers.

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.

**Fig. 5.104****Fig. 5.105**

5.12.1.2 Diverter (if present)



Note

The Diverter is not available if the tractor has 3 rear mechanical distributors plus 2 rear electronic distributors.

The switch (1) activates the quick couplings (C1-C2) or (D1-D2), alternatively, according to its position.

When the switch (1) is pressed towards the seat side, quick couplings (C1) and (C2) are activated.

Lever (C) controls the active quick couplings.

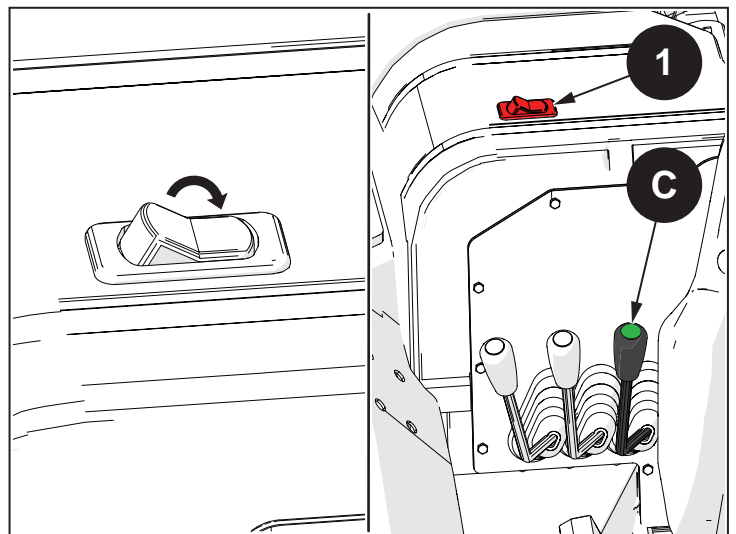


Fig. 5.106

When the switch (1) is pressed towards the side opposite the seat, quick couplings (D1) and (D2) are activated.

Lever (C) controls the active quick couplings.

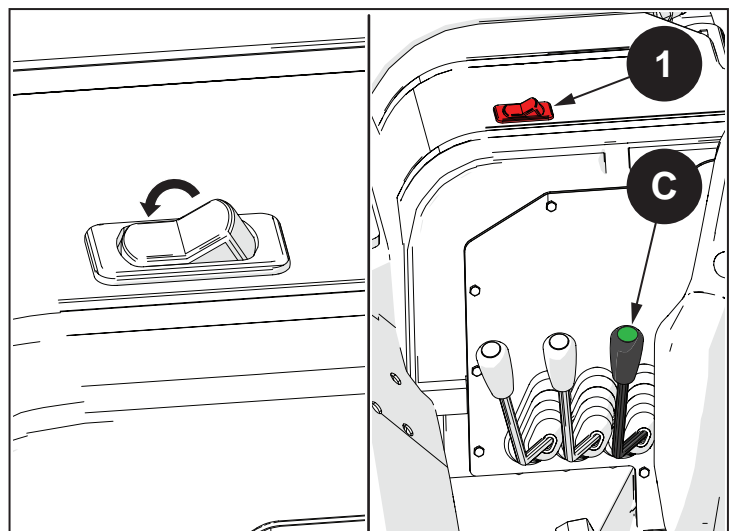


Fig. 5.107

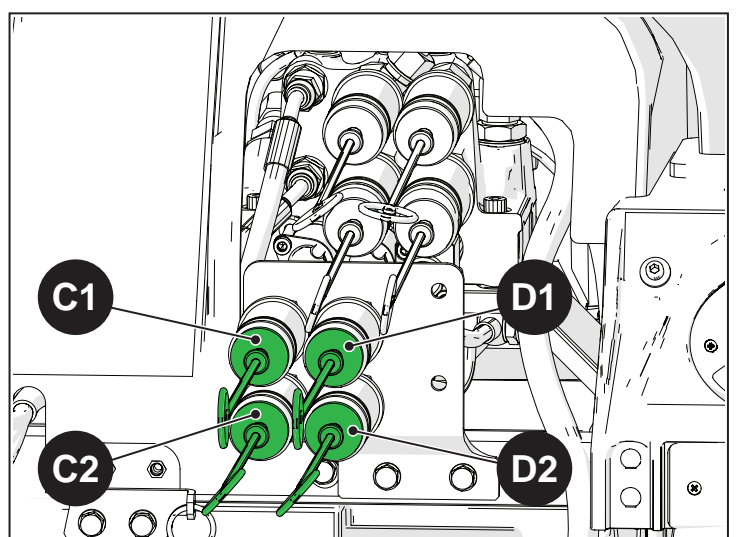


Fig. 5.108

5.12.1.3 Front auxiliary electronic distributors

These tractor models may be equipped with up to three front electronic distributors: two double acting ones and one double acting one with float function. The electronic distributors are controlled by the joystick.



Note

See the "Joystick" section for a detailed description of how the joystick works.

The green button (C) controls the front distributor with green quick couplers.

Hold the joystick and press button (A) to activate the distributor.

Moving the scroll wheel (1) up sends oil to the quick coupler (A1) and extends the cylinder.

Pulling the scroll wheel (1) down sends oil to the quick coupler (A2) so that the cylinder can be retracted.

Detent function: The distributor has a detent function. For instructions on how to activate the function, see the "Joystick" section.

Float function: The distributor has a float function. For instructions on how to activate the function, see the "Joystick" section.

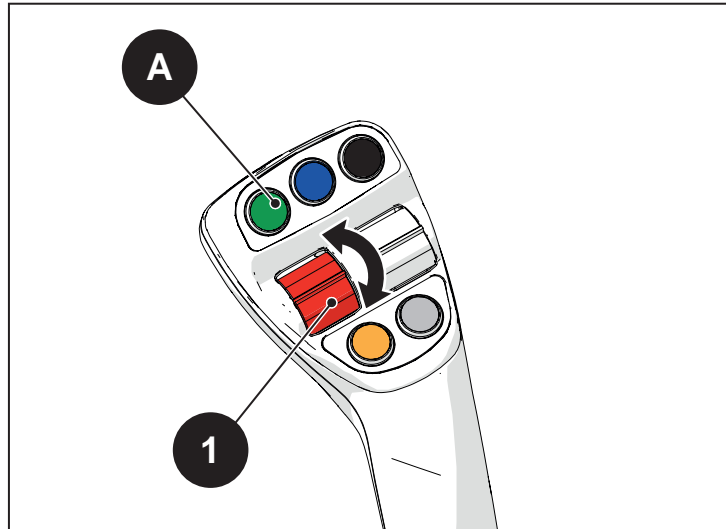


Fig. 5.109



Note

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

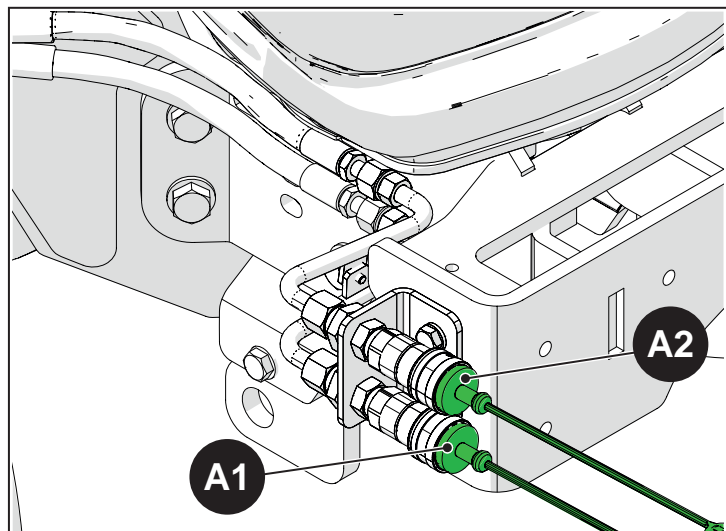


Fig. 5.110

The blue button (C) controls the front distributor with blue quick couplers.

Hold the joystick and press button (B) to activate the distributor.

Moving the scroll wheel (1) up sends oil to the quick coupler (B1) and extends the cylinder.

Pulling the scroll wheel (1) downwards sends oil to the quick coupler (B2) so that the cylinder can be retracted.

Detent function: The distributor has a detent function. For instructions on how to activate the function, see the "Joystick" section.

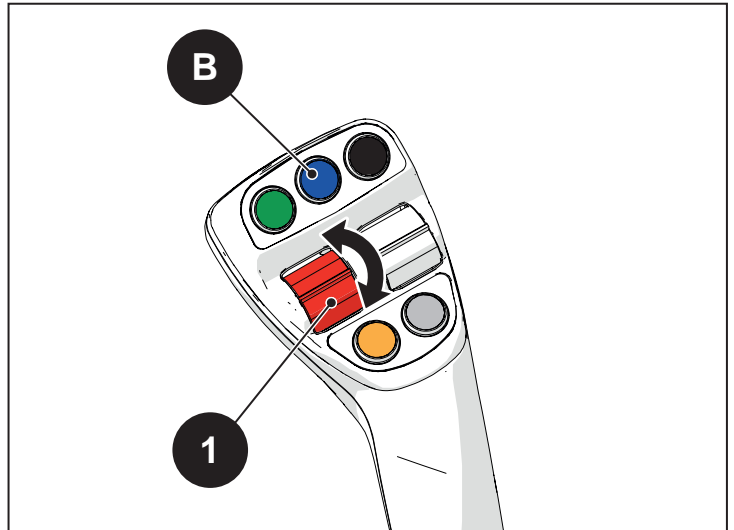


Fig. 5.111

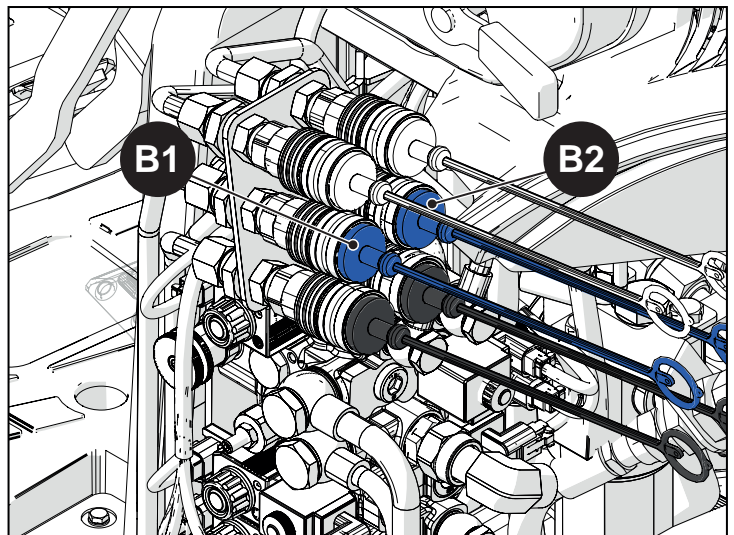


Fig. 5.112

The black button (C) controls the front distributor with black quick couplers.

Hold the joystick and press button (C) to activate the distributor.

Moving the scroll wheel (1) up sends oil to the quick coupler (C1) and extends the cylinder.

Pulling the scroll wheel (1) downwards sends oil to the quick coupler (C2) so that the cylinder can be retracted.

Detent function: The distributor has a detent function. For instructions on how to activate the function, see the "Joystick" section.

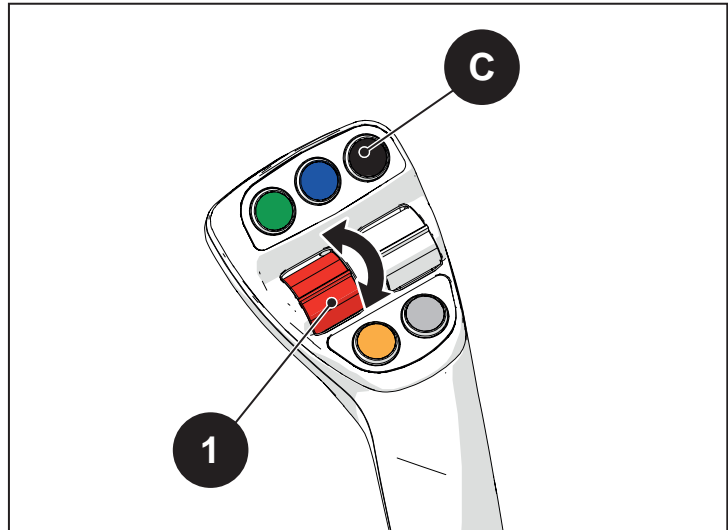


Fig. 5.113

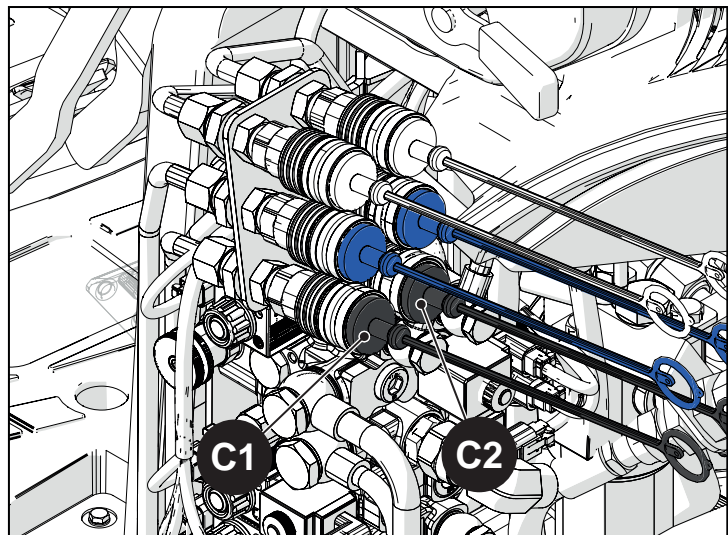


Fig. 5.114

5.12.1.4 Hydraulic motor



Note

See the "Joystick" section for a detailed description of how the joystick works.

The white button (A) controls the hydraulic motor.

Hold the joystick and press button (A) to activate the hydraulic motor.

Move the scroll wheel (1) to the left or right.

Detent function: The distributor has a detent function. For instructions on how to activate the function, see the "Joystick" section.

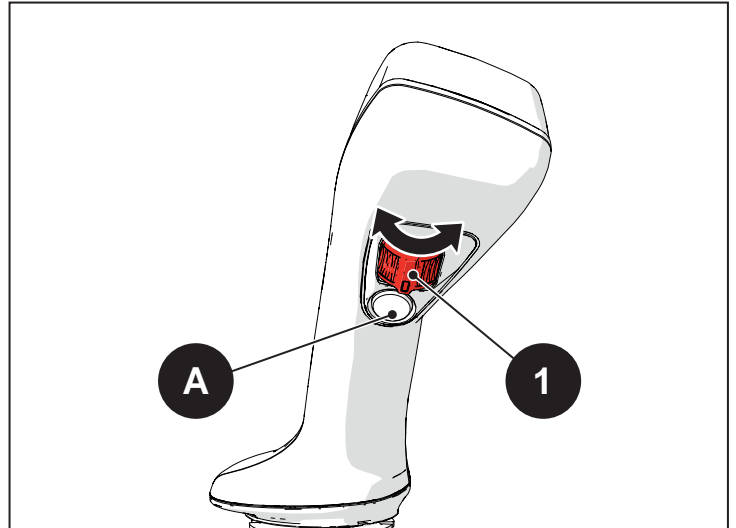


Fig. 5.115

The hydraulic motor has a manual flow regulator (2). Tighten or loosen the knob to adjust the flow of hydraulic fluid.

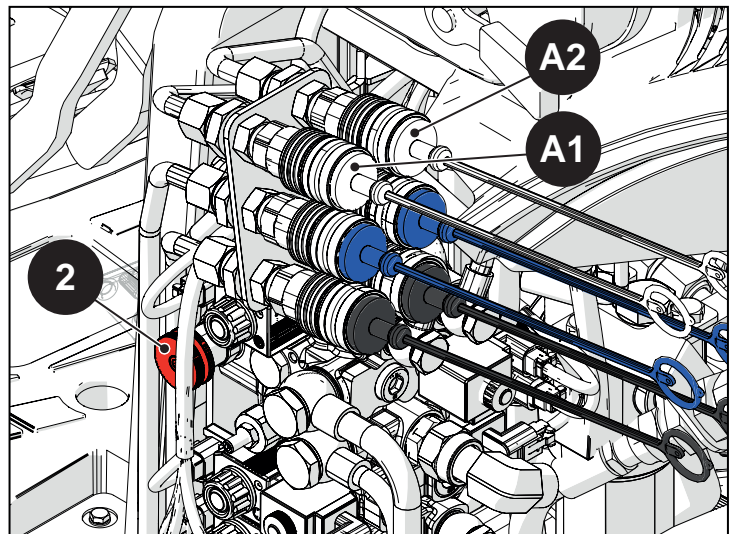


Fig. 5.116

5.12.2 Connecting external implements to the quick couplers



Keep out of the working radius of implements when connecting quick couplers.
Do not allow people to stand nearby.



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



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

Connect the hose to the quick 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.

5.12.3 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 engage 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.

5.13 Hydraulic trailer brakes (if present)



Danger

When a trailer with hydraulic braking is connected to the tractor, the brake pedals must always be locked together using the special catch (1).

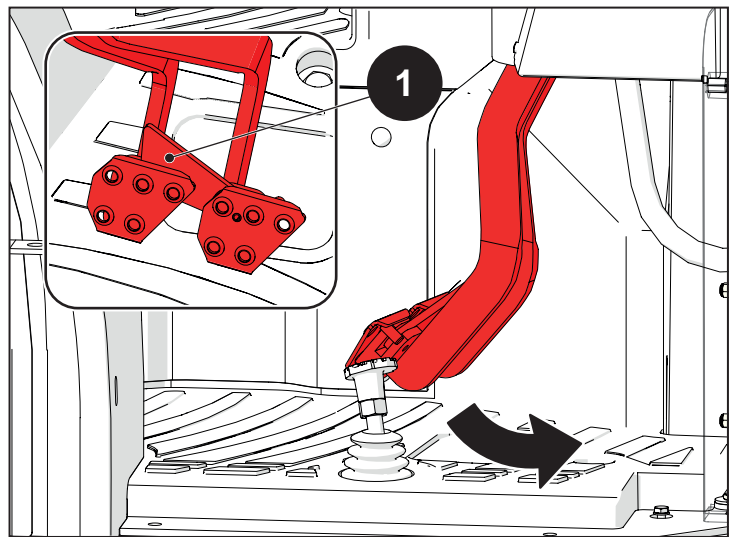


Fig. 5.117

When the tractor hand brake is applied, press button (2) and hold it down to deactivate the trailer parking brake. Release button (2) to reactivate the trailer parking brake.

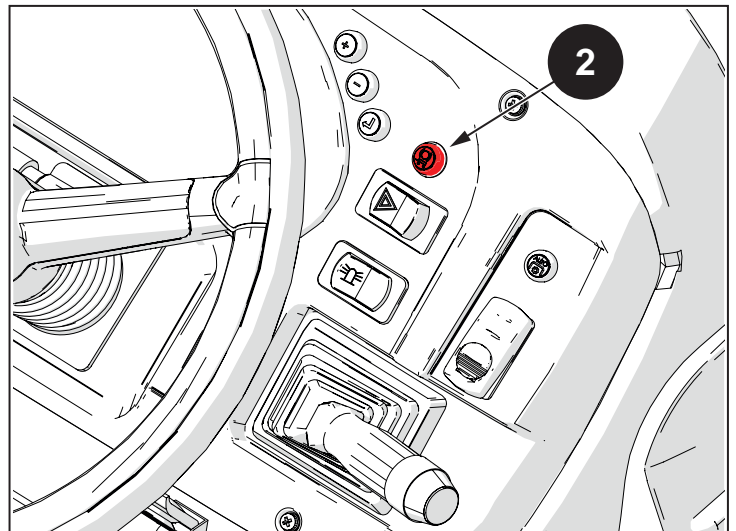


Fig. 5.118

5.13.1 Hydraulic trailer brakes - Single-line, Italy version

Attaching the trailer

After attaching the trailer to the tractor towing hitch, do the following.

- Apply the tractor hand brake and stop the engine.
- Connect the hydraulic brake connection on the trailer to coupling (1).



Attention

Make sure that the connectors have been correctly connected.

- Connect the electrical wiring of the trailer to the socket (2).



Warning

Check that the general alarm warning light (L12) does not light up on the dashboard.

