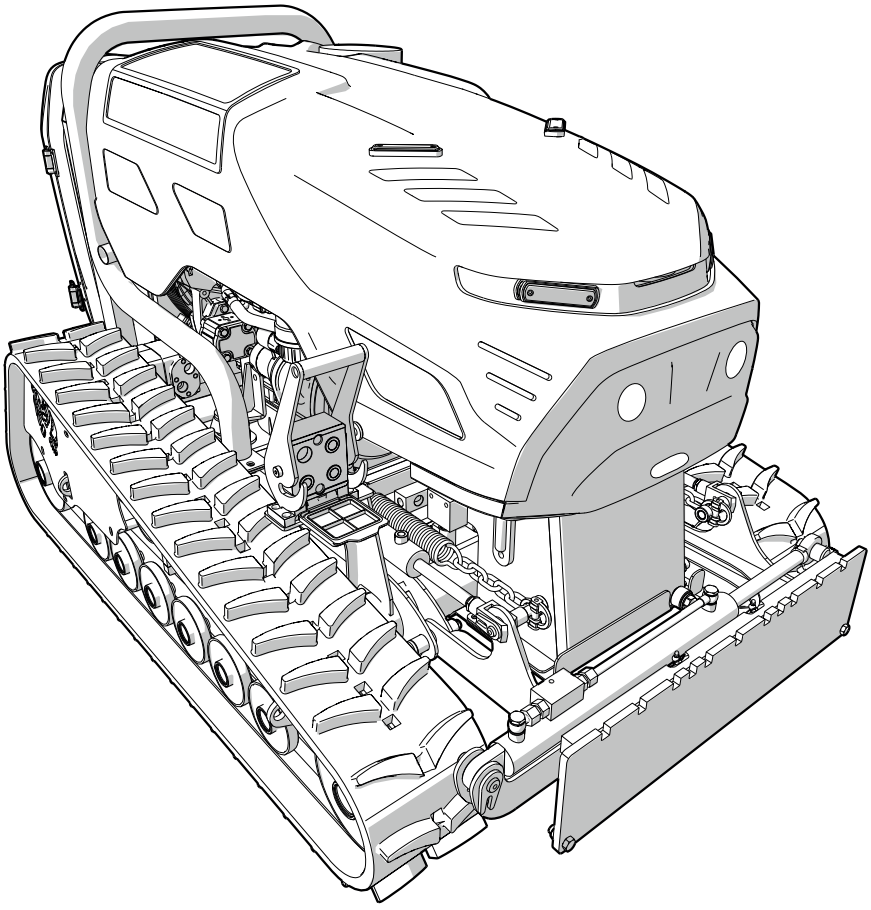
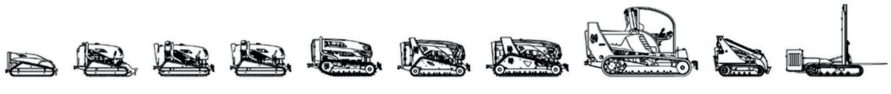
ENGLISH
Instructions

USE AND MAINTENANCE MANUAL

LV400 X

MDB006AEN





F23 F300 LV300 LV400 LV500Pro LV600 LV800 LV1400 MP100 PT18

COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV GL ISO 9001:2015

To be completed with the actual details of the machine concerned.

NOTICE

See chapter 3 for an explanation of the fields shown on the machine nameplate.

INTRODUCTION

- Before carrying out any operation on the machine and/or on the packaging of the various parts, read the entire instruction manual carefully.
- The instruction manual contains important information for the safety of the persons who work on the machine and for the machine itself.
- The company that uses the machine is responsible for ensuring that all operators have fully understood the instructions for use.
- Although the machine is equipped with active and passive safety devices, not all risks due to incorrect use can be avoided.
- MDB assumes no liability whatsoever for failure to follow the safety and prevention rules described in the various sections of this manual or for damage caused by improper use of the machine. Any changes to the machine must be authorised in advance by MDB.
- All work on the machine (maintenance, adjustments, repairs, cleaning) must be carried out by suitably trained personnel and as indicated in this manual.

NOTICE

MDB reserves the right to make any technical changes to this manual and to the machine without prior notice.

Requests for further copies of this manual should be sent to MDB's customer service.

MDB protects its rights regarding drawings and technical documentation, in accordance with the law.

MDB guarantees the contents of this publication, with the express prohibition of using the publication for other purposes, of any kind, unrelated to the operation of the machine to which it refers and for which this publication was written.

The accuracy of the information contained herein is guaranteed provided that all the requirements stated in this documentation are strictly observed by the user.

CONTENTS

1 SAFETY

1.1 GENERAL SAFETY REGULATIONS

1.1.1 SAFETY PROCEDURES

- Carefully read the safety information contained in this manual and follow the safety signs on the machine.
- Safety signs must be affixed, periodically maintained (cleaned) and, if damaged, replaced.
- Only allow authorised, qualified and trained personnel to operate the machine.
- Acquire the necessary training and skill, with the correct procedures for use and maintenance of the machine.
- The machine must always be kept in optimal operating conditions and must be used in ways and for purposes consistent with the its technical specifications.
- Changes to its components or their replacement with non-original components, or any other modifications not authorised in writing by the Manufacturer, affect safety and operation, and reduce the operating life of the machine, and thus invalidate the warranty.
- The Manufacturer bears no liability in the event of:
  - improper use of the machine;
  - Modification of machine components not authorised in writing by the manufacturer;
  - Personal injury, machine failure and/or damage to materials and/or third parties that is direct, connected and consequential
  - Damage resulting from the use of tools and/or optional components or accessories not authorised in writing by the manufacturer.
- The use of the machine and its equipment in complete safety requires maximum concentration by the operator.
- Do not use headphones to listen to music or the radio while operating the machine

NOTICE

For more details, please refer to the GENERAL CONDITIONS OF SALE on the website (URL landing page general conditions of sale).

CAUTION

The safety information in this chapter is intended to illustrate the main safety procedures to be adopted during the use and operation of the machine.

If in doubt or for further information on safety procedures, contact your supervisor and/or your authorised dealer before using the machine or carrying out maintenance operations.

1.1.2 EMERGENCY PREVENTION

- It is necessary to be prepared in the event of fire or accidents.
- Establish general emergency procedures to be implemented in the event of fires and/or accidents.
- Always keep a first aid kit and fire extinguisher within reach.
  - For correct use of the fire extinguisher, carefully read the information printed on the label attached to it.
  - Have the extinguisher periodically inspected and maintained, in accordance with the schedule given in the manual supplied with it, to always ensure perfect efficiency and correct operation when need arises.

⚠ CAUTION

Check your location and ensure that it has adequate phone coverage, in order to communicate it if need arises.

Always carry a mobile phone with emergency numbers for doctors, ambulance service, hospitals and fire-fighters.

1.1.3 PREPARING THE WORK AREA

- Carry out an inspection in the work area before starting activities.
- Move people away and remove objects within the range of action and movement of the machine.
- Do not allow people or vehicles to enter and transit the work area.
- Make sure that the surface of the work area is sufficiently solid to support the weight of the machine.

1.1.4 NOTICE OF MAINTENANCE WORK IN PROGRESS

- The ignition key must be removed from the control panel and kept by the maintenance technician.
- Before carrying out work on the machine, put the "Maintenance in progress" sign in position.
- Never operate the machine when the "Maintenance in progress" sign is present.

1.1.5 LIGHTNING PRECAUTIONS

- If lightning strikes the machine, or a point close to it, check the proper integrity of all the components and devices on the machine, particularly the machine's safety devices.
- If any fault is found, do not operate the machine and contact the support service for repairs.

1.1.6 PARKING THE MACHINE SAFELY

- When not in use, the machine at must be parked on a solid and flat surface.
- Once the machine is parked, shut it down as indicated in chapter 5.

1.1.7 SAFE HANDLING OF FLUIDS AND FIRE PREVENTION

Handle fuel with extreme care because it is highly flammable. In the event of combustion, explosions and fires can occur with the risk of serious injuries.

All fuel types and most lubricants are flammable

- Refuelling must be performed outdoors
- Always switch off the engine before refuelling.
- Do not refuel the machine in the vicinity of open flames or sparks
- Store flammable liquids away from potential sources of fire
- Do not burn or puncture the containers.

1.1.8 BURN HAZARD SAFETY PRECAUTIONS

- When the machine is in use, the engine coolant is hot and under pressure.
- When the machine is in use, the engine oil and hydraulic oil reach high temperatures.
- The cooling system pipes contain hot water or steam, which can cause scalding in the event of accidental skin contact.
- The hydraulic oil system pipes contain hot oil, which can cause scalding in the event of accidental skin contact.

To avoid scalding caused by hot liquids, perform work on the machine only after all the hot parts on the machine have cooled down.

The operator must wear the following personal protective equipment:

- Safety footwear
- Protective gloves
- Protective clothing
- Safety goggles

1.1.9 PRECAUTIONS AGAINST CONTACT WITH HIGH-PRESSURE LIQUIDS

› Pressurised liquids can penetrate the skin and eyes, causing serious injury.
› To avoid this risk, the residual pressure must be discharged.

WARNING

The operator must wear the following personal protective equipment:

› Safety footwear
› Protective gloves
› Protective clothing
› Safety goggles

› Use a strip of cardboard to detect any leaks.
› In the case of injury from contact with pressurised fluids, seek medical attention immediately.

1.1.10 FIRE PREVENTION

DANGER

The presence of any leakage of fuel, hydraulic oil and/or lubricant can lead to fires, with the consequent risk of serious injury.

› Make sure there are no missing or loose clamps, bent hoses or rubbing between rigid and/or flexible hoses.
› If necessary, tighten, repair or replace the radiator, clamps, pipes and flexible hoses if loose or damaged.
› Do not bend or hit high-pressure pipes.
› Never install bent or damaged pipes or flexible hoses.

1.1.11 PREVENTION OF SHORT CIRCUITS OR ELECTRICAL FAULTS

› Clean and tighten all electrical connections.
› Check that the electrical cables and wires are not loose, bent, hardened, worn or damaged.

WARNING

Short circuits can cause fires.

Do not use the machine if it has loose, bent and/or damaged cables or wires.

1.1.12 PRECAUTIONS FOR USE OF FLAMMABLE LIQUIDS

Any leakage of fuel, hydraulic oil and/or lubricant can lead to fires, with the consequent risk of serious injury.

- Prevent the risk of fire by performing a daily check and cleaning of the machine and immediately removing any traces or accumulations of liquid or flammable material.
- Do not store flammable liquids in the vicinity of open flames.
- Do not burn or destroy pressurised containers.
- Do not store oil-soaked clothing as these materials can catch fire with extreme ease.
- Do not wrap oil-absorbing materials around high temperature components.

1.1.13 REMOVING TRACES OF FLAMMABLE MATERIALS

Traces of fuel, hydraulic oil and/or dirty lubricants, grease, debris, dust residues and other flammable materials can lead to fires, with the consequent risk of serious injury.

- Prevent the risk of fire by performing a daily check and cleaning of the machine and immediately removing any oil or accumulations of flammable material.
- Check and clean the parts subject to high temperature.
- Do not wrap parts subject to high temperature in oil absorbing cloth.
- Avoid the presence of flammable materials in the vicinity of open flames.
- Do not burn or crush pressurised or sealed containers.
- Check and clean the machine daily and immediately remove any accumulated flammable materials.

1.1.14 ABANDONING THE MACHINE IN THE EVENT OF FIRE

In the event of a fire during use of the machine, leave the machine work area and switch off the machine as indicated in chapter 5.

1.1.15 PRECAUTIONS AGAINST EXPOSURE TO EXHAUST GASES

WARNING

Engine exhaust gases are toxic.

› If the machine has to be operated inside buildings, ensure that the space is adequately ventilated.

1.1.16 PREVENTION OF BATTERY EXPLOSIONS

DANGER

The liquid contained in the battery can explode.

› Do not create sparks and do not light flames near the battery.
› Never check the battery charge by placing a metal object between the terminals. Use a voltmeter.
› If a terminal becomes loose, it can produce sparks. Tighten all terminals securely.
› Connect the terminals to the correct electrical poles. Failure to comply with this advice may result in damage to electrical parts or fire.
› Always wear personal protective equipment when checking the relative density of the electrolyte.

CAUTION

The operator must wear the following personal protective equipment:

› Safety footwear
› Protective gloves
› Protective clothing
› Safety goggles

› Battery electrolyte is toxic. In the case of leakage from the battery, the electrolyte contained in the battery can penetrate the eyes.
› In the event of contact with eyes, rinse them abundantly with water for a few minutes. Seek medical advice immediately.

1.1.17 PRECAUTIONS FOR USE OF COOLANT

WARNING

Contact of coolant with eyes or skin can cause serious injury, burns and permanent damage.

When using coolant, always read the warnings on the package.

- Use a recovery and recycling system to prevent the release of coolant liquid into the atmosphere.
- Do not expose the skin to direct contact with the coolant.
- Always wear personal protective equipment when checking the relative density of the electrolyte.

WARNING

The operator must wear the following personal protective equipment:

- Safety footwear
- Protective gloves
- Protective clothing
- Safety goggles

1.1.18 SAFE HANDLING OF CHEMICALS

DANGER

Direct exposure to harmful chemicals can result in serious injury.

- Potentially harmful chemicals used on the machine include:
  - Lubricants
  - Electrolyte
  - Coolants
- The safety data sheet provides specific details on chemicals: physical and health hazards, safety procedures and emergency response techniques.
- Consult the safety data sheet before performing operations that require the use of chemicals.
- Follow the procedures indicated and wear the recommended protective equipment.

DANGER

The operator must wear the following personal protective equipment:

- Safety footwear
- Protective gloves
- Protective clothing
- Safety goggles

1.1.19 PROPER WASTE DISPOSAL

CAUTION

Incorrect waste disposal can cause environmental and ecological damage.

Contact the nearest environmental protection or recycling centre for information on the correct disposal procedures for hazardous waste such as oil, fuel, coolant, filters and electrolyte liquid.

- Potentially toxic waste used in the machine includes oil, fuel, coolant, filters and electrolyte liquid.
- When draining liquids, use sealed containers with a capacity greater than the volume of liquid drained.
- Do not dispose of the waste in soil, drainage channels or rivers.

1.2 SAFETY PICTOGRAM LEGEND

The following safety signs have been placed on the machine.

1.2.1 WARNING PICTOGRAMS

GENERAL HAZARD

DANGER HOT SURFACES

DANGER SUSPENDED LOADS

DANGER EXPLOSIVE MATERIAL

DANGER FORKLIFT TRUCKS

DANGER TOXIC SUBSTANCES

CRUSHING HAZARD

DANGER FLAMMABLE MATERIAL

DANGER CORROSIVE SUBSTANCES

ELECTRIC SHOCK HAZARD

DANGER OF ENTANGLEMENT IN MOVING PARTS

HAND-CRUSHING HAZARD

HAND-CUTTING HAZARD

DANGER OF ENTANGLEMENT/SHEARING OF UPPER LIMBS

1.2.2 PROHIBITION PICTOGRAMS

GENERIC PROHIBITION

LUBRICATING AND CLEANING THE MACHINE WHEN IN MOTION IS PROHIBITED

REMOVAL OF THE GUARDS IS PROHIBITED

THE USE OF OPEN FLAMES IS PROHIBITED

REACHING IN WITH HANDS IS PROHIBITED

CLIMBING ONTO THE MACHINE IS PROHIBITED

1.2.3 REQUIREMENT PICTOGRAMS

THE INSTRUCTIONS MUST BE READ BEFORE WORKING ON THE MACHINE

PROTECTIVE GLOVES MUST BE WORN

PROTECTIVE EYEWEAR MUST BE WORN

PROTECTIVE CLOTHING MUST BE WORN

SAFETY FOOTWEAR MUST BE WORN

HEARING PROTECTION MUST BE WORN

PROTECTIVE VISORS MUST BE WORN

SAFETY HELMETS MUST BE WORN

MASKS MUST BE WORN

THE MACHINE MUST ONLY BE LIFTED FROM THE INDICATED POINTS

1.2.4 ADDITIONAL PICTOGRAMS

DISPOSE OF IN ACCORDANCE WITH CURRENT REGULATIONS

1.3 HAND SIGNALS

When the operator has to position loads in conditions with a reduced field of vision, assign a person (signaller) to signal the manoeuvres to be performed, using the specific signals established by the standards.

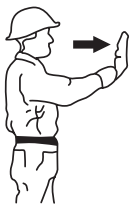
When additional instructions to those defined in the hand signalling system are required, these must be agreed on by the signaller and the operator before starting the movement of the load and/or the machine.

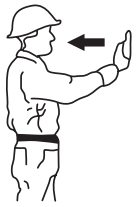
⚠ CAUTION

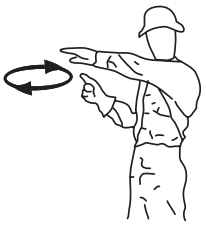
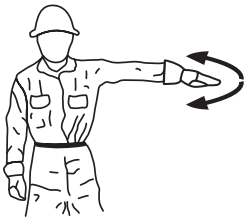
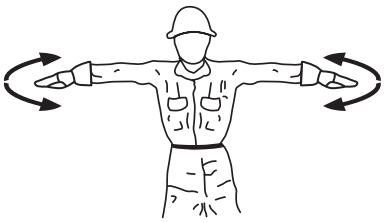
No movement or operation must be carried out without the signals being clearly understood by the signaller and the operator.

Signals should only come from one person.

The operator must check that the signaller is always in his field of vision and follow all his signals.

LIFT THE LOAD VERTICALLY Rotate your hand in small circles, with your forearm positioned vertically and your forefinger pointing upwards.	
LOWER THE LOAD VERTICALLY Rotate your hand in small circles, with one arm extended and your forefinger pointing downwards.	
MOVE THE LOAD AWAY HORIZONTALLY Stretch one arm out in front of you, with your hand in a vertical position facing the load to be moved away, and move your hand in the direction of the movement to be performed.	

MOVE THE LOAD CLOSER HORIZONTALLY Stretch one arm out in front of you, with your hand in a vertical position facing the signaller, and move your hand in the direction of the movement to be performed.	
STEER TO THE RIGHT Raise your forearm on the inner side of the turn with your fist closed. Rotate your other fist vertically indicating the direction of rotation of the wheel/track.	
STEER TO THE LEFT Raise your forearm on the inner side of the turn with your fist closed. Rotate your other fist vertically indicating the direction of rotation of the wheel/track.	
MOVE STRAIGHT FORWARD Rotate both fists vertically indicating the direction of rotation of the wheels/tracks.	
MOVE STRAIGHT BACK Rotate both fists vertically indicating the direction of rotation of the wheels/tracks.	

DISTANCE TO BE COVERED With your hands raised and facing inwards, move your hands laterally to indicate the distance to be covered.	
PERFORM THE MOVEMENTS SLOWLY Hold one hand still in front of the hand indicating the movements to be performed (the figure shows the command to slowly raise the load).	
STOP Stretch out your arm to the side, open your hand facing downwards and move your arm forward and back.	
EMERGENCY STOP With both arms extended horizontally, open your hands facing down and move both arms back and forth.	
STOP THE ENGINE Pass your thumb or forefinger over your throat.	

2 GENERAL INFORMATION

2.1 MANUFACTURER IDENTIFICATION DATA

Name	MDB S.r.l.
Head office	Contrada, Via Cupone, 13, 66022 Fossacesia CH
Telephone	+39 0872.50221
Fax	+39 0872.50231
Website	www.mdbsrl.com
Email	info@mdbsrl.com
VAT number	01960690699

2.1.1 TECHNICAL SUPPORT

Technical support will be provided by the Manufacturer via the portal set up by MDB (https://cloud.interactivespares.com/mdb) after logging in with the required credentials.

The customer must fill out a support request, carefully following the manufacturers indications, by entering the following details:

- Machine model
- Year of machine manufacture
- Machine identification serial number
- Hours of service
- Type of problem encountered

Once the data has been entered, the customer must provide the Manufacturer with all information necessary to assess the case, including any photo/video documentation requested by the manufacturer.

The Manufacturer will then carry out (remote) technical analysis of the critical issues indicated and provide support, if possible.

The technical analysis must show that the issues found have not been caused by incorrect use and/or maintenance, improper use or normal wear and tear, according to the instructions given in the "Use and Maintenance" manual provided to the Customer by the Manufacturer.

NOTICE

For more details, please see the general conditions of sale on the website (URL landing page general conditions of sale).

ORIGINAL REPLACEMENT PARTS

Changes to the components or their replacement with non-original components, or any other modifications not authorised in writing by the Manufacturer, affect safety and operation, and reduce the operating life of the machine, thereby invalidating the warranty.

The customer should make the request for original MDB parts through the portal established by MDB (https://cloud.interactivespares.com/mdb), after entering his or her credentials.

The customer must fill out the parts request, carefully following the manufacturers indications, by entering the following details:

- Machine model
- Year of machine manufacture
- Machine identification serial number
- Hours of service
- Required replacement part code no.
- Serial number of the component in question (if any)

NOTICE

For more details, please see the general conditions of sale on the website (URL landing page general conditions of sale).

2.2 WARRANTY

Unless otherwise agreed in writing, the Manufacturer guarantees that its products are free from defects, including those due to manufacturing or the material used, for a period of 12 (twelve) months, starting from the registration of the data of the MDB machine (based on the serial number displayed on the identification plate) valid for the duration of and no longer than the period indicated in the general conditions of sale, under penalty of forfeiture.

This registration must be made via the portal created by MDB at https://cloud.interactivespares.com/mdb, by entering the required details in the warranty activation form and giving consent to the processing of personal data.

Any work that changes the machine's configuration or functioning must be carried out or authorised by MDB.

The Manufacturer is not liable for any consequences deriving from the use of non-original spare parts or from work carried out by the Customer's own technicians and/or technicians not authorised by the manufacturer, and/or for which the manufacturer's supervision is required and/or for which there is no written authorisation.

Since improper use of the Products (machine and spare parts) is prohibited, the warranty only covers products used in ways and for purposes consistent with the technical specifications and in accordance with the manufacturer's instructions.

The Manufacturer does not acknowledge or answer for any damage to third parties, direct and/or indirect, caused to people or things deriving from use of the machine, machine downtime, penalties or other direct causes resulting from or related to the use of the machine.

For the warranty coverage of components not manufactured by MDB, the terms and conditions provided by the supplier shall apply.

In addition, the warranty is void in the following cases:

- Mismanagement by the Distributor/customer, its staff or third parties;
- Failure due to negligence, misuse or fraud by the Distributor/customer, its personnel or third parties;
- Failure to comply with the maintenance tasks required by the Manufacturer and contained in this "Use and Maintenance" manual,
- Wear of consumables (e.g. tracks, tyres, oil, filters, rubber seals, etc.) due to use;
- Defects caused by any other cause attributable to the Distributor/customer, its staff or/and third parties;
- Alterations or replacements of product parts not authorised by the Manufacturer.

NOTICE

All support and special maintenance operations during the warranty period are not the responsibility of the operator or maintenance technician, but are reserved to MDB specialist technicians and/or technicians indicated by MDB.

NOTICE

For more details, please see the general conditions of sale on the website (URL landing page general conditions of sale).

2.3 PRESERVATION OF THE MANUAL

The manual and its attachments:

- Are an integral part of the machine and must always accompany it.
- Should always be kept in an easily accessible place and protected from environmental agents that could affect their integrity and durability (see chapter 3).
- Must be available and accessible quickly and at any time by the authorised personnel.

2.4 RECIPIENTS OF THE MANUAL

For the purposes of the manual, the persons assigned to the machine are divided into:

- Operator: responsible for operating and using the machine.
- Maintenance technician: in charge of routine maintenance of the machine.

NOTICE **The term authorised personnel is used generically to identify a person who must work on the machine: operator, maintenance technician, etc.**

For more information on the recipients of the manual, see chapter 3.

2.5 SEARCH CRITERIA AND USE OF THE MANUAL

The information and instructions are collected and organised into chapters, sections and paragraphs, and can be easily found by consulting the index.
The essential information for the health and safety of the operators/maintenance technicians is preceded by warning signs and must be carefully read.
Safety instructions are classified as follows, according to the seriousness of the risk.

DANGER **Indicates cases where failure to follow the safety instructions may lead to SERIOUS injury to people or damage to the device.**

WARNING **Indicates cases where failure to follow the safety instructions may lead to MODERATE injury to people or damage to the device.**

CAUTION **Indicates cases where failure to follow the safety instructions may lead to SLIGHT injury to people or damage to the device.**

NOTICE **This indication highlights a note in the manual that is particularly important for use and maintenance of the machine and for information purposes.**

2.6 ENVIRONMENTAL REQUIREMENTS

The machine:

- Is suitable for operation in a ventilated environment.
- Is suitable for operation at a temperature between -30°C and +40°C.

The machine:

- IS NOT suitable for operation in a potentially explosive atmosphere.
- IS NOT suitable for operation in environments at risk of fire.

3 MACHINE FEATURES

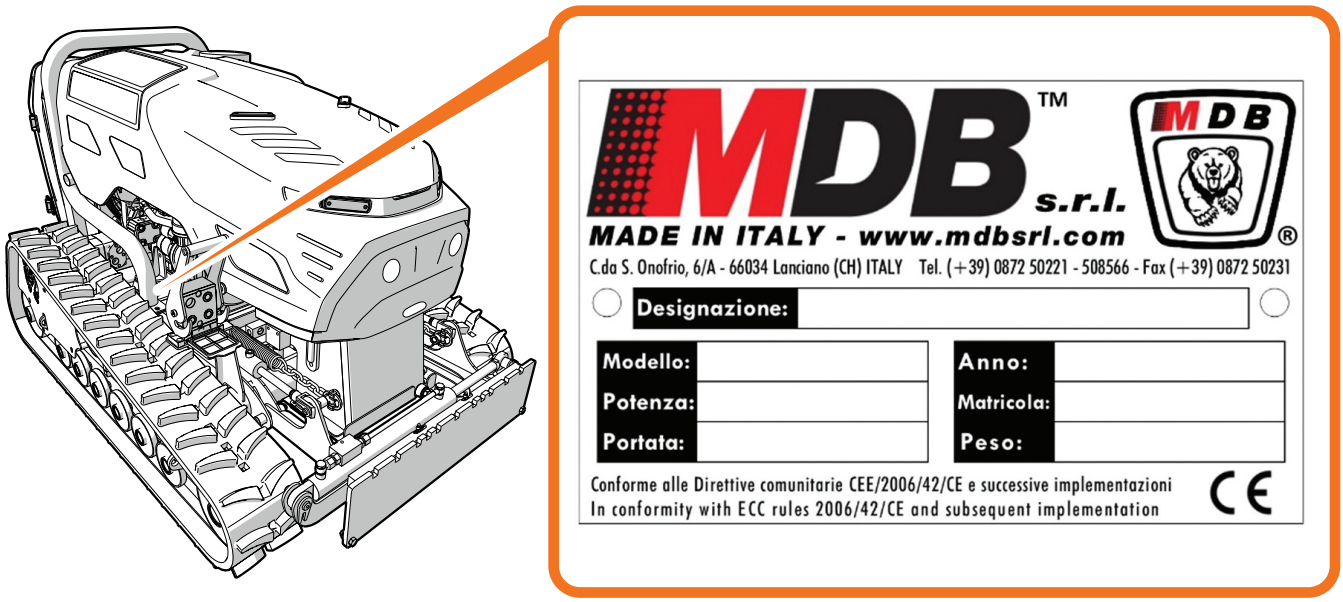
3.1 NAMEPLATE

The nameplate is affixed to the machine in the area shown in the figure.