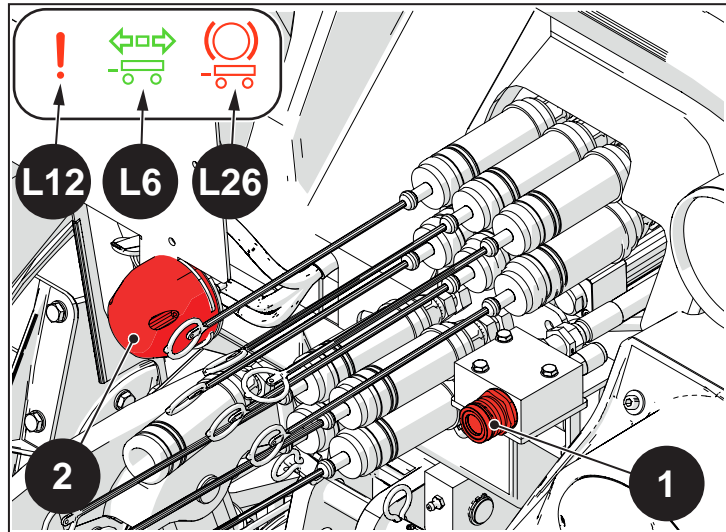


Fig. 5.119

- After starting the engine, press the brake pedals to load the trailer hydraulic system.
- The warning light (L6) on the dashboard indicates that there is incorrect pressure on the trailer brake valve when the hand brake is disengaged.
- The warning light (L26) indicates that the turn indicators have been switched on.



Note

The warning light (L6) only comes on if the engine is running.

Stopping the tractor and removing the trailer

Carry out the following procedure.

- Stop the tractor by following the procedure outlined in the special section.



Warning

Wait 10 seconds before stopping the engine after applying the hand brake to enable the trailer parking brake to engage.

- Apply the mechanical parking brake on the trailer (if present). Put chocks in position to block the wheels if necessary.
- Disconnect the hydraulic connections and electrical connection on the trailer.

5.13.2 Hydraulic trailer brakes - Double-line compatible with universal single-line trailers

Attaching the trailer

After attaching the trailer to the tractor towing hitch, do the following.

- Apply the tractor hand brake and stop the engine.
- Connect the hydraulic brake connections on the trailer to couplings (1) and (2).



Attention

Make sure that the connectors have been correctly connected.

- Connect the electrical wiring of the trailer to the socket (3).



Warning

Check that the general alarm warning light (L12) does not light up on the dashboard.

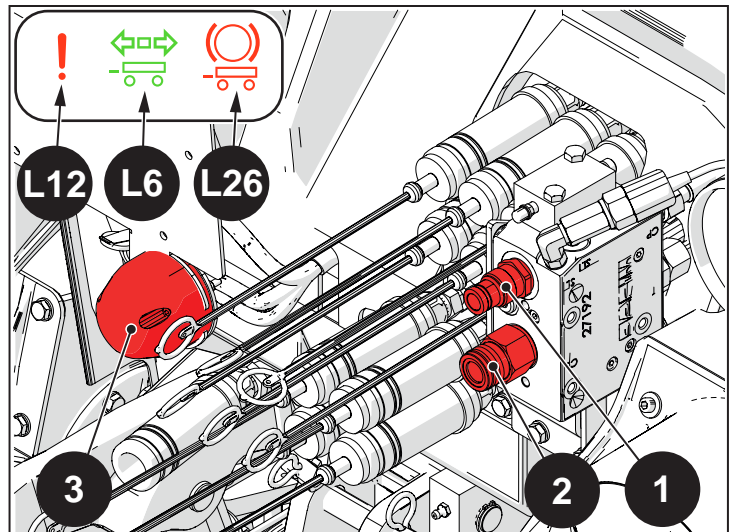


Fig. 5.120

- After starting the engine, press the brake pedals to load the trailer hydraulic system.
- The warning light (L6) on the dashboard indicates that there is incorrect pressure on the trailer brake valve when the hand brake is disengaged.
- The warning light (L26) indicates that the turn indicators have been switched on.



Note

The warning light (L6) only comes on if the engine is running.

Stopping the tractor and removing the trailer

Carry out the following procedure.

- Stop the tractor by following the procedure outlined in the special section.



Warning

Wait 10 seconds before stopping the engine after applying the hand brake to enable the trailer parking brake to engage.

- Apply the mechanical parking brake on the trailer (if present). Put chocks in position to block the wheels if necessary.
- Disconnect the hydraulic connections and electrical connection on the trailer.

5.14 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)

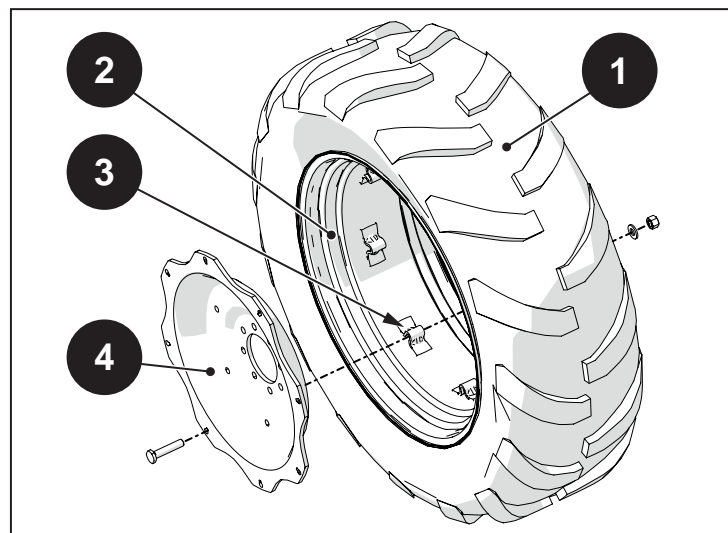


Fig. 5.121

5.14.1 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.

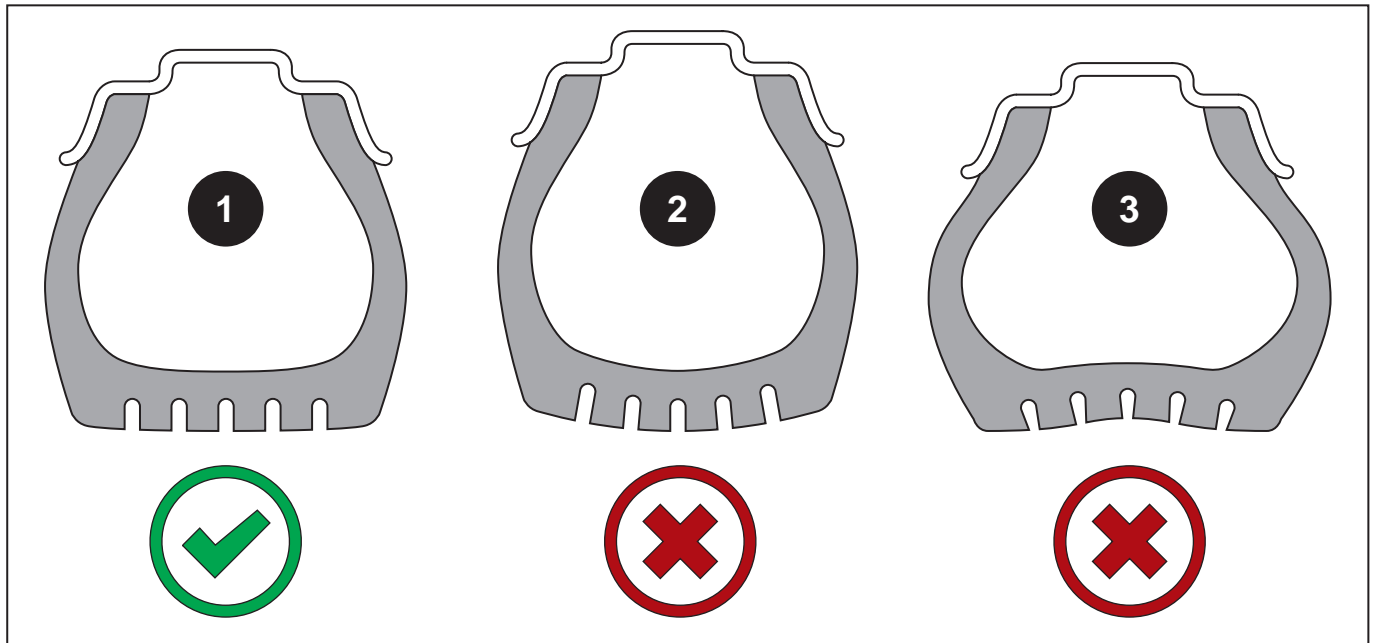


Fig. 5.122

- 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.

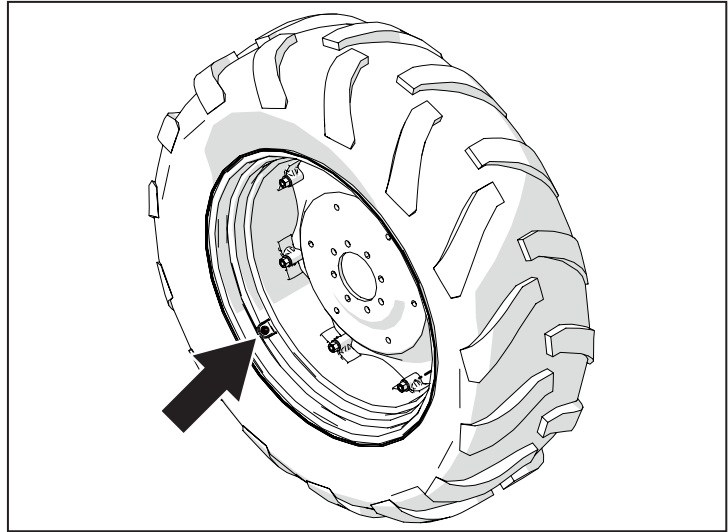


Fig. 5.123



Attention

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.

5.14.2 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.

5.14.3 Replacing a wheel

To replace a wheel, do the following.



Danger

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

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

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

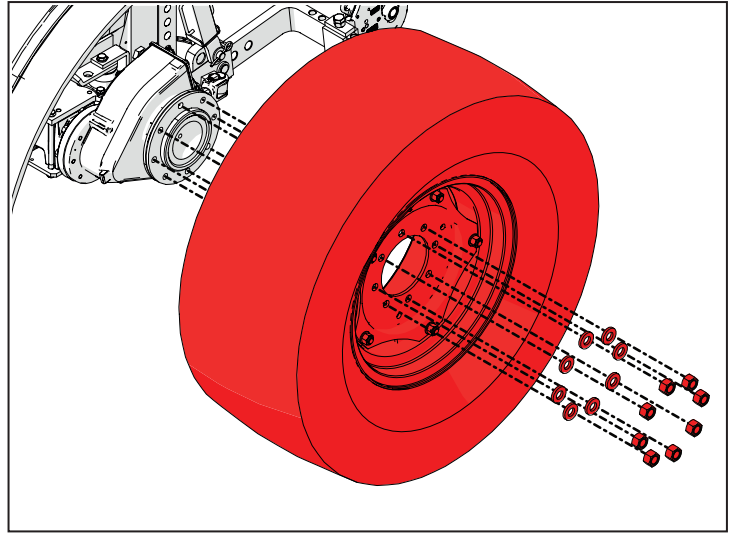


Fig. 5.124



Warning

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

Tightening torques

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

Rear wheel tightening torques	310 Nm
Front wheel tightening torques	227 Nm

5.14.4 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.

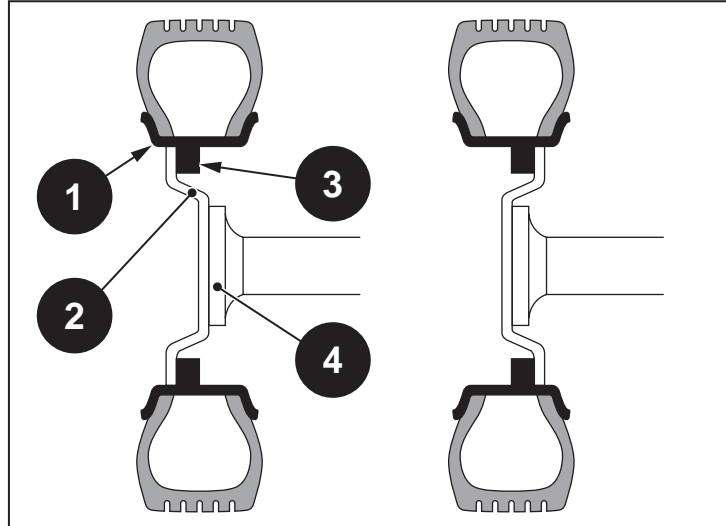


Fig. 5.125

⚠ 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).

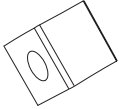
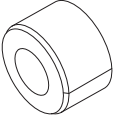


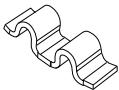
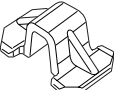
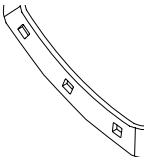
If this distance is not correct, you must **adjust the steering angle** of the wheels and if necessary, adjust the angle of rotation of the front mudguards (see the "Front mudguards" section).

5.14.4.1 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 for adjustable rims

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

Wheel	Torque (Nm)
DISC R. 8K X 16 REG. ARB	112
DISC R. 11 X 20 REG. ARB	250
DISC R. W10 X 24 REG. AR	250
DISC R. W12 X 24 REG. AR	230
DISC R. 8K X 16 REG. ARB	112
DISC R. W12 X 24 REG. AR	250
DISC R. W9 X 18 REG. ARB	250
DISC R. W10 X 28 REG. AR	295
DISC R. W9 X 18 REG. ARB	250

5.14.4.2 Track widths

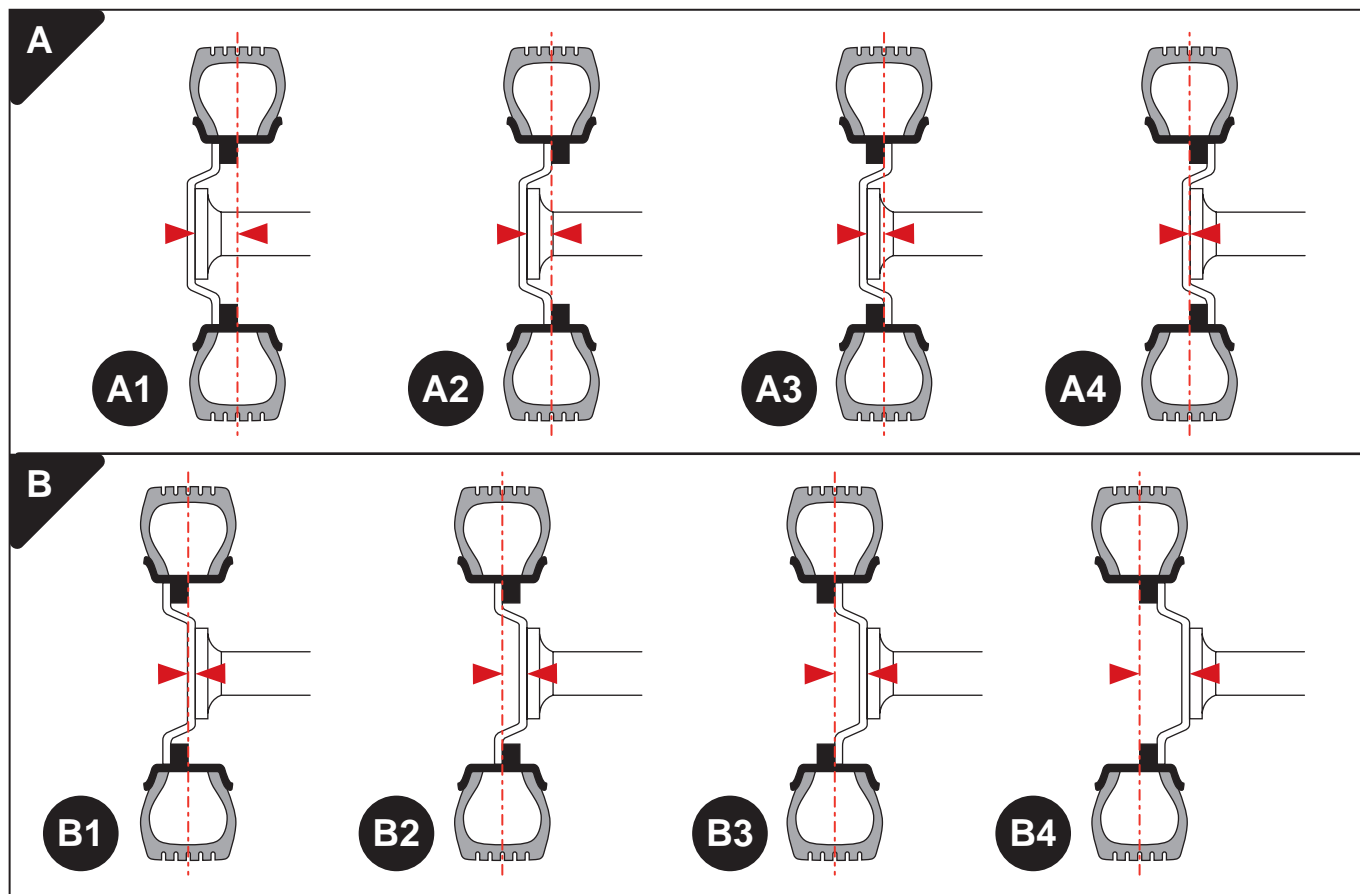


Fig. 5.126

A - Internally mounted flange
B - Externally mounted flange

Axle width

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

Front axle width (A):

Model	Distance (mm)
Q series	1302
S series	1302
S GT series	1312

Rear axle width (B):

Model	Distance (mm)
Q series	1228
S series	1268
S GT series	1268

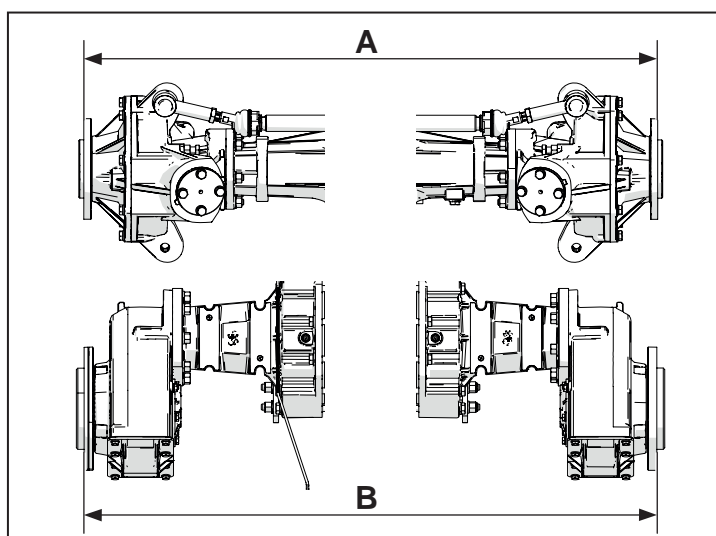


Fig. 5.127

Track widths for rear tyres

Speed radius index (mm)	Tyre	Wheel	A1 (mm)	A2 (mm)	A3 (mm)	A4 (mm)	B1 (mm)	B2 (mm)	B3 (mm)	B4 (mm)
Q90 - Q100 - Q110										
450	340/65R20	W11x20	-	1248	1104	1338	1134*	1368	1224	1458
500	340/70R20	W11x20	-	1248	1104	1338	1134*	1368	1224	1458
500	420/65R20	W11x20	-	1248	1104	1338	1134*	1368	1224	1458
525	380/70R20	W11x20	-	1248	1104	1338	1134*	1368	1224	1458
S90 - S100 - S110										
525	380/70R20	W11x20	-	1288	1144	1378	1174*	1408	1264	1498
525	320/70R24	W10x24	1084*	1138	1174	1228	1324	1378	1414	1468
550	360/70R24	W12x24	1102	1120*	1192	1210	1342	1360	1432	1450
S90 - S100 - S110 - GT90 - GT100 - GT110										
575	380/70R24	W12x24	1102	1120*	1192	1210	1342	1360	1432	1450
GT90 - GT100 - GT110										
600	420/70R24	W12x24	1042	1180	1132*	1270	1282	1420	1372	1510
600	360/70R28	W10x28	1044	1110	1146	1212*	1344	1410	1446	1512

* - Factory track width

Track widths for front tyres

Speed radius index (mm)	Tyre	Wheel	A1 (mm)	A2 (mm)	A3 (mm)	A4 (mm)	B1 (mm)	B2 (mm)	B3 (mm)	B4 (mm)
Q90 - Q100 - Q110										
360	260/70R16	8Kx16	1163†	1356	1224	1417	1203*	1396	1264	1457
390	280/70R16	8Kx16	1163†	1356	1224	1417	1203*	1396	1264	1457
410	280/70R18	W9x18	1171*	1251	1261	1341	1279	1359	1369	1449
410	320/65R18	W9x18	1171*	1251	1261	1341	1279	1359	1369	1449
S90 - S100 - S110										
350	240/70R16	8Kx16	1163†	1356	1224	1417	1203*	1396	1264	1457
360	260/70R16	8Kx16	1163†	1356	1224*	1417	1203†	1396	1264	1457
390	280/70R16	8Kx16	1163†	1356	1224*	1417	1203†	1396	1264	1457
GT90 - GT100 - GT110										
390	280/70R16	8Kx16	1173†	1366	1234*	1427	1213†	1406	1274	1467
410	280/70R18	W9x18	1181†	1261†	1271†	1351	1289*	1369	1379	1459

* - Factory track width

† - 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).

5.14.5 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.

- Turn 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

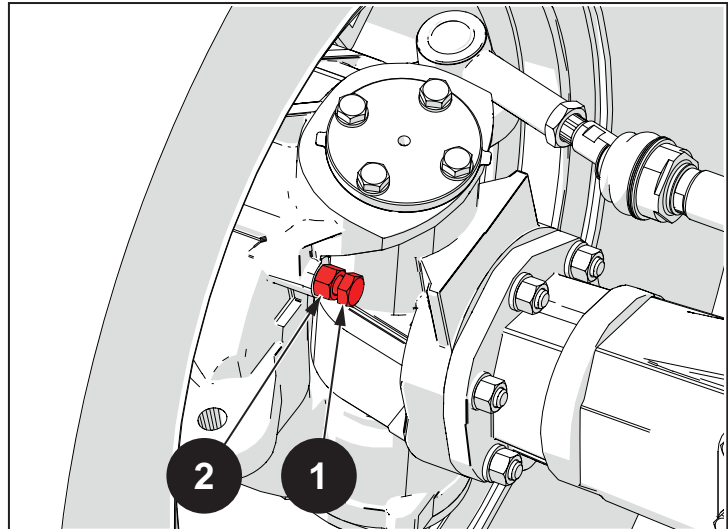


Fig. 5.128

5.15 Front mudguards (if present)



Note

The front mudguards are only available as an option for the S and S GT series models.

The front mudguards guarantee improved safety and help to protect the tractor from excessive dirt.

Depending on the tyres that have been fitted and the established track width (see relevant section), you may have to adjust the position of the mudguard to maintain the correct distance between it and the other parts of the tractor.

5.15.1 Adjusting the mudguard angle of rotation

The maximum angle of rotation of the mudguards can be adjusted. This is done by changing the position in the slot of the adjuster screw (1) in relation to the retainer bracket (2):

- if the screw (1) is placed as far as possible from the bracket (2), as shown in (A), the mudguard can reach the maximum angle of rotation;
- if the screw (1) is placed next to the bracket (2), as shown in (B), the mudguard cannot rotate and is blocked parallel to the engine;
- if the screw (1) is placed in an intermediate position, partial rotation is possible rather than the two extremes described above.

Each front mudguard has its own adjuster screw and the angle of rotation should therefore be adjusted on both.

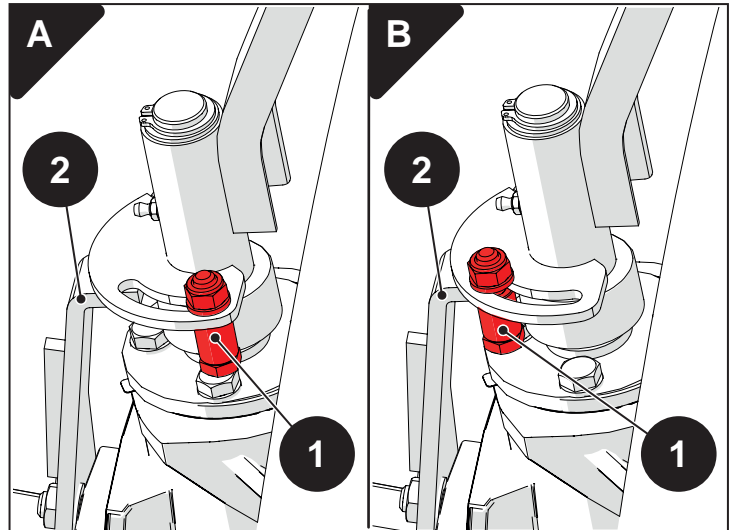


Fig. 5.129

5.15.2 Horizontal adjustment

The horizontal position of the mudguard can be adjusted in relation to the support (1): unscrew the mudguard fastener bolts near the slots (2), then move the mudguard to the horizontal position required and refasten it to the support (1) by refastening the bolts.

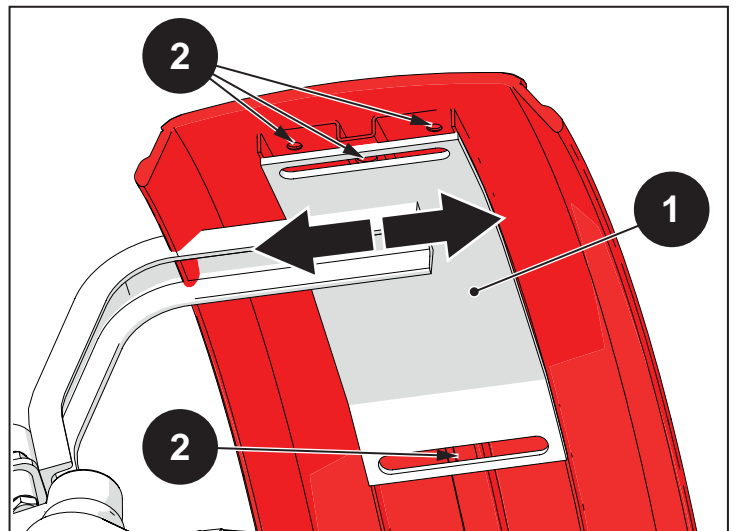


Fig. 5.130

5.16 Ballast weights

5.16.1 Front ballast weights (if provided)

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. These ballast weights weigh 34 Kg each, and up to 6 may be fitted to the tractor.

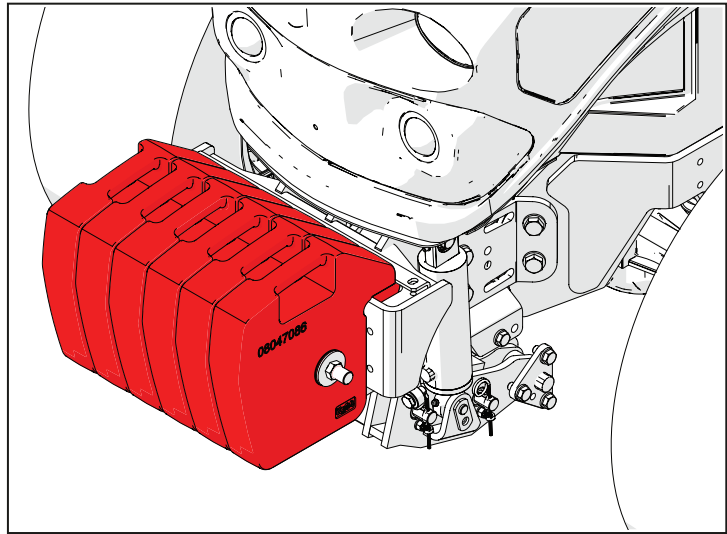


Fig. 5.131

To fit or remove the ballast weights:

- undo the screws (4) and remove the blade (3);
- undo the bolt (1);
- pull out the pin (2);
- fit or remove the ballast weights;
- refit the pin (2);
- tighten the bolt (1);
- put the ballast securing blade (3) into position and tighten to screws (4) to fasten it.

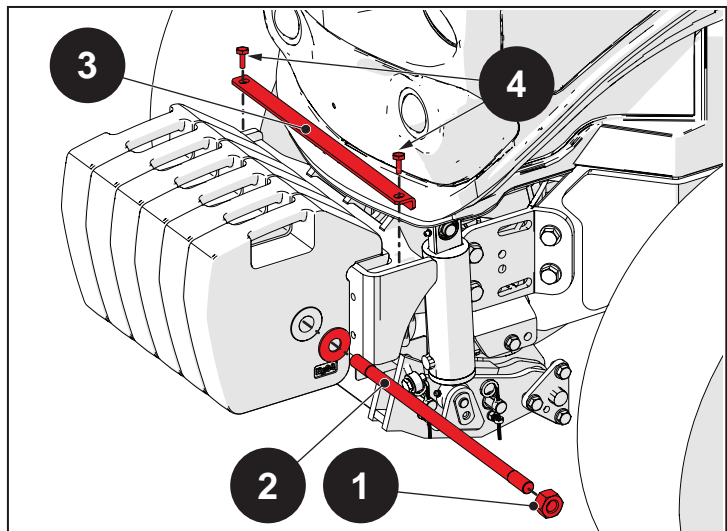


Fig. 5.132



Warning

Check that the ballast weights are securely fastened and that the bolt is tightened before using the tractor.

5.16.2 Liquid ballast

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

Warning

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

Warning

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

Warning

It is preferable to use tyres with inner tubes.

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

Warning

Use water with an antifreeze solution in cold weather.

Warning

Do not use alcohol as liquid ballast.

Danger

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

To fill with water:

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

Warning

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

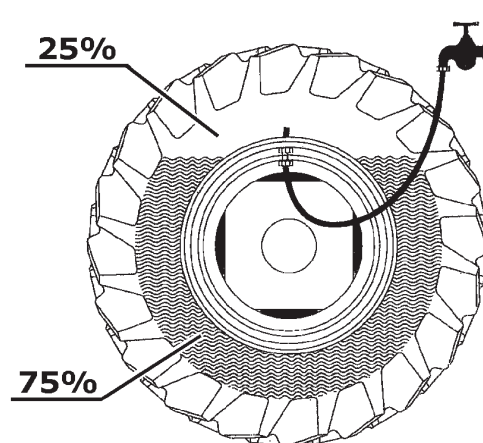
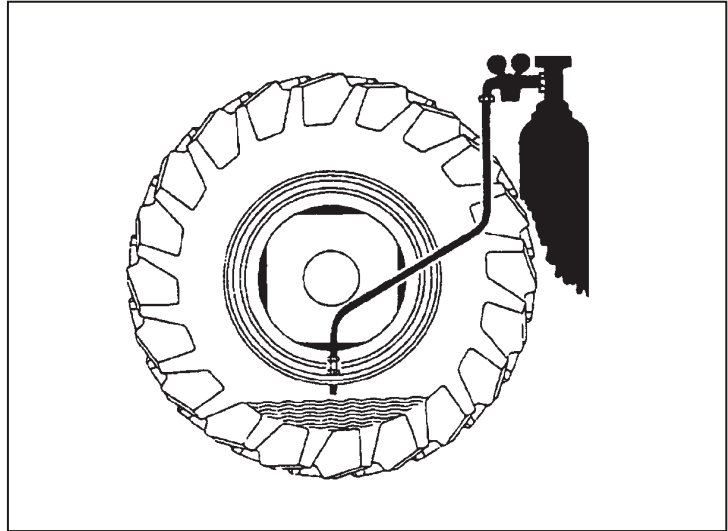


Fig. 5.133

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. 5.134**

6 : Service procedures

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6.1 Service intervals

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

 **Warning**

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

 **Warning**

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

 **Warning**

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

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

 **Note**

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

6.1.1 Service intervals

Group	Description of procedure	Replacement interval									
		Hours	50	150	300		900	900	1.200	4.000	8.000
		Months	12		12	24	12	24	24		
Engine (3)	Engine oil (1) (2)				X						
	Engine oil filter (1)		X (*)		X						
	Fuel filter				X						
	Coolant								X		
	Alternator belt							X			
	Air filter clogged sensor							X			
	Engine air filter - External				X						
	Engine air filter- Safety					X					
	Particulate filter									X	
	Partial engine overhaul									X	
	Complete engine overhaul										X
Cab	Cab air filter (dust filter)				X						
Transmission	Check of the clutch pedal travel adjustment		X								
	Transmission oil filter - Delivery (main pump)			X (*)	X						
	Transmission oil filter - Delivery (ancillaries pump)			X (*)	X						
	Transmission oil filter - Suction				X						
	Transmission oil - Rear Differential						X				
	Transmission oil - Final drive units						X				
	Front axle oil - Front differential						X				
Brakes	Brake Oil						X				
Lubrication	Rear lift		X								
	Front axle		X								
	Brake linkages		X								

(*) - 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) - Change the oil whenever the engine oil warning lamp illuminates, even if the number of operating hours indicated for the service interval has not been reached
- (3) - Normal scheduled maintenance of engine (after running-in), with engine used regularly on a daily basis. See the relative section for maintenance during the running-in period.

6.1.2 Technical maintenance operation



Note

The engine maintenance procedures and frequency are indicated as follows. See the specific sections for detailed descriptions of the operations involved.

Maintenance during running-in (first 50 hours)

Frequency *	Component	Task	Procedure
Every 10 hours (every day)	Engine oil (1)	Check level	Top up if necessary
	Coolant (3)	Check level	Top up if necessary
	Air cleaner	Check cleanliness	Clean with low pressure compressed air
		Check the clogging indicator on the filter housing	Clean the filter or replace with a new filter if necessary
	Engine and vehicle cooling system (radiators, intercooler, fan)	Check cleanliness	Clean with a soft-bristled brush Clean with low pressure compressed air.
After first 50 hours (at end of running-in)	Oil filter (2)	Replacement	-

* - On tractors with no counter, determine service intervals on the basis of equivalent full working days: one equivalent full working day = 12 operating hours.

- (1) - In heavy duty working conditions, such as when working in dusty environments and operating under extreme loads, change the engine oil and oil filter every 150 operating hours. Replace the engine oil and oil filter at least once every year even if the engine has not reached the operating hours specified as the service interval.
- (2) - Replace the filter at least once every 12 months even if the engine has not reached the operating hours specified as the service interval.
- (3) - Replace the fluid at least once every 24 months even if the engine has not reached the operating hours specified as the service interval.

Normal scheduled maintenance of engine (after running-in)



Warning

The engine oil must be changed immediately if the general alarm warning lamp comes on, accompanied by the electronic engine control unit error 3020 "Critical engine oil mass", even if the interval indicated in the maintenance schedule has not been reached.



The lighting of the general alarm warning light on the dashboard is accompanied by the appearance of the operator alert symbol (A) on the display.

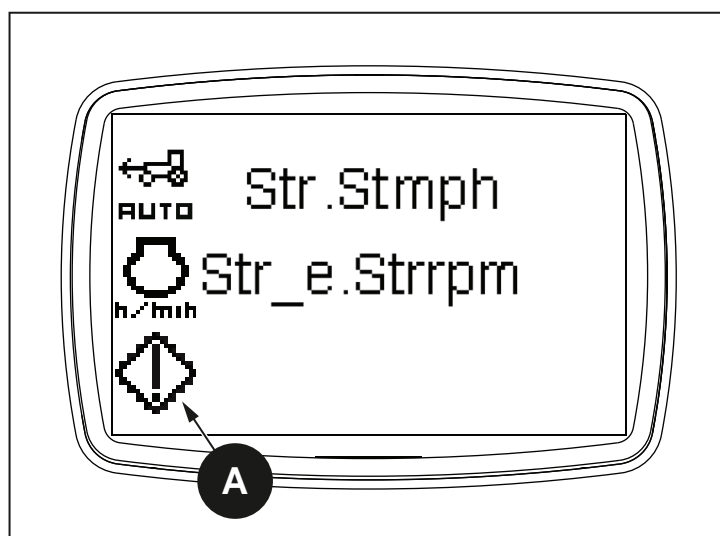


Fig. 6.1

Frequency (hours) *	Component	Task	Procedure
10 (every day)	Engine oil (1)	Check level	Top up if necessary
	Coolant (3)	Check level	Top up if necessary
	Air cleaner	Check cleanliness	Clean with low pressure compressed air
		Check the clogging indicator on the filter housing	Clean the filter or replace with a new filter if necessary
	Engine and vehicle cooling system (radiators, intercooler, fan)	Check cleanliness	Clean with a soft-bristled brush Clean with low pressure compressed air.
300	Engine oil (1)	Replacement	-
	Oil filter (2)	Replace the cartridge	-
	Air cleaner	Replace main cartridge	-
		Check cleanliness of safety cartridge	Clean with low pressure compressed air
		Check dust ejector system	-
	Fuel filter (2)	Replacement	-
	Air intake system and intercooler pipe	Check cleanliness	-
		Check seal tightness of pipes	-
	Oil separation circuit	Check seal tightness of pipes	-
	Vacuum circuit	Check seal tightness of pipes	-
900	Poly-V drive belt (4)	Replacement	-
	Fuel tank	Clean fuel tank and check function of filler cap	-
	Air cleaner	Replace clogging filter sensor	-
1.200	Coolant (3)	Replace	-
4.000	Particulate filter	Perform regeneration	Have the procedure performed by an authorised service centre
	Engine	Perform partial engine overhaul	Have the procedure performed by an authorised service centre
8.000	Engine	Perform complete engine overhaul	Have the procedure performed by an authorised service centre

* - On tractors with no counter, determine service intervals on the basis of equivalent full working days: one equivalent full working day = 12 operating hours.

- (1) - In heavy duty working conditions, such as when working in dusty environments and operating under extreme loads, change the engine oil and oil filter every 150 operating hours. Replace the engine oil and oil filter at least once every year even if the engine has not reached the operating hours specified as the service interval.
- (2) - Replace the filter at least once every 12 months even if the engine has not reached the operating hours specified as the service interval.
- (3) - Replace the fluid at least once every 24 months even if the engine has not reached the operating hours specified as the service interval.
- (4) - Replace the belt at least once every 24 months even if the engine has not reached the operating hours specified as the service interval.

6.2 General maintenance and inspection

Opening the bonnet

Fit a suitably sized hex head wrench (1) in the hole and turn clockwise to release the lock.

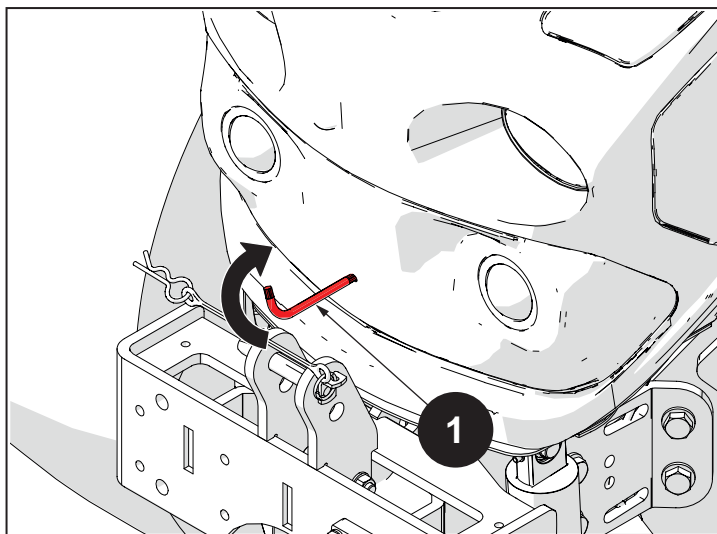


Fig. 6.2

6.2.1 Refuelling



Danger

Only refuel with the engine off.

The engine is designed to run with standard fuels available throughout Europe (compliant with EN 590 specifications). BIODIESEL (compliant with the specifications of UNI EN 14214) may be used in proportions up to 7% mixed in a standard fuel type available in Europe (as defined by the standard EN 590).

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



Warning

Do not use fuels with characteristics differing from those indicated. Use only low sulphur fuels. Sulphur content must not exceed 10-50 ppm (parts per million).

Using fuel with a higher sulphur content than the value indicated will compromise the diesel particulate filter.

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

Access the fuel tank cap (1) on models with the SG1/1 cab (low profile) as follows.

- Open the rear screen.
- Undo the knob (2) and lift the hinged panel (3).



Warning

Preferably use a funnel to fill the tank with fuel.

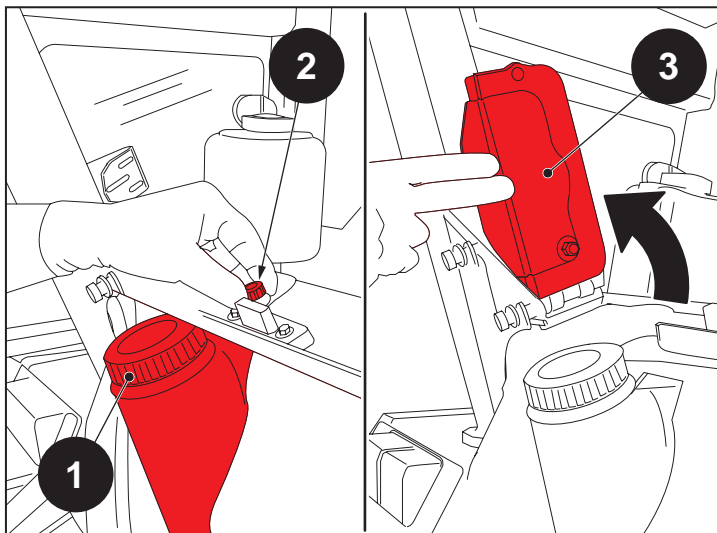


Fig. 6.3

6.2.2 Checking engine oil level



Attention

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



Attention

The DPF system (3) may reach extremely high temperatures and is situated close to the filler cap (2). Wear protective gloves to prevent the risk of burns.

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.