The nameplate displays the following details:

Description	Type of machine
Model	Machine model
Power	Engine power (kW)
Capacity	Maximum machine capacity (Kg)
Year:	Year of machine manufacture
Serial number	Machine identification serial number
Weight	Machine weight (Kg)

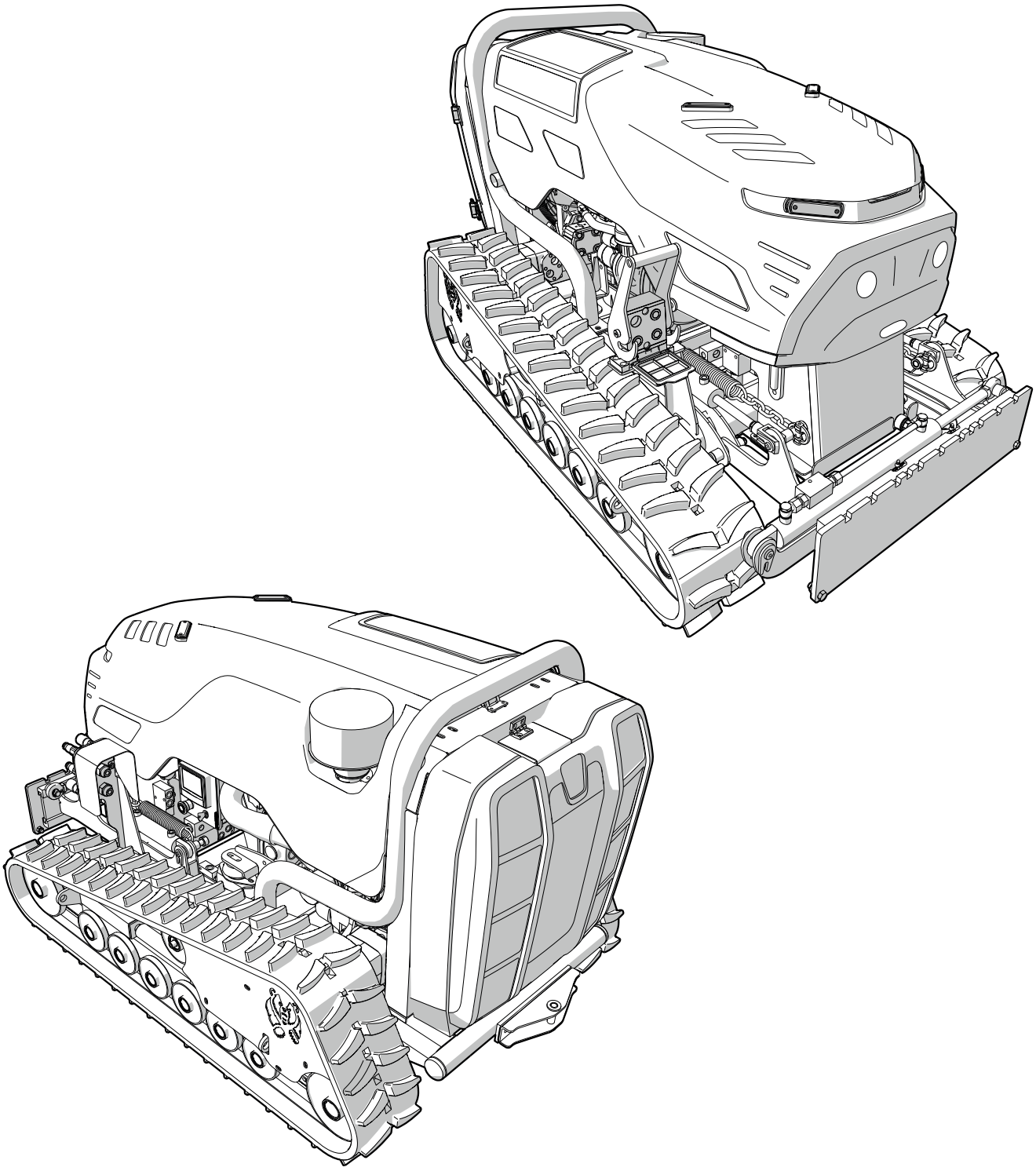
NOTICE **For the actual data of the machine concerned, see the figures shown on the inside front cover of this manual.**



NOTICE **The CE marking is affixed only within the European Community or in cases where it is required.**

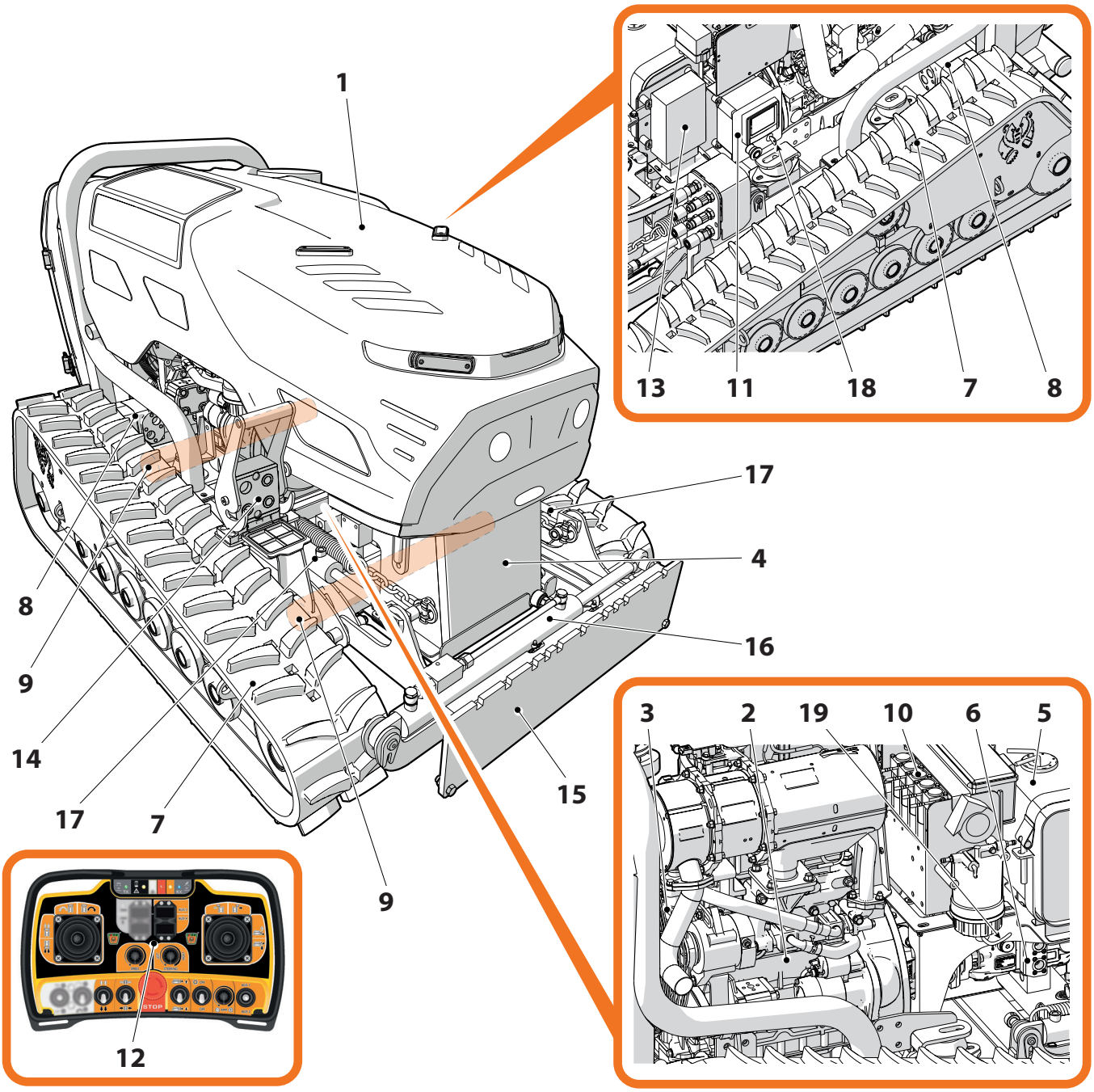
3.2 DESCRIPTION

The machine is designed for installing equipment and has the characteristics indicated in paragraph "3.10 Permitted uses" and paragraph "3.3 Technical specifications".
The machine control operations are performed by means of a remote control device, which allows the operator to operate the machine from a distance.
The remote control allows the operator to work with complete peace of mind, by following the indications on the operator's position given in paragraph "3.4.1 Operator position".



3.2.1 LIST OF UNITS

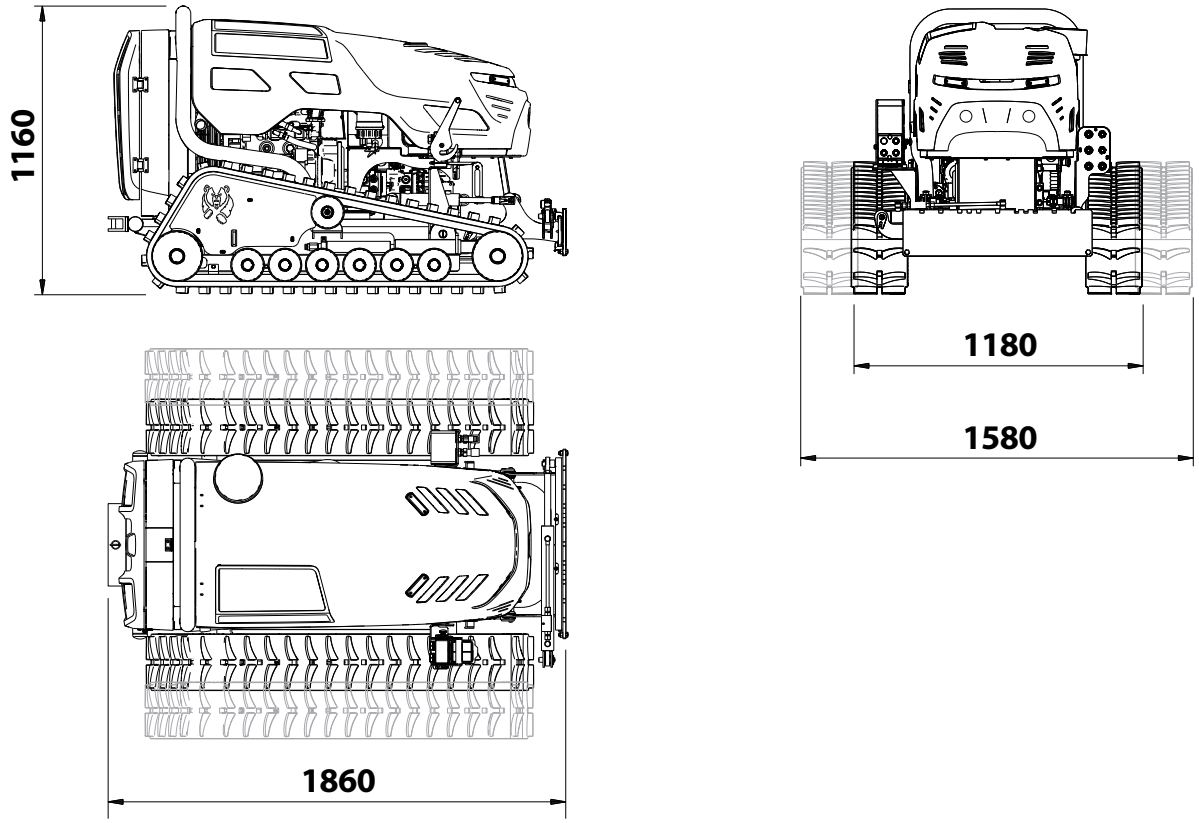
1 Bonnet
2 Engine
3 Water-oil radiator
4 Hydraulic oil tank
5 Fuel tank
6 Pump unit
7 Tracks
8 Track hydraulic motors
9 Track widen/narrowing cylinders
10 Manual distributor
11 Control panel
12 Radio control (transmitter)
13 Control unit (receiver)
14 Tool hydraulic connection valve
15 Tool carriage
16 Tool carriage side-shifting cylinder
17 Tool carriage vertical-shifting cylinder
18 Ignition key switch
19 "Battery disconnector" key

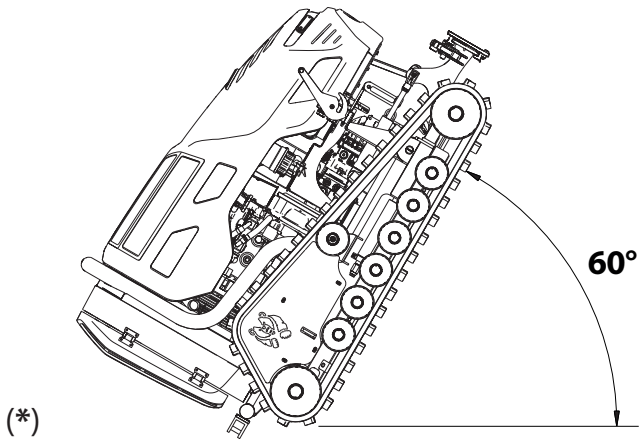


3.3 TECHNICAL SPECIFICATIONS

3.3.1 DIMENSIONS

The dimensions of the machine are shown in the figure.





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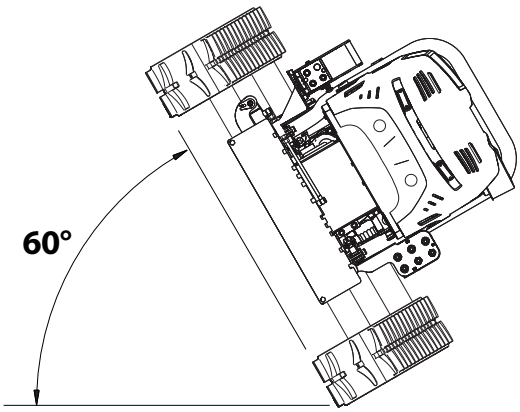


(*)

Work and movement configuration	Minimum overall dimensions	1160 mm x 1860 mm x 1180 mm
	Maximum machine inclination	Not permitted
Work-only configuration	Minimum overall dimensions	1160 mm x 1860 mm x 1580 mm
	Maximum machine inclination	60° (*)

3.3.2 WEIGHT

For this information, see the figures given on the inside front cover of this manual.

3.3.3 CAPACITY

For this information, see the figures given on the inside front cover of this manual.

3.3.4 OTHER TECHNICAL SPECIFICATIONS

Maximum speed	**7 Km/h**
Rpm	**For this information see Annex B**
Fuel tank capacity	**20 l**
Hydraulic oil tank capacity	**17 l**
Coolant tank capacity	**10 l**
Engine oil tank capacity	**For this information see Annex B**
Fuel type	**For this information see Annex B**
Hydraulic oil type	**PANOLIN HLP SYNTH**
Coolant type	**ENI ANTIFREEZE SPEZIAL FS KG 200**
Engine oil type	**5W40**
Type of grease for periodic lubrication	**PRESSOL NLG1 2**
Battery	**12 Volt - 60 Ah**

3.3.5 ENGINE SPECIFICATIONS

For this information see Annex B

3.4 WORK AREA

The work area **A** where the machine operates (on which the tool is or is not installed) must be cordoned off by appropriate signalling devices before the start of the work.

WARNING

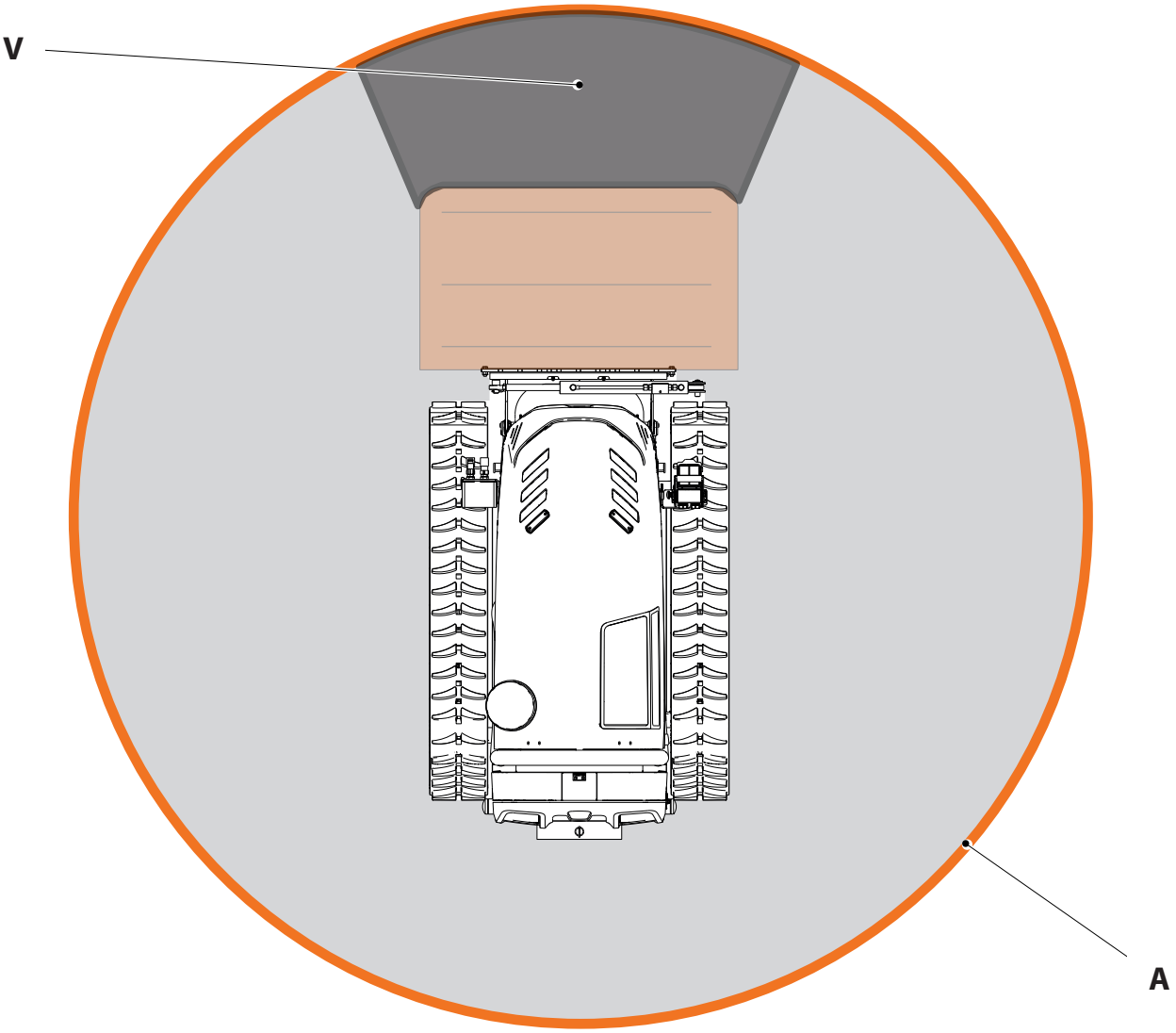
During the use of the machine, the work area A is out-of-bounds to all people.

NOTICE

The shape, size and hazard level of the work area is determined by the type of tool the machine is installing.

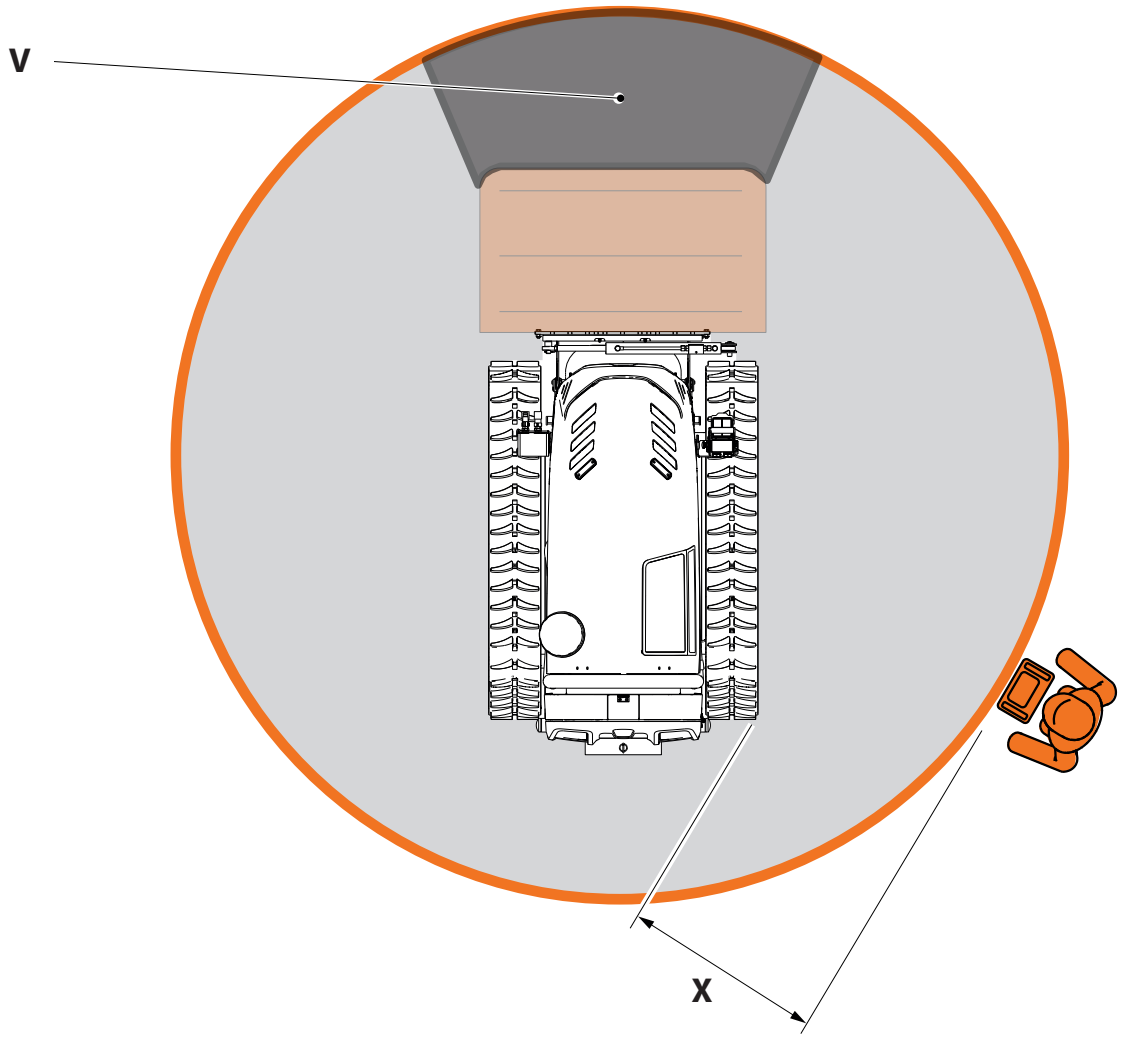
In particular, the work zone in the part in front of the tool V, varies considerably in relation to the type of equipment installed.

Therefore, for more detailed information on the work area, see the manual for the tool being installed on the machine.



3.4.1 OPERATOR POSITION

The operator controls the machine with the remote control unit and must remain at a minimum required distance **X** of **3 metres** from it, positioned as shown in the figure.



The zone in front of the tool installed on the machine (V), can pose various kinds of hazards.

DANGER

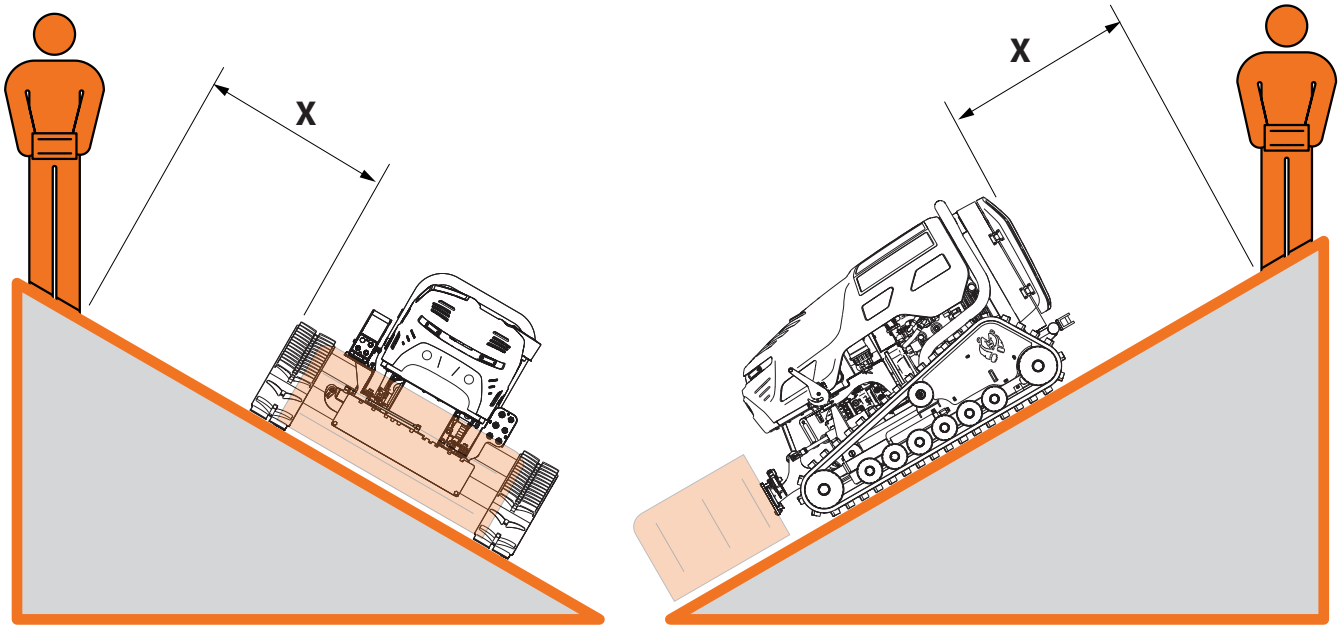
Therefore, for more detailed information on the zone (V), see the manual for the tool being installed on the machine.

Wear the required personal protective equipment, as indicated in paragraph "3.13 Personal protective equipment".

DANGER

When using the machine on sloping ground, always stand uphill from it, as indicated in the figure.

Always maintain a minimum distance X of 3 metres from the machine, as indicated in the figure.



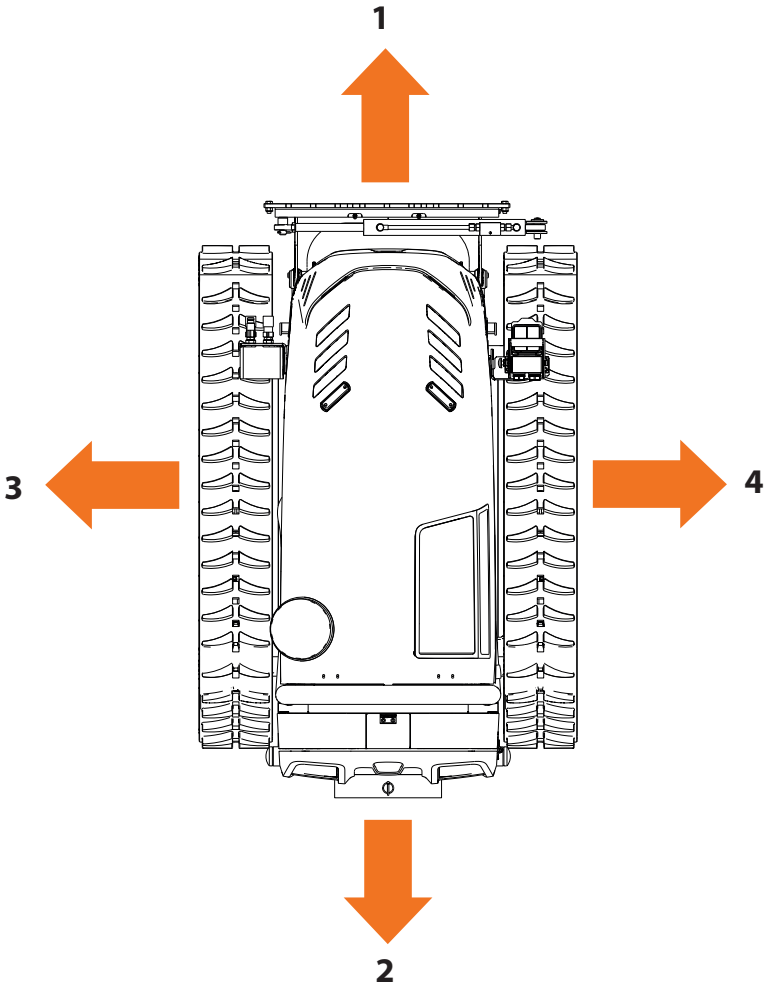
DANGER

Use of the machine on sloping ground is only possible in work only configuration, as indicated in paragraph "3.6 Machine configurations" and paragraph "3.3 Technical specifications"

Never go beyond the maximum permitted working inclination, as indicated in paragraph "3.3 Technical specifications".

3.4.2 MACHINE DIRECTIONAL POINTS

In this manual, the terms **Forward/Front (1)**, **Back/Rear (2)**, **Left (3)** and **Right (4)** refer to the machine's travel directions, as shown in the figure



3.5 RUNNING IN

NOTICE

Each machine is carefully adjusted and tested before delivery.

A new machine must be used with caution for the first hours of operation.

Each new machine must be used carefully, particularly with regard to the following points:

› After starting, allow the engine to run at idle speed for a few minutes so that it can warm up gradually (see chapter 5).

› Avoid operating the machine at its permissible load limit or at high speed (see chapter 5).