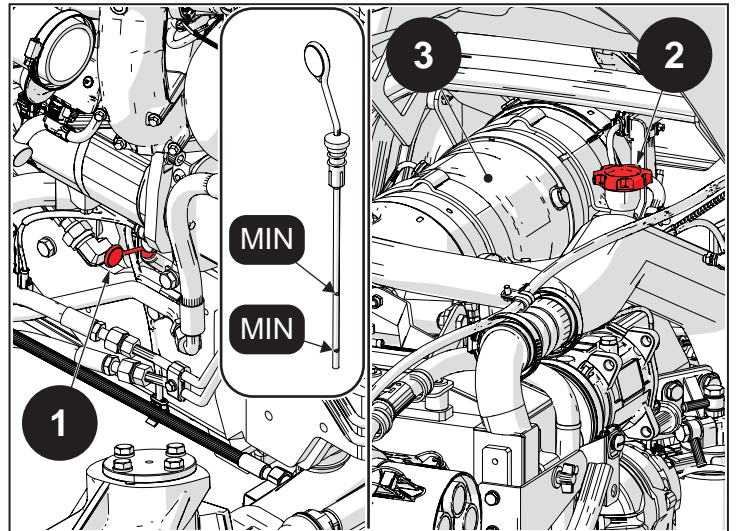


Fig. 6.4



Warning

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

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

6.2.3 Check the tightness of the screws and connectors

Proceed as follows.

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

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

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



Warning

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

6.2.4 Bodywork maintenance



Attention

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

- Electrical system components
- Tyres
- 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.

6.2.5 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 tightness of screws and connectors;
- check engine oil level;
- check engine coolant level;
- check belt tension;
- change engine oil;
- change coolant;
- change engine oil cartridge;
- change fuel filter;
- clean diesel particulate filter.

6.2.6 Cleaning and replacing the air filter



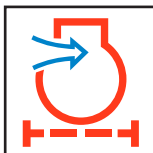
Attention

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



Note

The filter clogging indicator lamp is situated on the dashboard instrument.



This lamp illuminates to indicate that the air filter is clogged and must be serviced or replaced.

- Release the clips (1) and remove the cover (2).
- Remove the main filter cartridge (3) and clean with compressed air directed outwards from the inner side of the cartridge.
- Check the state of wear of the cartridge (3) and replace if necessary.
- Remove the safety cartridge (4) and clean both the cartridge and in the interior of the housing with compressed air.
- Check the state of wear of the cartridge (4) and replace if necessary.
- Refit the cartridge (4).
- Refit the cartridge (3) and the cover (2).

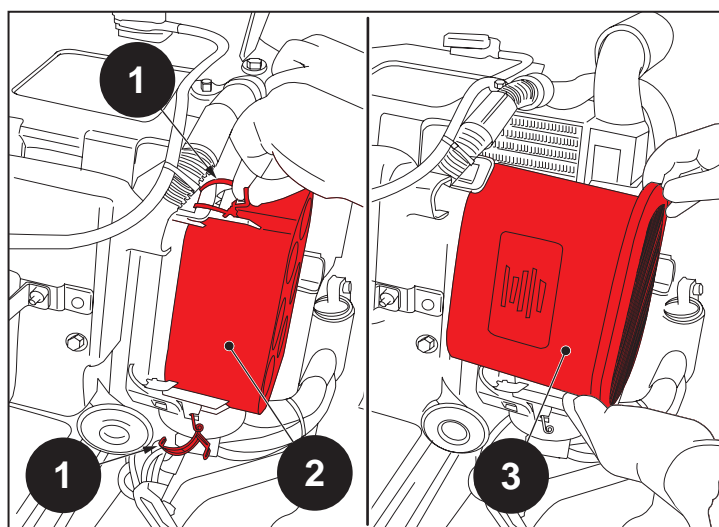


Fig. 6.5



Warning

Also replace the safety cartridge (4) every second or third time that the main cartridge (3) is replaced.

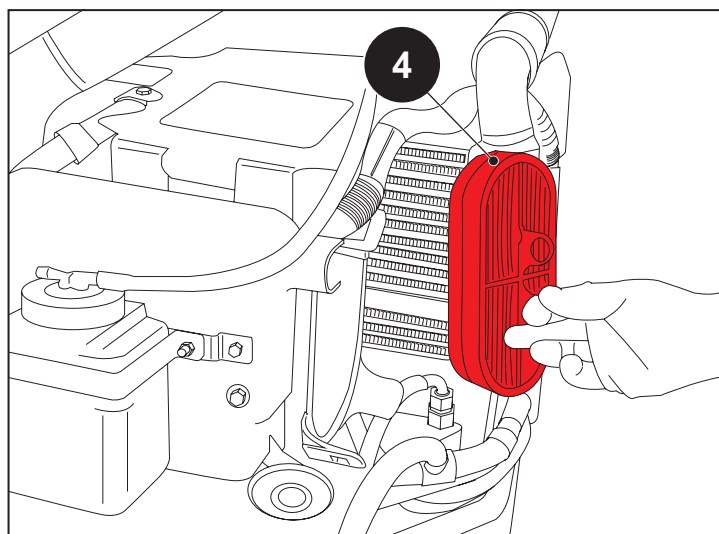


Fig. 6.6

6.2.7 Changing the engine oil

 **Attention**

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

 **Attention**

The DPF system (3) may reach extremely high temperatures and is situated close to the filler cap (2). Wear protective gloves to prevent the risk of burns.

 **Warning**

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

 **Warning**

Preferably perform a manual regeneration cycle of the diesel particulate filter before changing the engine oil.

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 (1) and wait for all the oil to drain into the pan.
- Replace the gasket and refit and tighten the plug (1).

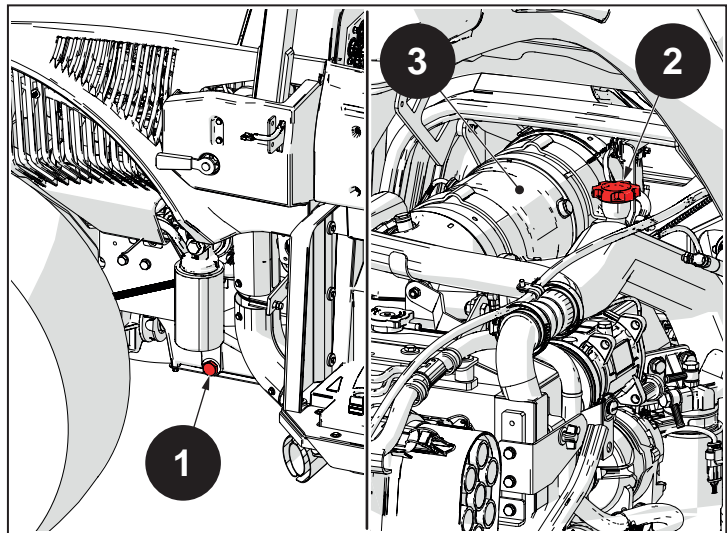


Fig. 6.7

 **Warning**

Tighten the plug (1) to a torque of 55 Nm (5.5 kgm).

- 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.
- Turn off the engine.
- Wait a few minutes for all the oil to drain back into the sump.
- Check the oil level.

6.2.8 Engine oil dilution

Reset parameters in electronic engine control unit (must be performed after an engine oil change).



Warning

The "Oil dilution calculation" parameter must be reset after every oil change.



Warning

This parameter is reset with the diagnostic tool used by authorised GOLDONI service centres or official dealers.

Check:

If the procedure has been performed successfully, the low engine oil pressure warning lamp flashes three times with a flash duration of 1 second and intervals of 0.5 seconds.



Note

This procedure is not possible with certain tractor configurations.



Warning

Dispose of used oil correctly as required by applicable legislation in the country of use.

Use the oils and lubricants recommended by the manufacturer (see "Lubricants, fuels and coolants").

6.2.9 Replacing the engine oil filter cartridge

- 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.

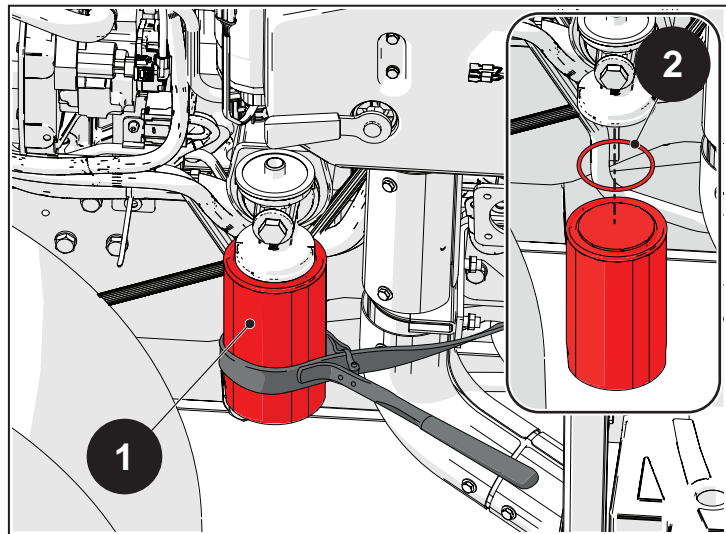


Fig. 6.8

 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 service centre.

 Warning
--

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

6.2.10 Checking and adjusting service brake pedal height

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.



Danger

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

The height of the brake pedals relative to the footboard is approximately 215 mm.



Note

If necessary, have the adjustment procedure performed by an authorised service centre.

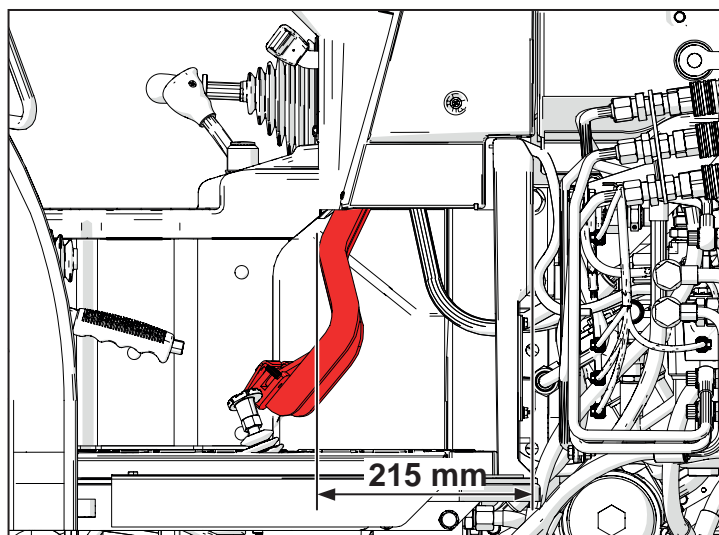


Fig. 6.9

After adjusting, grease the inner bushes using the indicated grease nipples, situated in front of the 4WD transfer case.

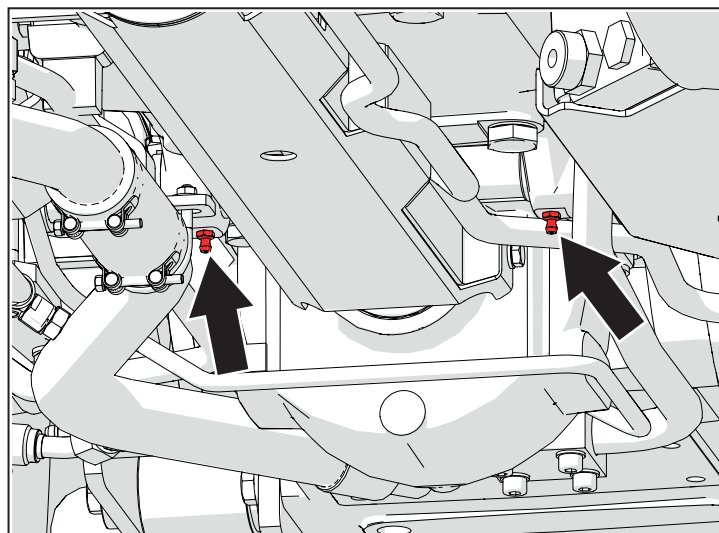


Fig. 6.10

6.2.11 Checking and adjusting clutch pedal travel

Periodically check the dead zone of the control. Free play should be maintained in the range +20/+30 mm. If the free play is not within this range, the clutch pedal must be adjusted.

Q series with roll bar and SG1/1 cab

Pedal in rest position (A)	195 mm
Kiss point (B)	220 mm
End of travel (C)	360 mm

S series with roll bar and GL11 cab, or Q series with cab

Pedal in rest position (A)	165 mm
Kiss point (B)	190 mm
End of travel (C)	330 mm

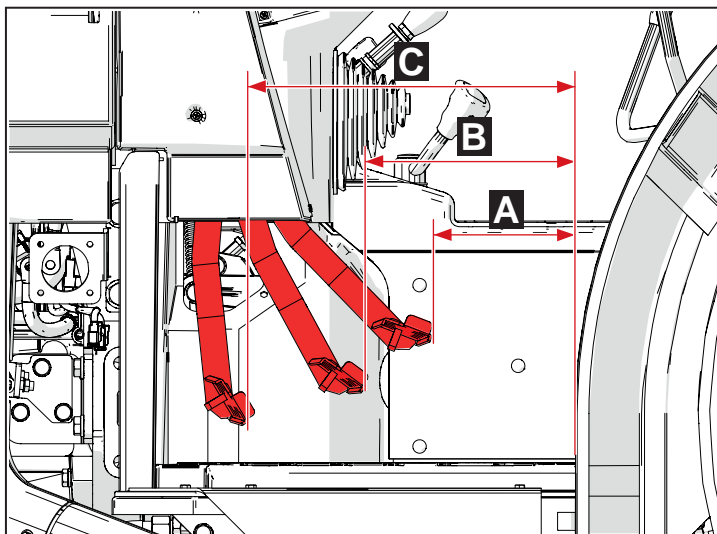


Fig. 6.11

Adjust the pedal as follows:

- The lateral cover panel must be removed to allow access to the adjuster screws.
- Tighten or loosen the adjuster nut (1) to adjust the dead zone of the pedal.

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

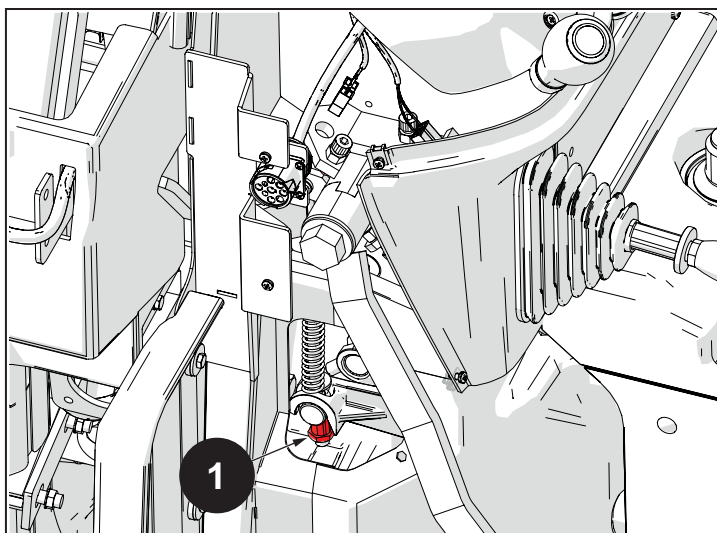


Fig. 6.12



Danger

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

6.2.12 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.

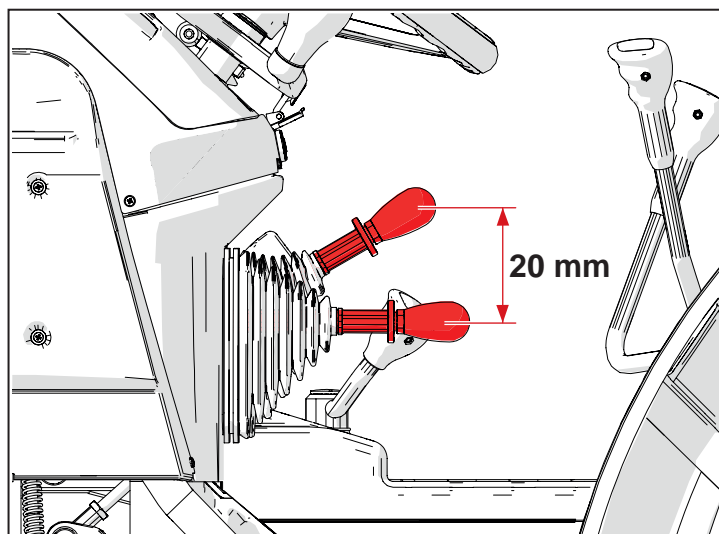


Fig. 6.13

The lateral cover panel must be removed to allow access to the adjuster screws. Adjust the lever as follows:

- Tighten or loosen the adjuster nut (1) to adjust the dead zone of the pedal.
- Tighten or loosen the screw (2) to adjust the end of travel position.

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

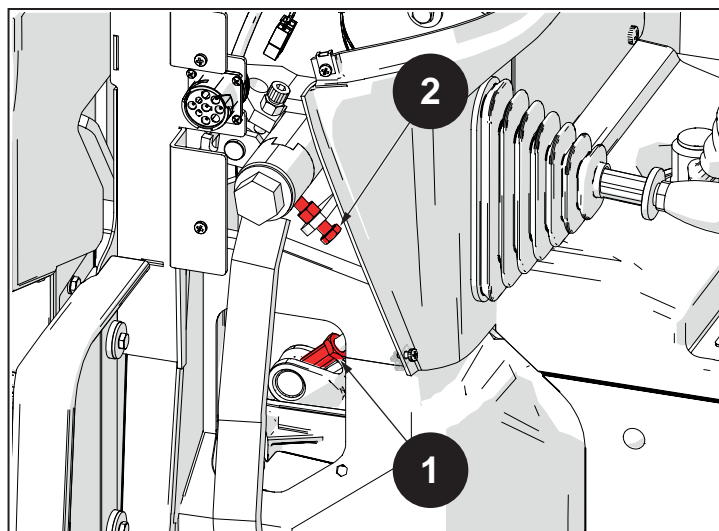


Fig. 6.14



Danger

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



Danger

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

6.2.13 Checking engine idle speed

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

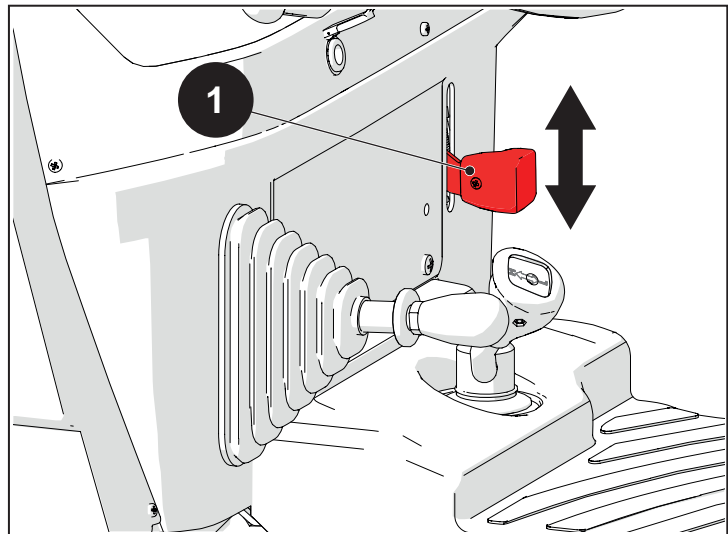


Fig. 6.15

6.2.14 Adjusting the valve clearance

Checked and adjusted by dealer only.

6.2.15 Checking the seatbelt

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

6.3 Engine cooling system maintenance

Attention

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.

Attention

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.

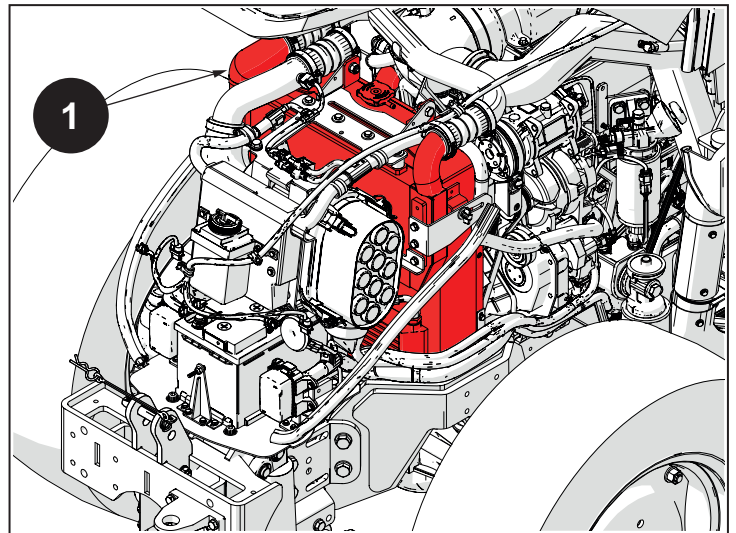


Fig. 6.16

6.3.1 Cleaning the engine cooling system

Undo the wing screws (1) on both sides of the radiator to free the intercooler (2).

Lift the intercooler (2) to allow sufficient room to access the coolant radiator.

Clean with a soft-bristled brush, removing all grass and debris.

Finish by cleaning with low pressure compressed air.

Warning

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

Attention

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.

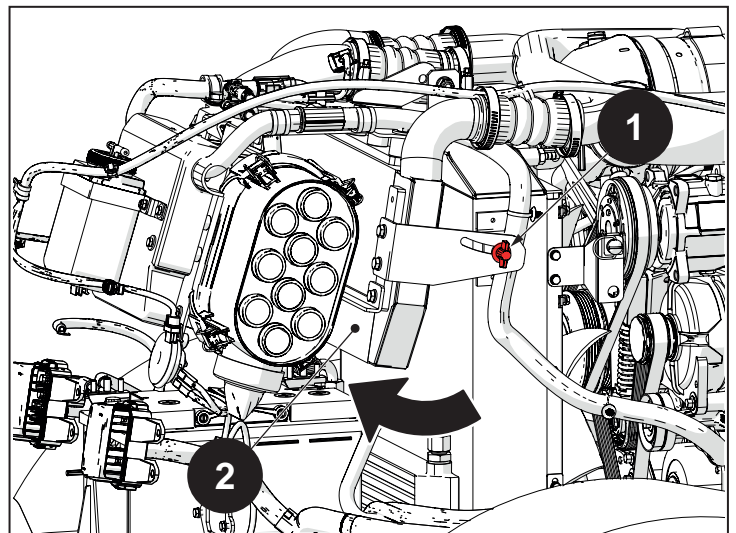


Fig. 6.17

6.3.2 Checking and refilling the engine coolant

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.
- Unscrew the filler cap (1).



Attention

Open the cap slowly and carefully to safely release the pressure in the system.

- If necessary, top up via the filler (1). The fluid must reach the base of the threaded radiator cap neck (1).

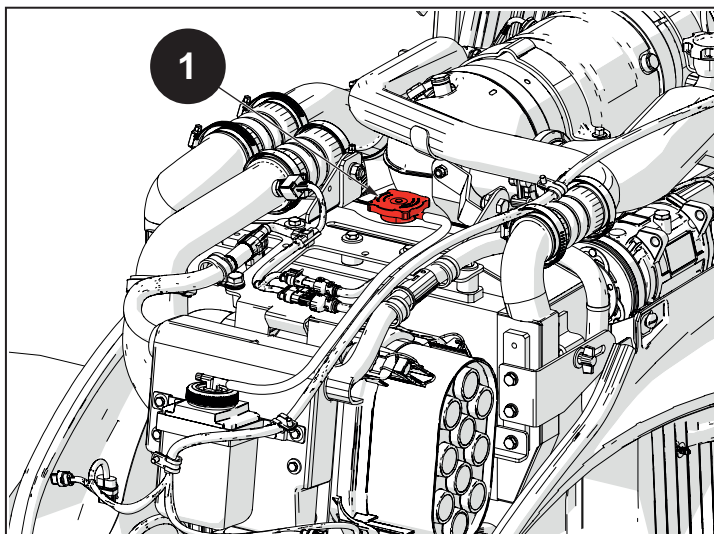


Fig. 6.18



Warning

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

6.3.3 Changing the engine coolant

Proceed as follows.

- Wait a few minutes with the engine at idle speed to warm the engine to operating temperature. The cooling circuit is now at operating pressure.
- Turn off the engine and remove the key from the ignition switch.



Attention

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 quantity of fluid.
- Unscrew the filler cap (1).



Attention

Open the cap slowly and carefully to safely release the pressure in the system.

- Open the taps (2) on both sides of the radiator.
- Wait for all the fluid to drain into the pan.
- Close the valves (2).
- Fill the system with new fluid. See "Lubricants, fuels and coolants" for the correct quantity and type of fluid.

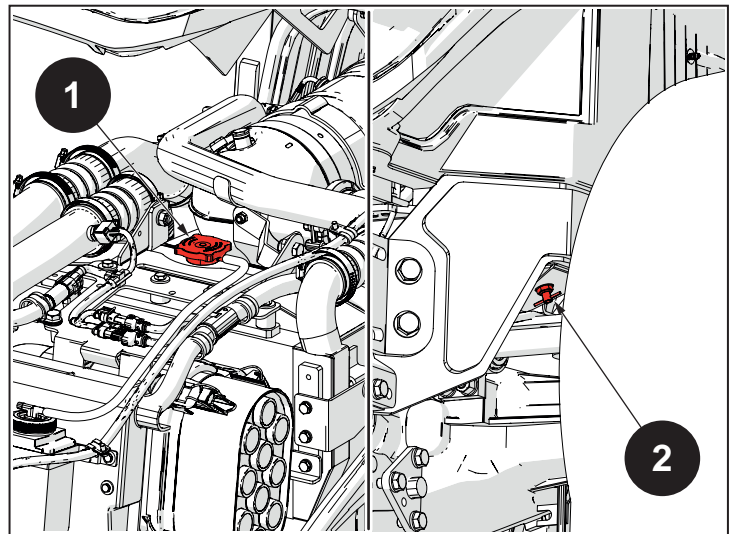


Fig. 6.19



Warning

The fluid must reach the base of the threaded radiator cap neck.

- Refit and tighten the cap (1).
- Start the engine and run at idle speed for a few minutes to warm the engine to operating temperature (70 - 80°C).
- Switch the engine off and wait for it to cool sufficiently.
- Check the coolant level and top up if necessary.



Warning

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

6.4 Fuel system maintenance

Danger

All fuels are flammable.

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

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

Danger

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

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

Danger

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

6.4.1 Changing the fuel filter

Proceed as follows.

- Turn off the engine and remove the key from the ignition switch.
- Wait for the engine to cool sufficiently to prevent the risk of burns.
- Place a suitable container underneath to collect any escaping oil.
- Remove the filter (1) and replace.
- Fill the new filter with the fuel contained in the old filter.
- Lubricate the gasket (2) of the new filter before fitting.
- Refit the filter.
- Bleed the air from the fuel circuit (see "Bleeding the fuel circuit")..
- Start the engine and check for any fuel leaks.

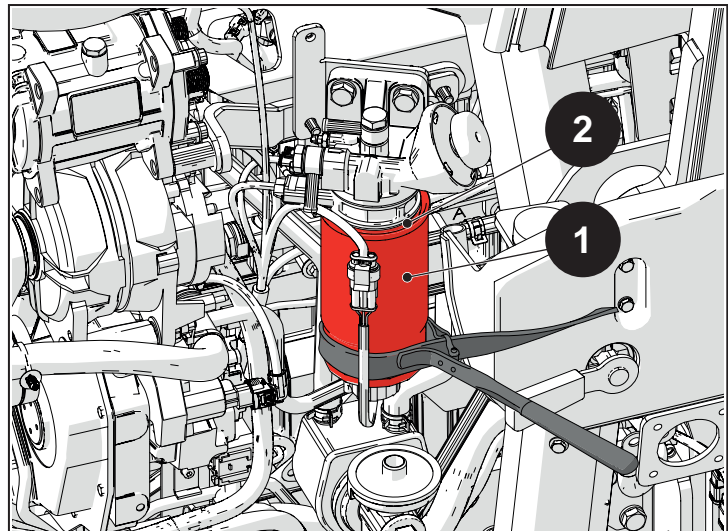


Fig. 6.20

Attention

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

Warning

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

6.4.2 Bleeding the fuel system

Warning

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

Proceed as follows.

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

Attention

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

- Place a suitably sized drain pan underneath.
- Loosen the screw (1).

Attention

Do not loosen the connectors of the high pressure fuel circuit pipes.

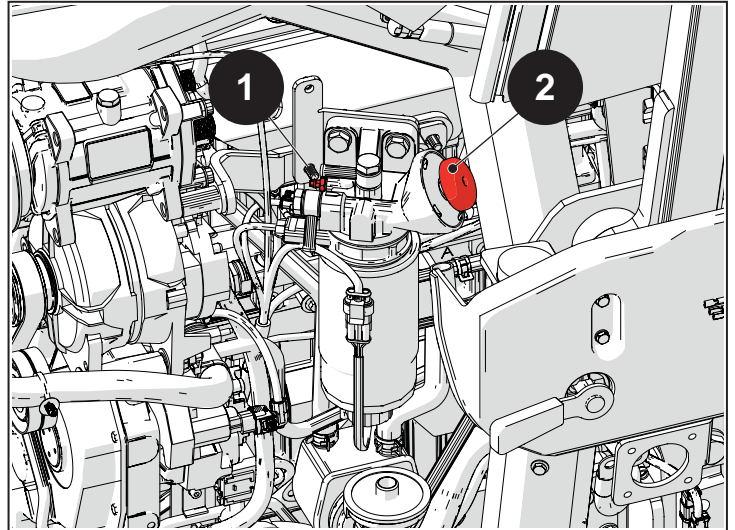


Fig. 6.21

- Manually operate the pump (2) to expel air from the circuit.
- Check that the fuel escaping from the bleed screw (1) is clean and contains no air bubbles.

Warning

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

- Tighten the screw (1).
- Wipe off all residual fuel before starting the engine.

6.4.3 Draining water from the fuel filter

Carry out the following procedure if the "water in fuel" alarm warning lamp (2) illuminates:

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

Attention

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

- Place a suitably sized drain pan underneath.
- Unscrew the water in fuel sensor (1) at the bottom of the fuel filter and drain the fuel from the filter until it contains no water.
- Refit and tighten the sensor (1).

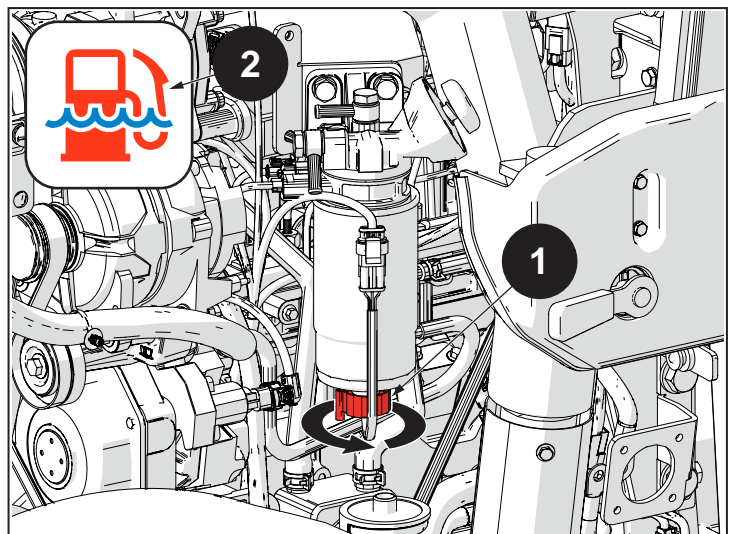


Fig. 6.22

Warning

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

6.4.4 Emptying sediment from the fuel tank

Park the tractor on level ground, remove the drain plug below 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.

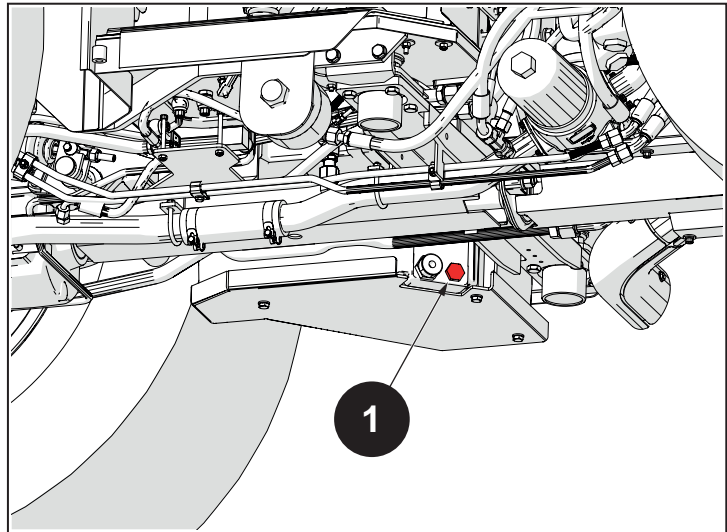


Fig. 6.23

6.4.5 Fuel tank maintenance

Clean the zone surrounding the tank cap. Replace the fuel cap with a genuine spare if it is missing or damaged. Check the tank is not dented or scuffed. If damaged, replace the tank with an original spare part.



Note

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

When necessary, clean the fuel filter (1) shown in the figure.

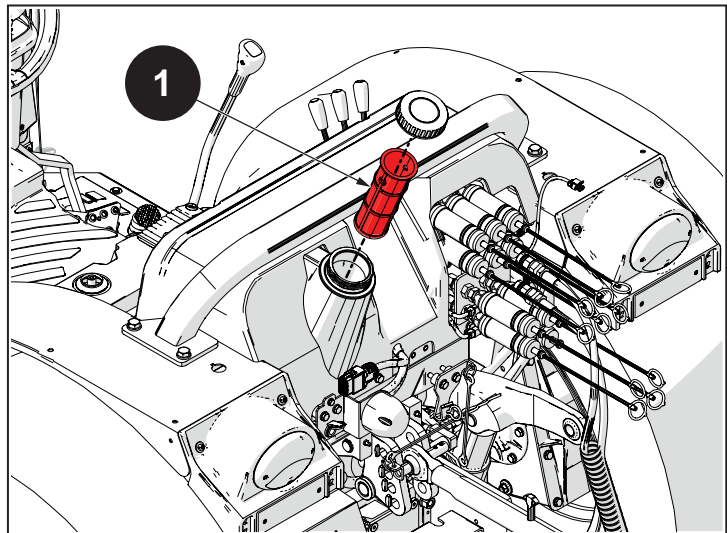


Fig. 6.24

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.

6.5.1 Cab air conditioner maintenance

! Attention

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

! Attention

The system is under pressure. Do not loosen connections or tamper with pipes.

! Attention

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

! Warning

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

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

! Note

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.

- A - GL11 cab
- B - SG1/1 cab

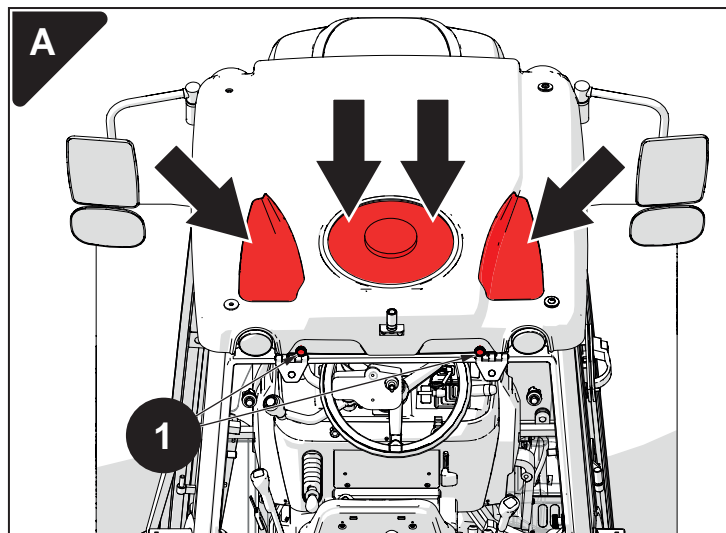


Fig. 6.25

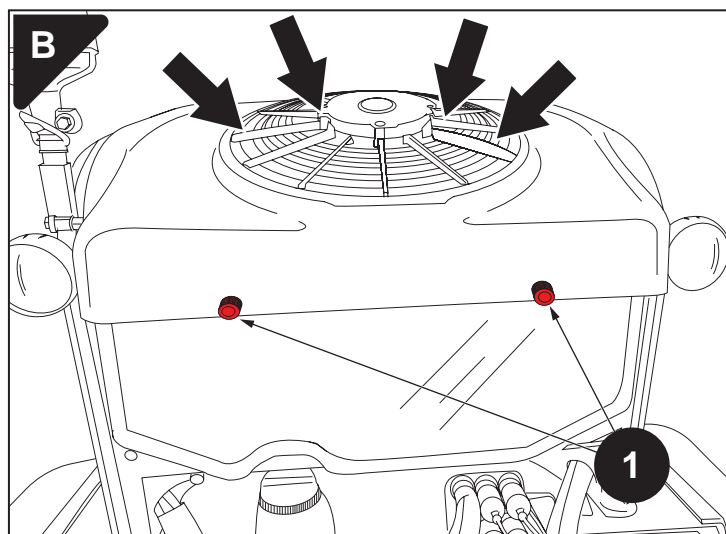


Fig. 6.26

6.5.2 Cab air filter maintenance, GL11 cab

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.



Warning

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

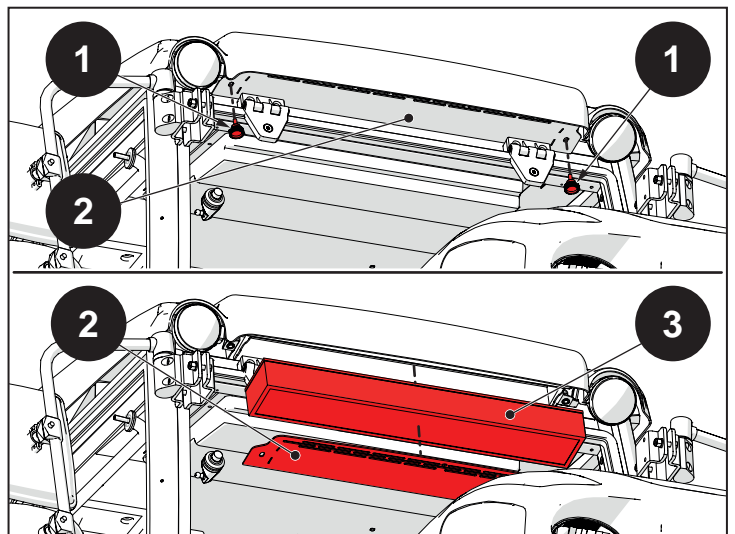


Fig. 6.27

6.5.3 Cab air filter maintenance, SG1/1 cab

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.



Note

The SG1/1 cab is equipped with two filters, one on the left and one on the right.



Warning

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

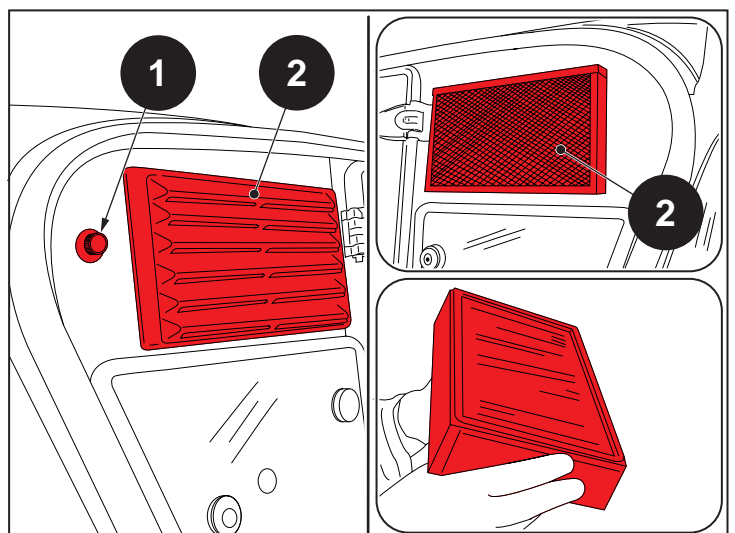


Fig. 6.28

6.5.4 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.

6.5.5 Windscreen washer system

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

- A - GL11 cab
- B - SG1/1 cab

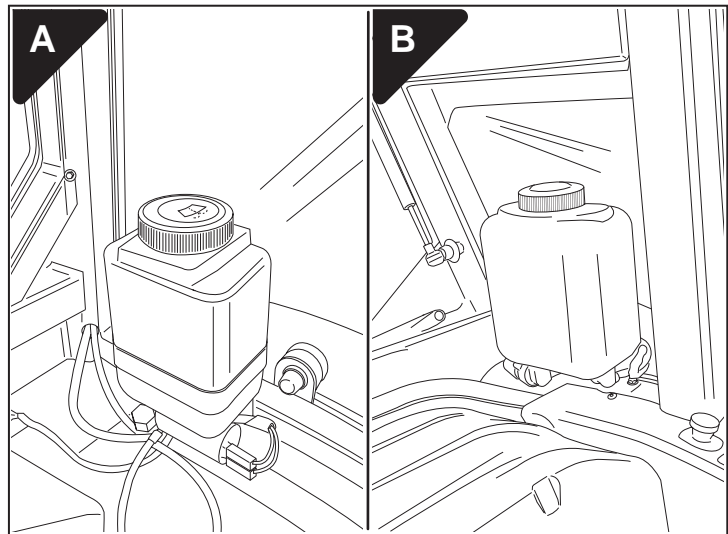


Fig. 6.29

6.5.6 Replacing cab windows/screens

 **Attention**

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.

6.5.7 Replacing the cab lights

 **Note**

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

6.6 Tractor hydraulic system maintenance

6.6.1 Maintenance of gearbox, drive gear and rear differential

Checking oil level

Park the tractor on level ground, undo the dipstick (1) and check the chassis oil level. If the level is below the bottom notch (MIN), add transmission oil to bring the level between the bottom (MIN) and top (MAX) notches on the dipstick (1). Run the engine for 5 minutes after adding the oil before checking the level again.