NOTICE

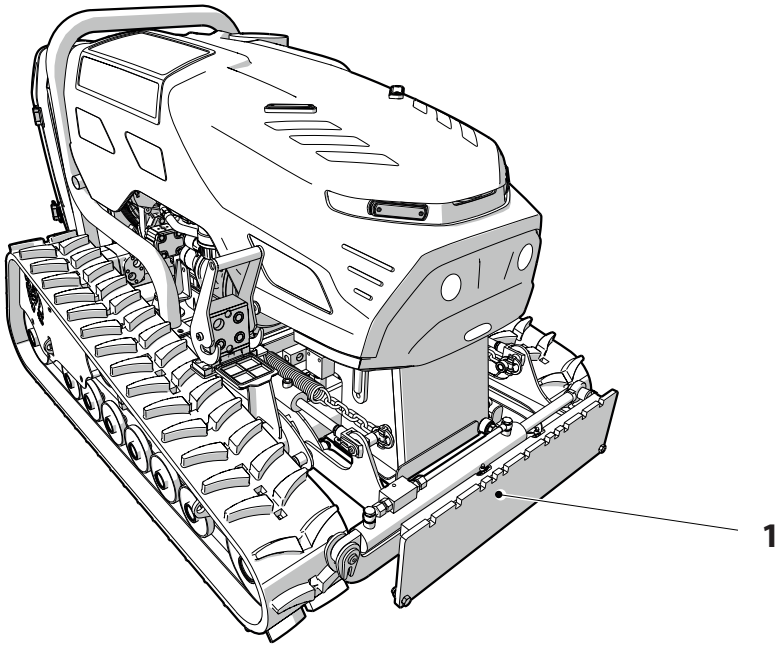
For all other information see Annex B

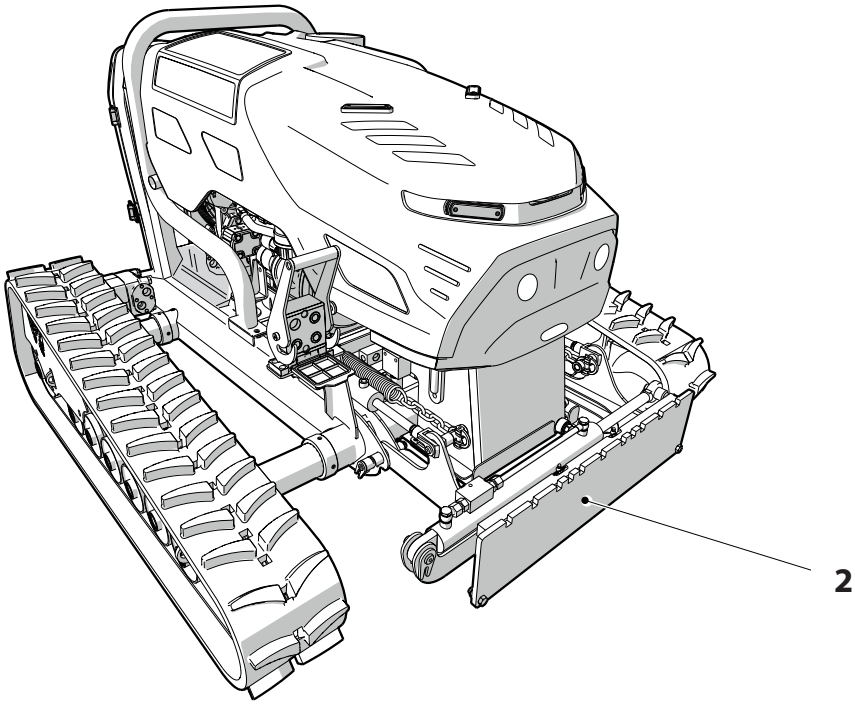
3.6 MACHINE CONFIGURATIONS

The machine is used in the following configurations:

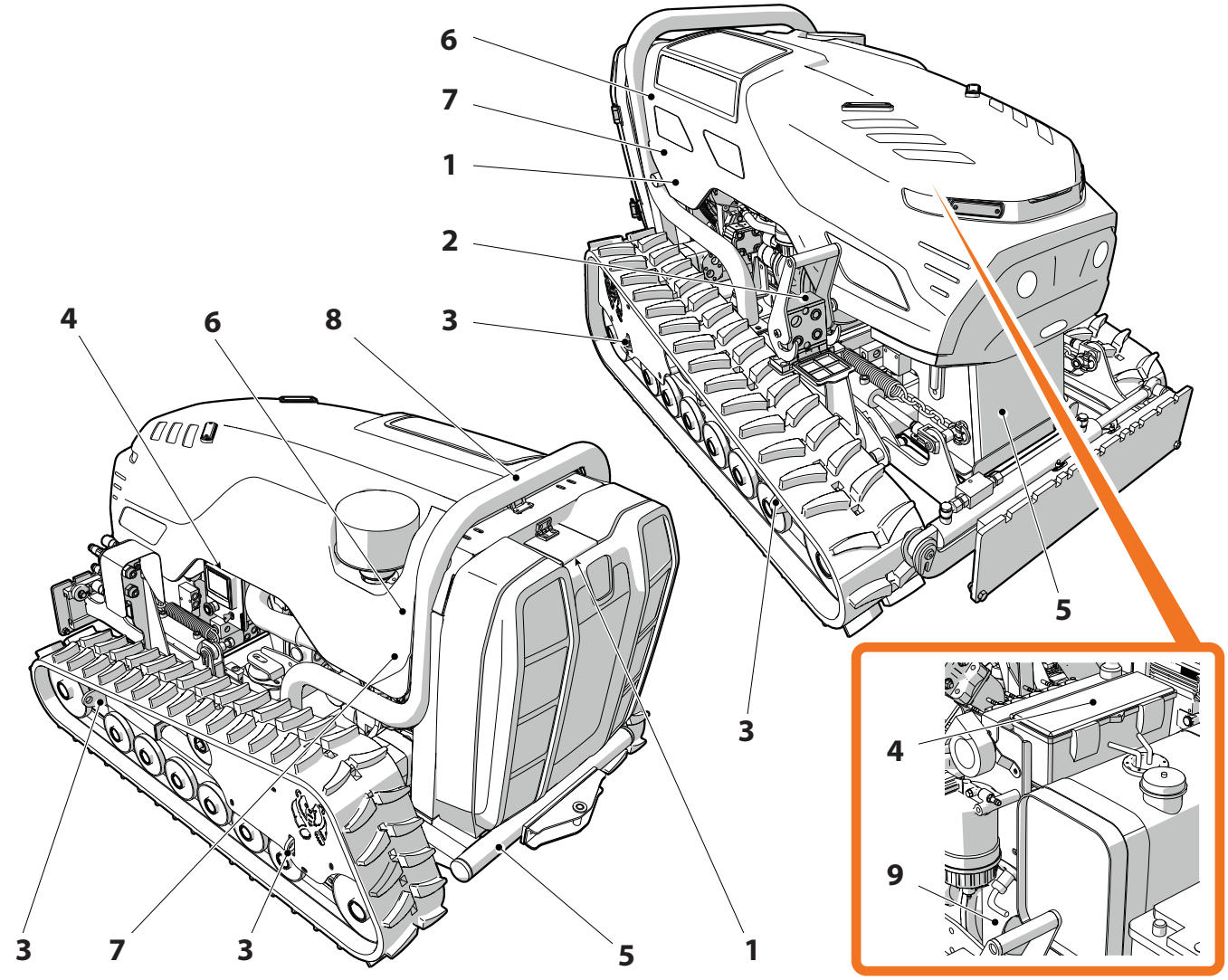
1 Work and movement configuration

2 Work-only configuration



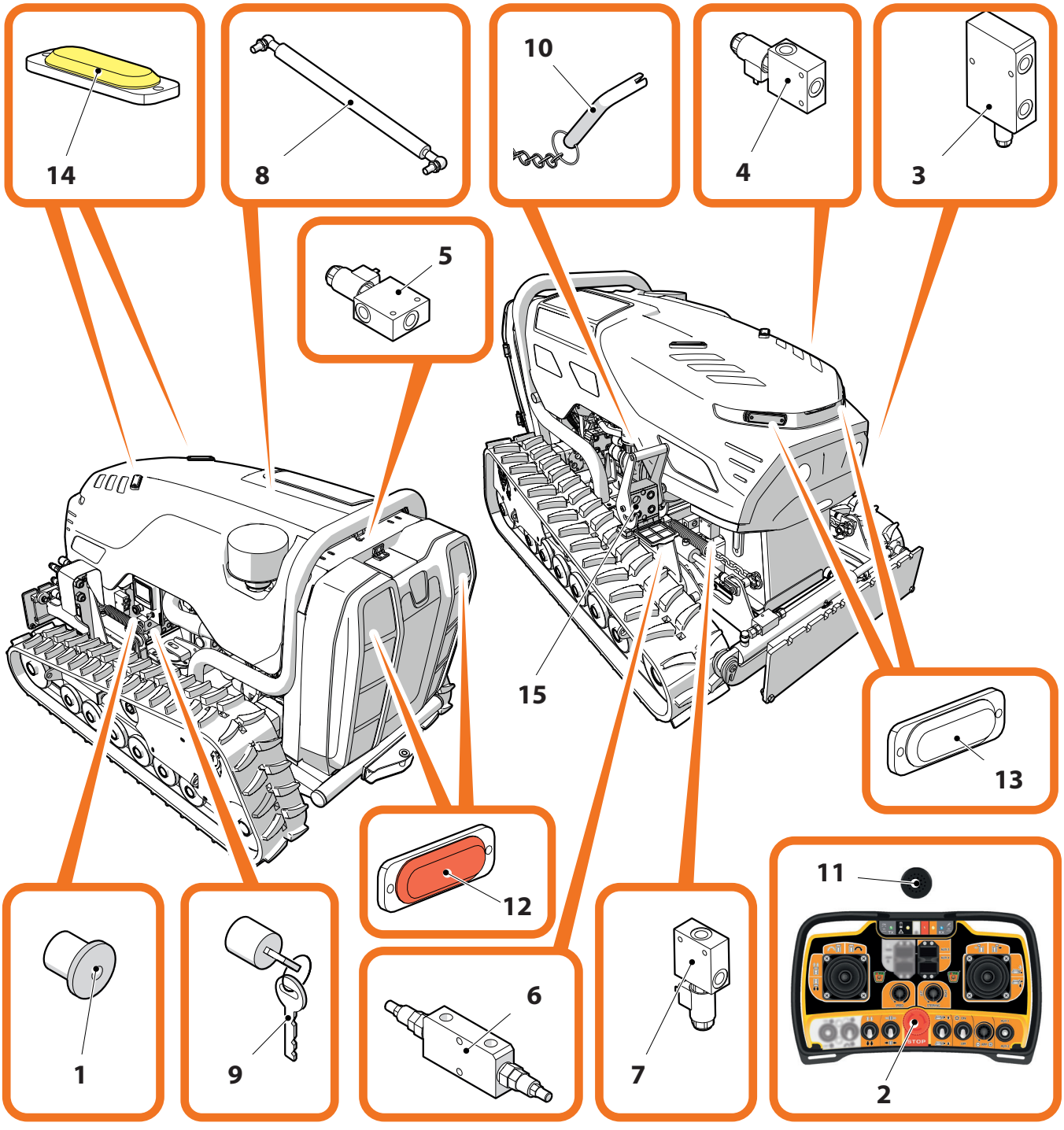


3.7 SAFETY SIGNS



3.8 SAFETY DEVICES

1 Control panel emergency button
2 Remote control emergency button
3 Tool carriage descent locking and control valve
4 Track motor brake release solenoid valve
5 Radiator fan control solenoid valve
6 Track widening/narrowing solenoid valve
7 Tool carriage vertical-shifting solenoid valve
8 Bonnet maintenance position safety gas spring
9 Ignition key switch
10 "Battery disconnector" key
11 Audible warning device
12 Red lights (solid)
13 White lights (solid)
14 Yellow lights (flashing)
15 Tool hydraulic connection valve



3.9 PROFESSIONAL USER PROFILES

The machine is designed for professional use.
The End customer is responsible for ensuring that the persons assigned to the various tasks:

- Read and understand the manual.
- Receive adequate instruction and training for their assigned tasks, in order to perform them safely.
- Receive specific training for the correct use of the machine.
- Use all the accident prevention equipment necessary for their safety, as required by current laws on health and safety in the workplace.
- Receive specific training to deal with any emergencies due to injuries to personnel.

3.9.1 OPERATOR

This type of machine can only be used by an experienced person (referred to as an operator) trained with regard to the limits of use and residual risks.
For driving specifications, follow the national provisions of the country of use of the machine.

DANGER

Use of drugs, alcohol or medicines that affect the reflexes undermine the ability to use the machine!

Persons under the influence of these substances are not authorised to perform any work or to use the machine.

The operator must have:

- Knowledge of the machine's technology and specific experience of its operation.
- Sufficient basic general and technical knowledge to read and understand the contents of the manual, including the correct interpretation of the drawings.
- Knowledge of the accident prevention regulations in force in the country where the machine is used:
  - General regulations (occupational health and safety, prevention of work accidents).
  - Specific regulations (for the type of machine).

OPERATOR REQUIREMENTS

NOTICE

The operator is responsible for the machine during working hours. He cannot allow unauthorised persons to operate the machine.

The operator is only allowed to use the controls and instruments on the control panel and the machine remote control.
The operator's working position is indicated in paragraph "3.4.1 Operator position".

3.9.2 MAINTENANCE TECHNICIAN

The maintainer must have:

- The necessary specific and specialised technical knowledge (mechanical, electrical, pneumatic, etc.) to safely carry out the operations for which he is responsible, as specified in this instruction manual, using suitable tools or devices.
- Sufficient basic general and technical knowledge to read and understand the contents of the manual, including the correct interpretation of the drawings.
- Knowledge of the accident prevention regulations in force in the country where the machine is used:
  - General regulations (occupational health and safety, prevention of work accidents).
  - Specific regulations (for the type of machine).

MAINTENANCE TECHNICIAN SKILLS

The maintenance technician is permitted to perform the routine maintenance operations indicated in this instruction manual, within the limits of his competence in mechanical, electrical, pneumatic and other fields.

3.10 PERMITTED USES

The machine is designed for the installation of equipment that carries out various processes.
The machine must only be used in a ventilated environment.

NOTICE

For further information, see the manual for the equipment being installed on the machine.

3.11 NON-INTENDED USES

No other use is envisaged (other than those specified in the preceding paragraph), unless expressly authorised by MDB.
MDB disclaims any and all liability for malfunctions or damage to persons or property due to uses other than those indicated in this manual.

3.12 NOISE LEVEL

As the machine is intended to operate in a ventilated environment, noise measurement was conducted as required by Directive 2000/14/EC on ambient noise emission of machines and equipment intended to operate outdoors.
The standard used for calculating the sound power level was UNI EN ISO 3744-2010. Standard UNI EN ISO 3744-2010 specifies the method for measuring sound pressure levels on a measurement surface containing the source, in order to calculate the sound power emitted by the noise source.
Surface sound pressure level: **81.75 dB(A)**
Sound power level: **101 dB(A)**

WARNING

The operator must wear the required personal protective equipment (hearing protection), in accordance with the legislation in force in the country of use of the machine.

3.13 PERSONAL PROTECTIVE EQUIPMENT

NOTICE

The employer is obliged to provide personal protective equipment and to instruct the personnel on its correct use and maintenance.

The operator and/or maintenance technician must use the following personal protective equipment for all machine use and maintenance operations.

PROTECTIVE GLOVES

PROTECTIVE VISOR

PROTECTIVE CLOTHING

SAFETY FOOTWEAR

HEARING PROTECTION

SAFETY HELMET

NOTICE

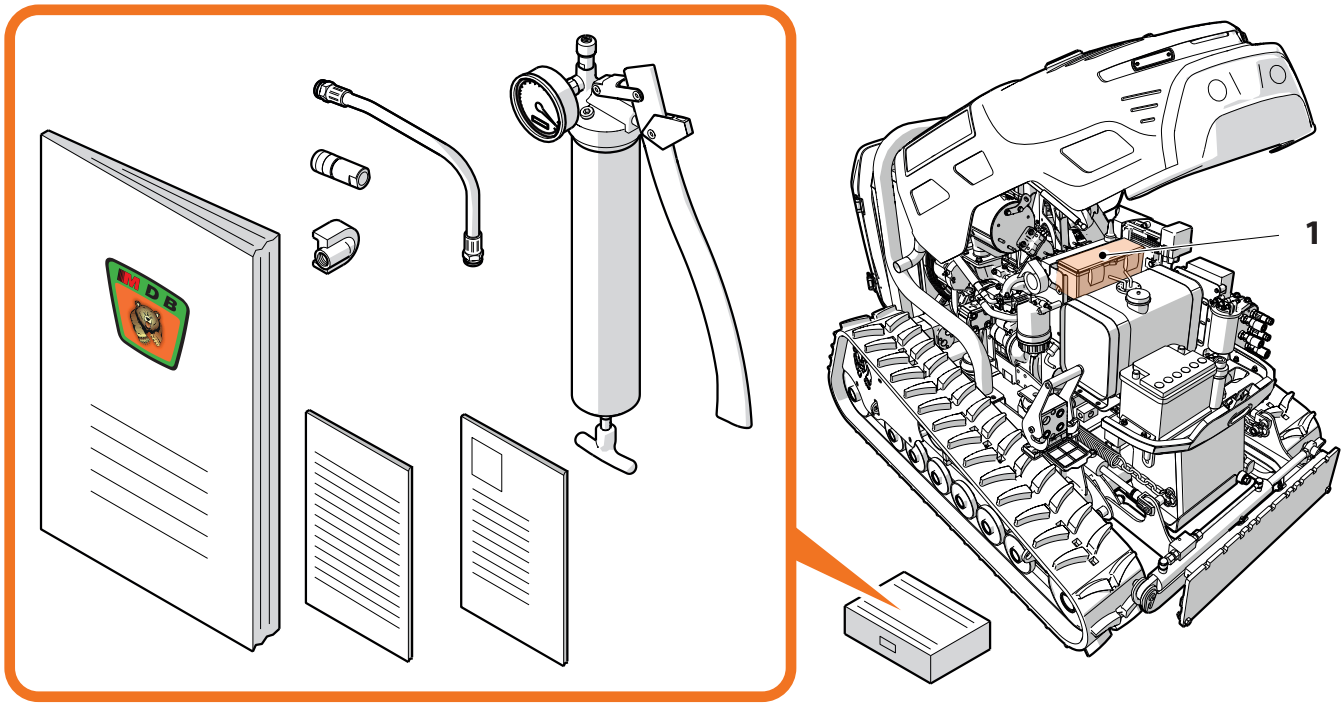
Avoid wearing loose clothing, jewellery or other objects that could get caught in parts of the machine during use and maintenance.

3.14 REMOTE CONTROL CASE, DOCUMENTATION AND EQUIPMENT

The technical documentation for the machine, the various annexes and the specific equipment supplied are stored in the special case provided, in which the remote control is also housed.
Additional devices (such as the remote control battery charger and spare battery), are stored in the box on board the machine **1**.

NOTICE

To access the box on the machine you must raise the bonnet, as shown in chapter 6.



3.15 ANNEXES

The following documents complete this instruction manual:
Annex A - Declaration of conformity
Annex B - Engine use and maintenance manual (and technical data sheet)
Annex C - Remote control unit use and maintenance manual
Annex D - Machine parts catalogue
Annex E - Tool use and maintenance manual (if included)

3.16 RESIDUAL RISKS

CAUTION

Pay attention to the operating range of the machine.

Avoid sudden manoeuvres (acceleration, deceleration or steering).

Do not use in adverse weather conditions.

Removal of plates and labels from the machine is prohibited.

The user is required to keep clean initials, plates and labels clean and restore them if they become illegible.

WARNING

Do not use for towing operations.

During manoeuvres, keep away from other obstacles.

Do not leave the machine with the engine running.

Take the appropriate precautions when working on the engines.

DANGER

Do not lift people.

Performing any kind of controls, repairs or maintenance operations on moving parts is prohibited.

Disconnect the battery cable before working on the electrical system.

When running, the engine and hydraulic system components can reach temperatures capable of causing slight burns. Wait for the machine to cool down or take appropriate precautions (gripping tools, gloves, etc.) before carrying out work.

All fuels, many lubricants and some coolants are flammable. Check for flammability and toxicity before use. Follow the supplier's instructions, particularly with regard to storage, disposal and emergency procedures.

Store flammable fluids away from any contact with fire.

Do not burn or puncture pressurised containers.

Do not store rags soaked in flammable material, as they may ignite and/or burn spontaneously.

Handle the fuel with caution: it is highly flammable. If ignited, the fuel can result in explosions or fire causing serious injury or death.

Avoid refuelling while smoking or in the vicinity of sparks or fire.

DANGER

Always switch off the engine before refuelling.

Fill the fuel tank outdoors.

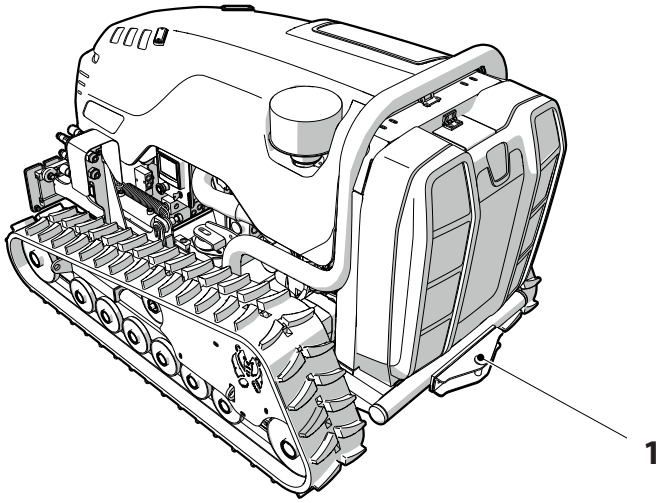
Strictly observe the maximum permitted working inclination, as indicated in paragraph "3.3 Technical specifications".

3.17 EMERGENCY DEVICES

The hook **1** is an emergency device that should be used only and exclusively in the situations listed below:

› Machine breakdown.

› Engine fault with no possibility of moving the machine.



WARNING

Using the hook to two trailers and/or carts is strictly prohibited.

4 UNPACKING, LIFTING AND TRANSPORT

Unpacking, lifting and transport operations must only be carried out by specialised personnel authorised for these types of manoeuvres.

There must be no people in the vicinity of the suspended load and/or within the range of movement of the lifting device during the unpacking, lifting and transport of the load.

CAUTION

Manual handling of loads must be carried out by personnel trained in the proper lifting methods and following the safety provisions contained in the laws in force in the country of use of the machine.

MDB declines all liability for damage to persons or property due to failure to comply with current safety regulations with regard to the lifting and handling of the load inside the user's factory.

4.1 UNPACKING

NOTICE

The package, upon arrival at the user's premises, must be handled with the utmost care and moved, both outdoors and indoors, with lifting devices of adequate capacity, in accordance with the indications given on the packaging and/or on the documents accompanying the package.

CAUTION

The operator must wear the following personal protective equipment:

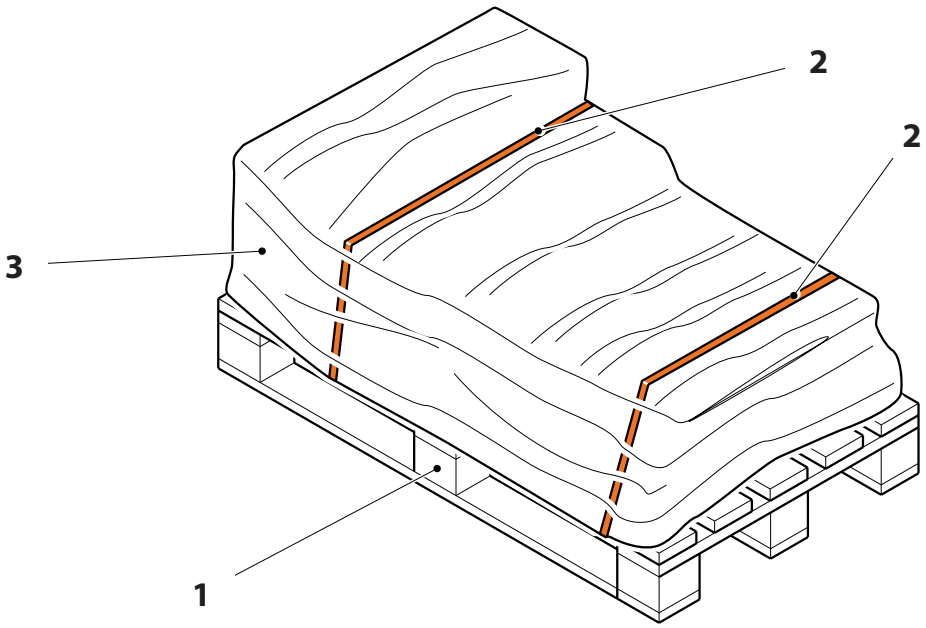
- Safety footwear
- Protective gloves
- Safety helmet
- Protective clothing
- Safety goggles

The machine is shipped packaged, in the following conditions:

- Machine secured to a pallet **1** by means of straps **2**.
- Machine wrapped with a protective material **3** for small accidental impacts.
- Machine wrapped with an additional clear film to protect it from dust, moisture and water.

NOTICE

The packaging also contains the case for storing the remote control, the technical documentation and attachments on the machine and specific supplied tools.



Unpack the machine as follows:

› Move the package to the designated location, using a forklift **4** of adequate capacity.

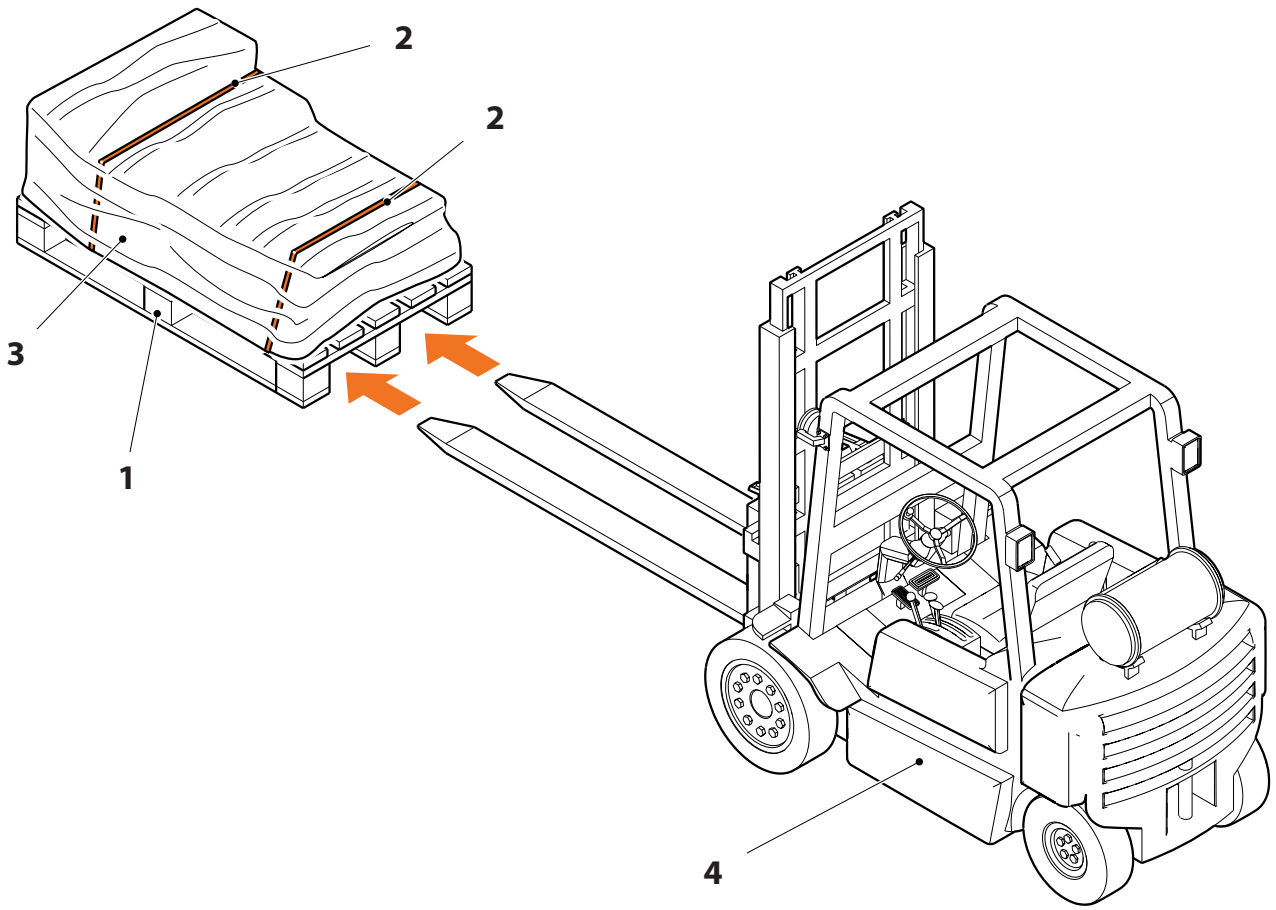
NOTICE

For the weight of the machine, see the details given on the inside front cover of this manual.

⚠ CAUTION

The forks must be of a suitable length to avoid imbalances in the load, which could cause overturning and consequent damage to the machine.

› Using cutting tools, carefully remove the strapping **2** and protective wrapping **3**.
  › Avoid damaging the machine components with the cutting tools.
› Carry out all the pre-start checks (see chapter 5 for the procedure).
  › If the battery is disconnected and/or missing, proceed as indicated in paragraph "5.4.5 Battery connection/presence check".
  › If the fuel level is insufficient, proceed as indicated in paragraph "5.4.1 Refuelling".
› Start the machine (see chapter 5 for the procedure).
› Pilot the machine slowly (see chapter 5 for the procedure) and bring it down from the packaging pallet **1** until it is positioned on the ground.



4.2 LIFTING

The machine can be lifted using the following methods:

- Lifting with a crane, hoist or bridge crane
- Lifting with forklift

DANGER

The above-mentioned method may only be used for lifting the machine onto a suitable means of transport (as indicated in paragraph“4.3 Transport”). No other use is permitted.

Any type of maintenance with the machine raised is strictly forbidden.

NOTICE

For the weight of the machine, see the details given on the inside front cover of this manual.

4.2.1 LIFTING WITH A CRANE, HOIST OR BRIDGE CRANE

CAUTION

The lifting equipment (ropes or chains) must be adequately sized for the weight of the machine.