Note

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

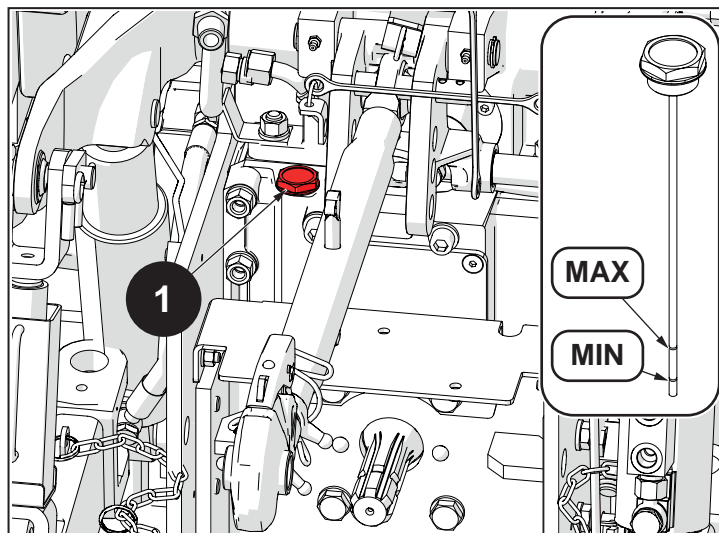


Fig. 6.30

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 following plugs to drain the oil:

- 1 - Gearbox
- 2 - Four-wheel drive
- 3 - Rear differential



Note

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

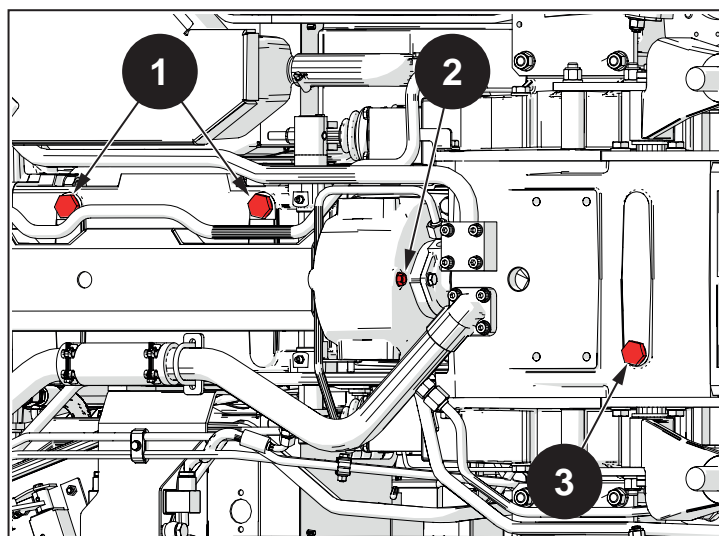


Fig. 6.31

6.6.2 Maintenance of front axle

Checking oil level

The oil must reach the bottom edge of the inspection plug holes (1) and (2). If necessary, top up with the recommended oil type.

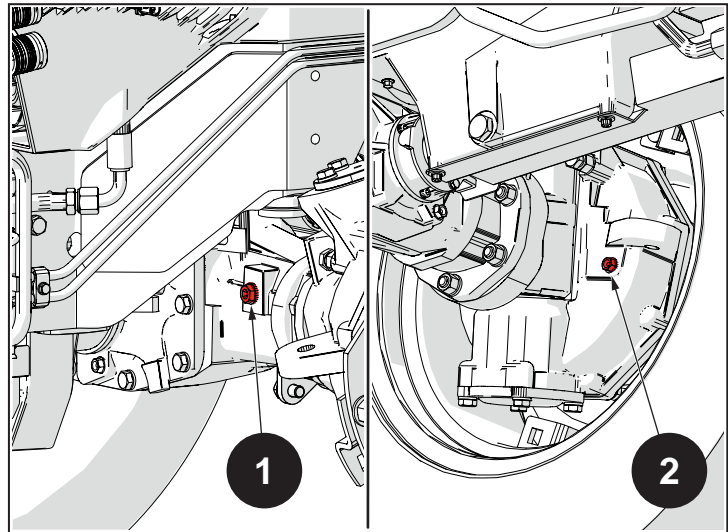


Fig. 6.32

Changing the oil

Drain the oil by removing the plug (4) and, if necessary, the plate (3) situated on the bottom of the reduction drive unit on each of the front wheels.



Note

To remove the plate (3), undo the screws fastening it to the final drive unit.

Add oil via plug (1) and plugs (2) on both front wheels.

Allow the oil to settle before checking the level again.



Warning

Have the procedure to change the front axle oil performed by an authorised GOLDONI service centre.

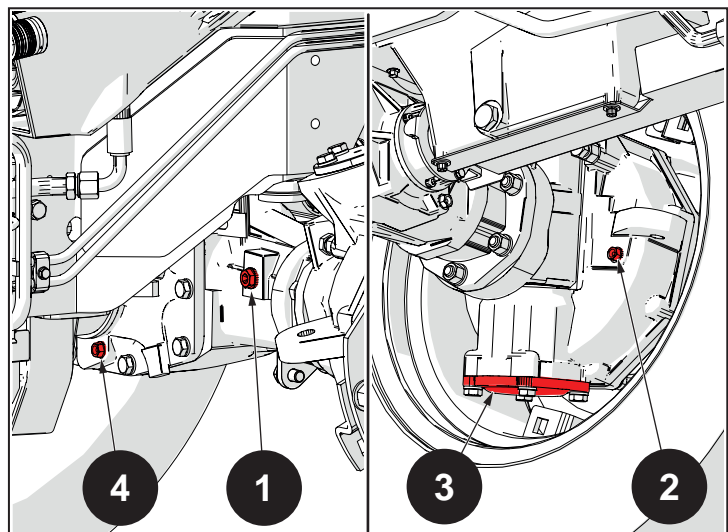
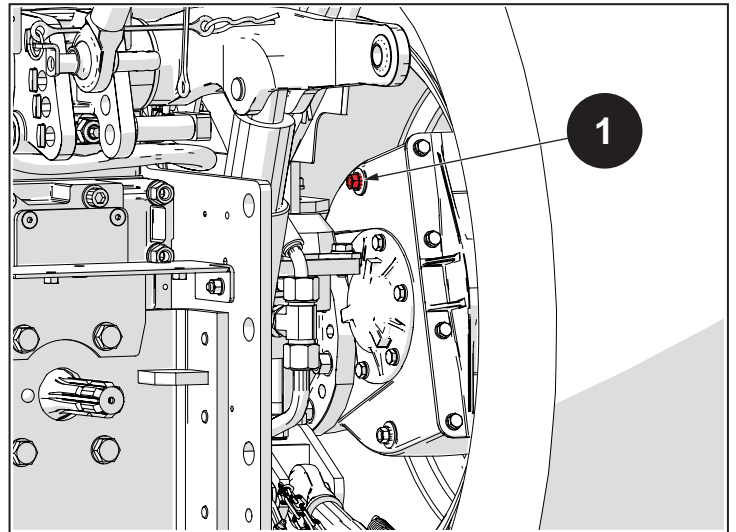


Fig. 6.33

6.6.3 Maintenance of rear axle final drive unit

Checking oil level

The oil level must reach the bottom edge of the threaded inspection plug hole (1) situated on the rear final drive unit. If necessary, top up with the recommended oil type.

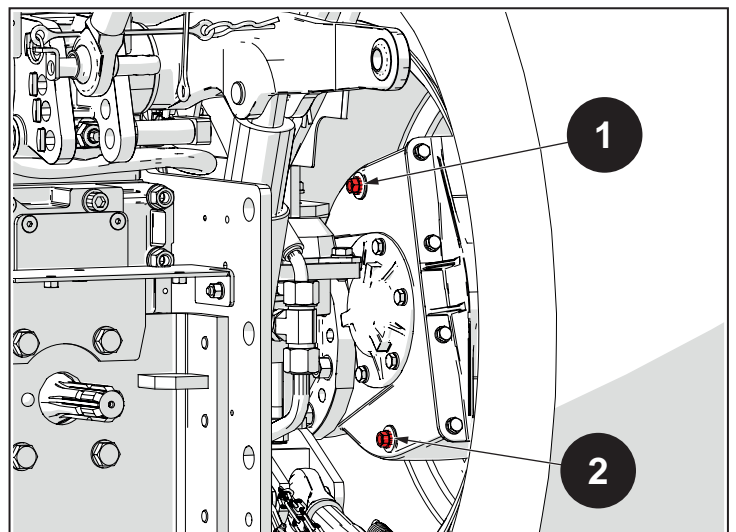
**Fig. 6.34**

Changing the oil

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

Add oil via the plug hole (1).

Allow the oil to settle before checking the level again.

**Fig. 6.35**

6.6.4 Hydraulic suction line filter maintenance

The hydraulic lift oil suction line absorption filter is located on the right hand side of the front gearbox, near the engine. The maintenance period is shown in the table. Carry out the following procedure.

- Place a suitably sized pan for collecting oil underneath the filter.
- Undo the cover (1) of the filter with a suitable wrench.
- Remove the filter cartridge. Check that there is no dirt residue in the housing.
- Fit a new original cartridge and refit and tighten the cover (1).

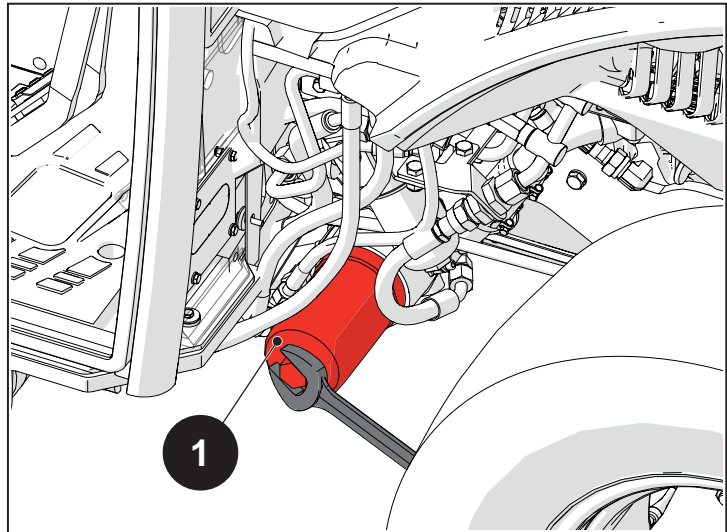


Fig. 6.36



Attention

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

6.6.5 Hydraulic delivery line filter maintenance

The absorption filter for the hydraulic lift oil is located on the right hand side of the front gearbox, near the engine. The maintenance period is shown in the table. Carry out the following procedure.

- Place a suitably sized pan for collecting oil underneath the filter.
- Undo the cover (1) of the filter with a suitable wrench.
- Remove the filter cartridge. Check that there is no dirt residue in the housing.
- Fit a new original cartridge and refit and tighten the cover (1).

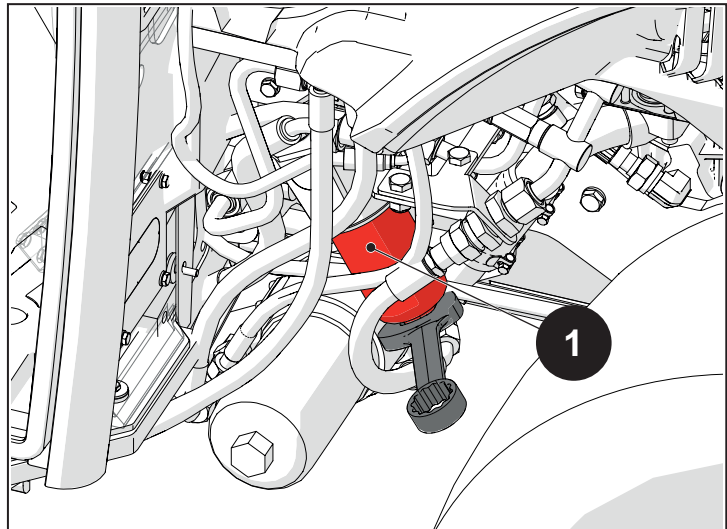


Fig. 6.37



Attention

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

6.6.6 Maintenance of front distributor hydraulic filter (if present)

The absorbent oil filter for the front distributors is located near the front hydraulic quick release couplers on the right hand side of the tractor. The maintenance period is shown in the table.



Note

The filter is only present if the tractor has front distributors.

Carry out the following procedure.

- Place a suitably sized pan for collecting oil underneath the filter.
- Undo the cover (1) of the filter with a suitable wrench.
- Remove the filter cartridge. Check that there is no dirt residue in the housing.
- Fit a new original cartridge and refit and tighten the cover (1).

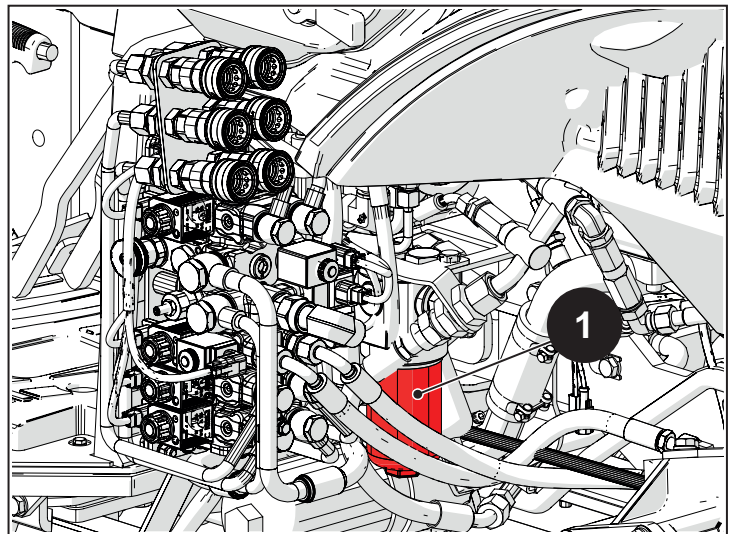


Fig. 6.38



Attention

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

6.6.7 Maintenance of the hydraulic brake system

Checking and servicing the service brake oil tank

A sensor device measuring the brake fluid level is incorporated in the filler cap of the service brake fluid tank (1); if the level is lower than normal, an indicator lamp (2) illuminates on the dashboard to warn that oil must be added.

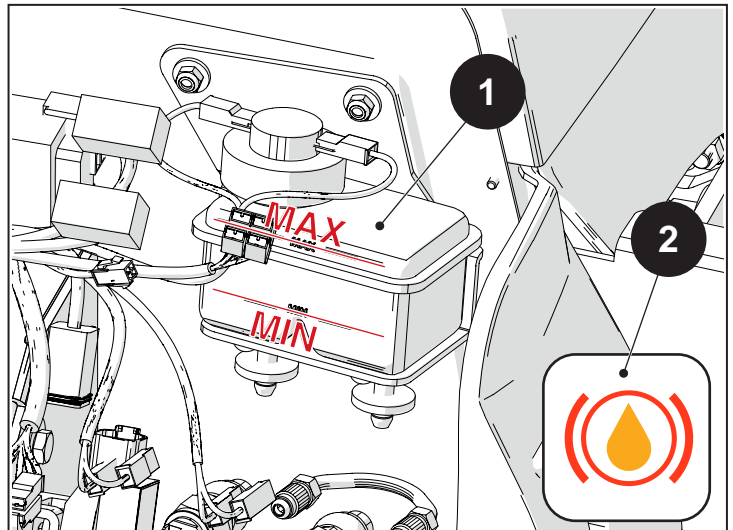


Fig. 6.39

Check the oil level in the service brake tank (1) manually as follows.

- Remove the reverse shuttle lever knob (3).
- Remove the steering wheel with the puller tool.



Steering wheel puller tool: P/N 07006212.

- Undo the screws (4) fastening the dashboard (5), and then carefully remove the dashboard.
- Check the oil level in the tank (1) is above the MIN marking. If necessary, top up with oil of the specified type. Do not exceed the MAX level marking.

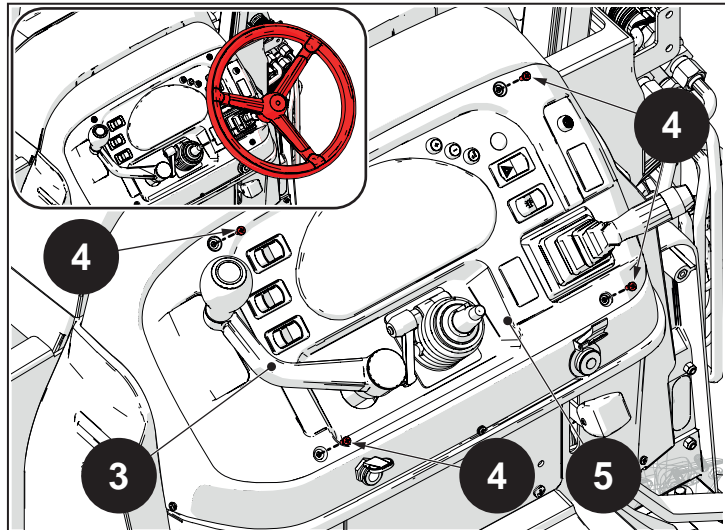


Fig. 6.40

Bleeding the brake circuit



In the case of abnormal brake system behaviour or brake system malfunction caused by air in the hydraulic brake system, have the procedure to bleed the air from the system performed by an authorised service centre.



If the tractor has a trailer hydraulic brake valve, the control valve unit must also be bled.

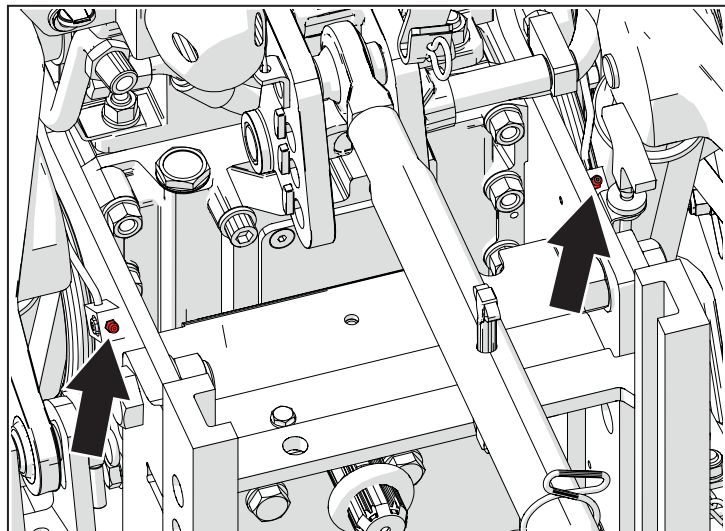


Fig. 6.41

6.7 Electrical system maintenance

Attention

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

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

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

Attention

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.

6.7.1 Battery

Checking condition of maintenance-free battery

Installing the battery

The battery is situated in front of the radiator. Open the bonnet 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



Attention

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.



Attention

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.

- Disconnect the negative cable first, and then disconnect the positive cable.
- Undo the bolts (1) and then remove the battery fastener brackets (2).
- Remove the battery, lifting slightly and easing it out towards the front.

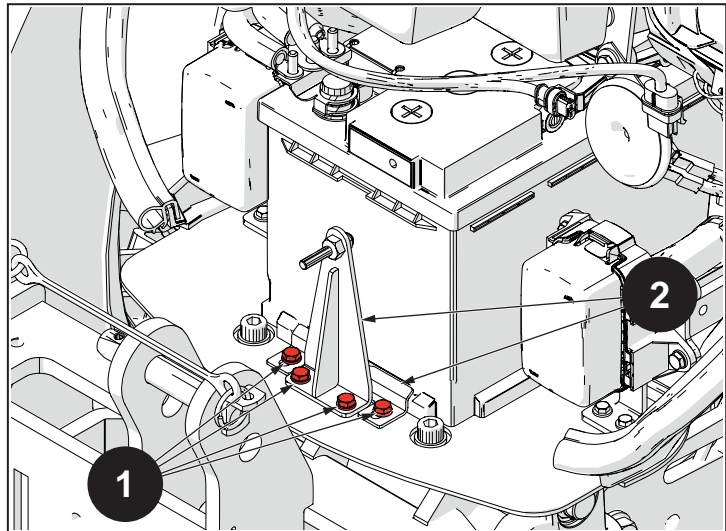


Fig. 6.42

Specifications for replacement battery

To replace the battery, consult your dealer.

- Battery voltage: 12V
- Start current: 850A

Battery charge modes

The charge modes normally used are constant current charging, constant voltage charging with limited current etc. Constant voltage, limited current charging is recommended for maintenance-free batteries.

1) Constant current charge

After charging the battery to a voltage of 16V with a 12A current, switch to a 6A current to complete the charge. The charging cycle ends once the battery voltage has stabilised for 1 to 2 hours (with a **min** difference of 0.03 V between the two voltage values). Alternatively, the battery is charged for 3-5 hours at a current of 6 A once the voltage has reached 16 V.

2) Constant voltage charge

14.8V~15.5V with constant voltage; the maximum current must not exceed 30A. Continue charging for 3 hours once the charge current reaches **min** 0.5 A. The total charging time must not exceed 24 hours.



Warning

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

6.7.2 Maintenance of the alternator Poly-V belt

Checking the belt

Check that the belt shows no signs of wear or cracking.