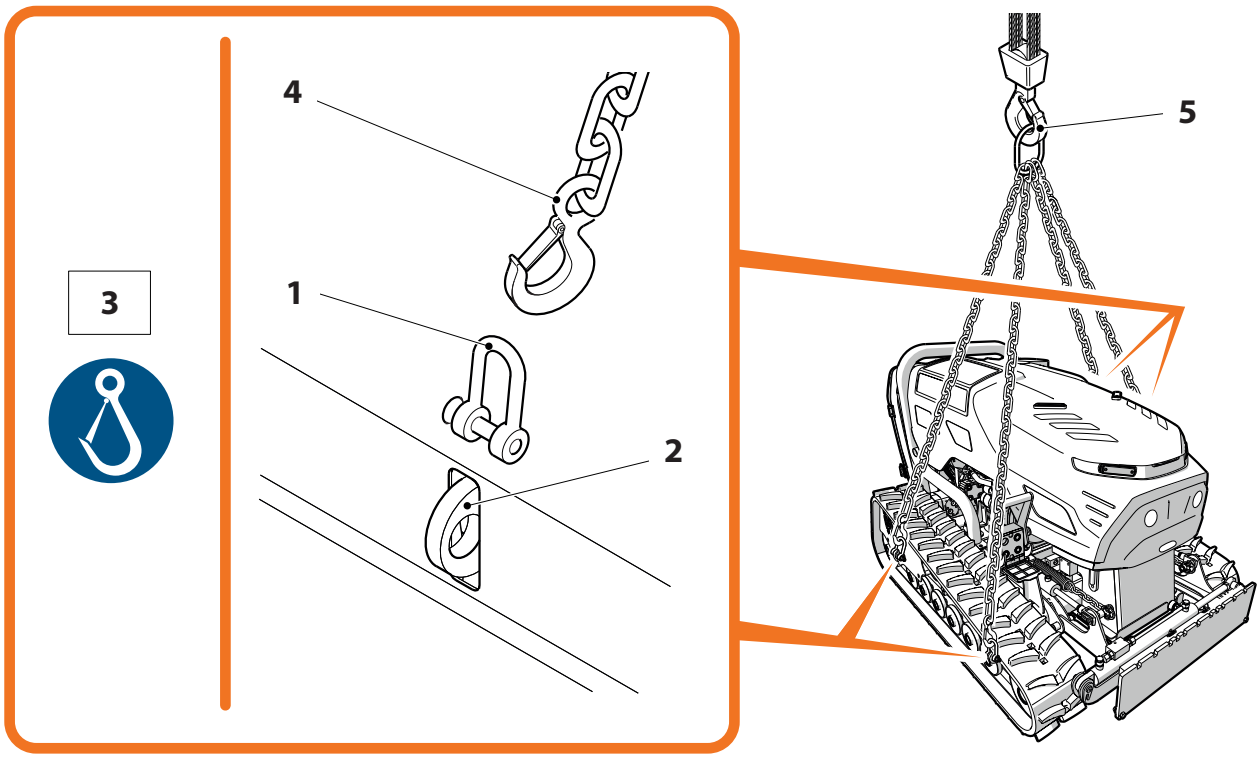
Lifting equipment (ropes or chains) is not supplied by MDB

The operator must wear the following personal protective equipment:

- Safety footwear
- Protective gloves
- Safety helmet
- Protective clothing
- Safety goggles

Proceed as follows:

- If the tracks are in a widened position, move them inwards (see chapter 5 for the procedure), bringing the machine to the work and movement configuration, as indicated in"3.6 Machine configurations".
- Connect the shackles **1** to the eyelets **2** on the machine.
  - The positioning of the eyelets **2** is indicated by special pictograms **3**.
- Connect the lifting equipment **4** (ropes or chains), to the hook **5** of the chosen lifting device (crane, hoist or bridge crane).
- Lift the machine and position it in the designated location.



4.2.2 LIFTING WITH A FORKLIFT

CAUTION

The forklift must be suitably sized for the weight of the machine

The operator must wear the following personal protective equipment:

- Safety footwear
- Protective gloves
- Safety helmet
- Protective clothing
- Safety goggles

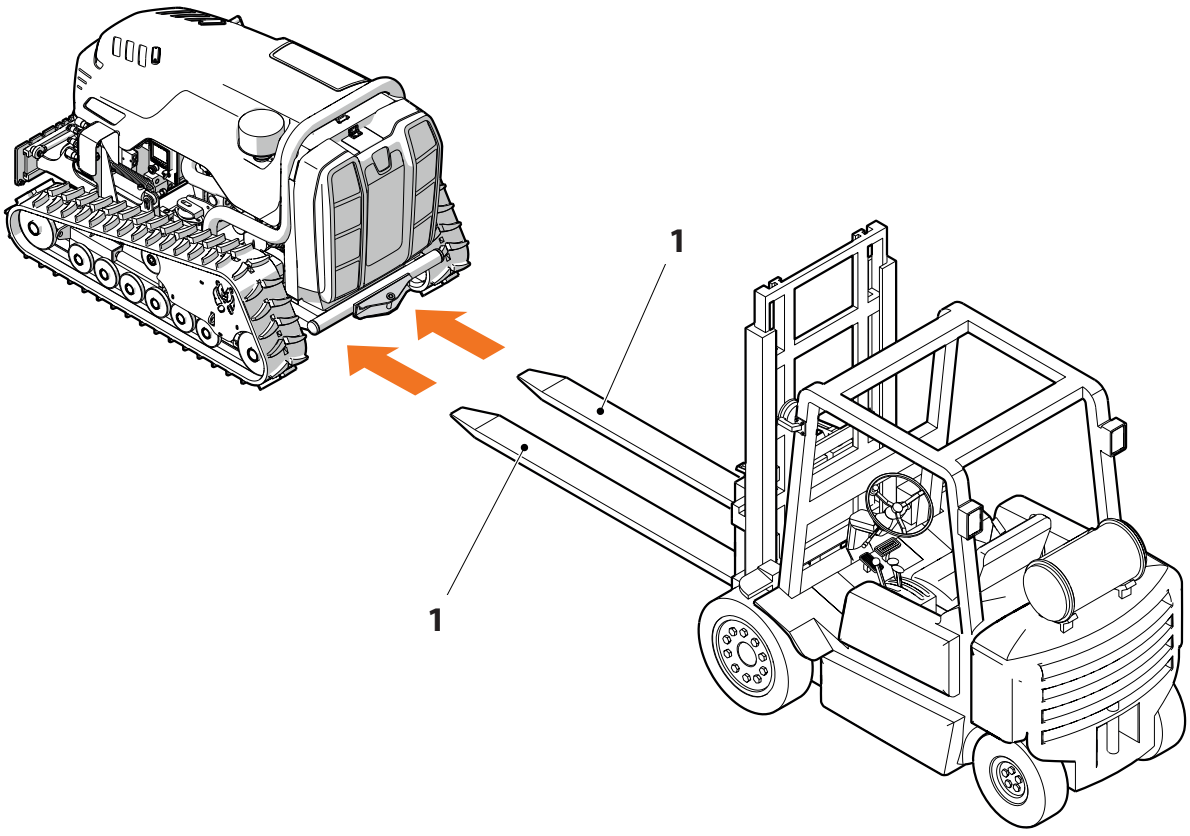
Proceed as follows:

- If the tracks are in a widened position, move them inwards (see chapter 5 for the procedure), bringing the machine to the work and movement configuration, as indicated in"3.6 Machine configurations".
- Arranged the forks **1** at a suitable distance apart, in order to ensure the stability of the load.

CAUTION

The forks must be of a suitable length to avoid imbalances in the load, which could cause overturning and consequent damage to the machine.

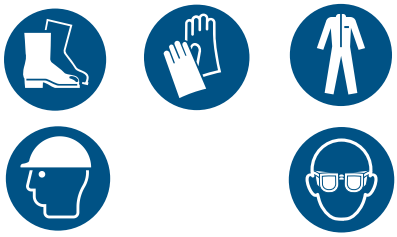
- Insert the forks **1** from the side shown in the figure.
  - The bottom of the machine frame is designed to accommodate the forks **1** of the forklift.
- Lift the machine and position it in the designated location.



4.3 TRANSPORT

If necessary, the machine can be transported on a means of transport.

CAUTION



The means of transport and ascent/descent ramps must be suitably sized for the weight of the machine.

The operator must wear the following personal protective equipment:

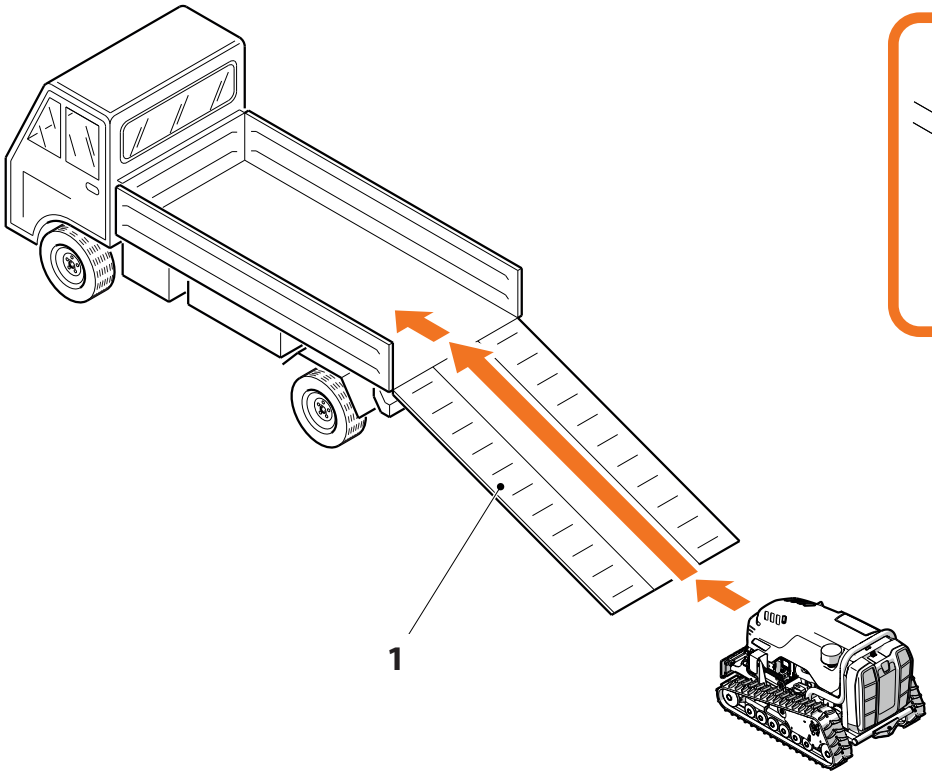
- Safety footwear
- Protective gloves
- Safety helmet
- Protective clothing
- Safety goggles

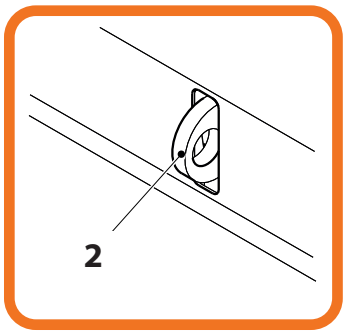
NOTICE

For the weight of the machine, see the details given on the inside front cover of this manual.

Load the machine as follows:

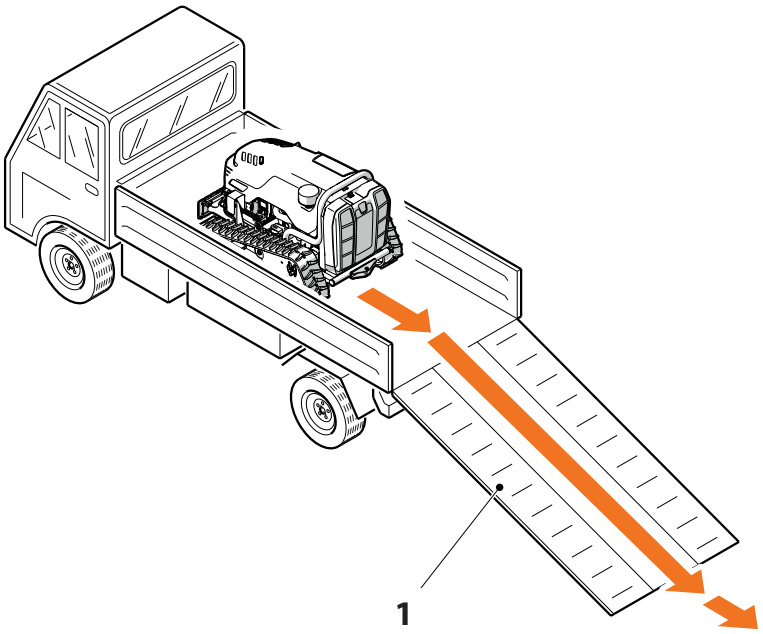
- Start the machine (see chapter 5 for the procedure).
- If the tracks are in a widened position, move them inwards (see chapter 5 for the procedure), bringing the machine to the work and movement configuration, as indicated in"3.6 Machine configurations".
- Pilot the machine slowly (see chapter 5 for the procedure and move it up the ramps **1** until it is positioned in the desired zone on the transport vehicle.
- Anchor the machine to the vehicle using ropes of an appropriate size, which are then fixed to the eyelets **2**.
- Shut down the machine (see chapter 5 for the procedure).

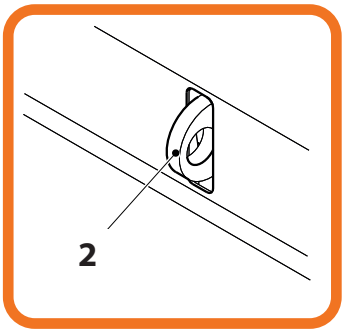




Unload the machine as follows:

› Release the machine from the vehicle, removing the ropes from the eyelets **2**.
› Start the machine (see chapter 5 for the procedure).
› Pilot the machine slowly (see chapter 5 for the procedure) and bring it down the ramp **1** until it is positioned in the work area.
› Use the machine (see chapter 5 for the procedure).





NOTICE

The machine can also be loaded on/unloaded from a vehicle using the methods explained in paragraphs ("4.2.1 Lifting with a crane, hoist or bridge crane" and "4.2.2 Lifting with a forklift" above).

5 OPERATION AND USE

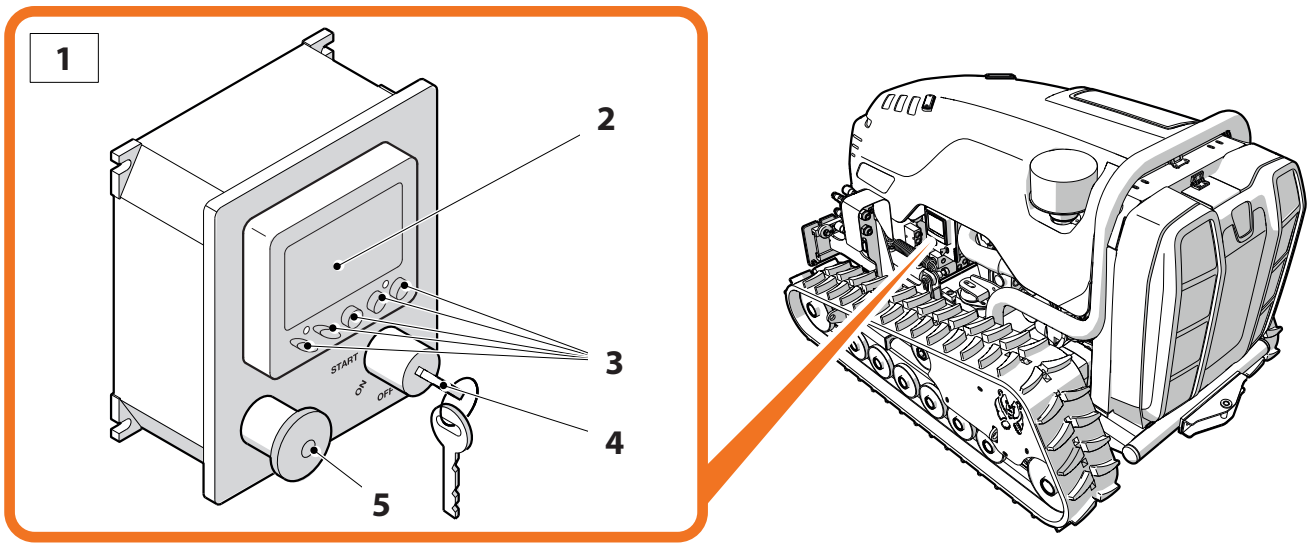
NOTICE

Before commissioning the machine, carefully read the following descriptions and follow the given instructions scrupulously.

5.1 CONTROL PANEL

The control panel **1**, positioned as shown in the figure, consists of:

- Display **2**
- Function buttons **3**
- Key switch for ignition **4**
- Emergency button **5**



The parameters monitored by the control panel for alarm signals are:

- Engine oil pressure (bar) (Not available)
- Engine temperature
- Accelerator signal voltage from radio
- Fuel level
- Engine speed
- Engine load
- Fuel consumption
- Battery voltage
- DPF (diesel particulate filter) input temperature
- DPF (diesel particulate filter) PM (particulate matter) saturation level
- DPF (diesel particulate filter) soot saturation level
- DPF output temperature (not available)
- Time meter
- Regeneration progress

For a detailed description of the alarms, see paragraph "5.1.5 Alarms"

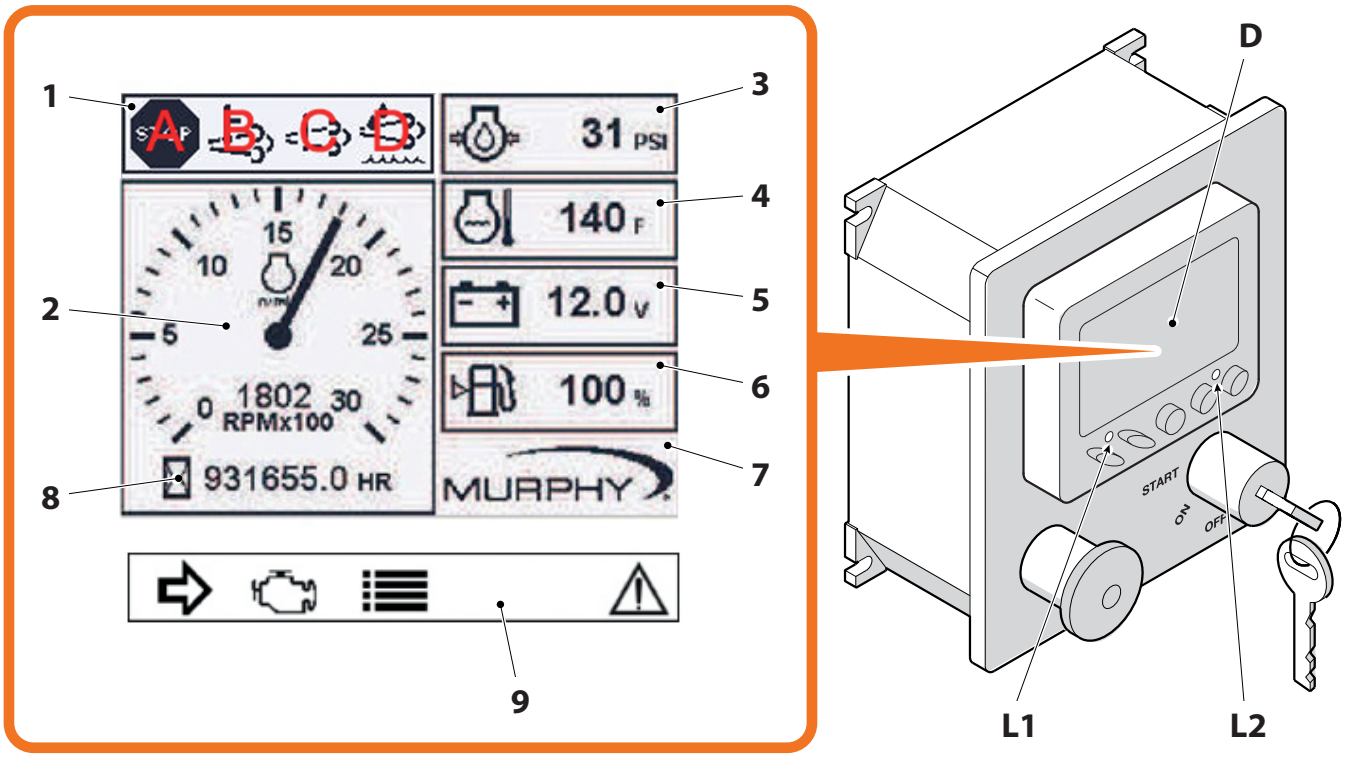
5.1.1 DISPLAY

Upon start-up, the LEDs **L1** and **L2** light up, the display **D** shows the initial logo for a few seconds, and then changes to the main screen, as shown in the figure.

The following parameters are displayed:

1 Alert pane: shows the various graphic symbols for:
- **A** Engine stopped due to malfunction
- **B** Automatic regeneration in progress
- **C** Not configured
- **D** Not configured

2 RPM: shows the engine speed
3 Engine oil pressure: indicates the engine oil pressure (Not available)
4 Engine water temperature: indicates the engine temperature
5 Battery voltage: indicates the battery voltage
6 Fuel level: indicates the fuel level
7 Shows the DPF (diesel particulate filter) regeneration progress
8 Shows the counter progress
9 Function button symbols: see paragraph below



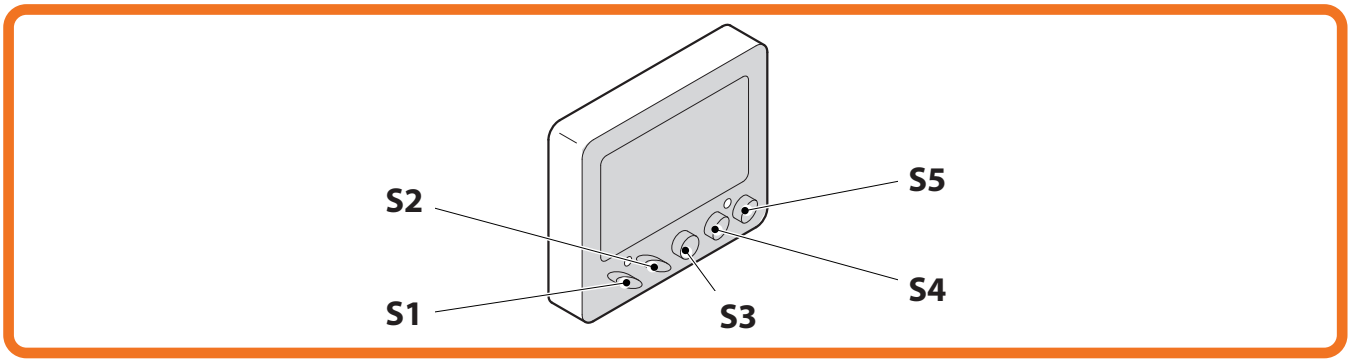
NOTICE

LED L1 (amber-yellow) is activated if an engine, low fuel or clogged air filter alarm is detected.

LED L2 (red) is activated in machine stoppage situations.

5.1.2 FUNCTION BUTTONS

Below the display there are the function buttons **S1**, **S2**, **S3**, **S4** and **S5**.
The function buttons are represented on the display by icons and they activate the following functions.



Button	Icon	Description
S1		› Scrolls through the sets of parameter pages › Displays the Brightness/Contrast page › Moves the selection up on certain pages › Moves the cursor to the left on the OEM password page › Scrolls through the various pages displaying the engine data
S2		› Shows the entry point of the diesel particulate filter (DFP) regeneration request › Shows the Language and Utilities pages › Moves the selection downwards on certain pages › Moves the cursor to the right on the OEM password page
S3		› Displays the entry point of the Settings page › Serves as the Enter/Exit button for the Settings page › Enters the settings menu
S4	Empty	› Shows the service reminder (on the “Request diesel particulate filter (DPF) regeneration” page) › Shows the Utilities page › Increases the Brightness/Contrast/Hours (Service reminder) values › Displays the software version › Displays the codes saved in the diagnostic messages
S5		› Displays the diagnostic messages screen › Is used as a Enter button for various page selections › Reduces the Brightness/Contrast/Hours (Service reminder) values › Displays the OEM Password page › Asks for errors when there are diagnostic messages

After displaying the page concerned, if no button is pressed within 5 seconds, it disappears from the display.

5.1.3 SETUP MENU

The adjustments described in the following paragraphs can be made from the settings menu.

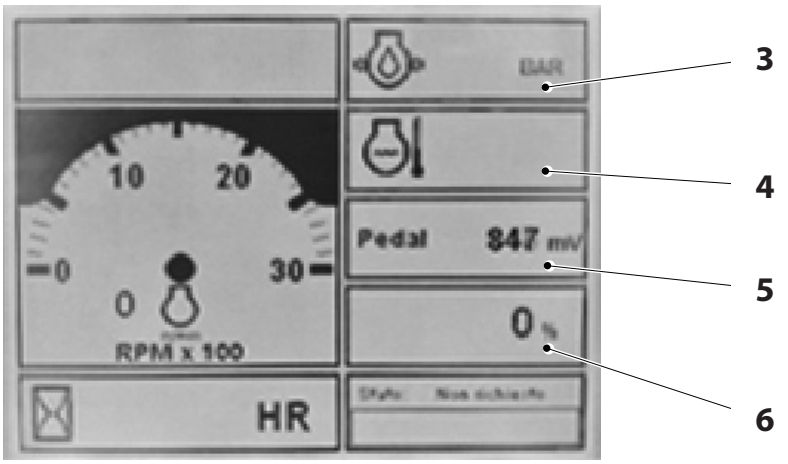
NOTICE

For the explanation and use of the function buttons mentioned in the following pages, see paragraph "5.1.2 Function buttons".

FUNCTION 1

The following parameters are displayed:

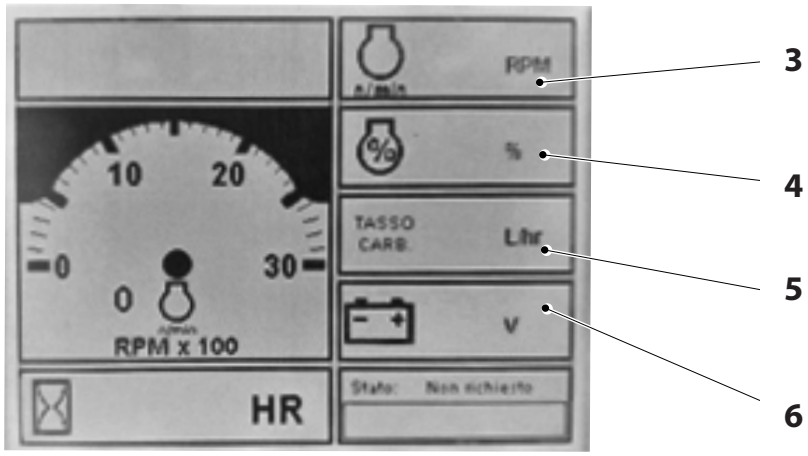
3 Engine oil pressure (bar) (Not available)
4 Engine temperature
5 Accelerator voltage signal from radio
6 Fuel level



FUNCTION 2

The following parameters are displayed:

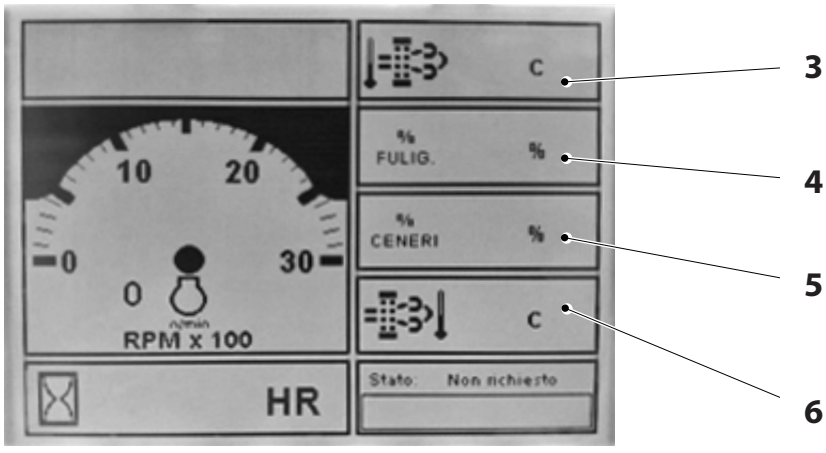
3 Engine speed
4 Engine load
5 Fuel consumption
6 Battery voltage



FUNCTION 3

The following parameters are displayed:

3 DPF (diesel particulate filter) input temperature
4 DPF (diesel particulate filter) PM (particulate matter) saturation level
5 DPF (diesel particulate filter) soot saturation level
6 DPF (diesel particulate filter) output temperature (not available)



BRIGHTNESS

Adjustments are made as follows:

- Press any function button to view the page
- Press function button 3 (Settings) and then function button 1 (Brightness/Contrast)
- Press function buttons 4 (+) and 5 (-) to adjust the brightness
- Press function button 3 (back arrow) to exit the page.

CONTRAST

Adjustments are made as follows:

- Press any function button to view the menu
- Press function button 3 (Settings) and then function button 1 (Brightness/Contrast)
- Press function button 2 to adjust the contrast
- Press function buttons 4 (+) and 5 (-) to adjust the contrast
- Press function button 3 (back arrow) to exit the menu

LANGUAGE AND UNIT OF MEASUREMENT

To set the language, proceed as follows:

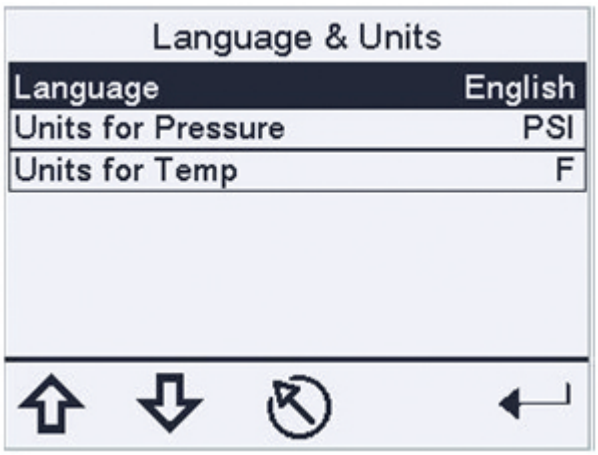
- Press any function button to view the page
- Press function button 3 (Settings) and then programmable button 2 (language/unit)
- Press function button 1 (up arrow) or 2 (down arrow) to select Language
- Press function button 5 to scroll through the available languages
- Press function button 3 (back arrow) to exit the page

To set the unit of pressure measurement, proceed as follows:

- Press any function button to view the page
- Press function button 3 (Settings) and then programmable button 2 (language/unit)
- Press function button 1 (up arrow) or 2 (down arrow) to select Unit of pressure
- Press function button 5 to choose between PSI, kPa or Bar
- Press function button 3 (back arrow) to exit the page

To set the unit of temperature measurement, proceed as follows:

- Press any function button to view the page
- Press function button 3 (Settings) and then programmable button 2 (language/unit)
- Press function button 1 (up button) or 2 (down button) to select Temperature unit
- Press function button 5 to choose between Fahrenheit (F) or Celsius (C)
- Press function button 3 (back arrow) to exit the page



DIAGNOSTICS

To display the diagnostics page, proceed as follows:

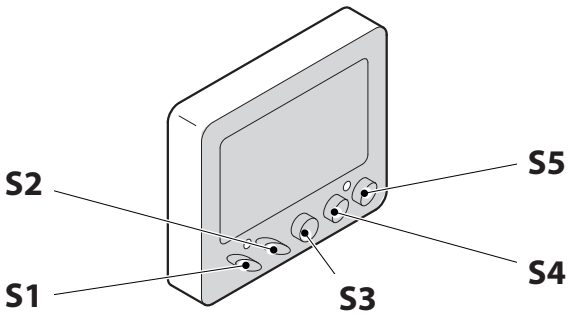
› Press any function button to view the menu

› Press the function button S5 (diagnostic modes)

› The diagnostic message screen will appear.
Press function buttons S1 and S2 to scroll through the additional messages, if present. Each saved code shows the suspect parameter number (SPN), failure mode identifier (FMI) and occurrence count (OC). The OC indicates whether the same fault has occurred more than once. If available, a textual explanation of the warning or stoppage is also displayed.

› To view the stored codes, press function button S4 (Stored codes)
The stored codes are required by the ECU. During the data request, "Data request" and Data reception are displayed. If the data are not received by the ECU, Timeout / Error is displayed. Press Stored codes to once more request the data from the ECU. If data are received, the Diagnostics message # of # screen is displayed. Press function buttons S1 and S2 to scroll through the additional messages, if present. Each saved code shows the suspect parameter number (SPN), failure mode identifier (FMI) and the occurrence count (OC). The OC indicates whether the same fault has occurred more than once. If available, a textual explanation of advice or for the stoppage is also displayed. Press function button S3 (Obtain faults) to receive further stored errors.

› Press function button S5 (back button) to return to the diagnostics screen

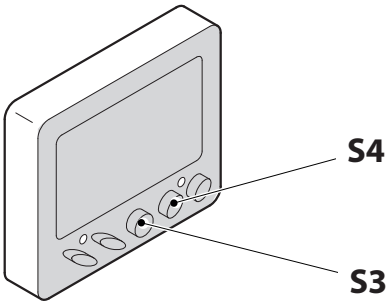


SOFTWARE VERSION

The information on the software version is useful for identifying the configuration used by the customer.

To identify the software version, proceed as follows:

- Press any function button to view the menu
- Press function button S3 (Settings)
- Press function button S4 (Utilities)
- Press function button S4 (software version) once more
- Press function button S3 to exit the menu



WARNING ICONS

The following warning icons may be present on the pages.

Icon	Alarm PGN	Alarm SPN (Suspect Parameter Number)	Description
	DM1		Stoppage diagnostic icon › Indicates an active stoppage fault.
	DM1		Diagnostic warning icon › Indicates an active fault.
		3697	Automatic regeneration icon › The icon indicates that automatic regeneration is in progress. You may still work while the machine is completing the automatic regeneration cycle. › It is good practice to check that the indicator light is not on before turning off the machine. If the indicator light on the display is on, wait for the regeneration cycle. The machine can only be switched off once it is completed. › If the machine does not perform the regeneration, there is a risk of the engine seizing. In this case, the engine manufacturer will not accept the warranty.
	64892	3703	Static or stationary regeneration icon › When this icon is lit up, the system requires stationary regeneration. You must stop and carry out the regeneration. › The conditions for performing the regeneration are: › Minimum RPM › Engine temperature above 60° › No active error

Icon	Alarm PGN	Alarm SPN (Suspect Parameter Number)	Description
			Static or stationary regeneration in progress icon › The icons displayed light up to indicate that the machine requires stationary regeneration and the conditions are suitable for performing the operation.

For a detailed description of the alarms, see paragraph "5.1.5 Alarms"

5.1.4 ENGINE REGENERATION THROUGH THE DIESEL PARTICULATE FILTER (DPF)

Continuous regeneration

The diesel particulate filter performs continuous regeneration while the engine is running.
The PM (particulate matter) is collected and burnt at the same time. This occurs if the engine is used at high speed and with a considerable load.
The regeneration is completely automatic.

Assisted regeneration

If the engine fails to burn the particulates through continuous regeneration, it automatically switches to assisted regeneration (with the help of electronic components such as DPF pressure sensors).
The particulates are burned in the DPF (diesel particulate filter) through delayed injection and opening of the intake valve, further increasing the temperature of the DPF (diesel particulate filter).
The regeneration is completely automatic.

Reset regeneration

This regeneration takes place after 50 hours of operation and then every 100 hours. Reset regeneration combines assisted regeneration with post injection, rather than delayed injection. This reaches higher temperatures.
The regeneration is completely automatic.

During reset regeneration, the indicated indicator light switches on until the end of the operation.

If the indicated LED is on, you must wait for the end of the reset regeneration.

NOTICE

During reset regeneration, there are changes in the engine noise and the exhaust fumes may be whitish.

Static or stationary regeneration

Even if the machine performs regeneration, a request for static or stationary regeneration may occur.

If the indicator light is on, perform the regeneration as soon as possible, due to the risk of blockage of the DPF (diesel particulate filter) and subsequent engine seizure.

During static or stationary regeneration, the indicator light remains on until the end of the operation.

NOTICE

Before performing static or stationary regeneration, make sure that the machine has enough fuel to run continuously for at least one hour.

WARNING

The areas near the DPF, exhaust, and engine are subject to high temperatures.

During static or stationary regeneration, make sure that all areas near the DPF, the exhaust and the engine are perfectly clean and free from processing residues.

Recovery regeneration

If the machine does not perform static regeneration, the DPF may become clogged. When this occurs, the engine failure warning light will come on and the engine will lock out.

NOTICE

Unlocking the engine is reserved to technicians from an MDB service centre. For this reason, contact the MDB support service (see chapter 2).

STATIC OR STATIONARY REGENERATION PROCEDURE:

The conditions for performing static or stationary regeneration are:

- Minimum RPM
- Engine temperature above 60°
- No active error

NOTICE

The machine may request static or stationary regeneration through a signal on the display.

If this occurs, perform the following procedure immediately.

- Press button S2
  - The regeneration request page appears.
- Confirm
  - The screen shown in the figure appears
- Press button S5 and confirm the request to carry out the regeneration process

  - The screen shown in the figure appears
- Press button S3 to confirm the request for the start of static or stationary regeneration

5.1.5 ALARMS

SPN	FMI	Description	Action
523249	5	No signal on the crank and cam speed sensors	Check the connector, wiring, drive shaft speed, cam speed sensor, E-ECU and pulse generator. Switch off a few times. Then check whether the DTC code is generated once more.
157	16	PLV valve open	Check the fuel system and fuel pump. Switch off a few times. Then check whether the DTC code is generated once more.
157	0	Actual rail pressure increase error	Check the fuel system, fuel pump and rail pressure sensor. Switch off a few times. Then check whether the DTC code is generated once more.
157	15	Rail pressure deviation error during actual rail pressure increase	Check the fuel system, fuel pump and rail pressure sensor. Switch off a few times. Then check whether the DTC code is generated once more.
157	18	Rail pressure deviation error during actual rail pressure decrease	Check the fuel system, fuel pump and rail pressure sensor. Switch off a few times. Then check whether the DTC code is generated once more.
172	4	New air temperature sensor failure (low voltage)	Check the connector, wiring, new air temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
172	3	New air temperature sensor failure (high voltage)	Check the connector, wiring, new air temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
110	4	Cooling water temperature sensor failure (low voltage)	Check the connector, wiring, cooling water temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
110	3	Cooling water temperature sensor failure (high voltage)	Check the connector, wiring, cooling water temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
91	4	Accelerator sensor 1 (insufficient sensor output)	Check the connector, wiring, accelerator sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
91	3	Accelerator sensor 1 (excess sensor output)	Check the connector, wiring, accelerator sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
174	0	Unusually high fuel temperature sensor temperature	Check the fuel temperature sensor system, fuel tank and fuel cooler. Switch off a few times. Then check whether the DTC code is generated once more.
174	4	Fuel temperature sensor failure (low voltage)	Check the connector, wiring, fuel temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
174	3	Fuel temperature sensor failure (high voltage)	Check the connector, wiring, fuel temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
157	4	Rail pressure sensor failure (low voltage)	Check the connector, wiring, rail pressure sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
157	3	Rail pressure sensor failure (high voltage)	Check the connector, wiring, rail pressure sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
654	5	1st cylinder circuit injector open (intrinsic position of the injector)	Check the connector, wiring, E-ECU and injector. Switch off a few times. Then check whether the DTC code is generated once more.
653	5	2nd cylinder circuit injector open (intrinsic position of the injector)	Check the connector, wiring, E-ECU and injector. Switch off a few times. Then check whether the DTC code is generated once more.
652	5	3rd cylinder circuit injector open (intrinsic position of the injector)	Check the connector, wiring, E-ECU and injector. Switch off a few times. Then check whether the DTC code is generated once more.
651	5	4th cylinder circuit injector open (intrinsic position of the injector)	Check the connector, wiring, E-ECU and injector. Switch off a few times. Then check whether the DTC code is generated once more.
110	0	Unusually high cooling water temperature sensor temperature (overheating)	Check the engine cooling water level, the engine cooling equipment and the cooling water temperature sensor system. Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
190	0	Overspeeding	Check the crank speed sensor, cam speed sensor, injector and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
28	4	Accelerator sensor 2 (insufficient sensor output)	Check the connector, wiring, accelerator sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
28	3	Accelerator sensor 2 (excess sensor output)	Check the connector, wiring, accelerator sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
29	4	Accelerator sensor 3 (insufficient sensor output)	Check the connector, wiring, accelerator sensor 3 and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
29	3	Accelerator sensor 3 (excess sensor output)	Check the connector, wiring, accelerator sensor 3 and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
102	13	EGR low pressure side sensor (abnormal learning value)	
102	4	EGR low pressure side sensor failure (low voltage)	Check the connector, wiring, low pressure EGR sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
102	3	EGR low pressure side sensor failure (high voltage)	Check the connector, wiring, low pressure EGR sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
654	6	First cylinder coil injector short circuit	Check the connector, wiring, E-ECU and injector. Switch off a few times. Then check whether the DTC code is generated once more.
653	6	Second cylinder coil injector short circuit	Check the connector, wiring, E-ECU and injector. Switch off a few times. Then check whether the DTC code is generated once more.
652	6	Third cylinder coil injector short circuit	Check the connector, wiring, E-ECU and injector. Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
651	6	Fourth cylinder coil injector short circuit	Check the connector, wiring, E-ECU and injector. Switch off a few times. Then check whether the DTC code is generated once more.
51	4	Intake throttle valve opening sensor fault (low voltage)	Check the connector, wiring, intake throttle valve opening sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
51	3	Intake throttle valve opening sensor fault (high voltage)	Check the connector, wiring, intake throttle valve opening sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522400	2	Crank signal malfunction	Check the connector, wiring, crank speed sensor, E-ECU and pulse generator. Switch off a few times. Then check whether the DTC code is generated once more.
522400	5	No crank signal	Check the connector, wiring, crank speed sensor, E-ECU and pulse generator. Switch off a few times. Then check whether the DTC code is generated once more.
522401	2	Cam signal malfunction	Check the connector, wiring, cam speed sensor, E-ECU and pulse generator. Switch off a few times. Then check whether the DTC code is generated once more.
522401	5	No cam signal	Check the connector, wiring, cam speed sensor, E-ECU and pulse generator. Switch off a few times. Then check whether the DTC code is generated once more.
2791	12	Open circuit between the EGR motor coils	Check the EGR valve. Switch off a few times. Then check whether the DTC code is generated once more.
2791	0	EGR overvoltage fault	Check the battery and the EGR valve. Switch off a few times. Then check whether the DTC code is generated once more.
105	4	Intake manifold temperature sensor failure (low voltage)	Check the connector, wiring, intake manifold temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
105	3	Intake manifold temperature sensor failure (high voltage)	Check the connector, wiring, intake manifold temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
412	4	EGR gas temperature sensor failure (low voltage)	Check the connector, wiring, EGR gas temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
412	3	EGR gas temperature sensor failure (high voltage)	Check the connector, wiring, EGR gas temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
3250	1	DPF intermediate temperature sensor temperature abnormally low	Check connector, wiring, DPF intermediate temperature sensor system, E-ECU, injector, DOC and tubes. Switch off a few times. Then check whether the DTC code is generated once more.
1209	13	EGR high pressure side sensor (abnormal learning value)	
1209	4	EGR high pressure side sensor failure (low voltage)	Check the connector, wiring, EGR pressure sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
1209	3	EGR high pressure side sensor failure (high voltage)	Check the connector, wiring, EGR pressure sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522580	12	EGR position sensor malfunction	Check the EGR valve. Switch off a few times. Then check whether the DTC code is generated once more.
522582	7	EGR initialisation malfunction	Check the EGR valve. Switch off a few times. Then check whether the DTC code is generated once more.
522243	6	GND start assist relay interrupted	Check the connector, wiring, start assist relay and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522243	5	Start assist relay interrupted	Check the connector, wiring, start assist relay and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
173	4	Exhaust manifold temperature sensor failure (low voltage)	Check the connector, wiring, exhaust manifold temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
173	3	Exhaust manifold temperature sensor failure (high voltage)	Check the connector, wiring, exhaust manifold temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
630	12	EEPROM memory clearing error	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
4257	12	Injector drive IC error	
633	5	High pressure pump drive circuit (circuit open)	Check the connector, wiring, SCV (MPROP) and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
633	3	High pressure pump drive circuit (VB high side short circuit)	Check the connector, wiring, SCV (MPROP) and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522572	6	High pressure pump drive circuit (drive current (high level))	Check the connector, wiring, SCV (MPROP) and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
2950	5	No load on the throttle control H-bridge circuit	Check the connector, wiring, intake throttle valve and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
1485	2	Early opening of the main relay	Check the connector, wiring, main relay and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
1485	7	Main relay contact blocked	Check the connector, wiring, main relay and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522323	0	Clogged air filter alarm	Check the air filter, wiring, air filter switch and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
28	1	Throttle sensor 3 failure (pedal in closed position)	

SPN	FMI	Description	Action
28	0	Throttle sensor 3 failure (pedal in open position)	Check the connector, wiring, pedal and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
2797	6	Injector control circuit short circuit (Bank1)	Check the connector, wiring, injector and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
2798	6	Injector control circuit short circuit (Bank2)	Check the connector, wiring, injector and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522329	0	Oil/water separator alarm	Check the oil/water separator, connector, wiring, oil/water separator switch and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
100	4	Oil pressure switch circuit open	Check the connector, wiring, oil pressure switch and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
100	1	Low oil pressure alarm	Check the oil pressure equipment, wiring, oil pressure switch and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
29	8	Pulse sensor failure (pulse communication)	Check the connector, wiring and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
108	10	Characteristic atmospheric pressure sensor failure	Check the atmospheric pressure sensor and the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
654	3	First cylinder injector short-circuit	Check the connector, wiring, E-ECU and injector. Switch off a few times. Then check whether the DTC code is generated once more.
653	3	Second cylinder injector short-circuit	Check the connector, wiring, E-ECU and injector. Switch off a few times. Then check whether the DTC code is generated once more.
652	3	Third cylinder injector short-circuit.	Check the connector, wiring, E-ECU and injector. Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
651	3	Fourth cylinder injector short-circuit	Check the connector, wiring, E-ECU and injector. Switch off a few times. Then check whether the DTC code is generated once more.
522401	7	Corner offset failure	Check the connector, wiring, cam speed sensor, E-ECU and pulse generator. Switch off a few times. Then check whether the DTC code is generated once more.
2791	1	EGR low voltage fault	Check the wiring, battery and EGR valve. Switch off a few times. Then check whether the DTC code is generated once more.
522579	12	Short circuit in the EGR motor coils	Check the EGR valve. Switch off a few times. Then check whether the DTC code is generated once more.
2791	7	EGR feedback malfunction	Check the EGR valve. Switch off a few times. Then check whether the DTC code is generated once more.
522583	1	EGR high temperature thermistor malfunction	Check the EGR valve. Switch off a few times. Then check whether the DTC code is generated once more.
522584	1	EGR low temperature thermistor malfunction	Check the EGR valve. Switch off a few times. Then check whether the DTC code is generated once more.
3720	0	Ash cleaning request 2	Check the DPF and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
3719	16	Regeneration stuck in standby	Check the injector, E-ECU, DOC and hoses Switch off a few times. Then check whether the DTC code is generated once more.
3719	0	Backup mode	Check the injector, E-ECU, DOC and hoses Switch off a few times. Then check whether the DTC code is generated once more.
3695	14	Restore the regeneration prohibition	Check the regeneration prohibition switch (including the CAN control). Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
3250	0	DPF intermediate temperature sensor temperature unusually high	
3242	4	DPF input temperature sensor failure (low voltage)	Check the connector, wiring, DPF input temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
3242	3	DPF input temperature sensor failure (high voltage)	Check the connector, wiring, DPF input temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
3250	3	DPF intermediate temperature sensor failure (high voltage)	Check the connector, wiring, DPF intermediate temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
3250	4	DPF intermediate temperature sensor failure (low voltage)	Check the connector, wiring, DPF intermediate temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
3242	0	DPF intake temperature sensor temperature unusually high	Check the connector, wiring, DPF intake temperature sensor, E-ECU, injector and exhaust pipes. Switch off a few times. Then check whether the DTC code is generated once more.
522746	12	Exhaust throttle valve (voltage failure)	
522747	12	Exhaust throttle valve (engine failure)	
522748	12	Exhaust throttle valve (sensor system failure)	
522749	12	Exhaust throttle valve (MPU failure)	
522750	12	Exhaust throttle valve (PCB failure)	

SPN	FMI	Description	Action
522751	19	Exhaust throttle valve (CAN failure)	
3719	9	Recovery regeneration failure	Check the DPF intermediate temperature sensor system, injector and DOC. Switch off a few times. Then check whether the DTC code is generated once more.
3719	7	Recovery regeneration prohibition	Check the SF. Switch off a few times. Then check whether the DTC code is generated once more.
3609	4	DPF high pressure side sensor failure (low voltage)	Check the connector, wiring, high-pressure side DPR sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
3609	3	DPF high pressure side sensor failure (high voltage)	Check the connector, wiring, high-pressure side DPR sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522574	0	Overload (Method P)	Check the DPF differential pressure sensor system. Switch off a few times. Then check whether the DTC code is generated once more.
523471	6	Actuator drive circuit 3 earth leakage	Check the connector, wiring and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523473	12	AD 1 converter failure	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523474	12	AD 2 converter failure	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523475	12	External monitoring IC and CPU 1 failure	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523476	12	External monitoring IC and CPU 2 failure	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
523477	12	ROM fault	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523478	12	Failure of shut-down path 1	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523479	12	Failure of shut-off path 2	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523480	12	Failure of shut-off path 3	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523481	12	Failure of shut-off path 4	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523482	12	Failure of shut-off path 5	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523483	12	Failure of shut-off path 6	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523484	12	Failure of shut-off path 7	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523485	12	Failure of shut-off path 8	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523486	12	Failure of shut-off path 9	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523487	12	Failure of shut-off path 10	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
523488	0	Engine speed recognition error	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522581	7	EGR valve malfunction stuck open	Check the EGR valve. Switch off a few times. Then check whether the DTC code is generated once more.
412	0	EGR high gas temperature alarm	Reduce engine speed and load. Switch off a few times. Then check whether the DTC code is generated once more.
167	5	Charging switch circuit open	Check the connector, wiring, charging switch and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
167	1	Charging alarm	Check the alternator, connector, wiring, charging switch and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522588	12	Excessive voltage power supply 1	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522590	12	Sensor 1 supply voltage error	Check the connector, wiring and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522576	12	EEPROM memory reading error	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522578	12	EEPROM memory writing error	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522585	12	SPI CY146 communication error	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522589	12	Insufficient supply voltage 1	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
522591	12	Sensor 2 supply voltage error	Check the connector, wiring and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522592	12	Sensor 3 supply voltage error	Check the connector, wiring and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522744	4	Actuator drive circuit 1 earth leakage	Check the connector, wiring and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522994	4	Actuator drive circuit 2 earth leakage	Check the connector, wiring and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522571	3	High-pressure pump drive circuit (VB low side short circuit)	Check the connector, wiring, injector and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
633	6	High pressure pump drive circuit (high side GND short circuit)	Check the connector, wiring, SCV (MPROP) and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522571	6	High-pressure pump drive circuit (low side GND short circuit)	Check the connector, wiring, SCV (MPROP) and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522572	11	High pressure pump drive circuit (pump overload error)	Check the connector, wiring, SCV (MPROP) and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522624	7	Dual throttle sensor failure (closed position)	Check the connector, wiring, accelerator sensor 1, accelerator sensor 2 and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522623	7	Dual throttle sensor failure (open position)	Check the connector, wiring, accelerator sensor 1, accelerator sensor 2 and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523462	13	Injection quantity adjustment (IQA) due to 1st cylinder injector error	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
523463	13	Injection quantity adjustment (IQA) due to 2nd cylinder injector error	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523464	13	Injection quantity adjustment (IQA) due to 3rd cylinder injector error	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523465	13	Injection quantity adjustment (IQA) due to 4th cylinder injector error	Check the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
2950	3	Throttle valve control power short circuit H1 bridge output	Check the connector, wiring, intake throttle valve and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
2950	4	Throttle valve control GND short circuit H1 bridge output	Check the connector, wiring, intake throttle valve and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
2950	6	Throttle control H bridge circuit overload	Check the connector, wiring, intake throttle valve and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
2951	3	Throttle valve control VB power short circuit H2 bridge output	Check the connector, wiring, intake throttle valve and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
2951	4	Throttle valve control GND short circuit H2 bridge output	Check the connector, wiring, intake throttle valve and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523468	9	Rail pressure error (rail pressure error checked after opening of PLV valve)	Check the fuel system, fuel pump, and rail pressure sensor. Switch off a few times. Then check whether the DTC code is generated once more.
523469	0	Rail pressure failure (timing of the PLV valve opening error)	Check the fuel system, fuel pump, rail pressure sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
523470	0	Rail pressure failure (time of the PLV valve opening error)	Check the fuel system, fuel pump, rail pressure sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
523489	0	Rail pressure failure (actual rail pressure is too high during reduced PRV efficiency)	Check the fuel system, fuel pump, and rail pressure sensor. Switch off a few times. Then check whether the DTC code is generated once more.
523491	0	Rail pressure error (injector B/F temperature error during reduced efficiency of PLV4)	Check the fuel system, fuel pump, and rail pressure sensor. Switch off a few times. Then check whether the DTC code is generated once more.
523460	7	Rail pressure failure (run time error during reduced RPS efficiency)	Check the connector, wiring, SCV (MPROP), supply temperature sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
108	4	Atmospheric pressure sensor failure (low voltage)	Check the atmospheric pressure sensor and the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
108	3	Atmospheric pressure sensor failure (high voltage)	Check the atmospheric pressure sensor and the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
3720	16	Ash cleaning request 1	Check the DPF and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
3251	0	DPF differential pressure sensor unusually high pressure	
3251	13	DPF differential pressure sensor (abnormal learning value)	
3251	4	DPF differential pressure sensor failure (low voltage)	Check the connector, wiring, DPF differential pressure sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
3251	3	DPF differential pressure sensor failure (high voltage)	Check the connector, wiring, DPF differential pressure sensor and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522575	7	Regeneration defect (fixed regeneration fault)	Check the DPF intermediate temperature sensor system, injector and DOC. Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
522577	11	Regeneration defect (fixed regeneration not performed)	Check the connector, wiring, regeneration request lamp, regeneration request switch and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522573	0	Overload (Method C)	Check the DPF intermediate temperature sensor system. Switch off a few times. Then check whether the DTC code is generated once more.
522610	9	CAN1 (for EGR): Time of exit from reception	Check the E-ECU, connector, wiring and EGR valve. Switch off a few times. Then check whether the DTC code is generated once more.
522730	12	Immobilizer: CAN communication fault	Check the E-ECU, connector, wiring and machine side controller. Switch off a few times. Then check whether the DTC code is generated once more.
237	31	VI reception time out (CAN message)	Check the E-ECU, connector, wiring, machine side controller and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522596	9	TSC1 reception time out (CAN message) (SA1)	Check the E-ECU, connector, wiring, machine side controller and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
2791	9	ECM EGR data failure	Check the EGR valve. Switch off a few times. Then check whether the DTC code is generated once more.
1202	2	Immobiliser: System failure	Check the immobiliser unit.
522611	9	Exhaust throttle valve (CAN message from exhaust throttle valve time out)	Check the E-ECU, connector, wiring and exhaust throttle valve. Switch off a few times. Then check whether the DTC code is generated once more.
522599	9	Y_ECR1 reception time out (CAN message)	Check the E-ECU, connector, wiring, machine side controller and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522600	9	Y_EC reception time out (CAN message)	Check the E-ECU, connector, wiring, machine side controller and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.

SPN	FMI	Description	Action
522601	9	Y_RSS reception time out (CAN message)	Check the E-ECU, connector, wiring, machine side controller and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522603	9	VH reception time out (CAN message)	Check the E-ECU, connector, wiring, machine side controller and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522605	9	Y_ECM3 reception time out (CAN message)	Check the E-ECU, connector, wiring, machine side controller and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522609	9	Y_ETCP1 reception time out (CAN message)	Check the E-ECU, connector, wiring, machine side controller and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522597	9	TSC1 reception time out (CAN message) (SA2)	Check the E-ECU, connector, wiring, machine side controller and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522618	9	EBC1 reception time out (CAN message)	Check the E-ECU, connector, wiring, machine side controller and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522619	9	Y_DPFIF reception time out (CAN message)	Check the E-ECU, connector, wiring, machine side controller and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
522617	12	EGR target value out of range	Check the EGR valve and the E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.
237	13	VI reception data failure (CAN message)	Check the E-ECU, connector, wiring, machine side controller and E-ECU. Switch off a few times. Then check whether the DTC code is generated once more.

5.2 REMOTE CONTROL

The remote control allows you to pilot the machine from a specific distance (see paragraph "3.4.1 Operator position"), and control its various working functions. The transmission frequency automatically changes to avoid sending the signals on channels already used by other devices.
For further information on the remote control see Annex C.

NOTICE

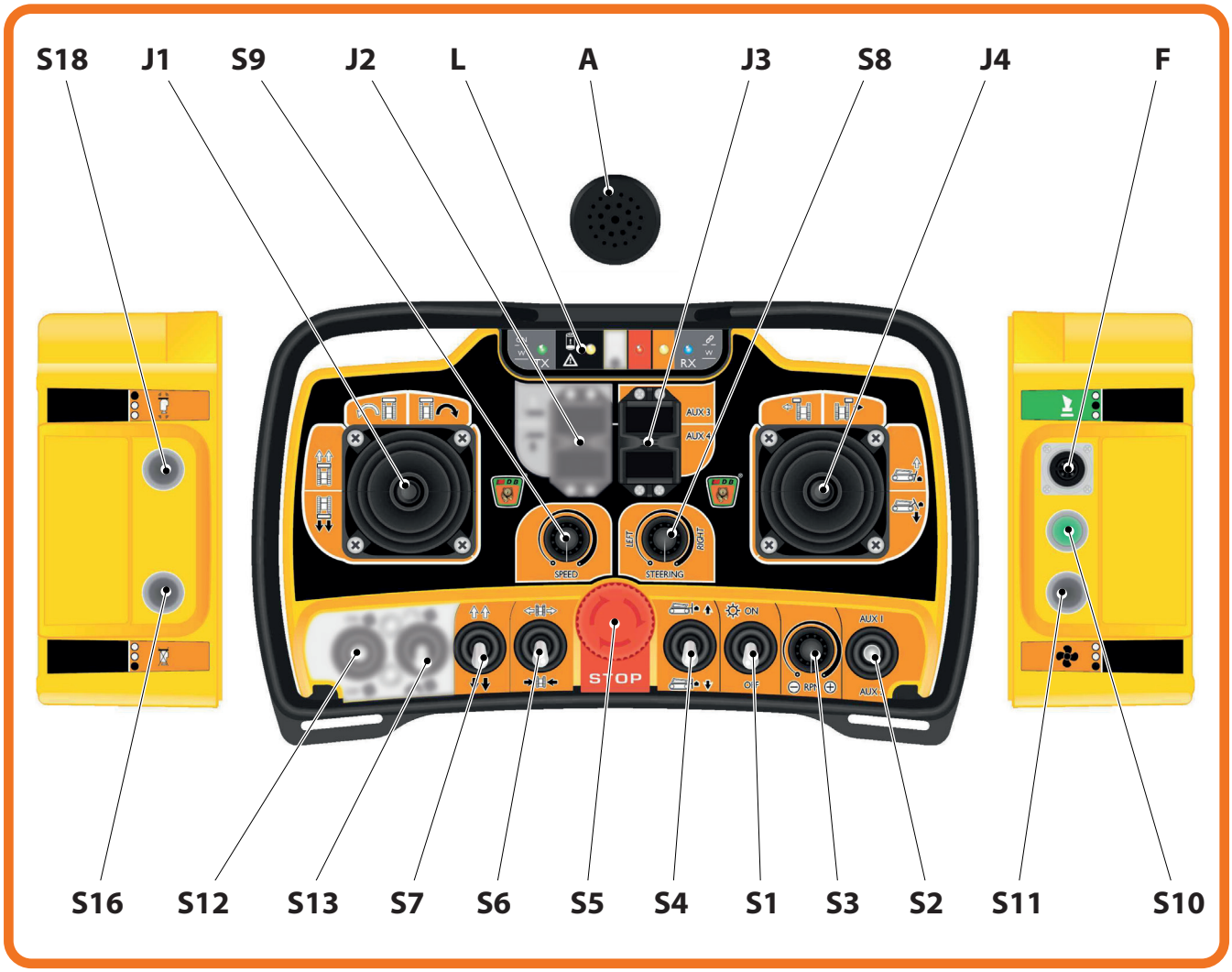
In this manual, only the specific remote control commands of the machine in question are covered.