Replacing the belt with a linear belt tensioner



Attention

The procedure to replace the belt with a linear belt tensioner requires the use of special tools and must only be performed by specially skilled personnel. Have this procedure performed by an authorised service centre.

6.7.3 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 bonnet.



Attention

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.

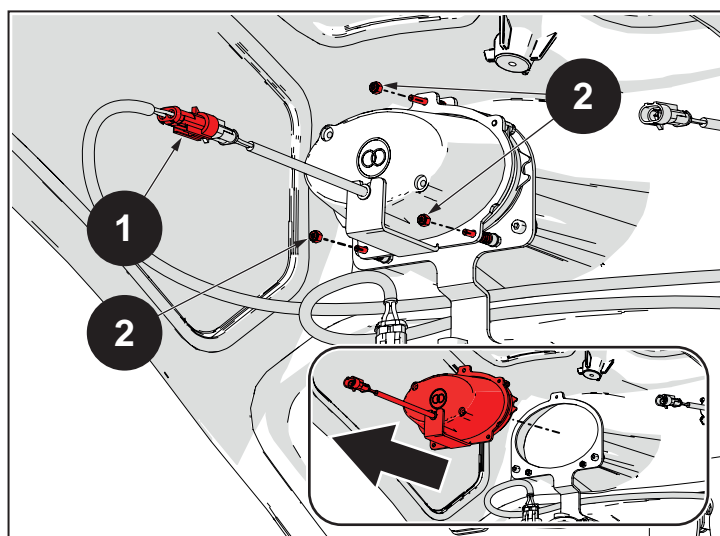


Fig. 6.43

- Undo the screws (3) and remove the cover (4).
- Detach the clip (5) and then turn the cover anticlockwise (6).
- Replace the old bulb with a 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.

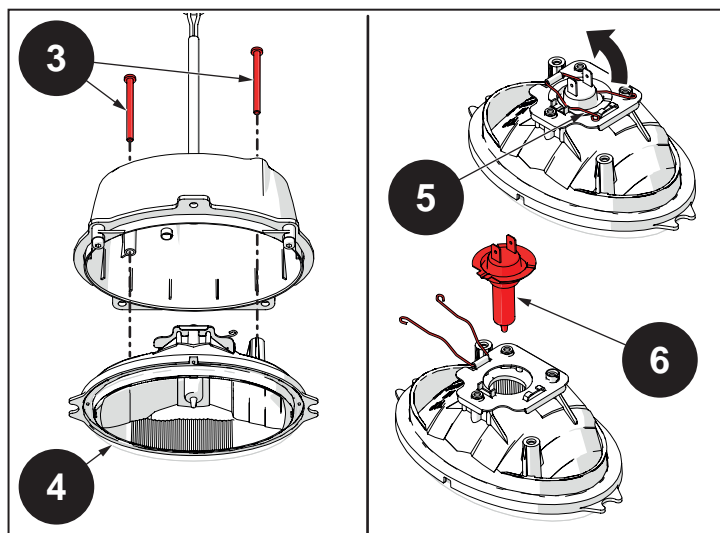


Fig. 6.44

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

Proceed as follows.

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

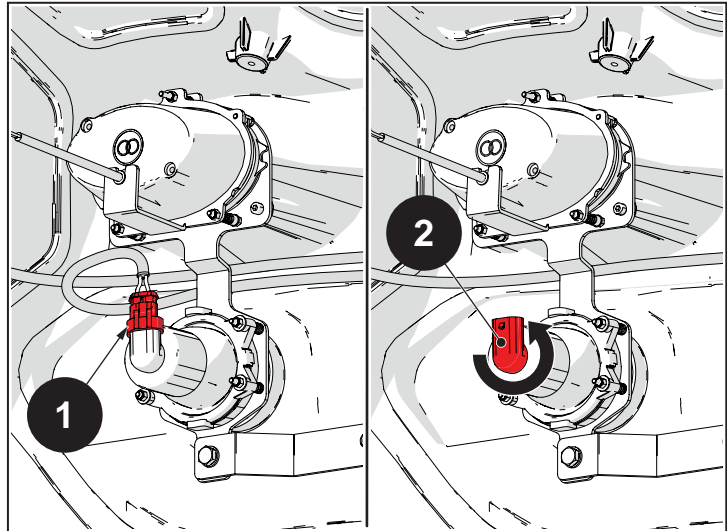


Fig. 6.45

Replacing a cab work light bulb

Proceed as follows.

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

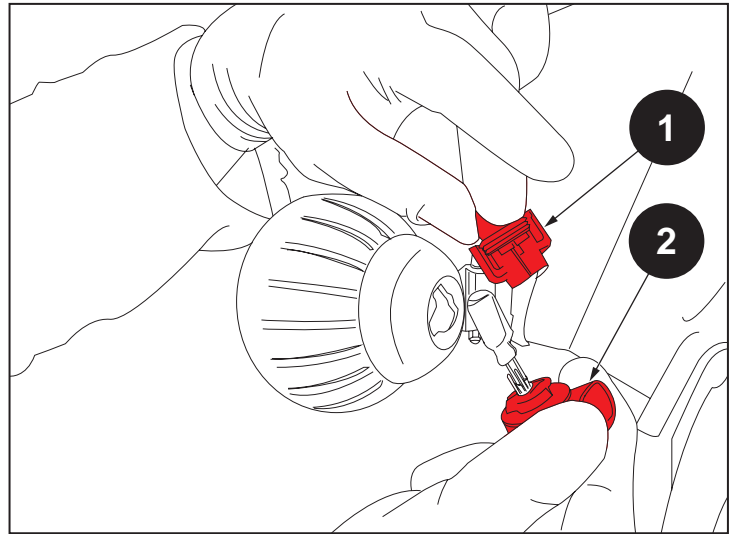


Fig. 6.46



Warning

On machines with a GL11 cab, the wiring harness-bulb connector is situated under the roof panel. Undo the fastener screws of the roof panel and lift the panel in order to disconnect the wiring harness connector and replace the bulb.

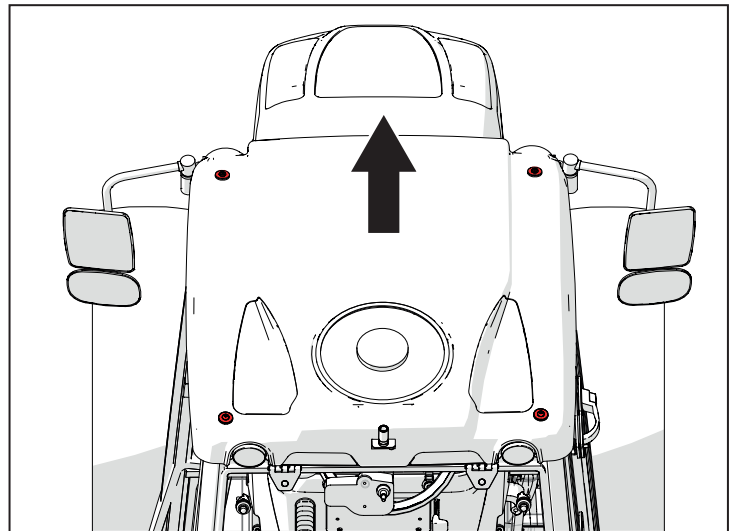


Fig. 6.47

Replacing a rear work light bulb



Note

This procedure is applicable for tractor versions with no cab.

Proceed as follows.

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

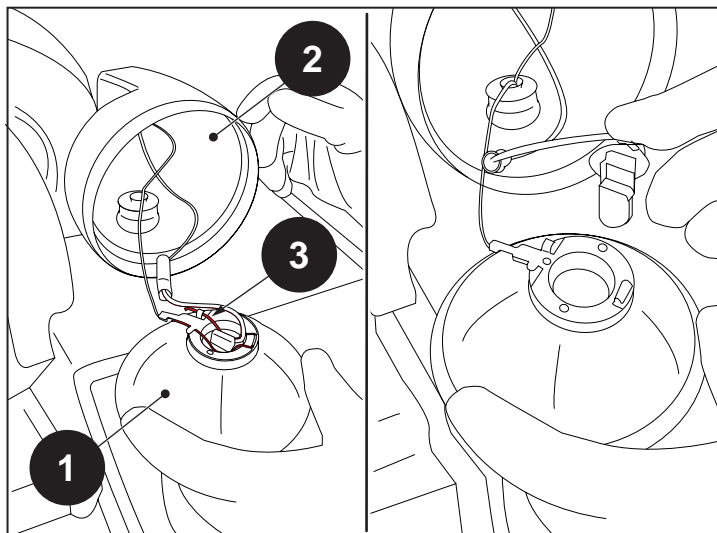


Fig. 6.48

Replacing the side marker and lateral turn indicator light bulbs

Proceed as follows.

- Undo the screws (1) and remove the bulb holder cover.
- To replace the turn indicator bulb (2): turn the bulb anticlockwise while pushing inwards to unscrew from the bulb holder.
- To replace the side marker light bulb (3): widen the lugs (4) and remove the bulb.
- Replace the old bulb with a new original component.
- Refit the bulb holder cover and tighten the screws (1) to fasten the holder in place.

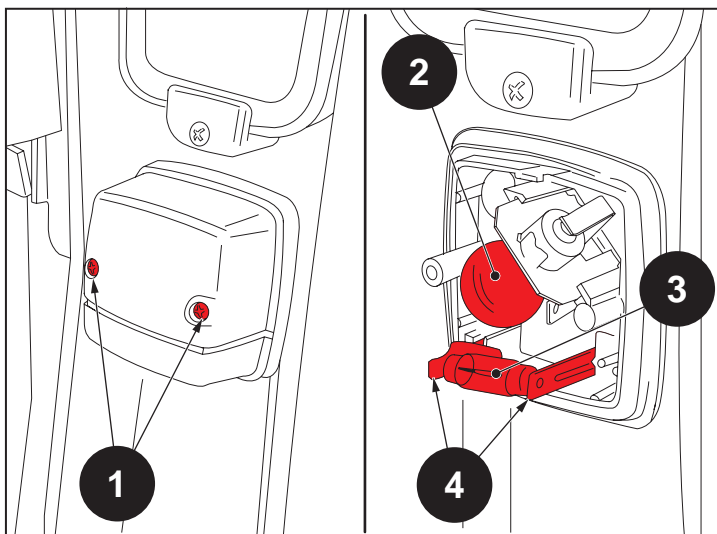


Fig. 6.49

Replacing the tail light, rear turn indicator and brake light

Proceed as follows.

- Undo the screws (1) and remove the bulb holder cover.
- Turn the bulb anticlockwise while pushing inwards to unscrew from the bulb holder.
- Replace the old bulb with a new original component.
- Refit the bulb holder cover and tighten the screws (1) to fasten the holder in place.

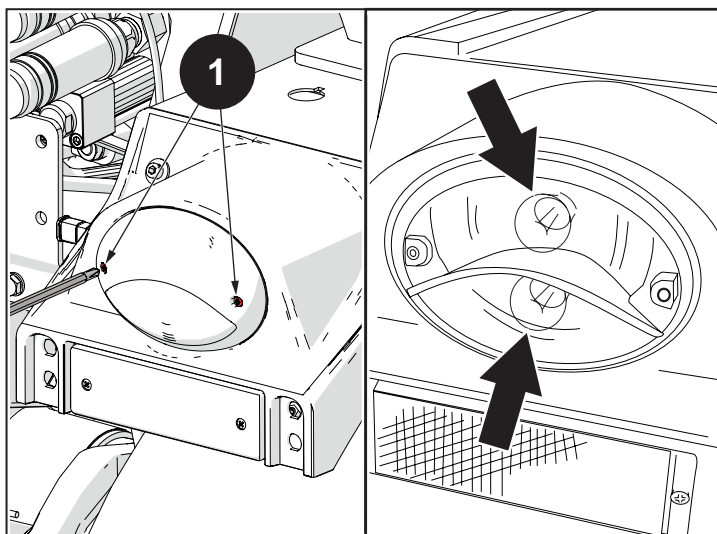


Fig. 6.50

Replacing the ceiling light bulb

(A) - Cab GL11:

Pprise off the cover lens 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.

(B) - Cab SG1/1:

Remove the cover lens of the light unit, undoing the fastener screws with a screwdriver, replace the bulb, test the light to make sure that it works and then refit the cover lens.

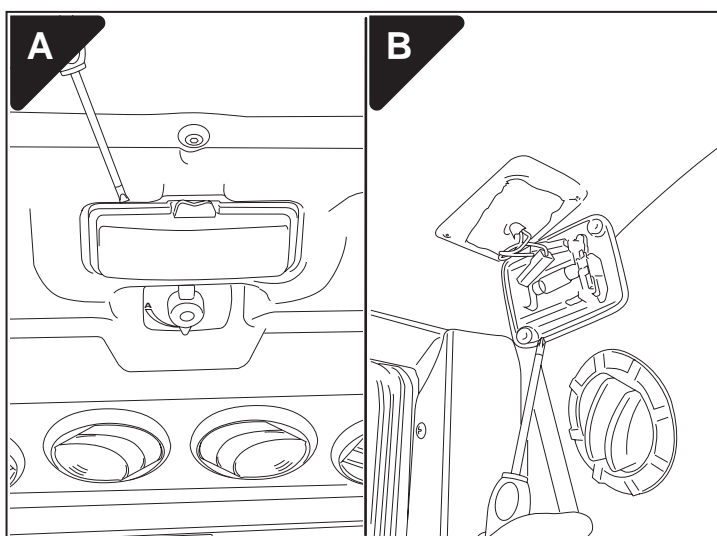


Fig. 6.51

Replacing the license plate light bulb

Proceed as follows.

- Undo the screws (1) and remove the bulb holder cover.
- Turn the bulb anticlockwise while pushing inwards to unscrew from the bulb holder.
- Replace the old bulb with a new original component.
- Refit the bulb holder cover and tighten the screws (1) to fasten the holder in place.

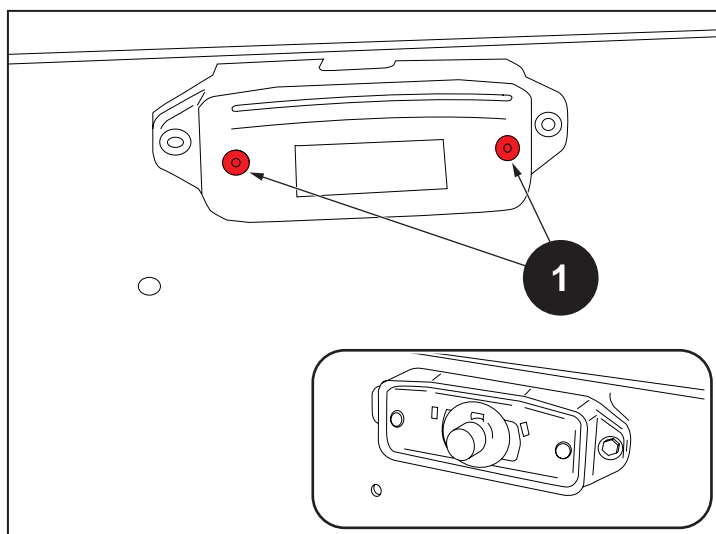


Fig. 6.52

6.7.4 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.

Attention

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

Warning

Do not replace the old fuse with a new one with a higher rated value. This may damage the machine. Contact an authorised service centre if replacement fuses with the correct rating blow continuously.

Glow plug fuse and relay

Located on left hand side of engine.

1	Glow plug relay	-
2	Glow plug fuse	60A

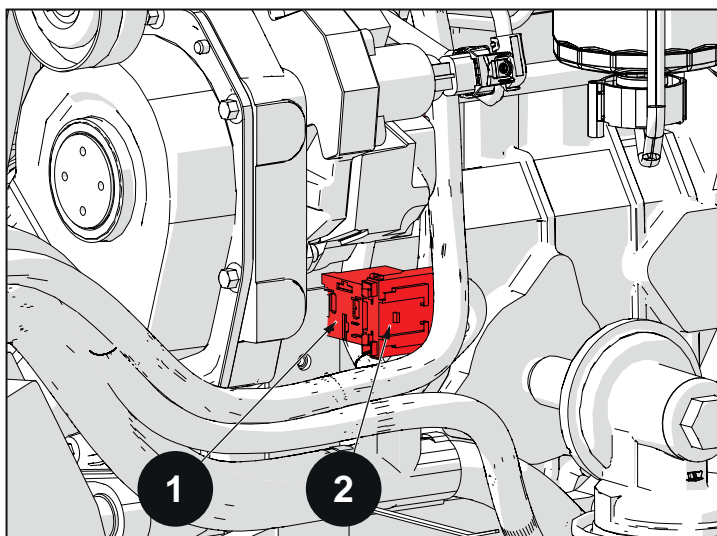


Fig. 6.53

Fuse box

The entire electrical system is protected by dual fuse boxes (1) and (2).

These fuse boxes are situated in front of the engine, to the sides of the battery.

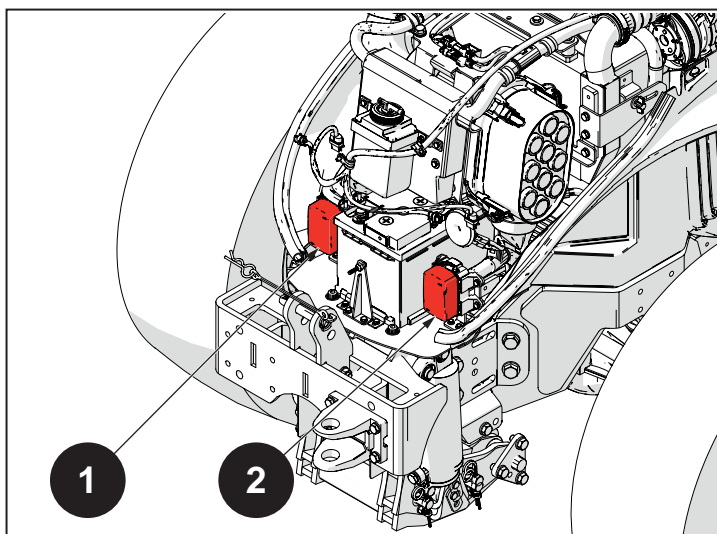


Fig. 6.54

Functions of fuse box (1), figure 6.54:

A	Main relay	30A
B	Main fuse	70A
C	Starter relay	20A
D	Fuel heater	20A
E	Trailer socket	30A
F	Engine control unit (battery)	15A
G	Engine control unit (battery)	10A
H	Accessories	15A
I	Fuel heater	20A
L	Trailer socket	15A
M	Diagnostic port	10A

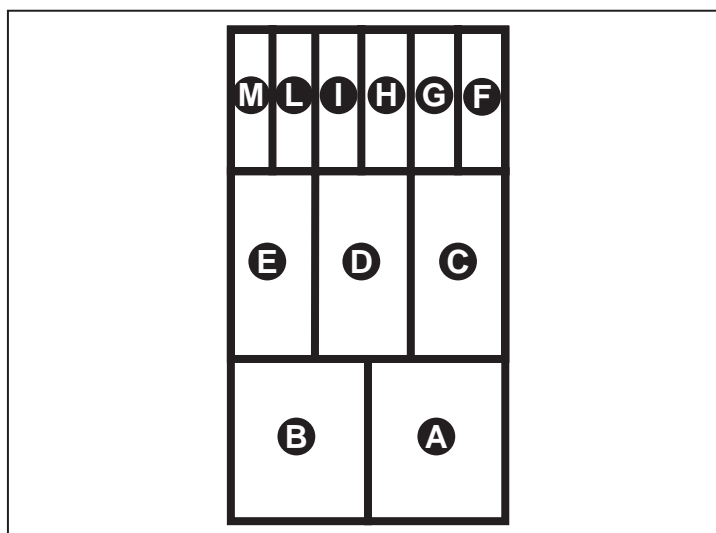


Fig. 6.55

Functions of fuse box (2), figure 6.54:

A	Hazard warning lights	10A
B	Sensor switch	10A
C	Horn, power socket, rotating beacon	20A
D	Dashboard (battery)	10A
E	Turn indicator lights	10A
F	Dashboard (ignition switch)	5A
G	Vehicle ECU (battery)	10A
H	Engine ECU (ignition switch)	5A
I	Vehicle ECU (ignition switch)	5A
L	LH parking light	10A
M	High beam headlights	10A
N	RH parking light	10A
O	LH low beam headlight	10A
P	Brake light	10A
Q	RH low beam headlight	10A
R	Brake light relay	-
S	Low beam relay	-
T	High beam relay	-
U	Dashboard LED relay	-
V	Start enable relay	-

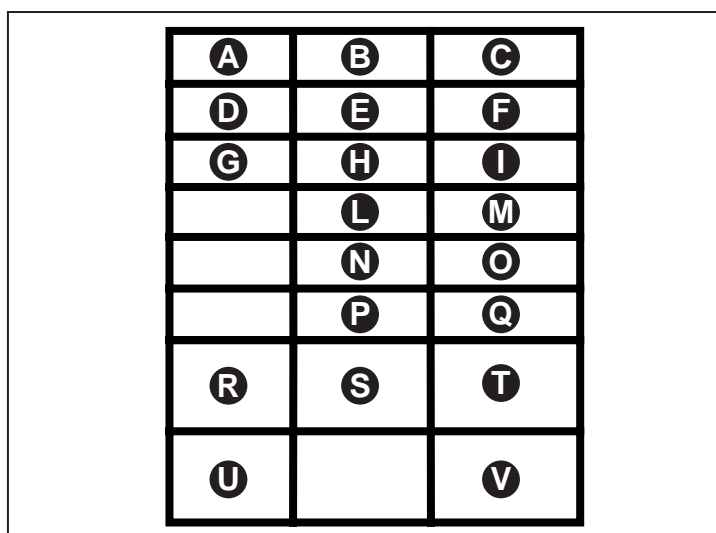


Fig. 6.56

GL11 cab fuse box

The entire electrical system is protected by a single power circuit fuse box (1).