For the other commands, see the manual for the tool installed on the machine.

5.2.1 DESCRIPTION OF THE REMOTE CONTROL

Control	Description
A	Audible warning device (machine status warning device that operates in tandem with some of the LED functions)
L	LED signal lights
F	Serial socket for the wired remote control, for the connection between the remote control and the control unit (used only in the case of radio signal interference, or damage to the remote control batteries)
J1	Steer right - Steer left / Machine forward movement - Machine backward movement
J2	Control used by the installed tool (see tool manual)
J3	Auxiliary control [used for optional tools (if present)]
J4	Move tool right - Move tool left / Move tool up - Move tool down
S1	Lights on/ Lights off
S2	Auxiliary control [used for optional tools (if present)]
S3	Engine speed regulator
S4	Floating tool / Semi-floating tool
S5	Emergency button (If pressed the machine stops and the engine shuts down. To restart the machine, the procedure for connecting the remote control with the control unit must be repeated (see the following paragraphs) / Remote control off
S6	Track span widening / Track span reduction
S7	Normalized J1 commands / Inverted J1 commands

Control	Description
S8	Right trajectory correction/Left trajectory correction
S9	Speed regulator
S10	Remote control On button / Remote control-Control unit connection button / Horn (works only when the remote control and the control unit are connected)
S11	Turning on the radiator cleaning fan / Turning off the radiator cleaning fan
S12	Control used by the installed tool (see tool manual)
S13	Control used by the installed tool (see tool manual)
S16	Engine kill switch
S18	Engine start button

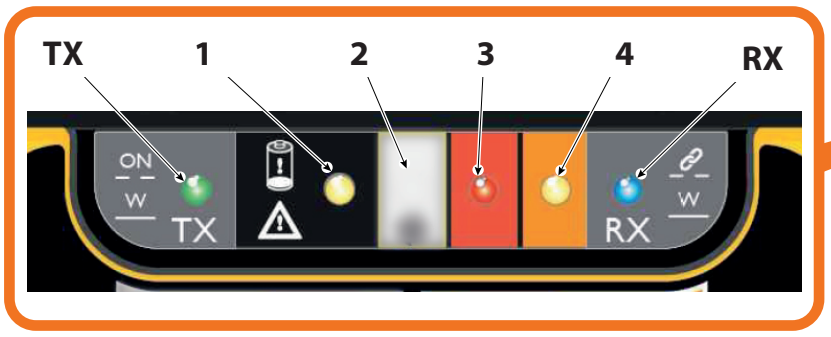


5.2.2 REMOTE CONTROL LEDS

The remote control features LEDs that signal various information to the operator concerning:

- Machine operating states
- Operating problems
- Type of faults
- Diagnostic functions
- Battery charge level

LED	Colour	Status	Description
TX	Green on grey background	On	The remote control has established a connection with the control unit
		Off	The remote control is off or faulty
		Flashing	
1	Yellow on black background	Two flashes in rapid proximity with a twenty second pause	Low battery
2	/	/	Led used by the installed tool (see tool manual)
3	Red on red background	On	One-second audible signal: high engine temperature (above 105°C) (wait for reset operation)
			Two-second audible signal: low engine oil pressure (wait for reset operation)
		Flashing	High engine temperature (above 95°C) (wait for reset operation)
4	Yellow on orange background	On	Clogged air filter. Scheduled maintenance due signal.
		Flashing	Fuel level at minimum
RX	Blue on grey background	On	The remote control has established a connection with the control unit
		Off	The remote control is off or faulty
		Flashing	The remote control is seeking a connection with the control unit

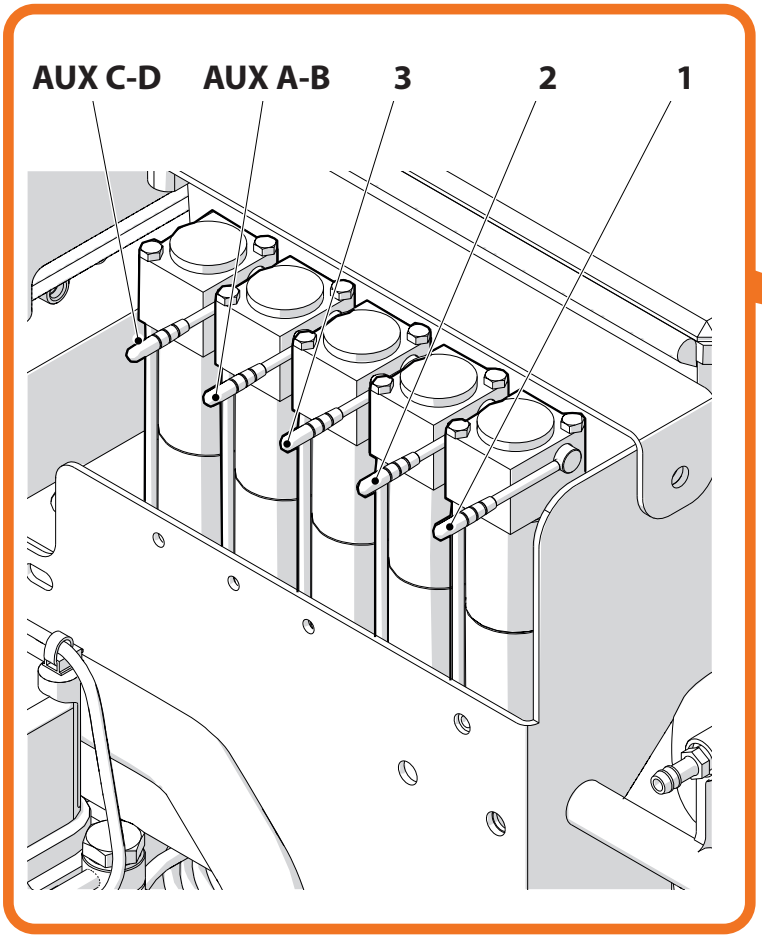


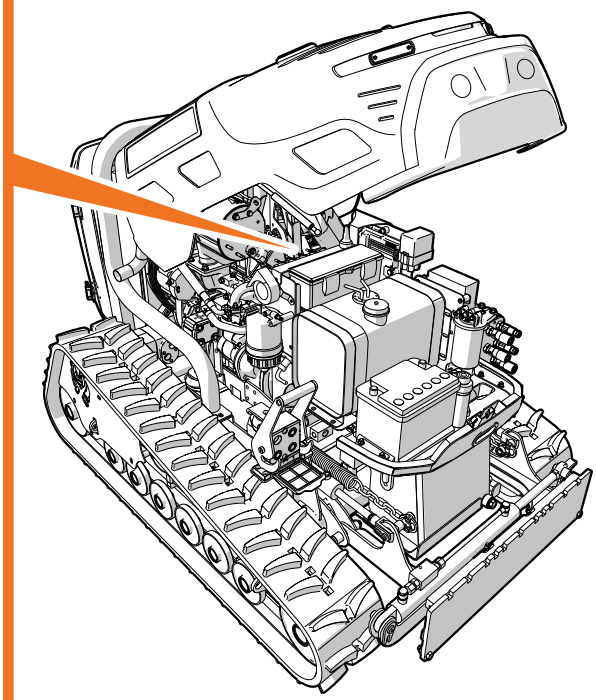
5.3 CONTROLS ON THE MACHINE

NOTICE

To access the controls on the machine, the bonnet must be opened, as indicated in chapter 6.

Control	Description
1	Track span widening / Track span reduction
2	Upward tool movement - Downward tool movement
3	Tool movement to the right - Tool movement to the left
AUX A-B	Auxiliary control [used for optional tools (if present)]
AUX C-D	Auxiliary control [used for optional tools (if present)]





5.4 PRE-START CHECKS

NOTICE

The machine is delivered in variable conditions depending on the regulations in force in the country of use.

For this reason, some of the operations listed in the following paragraphs may be unnecessary, as they have already been carried out before shipping.

NOTICE

Before starting any type of operation, make sure that the ignition key is not inserted in the control panel and, if necessary, remove it and hand it over to the machine manager.

Before starting any type of operation, make sure that the "battery disconnector" key is in the OFF position, and disconnect it.

Proceed as follows:

› Place the machine on a level surface.
› Place a "Do not use" sign on the control panel.
› Prohibit access to the area around the machine by all unauthorised persons.

5.4.1 REFUELLING

DANGER

Handle fuel with extreme care because it is highly flammable. In the event of combustion, explosions and fires can occur with the risk of serious injuries.

All fuel types are flammable. Do not burn or puncture the containers.

Store flammable liquids away from potential sources of fire.

Refuelling must be carried out in well-ventilated areas.

Do not refuel the machine in the vicinity of open flames or sparks.

Do not get too close to the refill cap, so as not to inhale harmful vapours.

The operator must wear the following personal protective equipment:

- Safety footwear
- Protective gloves
- Protective clothing
- Safety goggles
- Cover

NOTICE

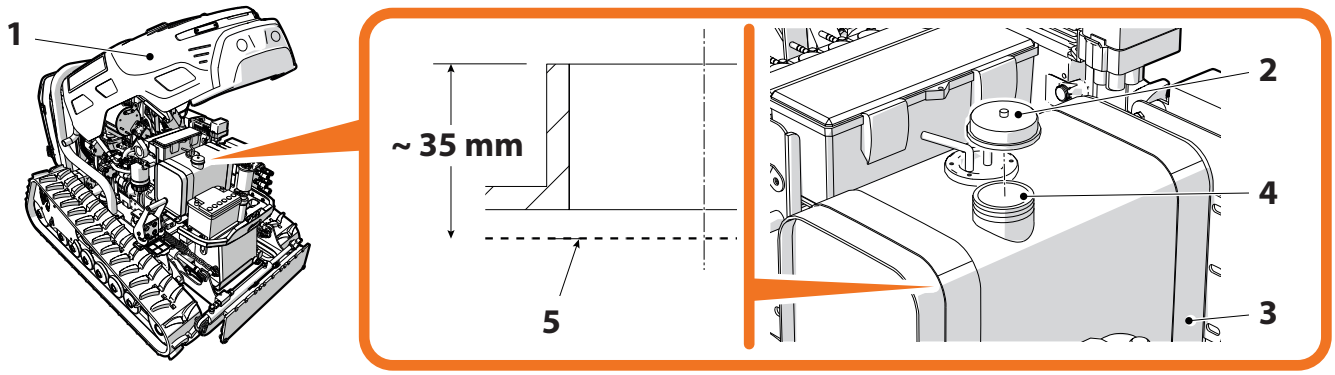
See Annex B for the type of product to use.

See paragraph "3.3.4 Other technical specifications" for the quantity of product to use.

The control panel signals the minimum fuel level to the operator. Refuelling must be carried out strictly before the tank is completely emptied.

Proceed as follows:

- Open the hood **1** (as shown in chapter 6).
- Unscrew the cap **2**.
- Use a funnel and pour the fuel into the tank **3** through the inlet tube**4.**
- Visually check the level of the added fuel, checking that it reaches the level mark **5**.



5.4.2 ENGINE OIL REFILL

Proceed as follows:

› Check the engine oil level and top up if necessary, as indicated in chapter 6.

5.4.3 COOLANT REFILL

Proceed as follows:

› Check the coolant level and top it up, if necessary, as indicated in chapter 6.

5.4.4 HYDRAULIC OIL REFILL

Proceed as follows:

› Check the hydraulic oil level and top up if necessary, as indicated in chapter 6.

5.4.5 BATTERY CONNECTION/PRESENCE CHECK

DANGER

The liquid contained in the battery can explode.

Connect the terminals to the correct electrical poles. Failure to comply with this advice may result in damage to electrical parts or fire.

Proceed as follows:

› Open the hood **1** (as shown in chapter 6).
› Turn the "battery disconnector" key to OFF and remove it (see the paragraphs below for the procedure).
› Locate the battery.
› Connect the respective cables to the battery terminals.
  › Observe the negative and positive connections as shown by the respective symbols.

NOTICE

If the machine does not have a battery, install one with the specifications indicated in paragraph"3.3.4 Other technical specifications".

5.5 START-UP

The machine can be started in two different modes:

- Manual start
- Remote control start

5.5.1 MANUAL START

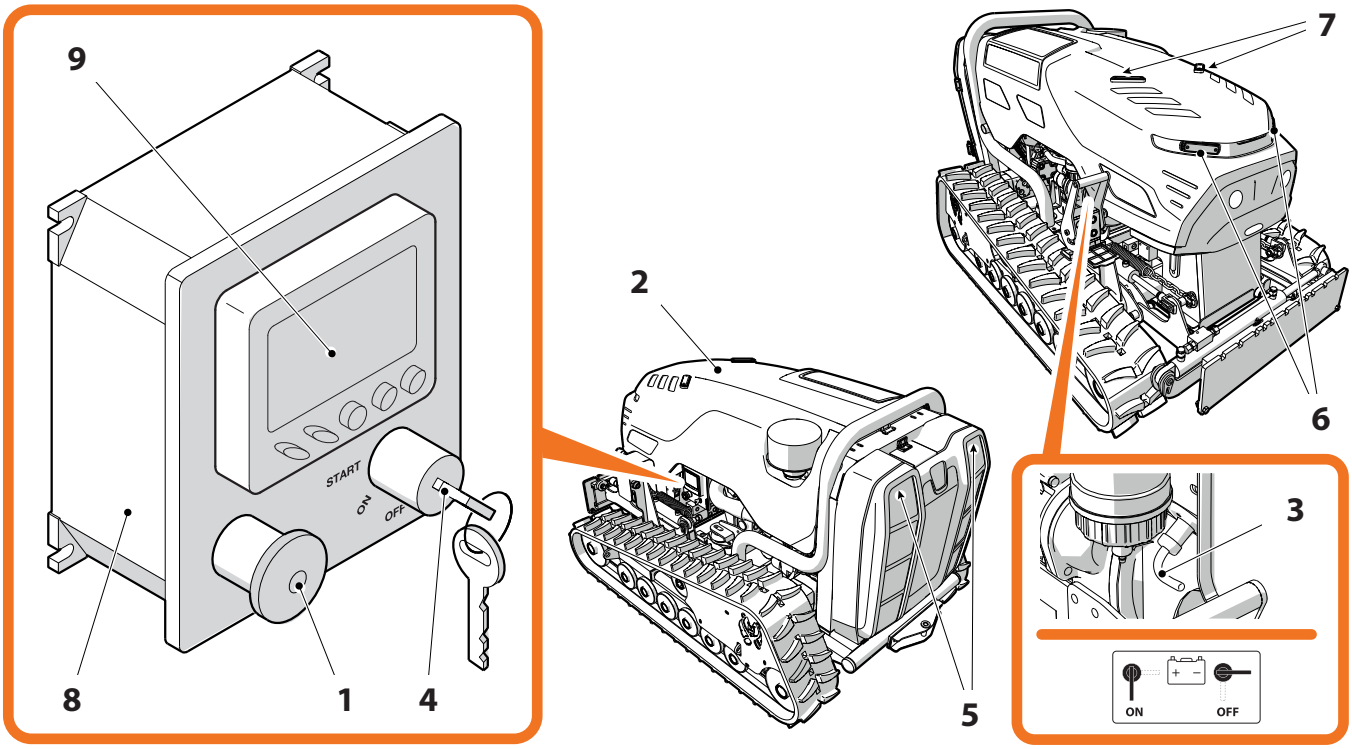
Proceed as follows:

- Check that emergency button **1** is not pressed.
- Open the hood **2** (as indicated in chapter 6).
- Insert the "battery disconnector" key **3**, and turn it to ON.
- Close the hood **2**.
- Insert the ignition key **4** and turn it to ON.
  - The red lights **5** turn on steadily, the white lights **6** turn on steadily and the yellow lights **7** flash.
  - A long acoustic signal (beep), informs the operator that the control panel **8** is starting.
  - Wait until the MDB logo disappears from the display **9**.
- Turn the ignition key **4** to START.
  - The engine starts.
- Release the ignition key **4**, which will return to ON.
  - This is necessary for the hydraulic system to operate correctly

NOTICE

The starting operation can be repeated for a maximum of twenty consecutive seconds. Then, if the engine does not start, wait one minute before repeating the operation.

If the engine does not start after two attempts, contact MDB service.



5.5.2 REMOTE CONTROL START

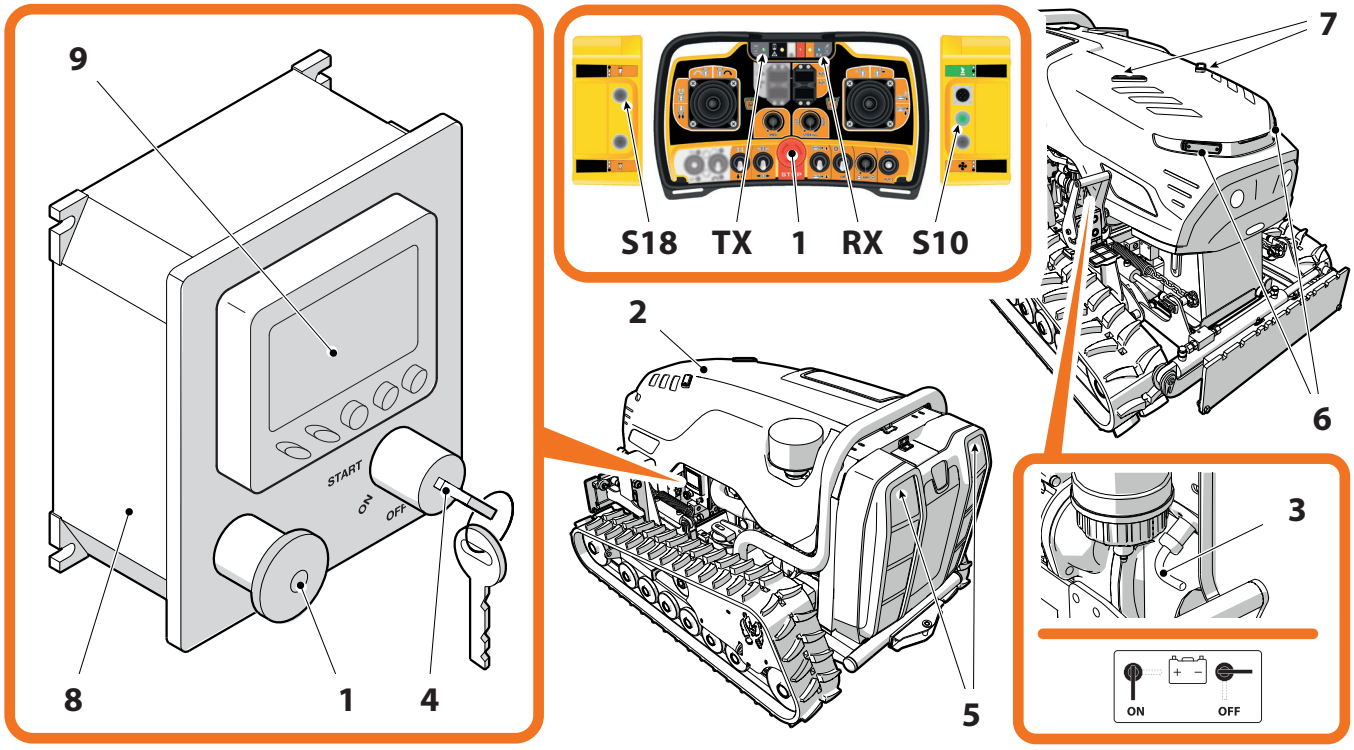
Proceed as follows.

- Check that emergency button **1** is not pressed.
- Open the hood **2** (as indicated in chapter 6).
- Insert the "battery disconnector" key **3**, and turn it to ON.
- Close the hood **2**.
- Insert the ignition key **4** and turn it to ON.
  - The red lights **5** turn on steadily, the white lights **6** turn on steadily and the yellow lights **7** flash.
  - A long acoustic signal (beep), informs the operator that the control panel **8** is starting.
  - Wait until the MDB logo disappears from the display **9**.
- Press button **S10** on the remote control to turn on the remote control.
  - The **TX** indicator light will flash and after a few seconds the **RX** light will also start to flash.
- Press **S10** once more to confirm the selection.
  - Once the connection is been confirmed, the **TX** and **RX** LEDs remain on steadily.
- Press the engine start button **S18**.
  - The engine starts.

NOTICE

The starting operation can be repeated for a maximum of twenty consecutive seconds. Then, if the engine does not start, wait one minute before repeating the operation.

If the engine does not start after two attempts, contact MDB service.



5.6 USE

NOTICE

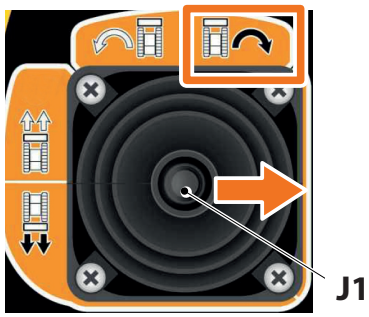
The procedures described below are intended to illustrate the main controls necessary for the correct operation of the machine.

In order to perform the operations correctly and in complete safety, you must fully understand the following procedures.

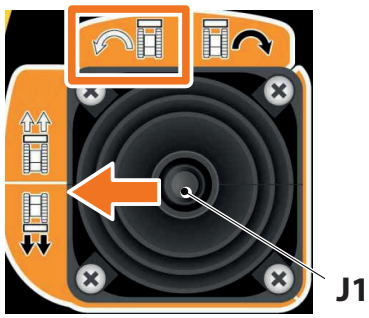
5.6.1 MAIN CONTROLS

The main machine controls are listed below.

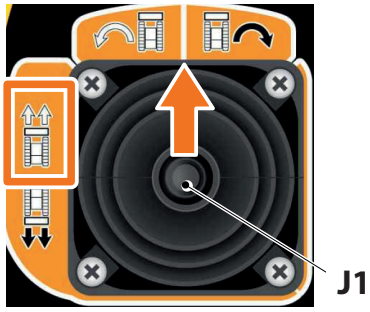
› Move lever **J1** in the direction indicated by the arrow to steer to the right.



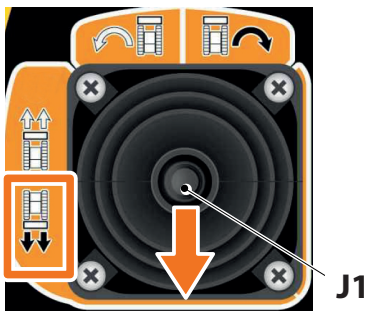
› Move lever **J1** in the direction indicated by the arrow to steer to the left.



› Move lever **J1** in the direction indicated by the arrow to move the machine forward.



› Move lever **J1** in the direction indicated by the arrow to move the machine backwards.

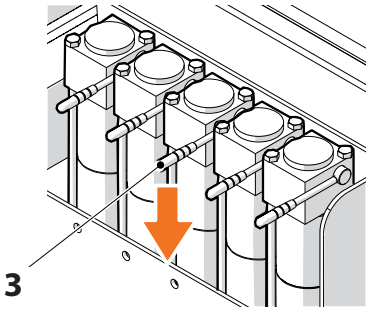


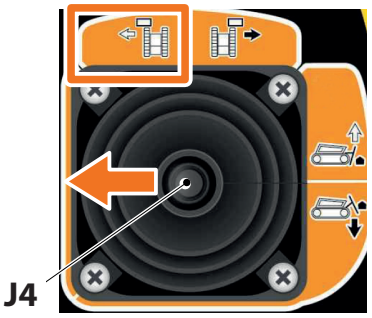
With the remote control:

› Move lever **J4** in the direction indicated by the arrow to move the tool to the left.

With the controls on the machine:

› Move lever **3** in the direction indicated by the arrow to move the tool towards the left.



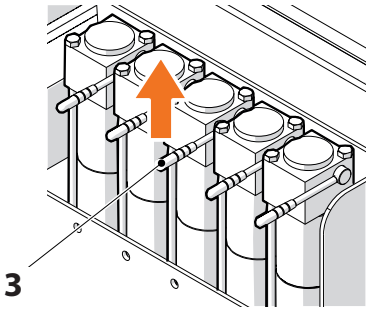


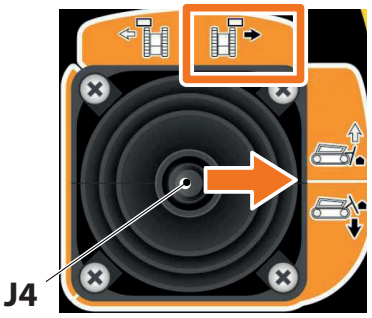
With the remote control:

› Move tool **J4** in the direction indicated by the arrow to move the tool towards the right.

With the controls on the machine:

› Move lever **3** in the direction indicated by the arrow to move the tool towards the right.



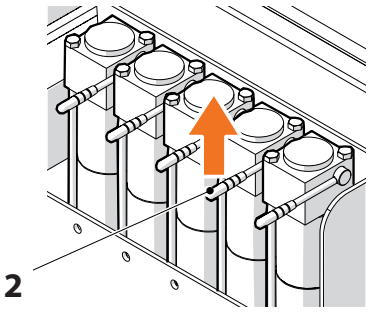


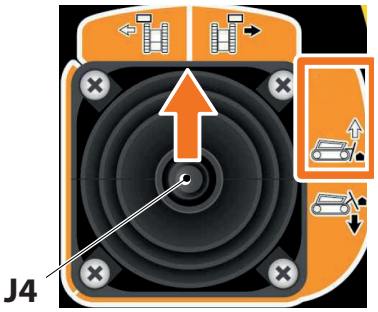
With the remote control:

› Move lever **J4** in the direction indicated by the arrow to raise the tool upwards.

With the controls on the machine:

› Move lever **2** in the direction indicated by the arrow to lower the tool downwards.



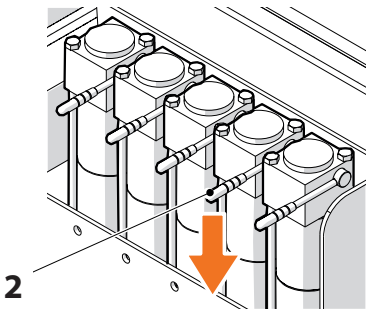


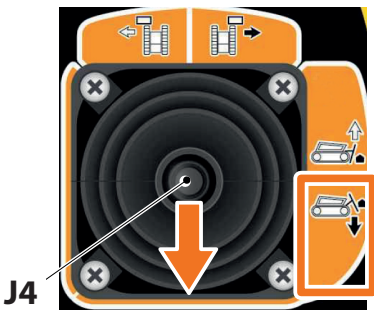
With the remote control:

› Move lever **J4** in the direction indicated by the arrow to move the down downwards.

With the controls on the machine:

› Move lever **2** in the direction indicated by the arrow to move the tool downwards.



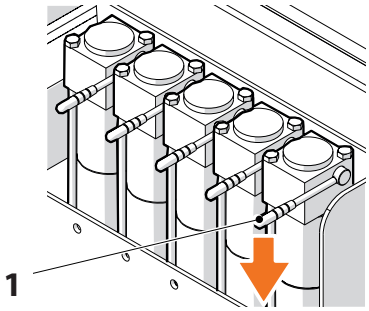


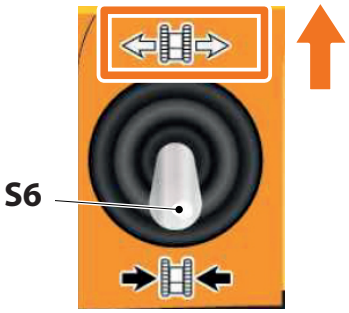
With the remote control:

› Move lever **S6** in the direction indicated by the arrow to widen the tracks.

With the controls on the machine:

› Move lever **1** in the direction indicated by the arrow to widen the tracks.