The fuse box is situated on the right hand side of the roof headliner.

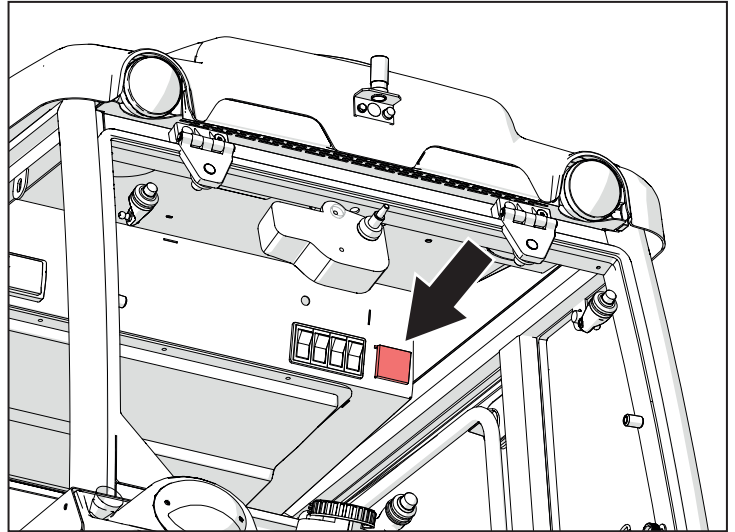


Fig. 6.57

A	Windscreen wiper/washer	7.5A
B	Fan switch	20A
	Cabin light unit	
C	Work light	15A
D	The fan housing/heat exchanger	25A
E	Rear lights	10A
F	Rotating beacon	20A

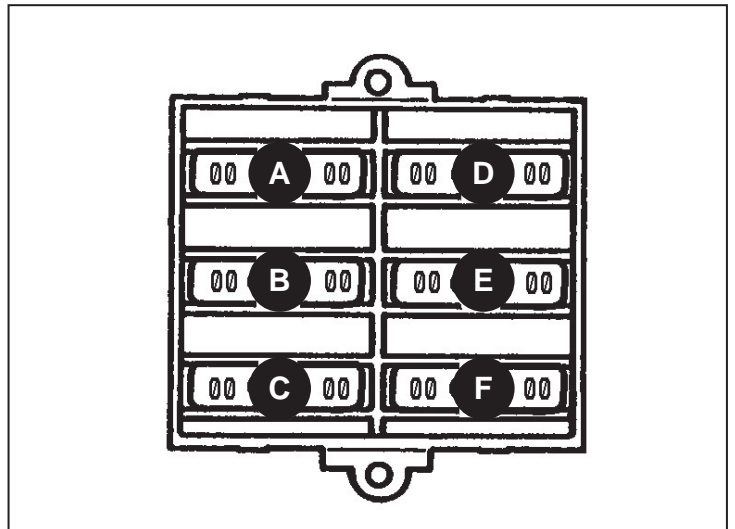


Fig. 6.58

SG1/1 cab fuse box

The entire electrical system is protected by a single power circuit fuse box (1).

The fuse box is situated in the right hand rear corner of the roof headliner.

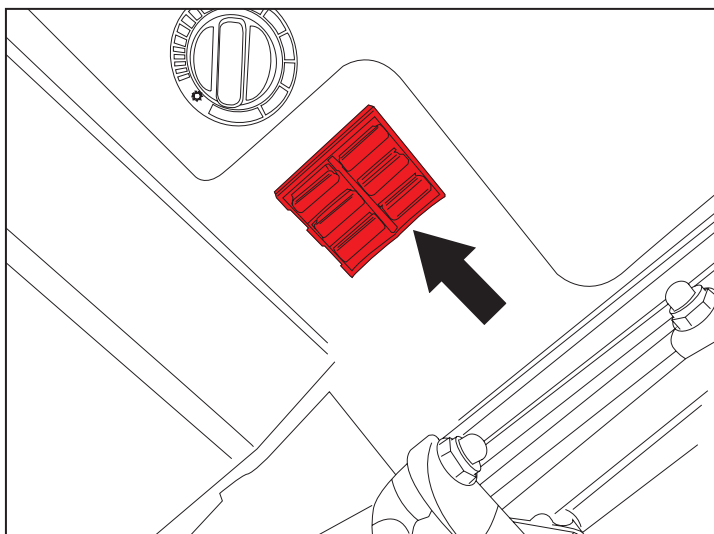


Fig. 6.59

A	Windscreen wiper/washer	10A
B	The fan housing/heat exchanger	15A
C	Work light	15A
D	Fan switch Air conditioner power feed.	15A
E	Cabin light unit	30A
F	Compressor	5A

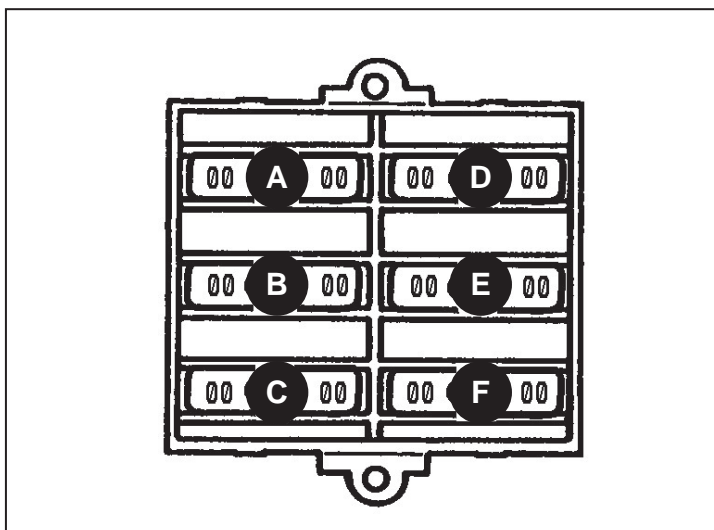


Fig. 6.60

6.8 Lubrication and grease points

Lubricating the rear lift

Perform whenever needed or at least every 50 operating hours.

The grease points of the rear lift are as follows:

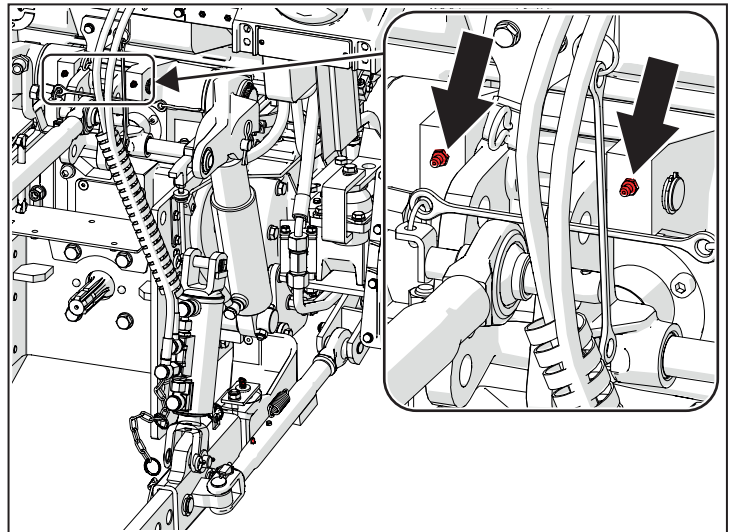
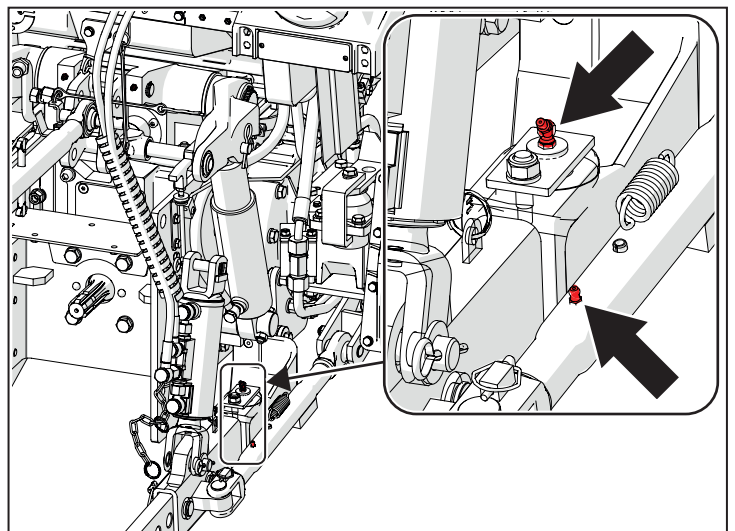
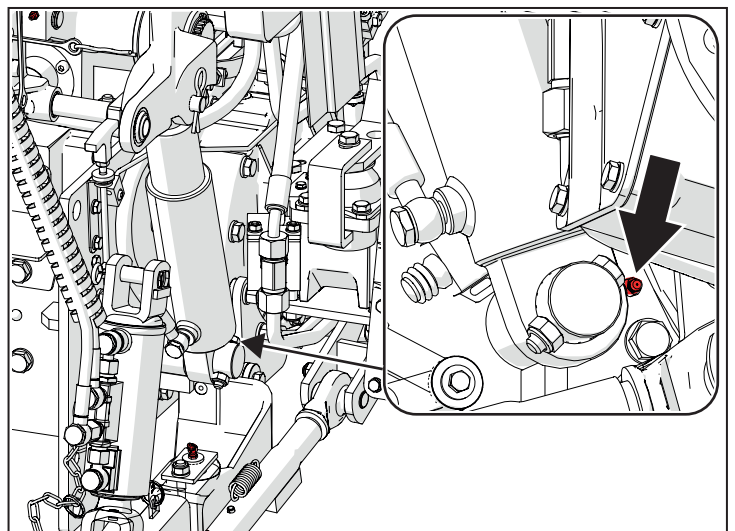
- Top link pin
- Hydraulic cylinders
- Arm swing pins
- Swing tie-rod

**Note**

Lower the lift before lubricating the components.

**Note**

Use recommended lubricant grease.

**Fig. 6.61****Fig. 6.62****Fig. 6.63**

Lubricating the front axle

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

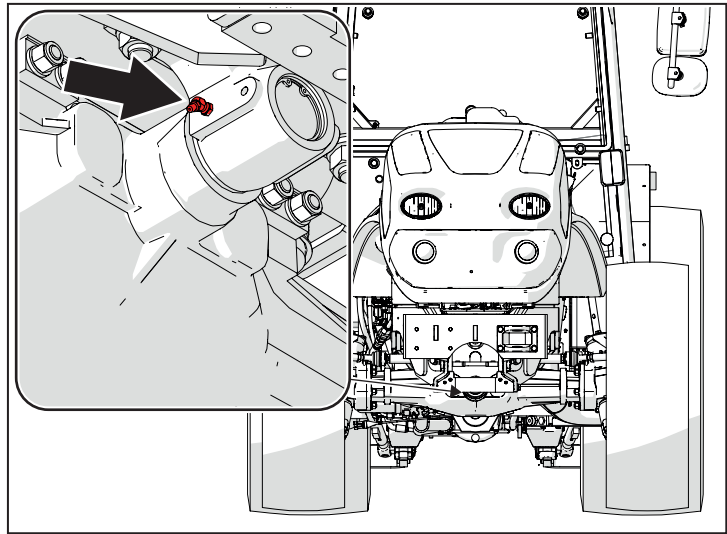


Fig. 6.64

Lubricating the brake linkages

Whenever needed or at least every 50 operating hours, add new grease to brake control linkage pivot. The relative grease nipples are situated at the bottom of the tractor, in front of the 4WD transfer case.

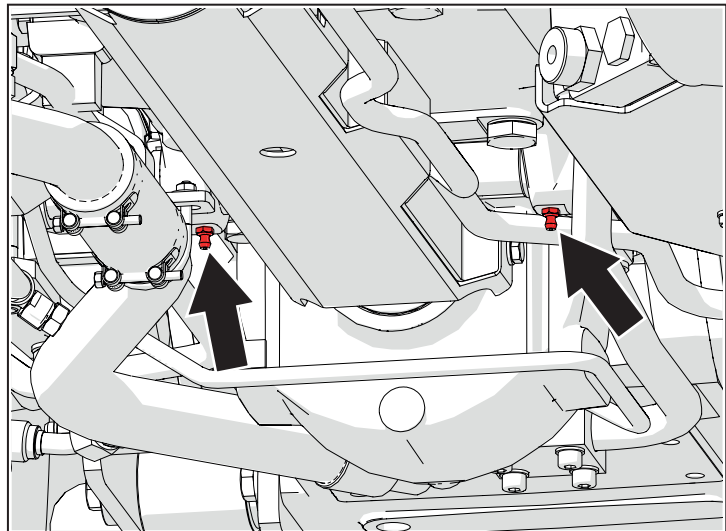


Fig. 6.65

Lubricating the front mudguard support (if present)

Whenever needed or at least every 50 operating hours, add new grease to the front mudguard sliding supports, if fitted. The relative grease nipples are situated on the front mudguard supports between the front wheels and the engine assembly.

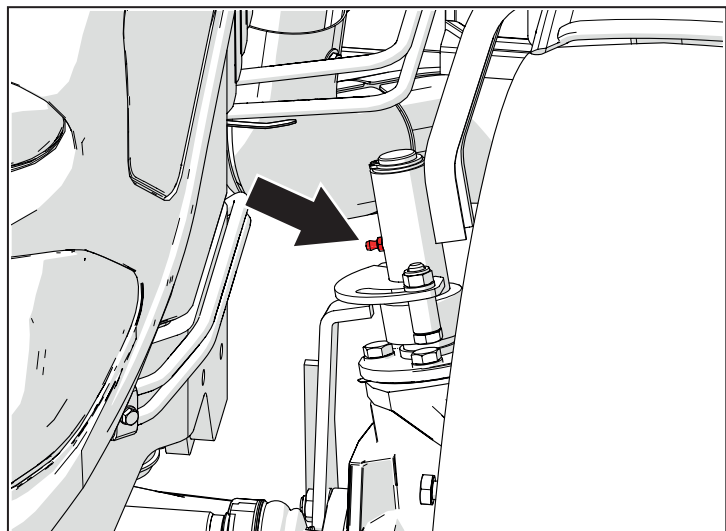


Fig. 6.66

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. Do 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 maintenance needed.
- Check battery charge and the battery electrolyte level.
Check the condition of the electrical contacts.
Install the batteries and connect the cables.
- Check engine operation.
- Start the engine and run at idle speed and at zero load for a few minutes.



Note

While the engine is running at idle speed, check all the instruments and indicator lamps to ensure that the engine is operating correctly.

- If no malfunctions are noted, warm the engine to operating temperature (70 to 80°C).
- Check the systems and functions of the tractor, including the air conditioner.
- 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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7.1 Troubleshooting

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.



Attention



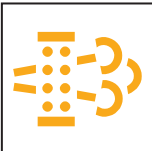
An active visual and/or audible warning signal indicates that a fault or malfunction has been identified. Stop the engine immediately and refer to the documentation provided by the constructor of the vehicle/equipment in which the engine is installed.

Faults, causes and solutions

Problem	Cause	Solution
The instrument panel does not switch on and the engine does not start when the ignition is turned to on/start	Flat battery	Charge or replace the battery
	Blown fuse	Replace the fuse
	Electrical cables disconnected or no electrical continuity in cables	Check electrical connections
	Engine speed sensor fault	Replace the sensor Have the procedure performed by an authorised service centre
Engine does not start	Air in fuel circuit	Bleed the system (see "Bleeding fuel circuit")
	Injectors fouled or faulty	Replace the injectors Have the procedure performed by an authorised service centre
	Fuel pressure regulator valve faulty	Replace the valve Have the procedure performed by an authorised service centre
	Ignition switch fault	Replace the ignition switch Have the procedure performed by an authorised service centre
	Water and/or contaminants in fuel	Have the procedure performed by an authorised service centre
	Fuel filter clogged	Replace the filter (see "Changing fuel filter")
Starter motor runs without cranking engine	Electromagnet fault	Check the starter motor
		Have the procedure performed by an authorised service centre
Starter motor does not turn	Flat battery	Charge or replace the battery
	Interrupted electrical connection	Check electrical connections
	Worn brushes	Replace the worn brushes Have the procedure performed by an authorised service centre

Problem	Cause	Solution
Engine cuts out after starting	Air in fuel circuit	Bleed the system (see "Bleeding fuel circuit")
	Fuel filter clogged	Replace the filter (see "Changing fuel filter")
	Injection pump faulty	Have the procedure performed by an authorised service centre
	Fuel pressure regulator valve faulty	Replace the valve Have the procedure performed by an authorised service centre
	Water and/or contaminants in fuel	Have the procedure performed by an authorised service centre
	Electrical cables disconnected or no electrical continuity in cables	Check electrical connections
Engine cannot reach operating speed	Fuel filter clogged	Replace the filter (see "Changing fuel filter")
	Air in fuel circuit	Bleed the system (see "Bleeding fuel circuit")
	Injection pump faulty	Have the procedure performed by an authorised service centre
	Injectors fouled or faulty	Replace the injectors Have the procedure performed by an authorised service centre
	Water and/or contaminants in fuel	Have the procedure performed by an authorised service centre
	Air filter clogged	Clean or replace the filter
	Insufficient engine intake air flow	Have the procedure performed by an authorised service centre
	Engine overheating	Have the procedure performed by an authorised service centre
	Overload	Reduce load
Black smoke from exhaust pipe	Injectors fouled or faulty	Replace the injectors Have the procedure performed by an authorised service centre
	Turbocharger defective	Replace the turbocharger Have the procedure performed by an authorised service centre

Problem	Cause	Solution
Small quantity of white smoke from exhaust pipe	Oil level too high	Correct oil level
	Piston rings worn	Check compression Have the procedure performed by an authorised service centre
	Valve guides worn	Have the procedure performed by an authorised service centre
Large quantity of white smoke from exhaust pipe	Cylinder head gasket blown	Have the procedure performed by an authorised service centre
	Water pump faulty	Replace pump Have the procedure performed by an authorised service centre
		Replace the belt Have the procedure performed by an authorised service centre
	Thermostat valve faulty	Replace the valve Have the procedure performed by an authorised service centre
	Low coolant level	Top up if necessary (see "Checking engine coolant level")
Pressure gauge indicates low engine oil pressure and the relative indicator lamp lights	Pressure gauge fault	Check pressure gauge and replace if necessary Have the procedure performed by an authorised service centre
	Insufficient oil level	Top up oil to correct level (see "Checking engine oil level")
	Oil pump fault	Check pump and replace if necessary Have the procedure performed by an authorised service centre
	Sensor fault	Check sensor and replace if necessary. Have the procedure performed by an authorised service centre
	Engine oil filter clogged	Change the engine oil filter (see "Changing engine oil filter cartridge")
Engine coolant temperature indicator lamp illuminates	Low coolant level	Top up engine coolant to correct level (see "Checking engine coolant level")
	Filler cap overpressure valve stuck	Replace the cap
	Water pump faulty	Replace pump Have the procedure performed by an authorised service centre
	Thermostat valve faulty	Replace the valve Have the procedure performed by an authorised service centre

Problem	Cause	Solution
Engine coolant temperature indicator lamp illuminates	Belt broken or worn	Replace the belt Have the procedure performed by an authorised service centre
Loss in power	Fuel filter clogged	Replace the filter (see "Changing fuel filter")
	Air in fuel circuit	Bleed the system (see "Bleeding fuel circuit")
	Injection pump faulty	Replace pump Have the procedure performed by an authorised service centre
	Injectors fouled or faulty	Replace the injectors Have the procedure performed by an authorised service centre
	Air filter clogged	Clean or replace the filter
	Engine overheating	Have the procedure performed by an authorised service centre
	Insufficient engine intake air flow	Have the procedure performed by an authorised service centre
Battery warning lamp lights	Alternator not charging the battery	Check the alternator and replace if necessary Have the procedure performed by an authorised service centre
Oil pressure warning lamp lit	Insufficient engine oil pressure	Switch off the engine Have the procedure performed by an authorised service centre
Water in fuel indicator lamp lit 	Water in fuel filter	Drain the water from the fuel filter (see "Draining water from the fuel filter").
Engine warning lamp lit 	Engine fault	Have the procedure performed by an authorised service centre
Diesel Particulate Filter warning lamp lit 	Diesel Particulate Filter clogged	Perform an Diesel Particulate Filter regeneration cycle, see chapter "INSTRUCTIONS FOR USE".

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