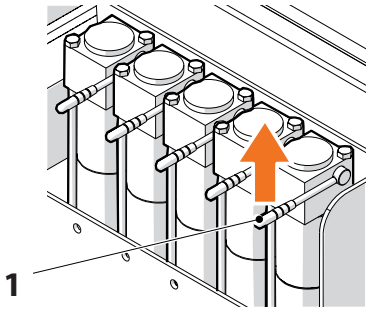


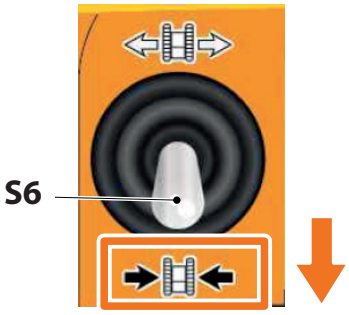
With the remote control:

› Move lever **S6** in the direction indicated by the arrow to reduce the track span.

With the controls on the machine:

› Move lever **1** in the direction indicated by the arrow to reduce the track span.



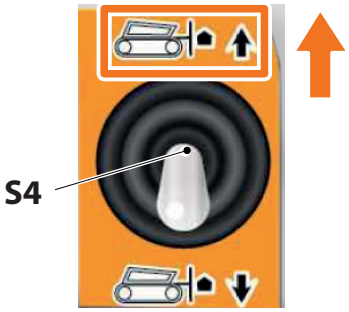


NOTICE

See paragraph "3.6 Machine configurations" for the machine's working and movement configurations, which can be set with the above-mentioned controls.

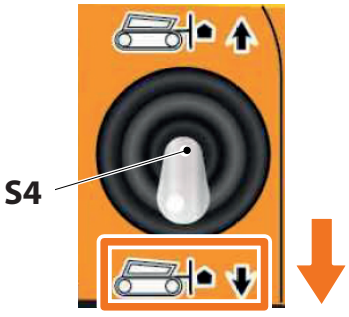
› Turn switch **S4** in the direction indicated by the arrow to activate the semi-floating tool movement.

  › In the semi-floating movement, the tool rises from the ground up to the height set with lever J4.

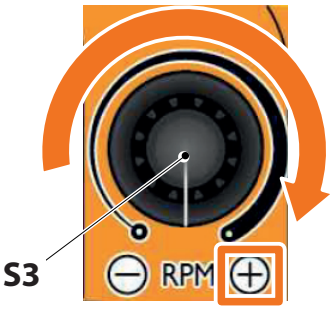


› Turn switch **S4** in the direction indicated by the arrow to activate the floating tool movement.

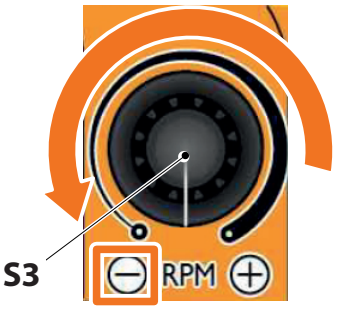
  › In the floating movement, the tool follows the profile of the terrain.



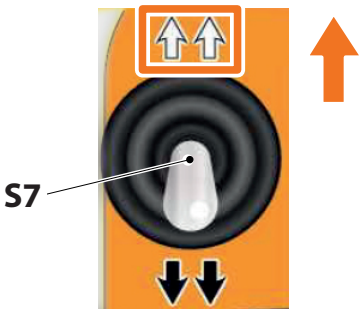
› Turn knob **S3** in the direction indicated by the arrow to increase the engine speed.
  › Regulate the engine speed in relation to the work being carried out.



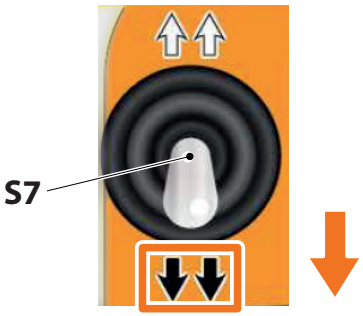
› Turn knob**S3** in the direction indicated by the arrow to reduce the engine speed.
  › Regulate the engine speed in relation to the work being carried out.



› Turn switch **S7** in the direction indicated by the arrow to leave the J1 commands unchanged.



› Turn switch **S7** in the direction indicated by the arrow to reverse the J1 commands.



› The adjustment allows the machine to move always in alignment with the direction of travel, allowing the operator to correct the traction of the individual tracks (when necessary, depending on the working conditions).
› The adjustment aligns the trajectory travelled by the machine with the machine axis. Once the path has been completed, simply return the control knob to its original position.
› If the work surface does not affect the progress of the machine, the machine's axis of travel (parallel to the tracks) will correspond to the axis of the machine, and it will not be necessary to use this adjustment.

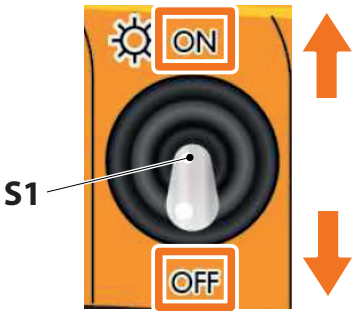
› Turn control knob **S8** in the direction indicated by the arrow to adjust the machine's trajectory to the right.

› Turn control knob **S8** in the direction indicated by the arrow to adjust the machine's trajectory to the left.

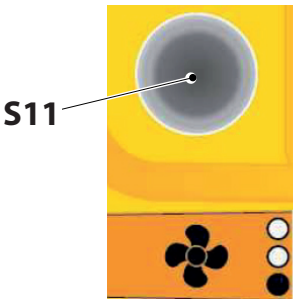
› Turn control knob **S9** in the direction indicated by the arrow to increase the machine speed.

› Turn control knob **S9** in the direction indicated by the arrow to reduce the machine speed.

- Press switch **S1** in the direction indicated by the arrow (ON), to turn on the lights.
- Press switch **S1** in the direction indicated by the arrow (OFF), to turn off the lights.



- Press button **S11** to activate the radiator cleaning fan.
- Release button **S11** to activate the radiator cleaning fan.



NOTICE

For the cleaning times, see chapter 6.

5.6.2 SAFETY GUIDELINES FOR USE

DANGER

During use, there must be no people in the work area of the machine, as indicated in the paragraph "3.4 Work area".

CAUTION

Move the controls gradually (see paragraph "5.2.1 Description of the remote control" and/or paragraph "5.3 Controls on the machine") in order to achieve a slow and constant ascent/descent and stop without jolts.

DANGER

Avoid starting, braking and steering abruptly.

NOTICE

Use the horn to alert any people present in the work area.

5.6.3 USE

NOTICE

The use of the machine varies according to the type of tool installed on it.

Therefore, for information on using the machine, see the manual for the tool installed on it.

WARNING

Do not stop the machine in work or transit areas.

CAUTION

Move the relevant controls (see paragraph "5.2.1 Description of the remote control" and/or paragraph "5.3 Controls on the machine") gradually in order to achieve smooth and constant work and a smooth stop.

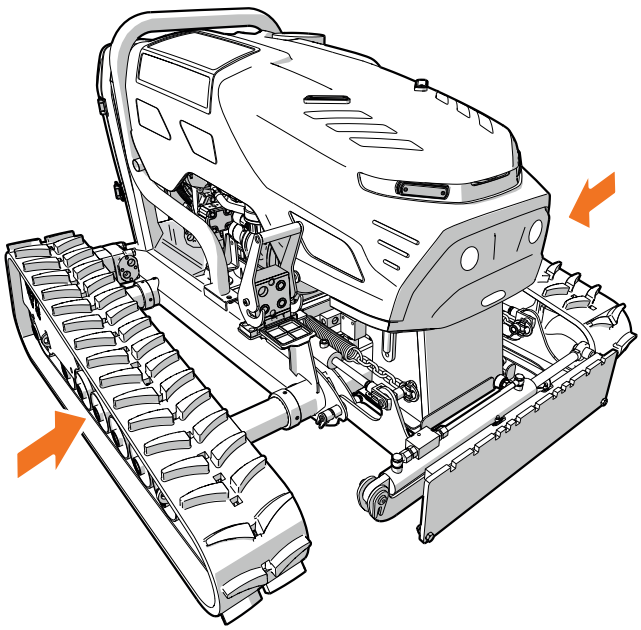
5.7 PARKING

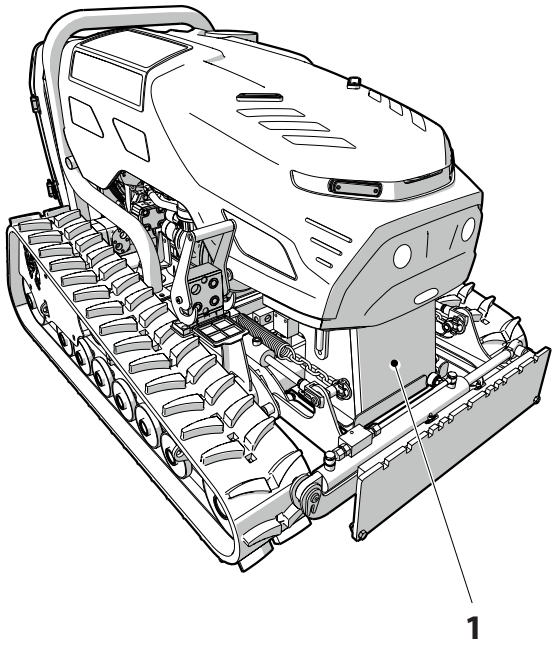
Proceed as follows:

› Identify the machine parking zone.
› Move the machine to the prepared zone (using the controls indicated in the previous paragraphs).
› If the tracks are in an widened position, reduce the track span (use the commands indicated in the previous paragraphs), bringing the machine to the work and movement configuration **1**, as indicated in paragraph "3.6 Machine configurations".

NOTICE

If there is a need to remove the tool installed on the machine, proceed as indicated in the manual for the tool.





5.8 SHUT DOWN

The machine can be shut down in two different ways:

- Manual shutdown.
- Shutdown by remote control

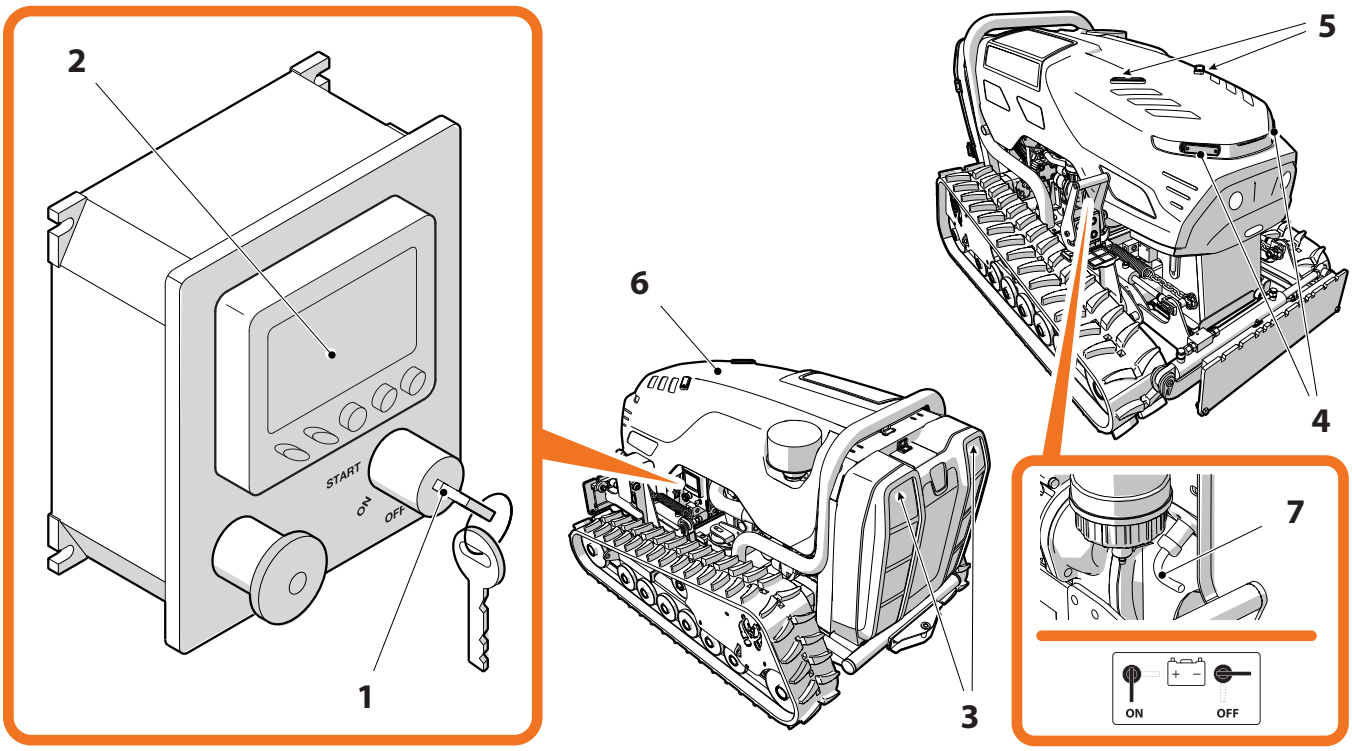
NOTICE

At the end of the work shift, the operator must check that there are no leaks of liquids (fuel, coolant or hydraulic oil).

5.8.1 MANUAL SHUTDOWN.

Proceed as follows.

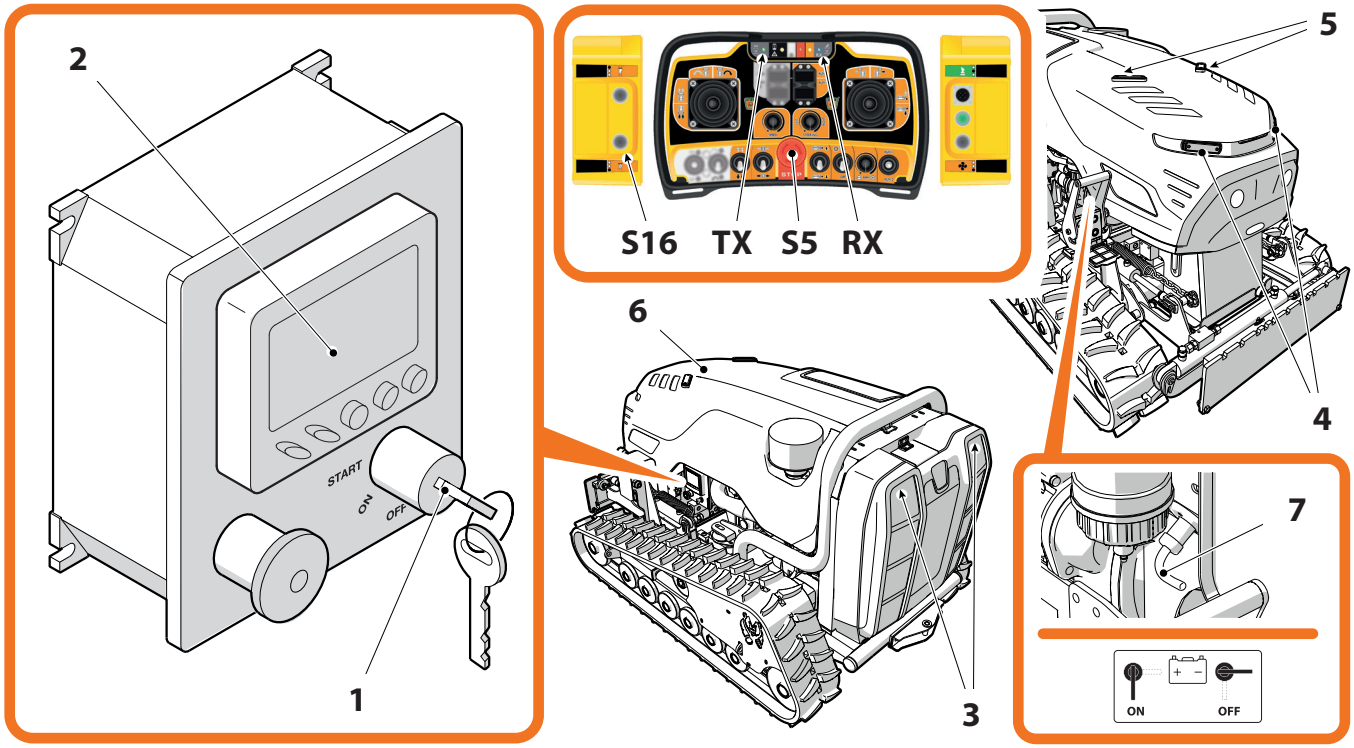
- Turn the ignition key **1** to OFF.
  - The engine stops.
  - The display **2** turns off.
  - The red lights **3** turn off, the white lights **4** turn off and the yellow lights **5** turn off.
- Remove the ignition key **1**, and hand it over to the manager.
- Open the hood **6** (as indicated in chapter 6).
- Turn the "battery disconnector" key **7** to OFF.
- Remove the "battery disconnector" key **7**.
- Close the hood **6**.



5.8.2 SHUTDOWN BY REMOTE CONTROL

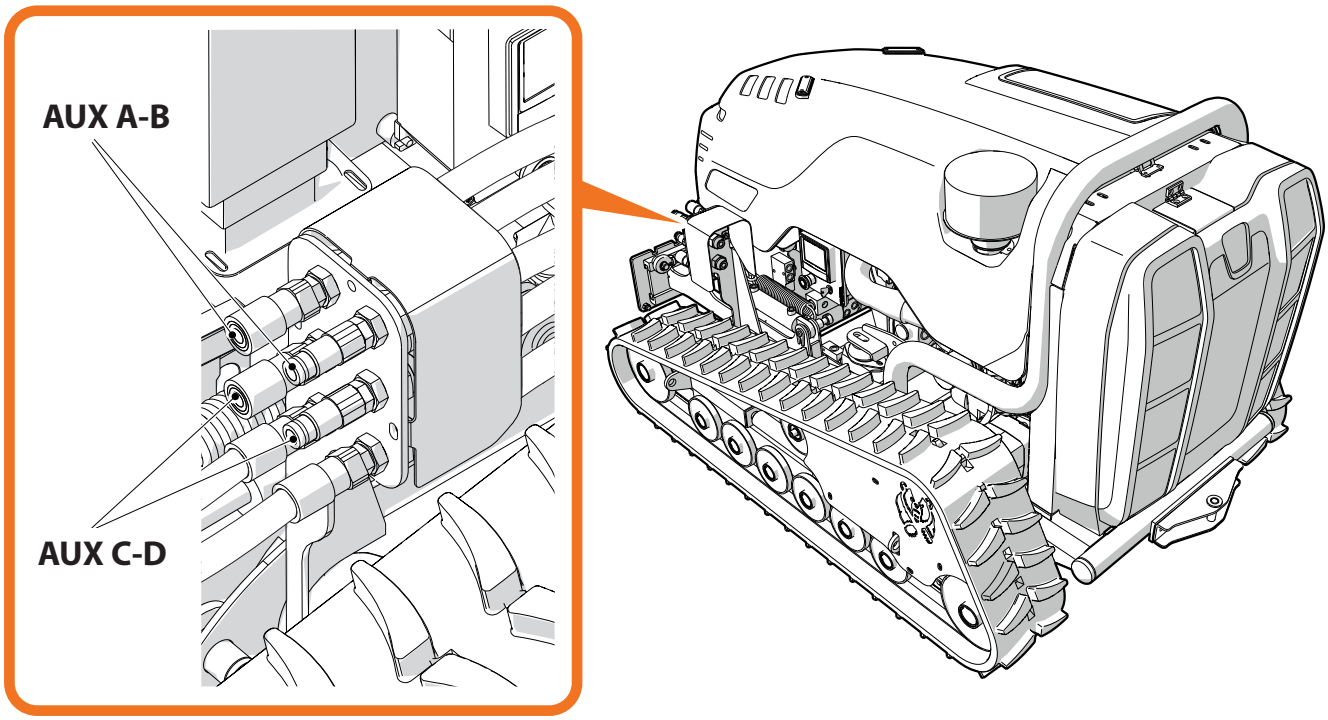
Proceed as follows.

› Press the engine shutdown button **S16**.
  › The engine stops.
› Press button **S5** on the remote control to turn off the remote control.
  › The **TX** and **RX** LEDs turn off.
› Turn the ignition key **1** to OFF.
  › The display **2** turns off.
  › The red lights **3** turn off, the white lights **4** turn off and the yellow lights **5** turn off.
› Remove the ignition key **1**, and hand it over to the manager.
› Open the hood **6** (as indicated in chapter 6).
› Turn the "battery disconnector" key **7** to OFF.
› Remove the "battery disconnector" key **7**.
› Close the hood **6**.
› Place the remote control in the provided case.



5.9 HYDRAULIC CONNECTION OF OPTIONAL TOOLS

Optional tools can be installed on the machine for various types of use.
These tools are connected hydraulically to the machine through the **AUX A-B** and **AUX C-D** connections, and are controlled via the remote control and/or the controls on the machine, as indicated in paragraph "5.2 Remote control" and paragraph "5.3 Controls on the machine".



6 MAINTENANCE

Proper maintenance is a key factor for a long machine working life.
All maintenance operations must be carried out following the instructions in this manual, and in accordance with the laws in force in the country of use of the machine.
MDB assumes no responsibility for damage to the machine or accidents caused by incorrect maintenance.
If parts need to be replaced, this must be done exclusively with original MDB replacement parts.
MDB assumes no responsibility for damage to the machine or for accidents due to the use of non-original parts.
Use of non-original parts leads to immediate forfeiture of the warranty.

Maintenance operations are divided into:

- Routine maintenance (by the end user's maintenance technicians).
- Special maintenance (by specialised MDB technicians or authorised personnel).

6.1 PREPARING FOR MAINTENANCE

Before starting maintenance work, the machine must be prepared as follows:

- If a tool is installed on the machine, remove and park it (see the manual for the tool installed on the machine).
- Place the machine on a level surface.
- Place the machine tracks in maximum widening configuration (see chapter 3 and chapter 5).
- Turn the "battery disconnector" key to the OFF position and remove it (see chapter 5).
  - To access the "battery disconnector" zone, you must raise the bonnet, as shown in chapter 6.
- Place a "Do not use" sign on the control panel.
- Prohibit access to the area around the machine by all unauthorised persons.

DANGER

Unless otherwise specified, perform maintenance operations with the engine cold.

Before starting any type of maintenance, make sure that the ignition key is not inserted in the control panel and, if necessary, remove it, handing it over to the machine manager.

During maintenance operations, any tool installed on the machine must be removed (for the procedure, see the manual for the tool installed on the machine).

NOTICE

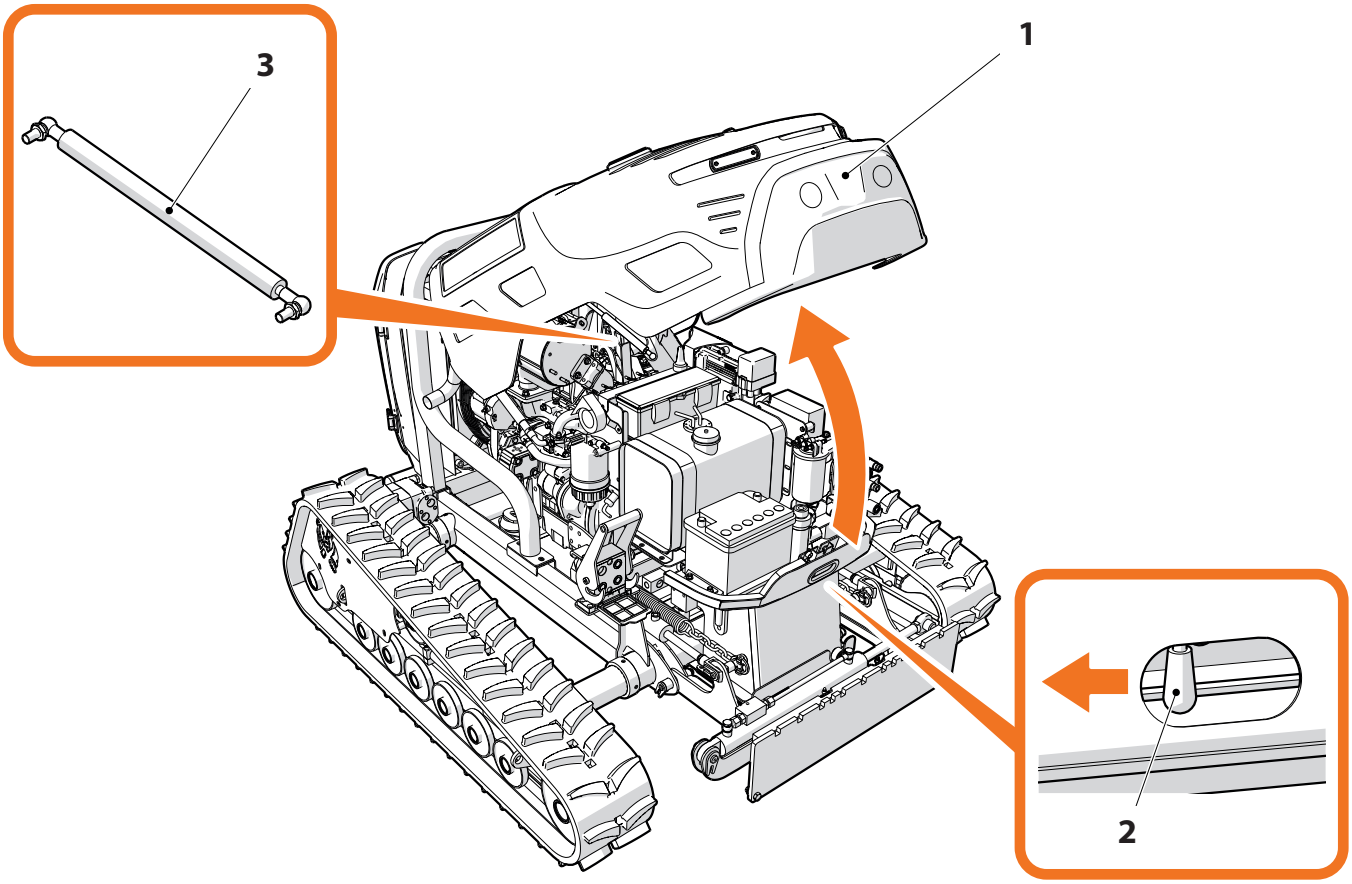
Unless otherwise specified, perform maintenance operations with the machine positioned on a level surface.

6.1.1 ENGINE COMPARTMENT BONNET

Some times of maintenance require the bonnet to be open **1**.

To open the bonnet **1**, proceed as follows:

› Turn the knob **2** in the direction shown by the arrow.
› Raise the bonnet **1** in the direction shown by the arrow.
  › The gas spring **3** keeps the bonnet **B** in the raised position.



6.2 EQUIPMENT SUPPLIED

MDB supplies the following equipment:

› Grease pump
› Grease pump hose
› Track tensioning fitting
› Grease gun fitting
› Grease (see chapter 3 for the type of grease)
› Replacement fuse kit
› Fuse pliers

NOTICE **All maintenance equipment not expressly mentioned above is not supplied by MDB, but is the responsibility of the end user.**

6.3 SCHEDULED MAINTENANCE TABLE

The information necessary for determining when the machine needs maintenance is given below.
Carry out maintenance work in accordance with the time intervals, the indications of the hour meter (see chapter 5) and the table below.

Time interval (Hours)	Type of maintenance	See paragraph
8	General machine cleaning	6.4.2
8	Cleaning the radiator	6.4.3
8	Checking engine oil	6.4.4
8	Checking coolant	6.4.7
8	Hydraulic oil level check	6.4.10
8	Air filter check	6.4.13
8	Check the separator filter	6.4.18
8	Track check and tensioning	6.4.24
8	Periodic lubrication	6.4.25
8	Checking tightening elements	6.4.26
8	Cooling system check	6.4.28
8	Hydraulic system check	6.4.29
8	Electrical system check	6.4.30
40	General checks	6.4.1
50	Changing the engine oil and replacing the oil filter	6.4.6
50	Replacing the separator filter	6.4.20
160	Hydraulic oil filter check	6.4.16
200	Changing the engine oil and replacing the oil filter	6.4.6
250	Replacing the fuel filter	6.4.21
500	Checking working components	6.4.27
1000	Hydraulic oil change	6.4.12
1000	Replacing the air filters	6.4.15
1000	Replacing the hydraulic oil filter	6.4.17
4000	Coolant change	6.4.9
6000	Cleaning the particle filter	6.4.22
9000	Replacing the particulate filter	6.4.23

6.3.1 CHECK LIST

Symbols used	
Description	**Symbol**
General indication	•
Functional test	
Replacement	
Visual check	
Screw tightness check	
Cleaning	

Type of maintenance	Maintenance intervals										
	8	40	50	160	200	250	500	1000	4000	6000	9000
General machine cleaning											
Cleaning the radiator											
Checking engine oil											
Checking coolant											
Hydraulic oil level check											
Air filter check											

Type of maintenance	Maintenance intervals										
	8	40	50	160	200	250	500	1000	4000	6000	9000
Check the separator filter											
Track check and tensioning											
Periodic lubrication	•										
Checking tightening elements											
Cooling system check											
Hydraulic system check											
Electrical system check	 										
General checks											
Changing the engine oil and replacing the oil filter											
Replacing the separator filter											
Hydraulic oil filter check											
Changing the engine oil and replacing the oil filter											

Type of maintenance	Maintenance intervals										
	8	40	50	160	200	250	500	1000	4000	6000	9000
Replacing the fuel filter						↻					
Checking working components							🔍 ⚙				
Hydraulic oil change								↻			
Replacing the air filters								↻			
Replacing the hydraulic oil filter								↻			
Coolant change									↻		
Cleaning the particle filter										Clean	
Replacing the particulate filter											↻

6.4 ROUTINE MAINTENANCE

NOTICE

Maintenance must only be carried out by a qualified and authorised person, referred to as the maintenance technician.

The maintenance technician must be sufficiently skilled and experienced to assess the condition of the machine and the effectiveness of personal protective equipment, based on technical norms.

Routine maintenance is under the responsibility of the end user's maintenance technicians.

6.4.1 GENERAL CHECKS

Carry out a general machine integrity check every 40 working hours.

6.4.2 GENERAL MACHINE CLEANING

Clean the machine thoroughly from all mud and debris every 8 working hours.
The cleaning process can be:

- Manual (Use a soft cloth dampened with water and/or environmentally friendly detergents)
- Assisted (Use a pressurised water cleaning device)

NOTICE

Use only environmentally friendly, neutral pH detergents for cleaning operations.

Do not use cleaning devices that may scratch or scrape.

USING A PRESSURISED WATER CLEANING DEVICE

⚠ CAUTION

Unless the following instructions are followed, machine damage may occur.

- The water and detergent temperature must never exceed 60°C.
- The nozzle of the cleaning equipment must always be kept at the right distance from the machine. This is to avoid damaging the parts being washed.
- The water spray must never be pointed towards:
  - Electrical and electronic components
  - Plastic components
  - Bearings
  - Support points
  - Plates and stickers

6.4.3 CLEANING THE RADIATOR

Every 8 hours of work, carry out the cleaning mentioned above.

WARNING

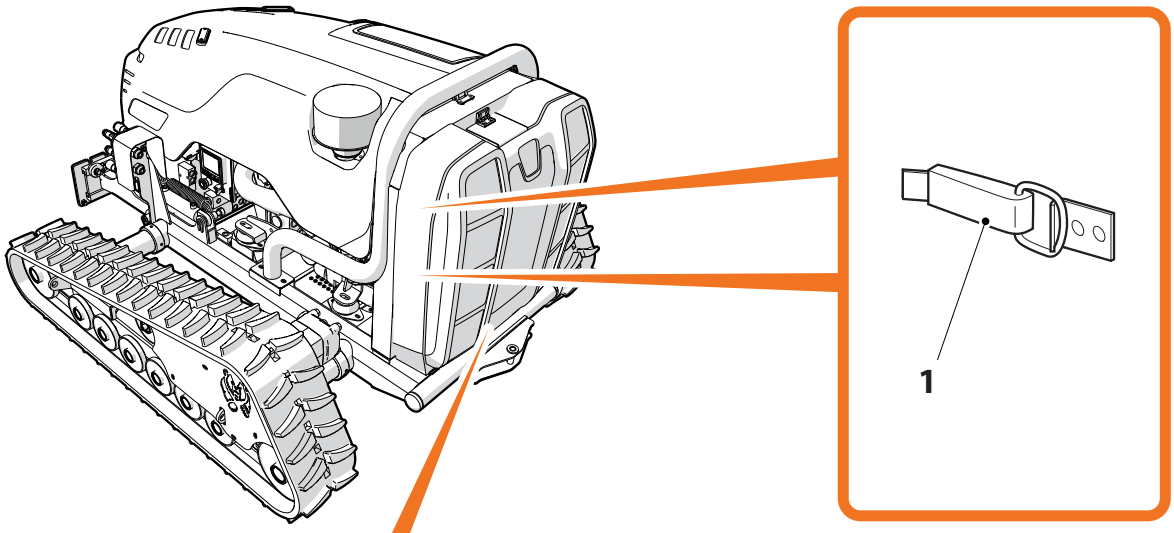
BURN HAZARD

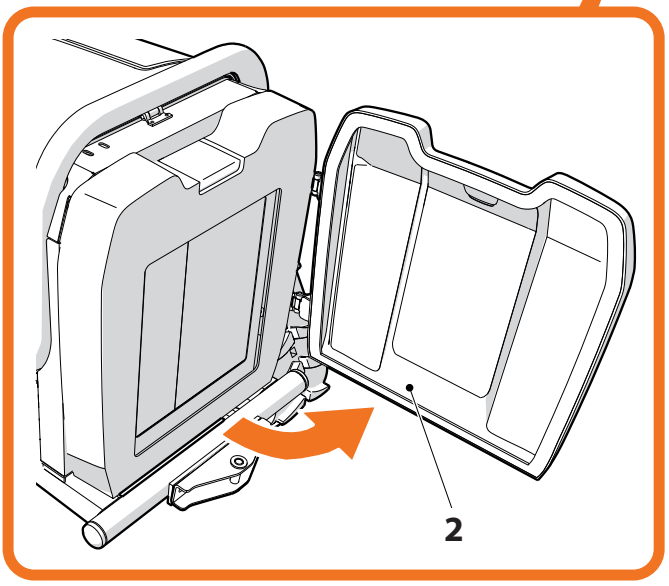
The operator must wear the following personal protective equipment:

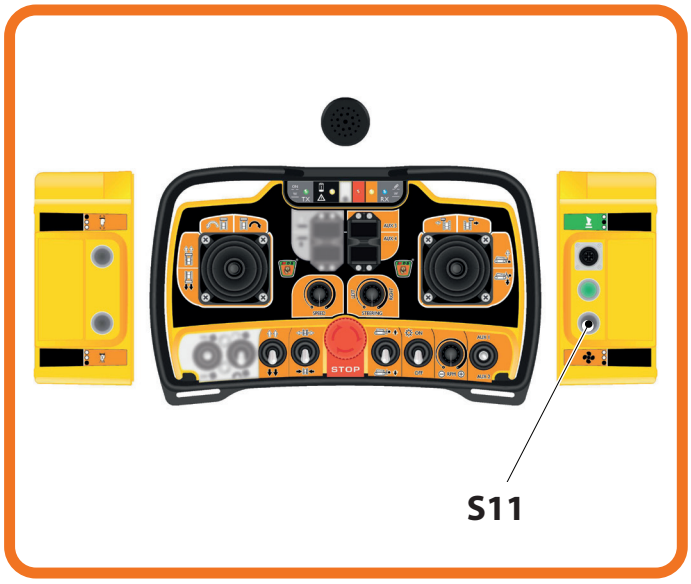
- Safety footwear
- Heat resistant gloves
- Protective clothing
- Safety goggles

Proceed as follows:

- Unlock the tie rods **1** and open the casing **2**, turning it in the direction indicated by the arrow.
- Press button **S11** to activate radiator cleaning fan.







6.4.4 CHECKING ENGINE OIL

Carry out this check every 8 working hours.

WARNING

BURN HAZARD

The operator must wear the following personal protective equipment:

- Safety footwear
- Heat resistant gloves
- Protective clothing
- Safety goggles

Proceed as follows:

- Visually check the oil level as shown in Annex B.
- If the oil is below the minimum level, top it up as described in the next paragraph.

6.4.5 TOPPING UP ENGINE OIL

NOTICE

See paragraph "3.3.4 Other technical specifications" for the type of product to use.

See Annex B for the quantity of product to use.

Proceed as follows:

- Top up the oil as shown in Annex B.

6.4.6 CHANGING THE ENGINE OIL AND REPLACING THE OIL FILTER

Change the oil and filter after the first 50 hours of work.
Subsequent oil changes and filter replacements should be carried out every 200 working hours.

NOTICE

This operation must only be carried out by MDB service centre technicians. For this reason, contact the MDB support service (see chapter 2).

6.4.7 CHECKING COOLANT

Carry out this check every 8 working hours.

WARNING

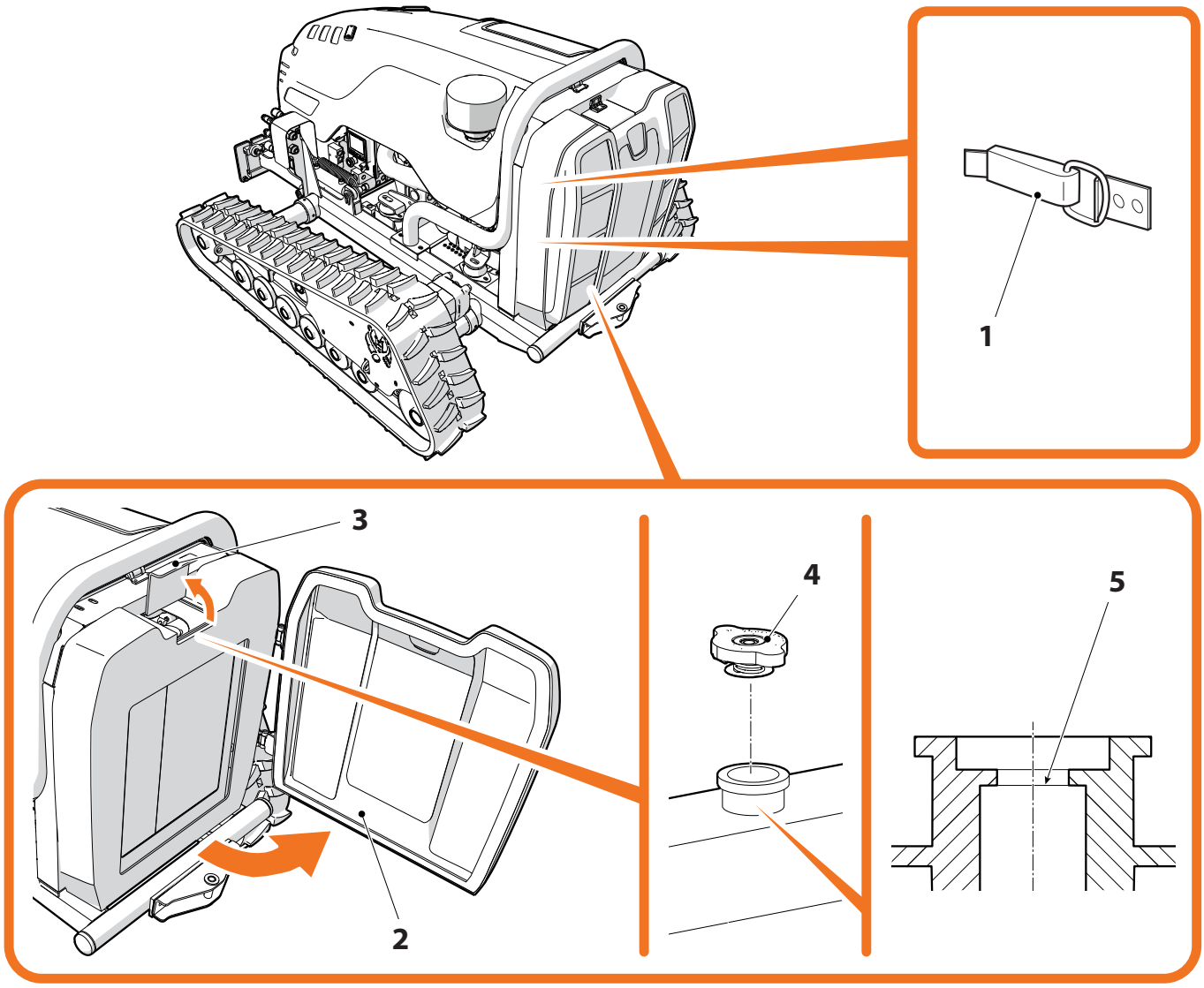
BURN HAZARD

The operator must wear the following personal protective equipment:

- Safety footwear
- Heat resistant gloves
- Protective clothing
- Safety goggles

Proceed as follows:

- Unlock the tie rods **1** and open the casing **2**, turning it in the direction indicated by the arrow.
- Open the casing **3**, turning it in the direction indicated by the arrow.
- Unscrew the cap **4**.
- Visually check the level of the coolant, checking that it reaches the level mark **5**.
- If the coolant is lower than the level mark **5**, follow the indications in the paragraph below.



6.4.8 TOPPING UP COOLANT

NOTICE

See paragraph "3.3.4 Other technical specifications" for the type of product to use.

See paragraph "3.3.4 Other technical specifications" for the quantity of product to use.

Proceed as follows:

- Top up the coolant using a hose with the end fixed to a funnel.
- Check the level of the input coolant, as indicated in the previous paragraph.
- Start the machine and leave it running for 10 minutes.
- Check the coolant level again as indicated in the previous paragraph, and top up it further if necessary.

6.4.9 COOLANT CHANGE

Carry out the above replacement every 4,000 hours of work.

NOTICE

This operation must only be carried out by MDB service centre technicians. For this reason, contact the MDB support service (see chapter 2).

6.4.10 HYDRAULIC OIL LEVEL CHECK

Carry out this check every 8 working hours.

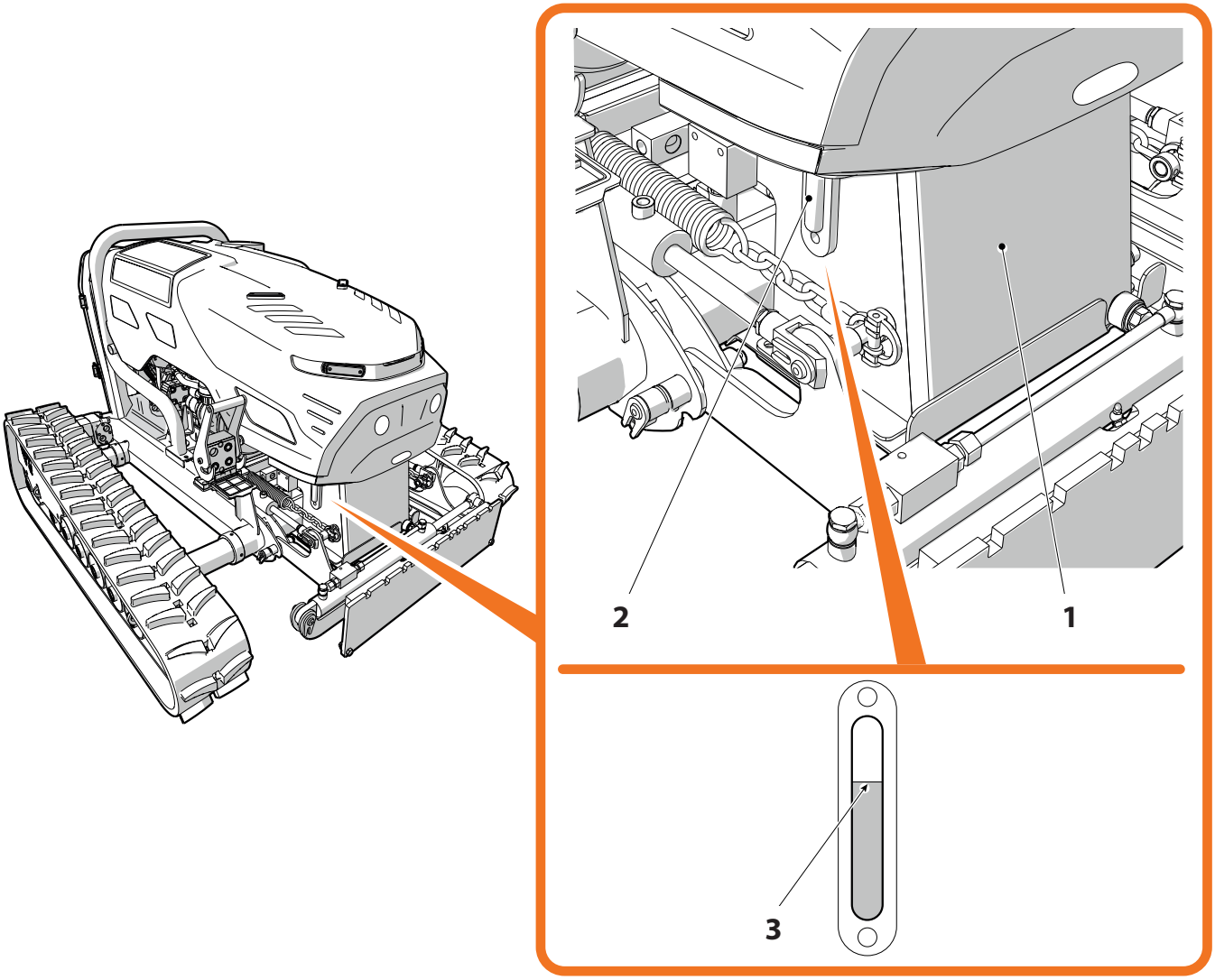
CAUTION

The operator must wear the following personal protective equipment:

- Protective clothing
- Safety footwear

Proceed as follows:

- Visually check the oil level in tank **1** using the level indicator **2**.
- If the oil is below the right level **3** (two-thirds of the full load), top it up as described below.



6.4.11 TOPPING UP HYDRAULIC OIL

WARNING

BURN HAZARD

The operator must wear the following personal protective equipment:

- Safety footwear
- Heat resistant gloves
- Protective clothing
- Safety goggles

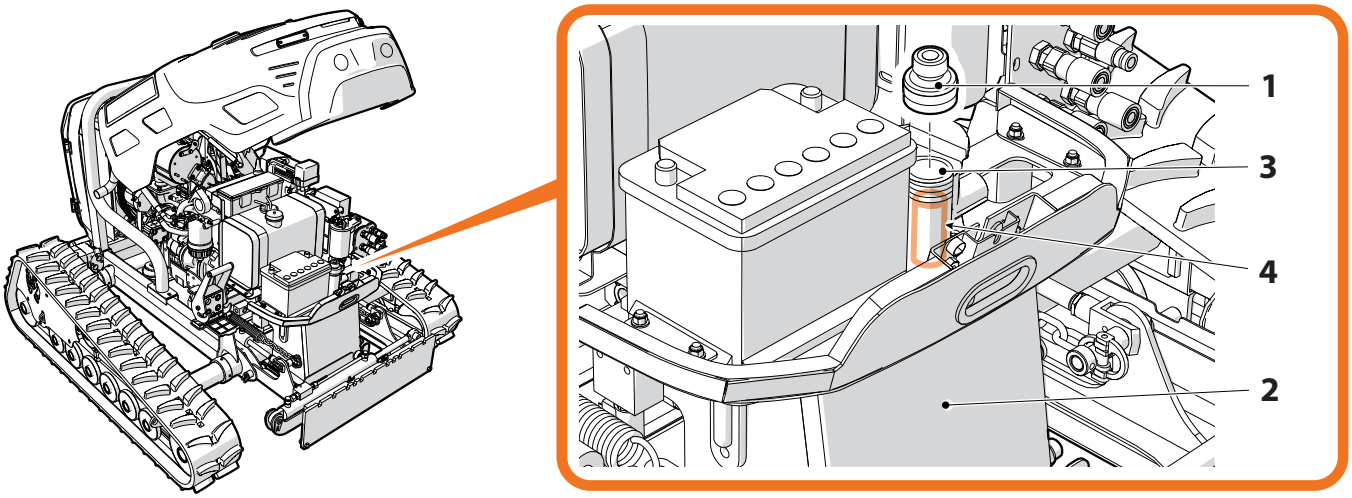
NOTICE

See paragraph "3.3.4 Other technical specifications" for the type of product to use.

See paragraph "3.3.4 Other technical specifications" for the quantity of product to use.

Proceed as follows:

- Open the bonnet (see paragraph "6.1.1 Engine compartment bonnet").
- Unscrew the cap **1**.
- Use a funnel and pour the oil into the tank **2** through the inlet tube**3.**
  - The inlet tube **3** contains a filter **4** which can be removed (pulled upwards) to clean out any impurities.
- Check the level of the input oil, as indicated in the previous paragraph.



6.4.12 HYDRAULIC OIL CHANGE

The hydraulic oil should be changed every 1000 working hours.

NOTICE

This operation must only be carried out by MDB service centre technicians. For this reason, contact the MDB support service (see chapter 2).

6.4.13 AIR FILTER CHECK

Carry out this check every 8 working hours.

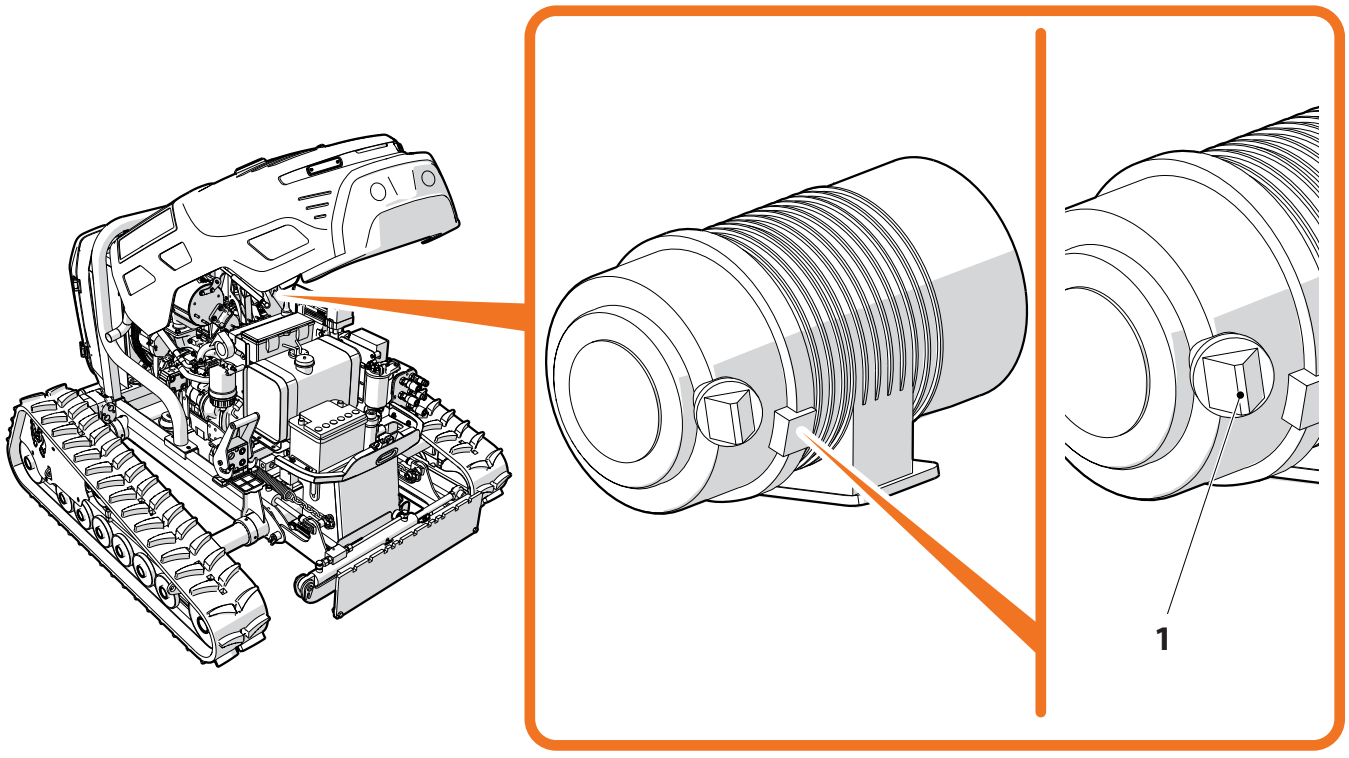
CAUTION

The operator must wear the following personal protective equipment:

- Safety footwear
- Gloves
- Protective clothing
- Safety goggles

Proceed as follows:

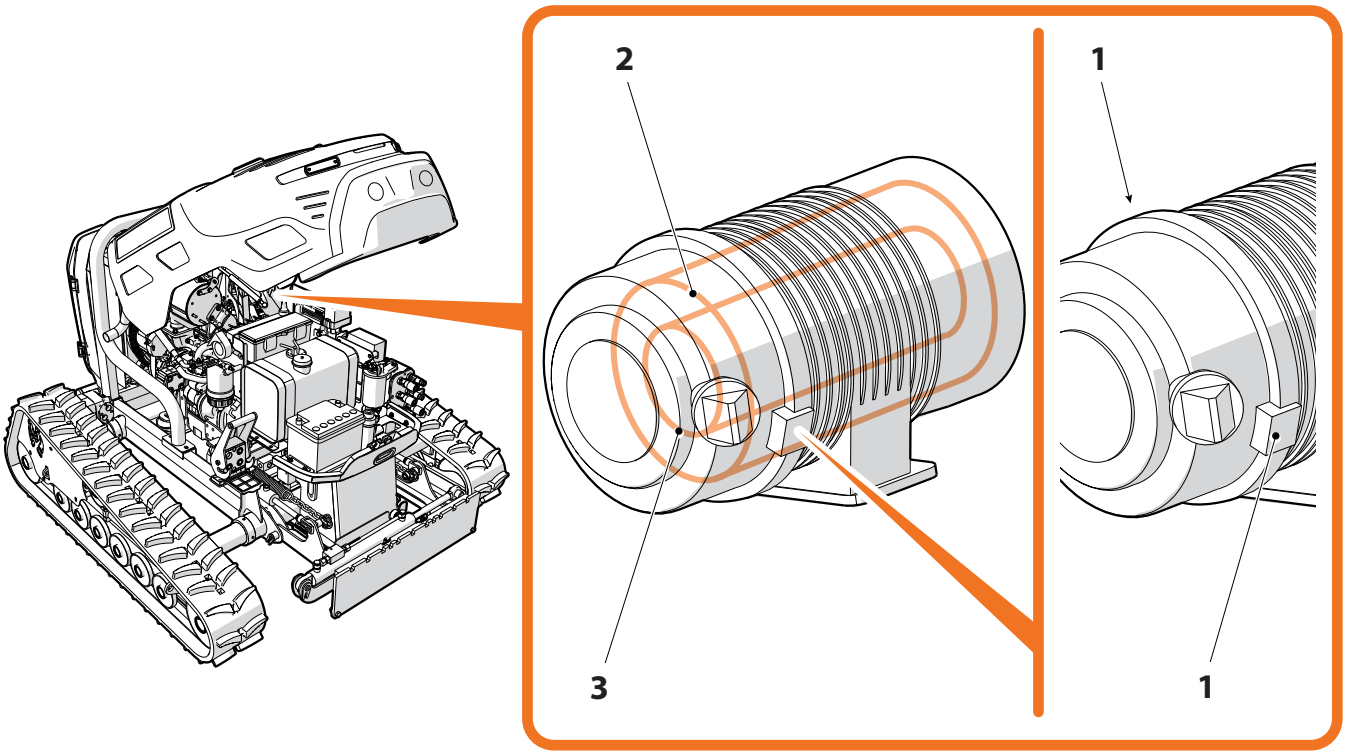
- Open the bonnet (see paragraph "6.1.1 Engine compartment bonnet").
- Place a container under the valve **1**.
- Manually press the edges of valve **1**.
  - If no dust and/or debris come out, it means that the filters are clean.
  - If dust and/or debris come out, it means that the filters are dirty.
- If the filters are dirty, clean them as described below.



6.4.14 CLEANING THE AIR FILTERS

Proceed as follows:

› Undo the clips **1**.
› Remove the outer filter **2** and the inner filter **3**.
› Move to an environment with a dust extraction system.
› Clean the external filter **2** and the internal filter **3** with compressed air.
› Direct the blast of compressed air from the inside the filters towards the outside.



6.4.15 REPLACING THE AIR FILTERS

Carry out the above replacement every 1000 hours of work.

NOTICE

This operation must only be carried out by MDB service centre technicians. For this reason, contact the MDB support service (see chapter 2).

6.4.16 HYDRAULIC OIL FILTER CHECK

Carry out this check every 160 working hours.

CAUTION

The operator must wear the following personal protective equipment:

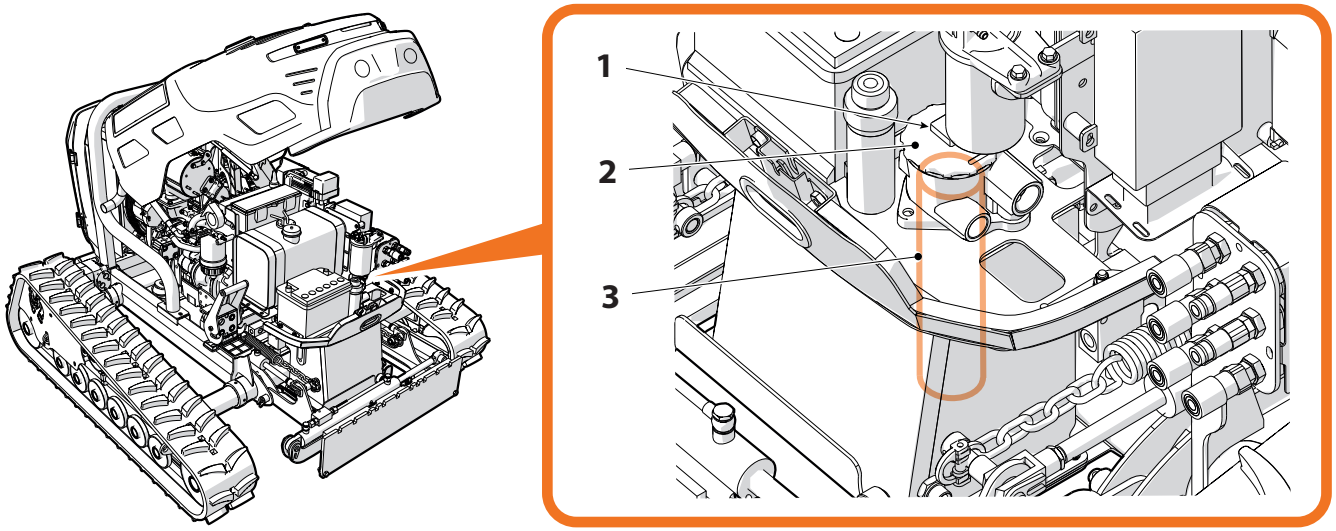
- Safety footwear
- Gloves
- Protective clothing
- Safety goggles

DANGER

This operation must only be carried out with the machine engine cold.

Proceed as follows:

- Open the bonnet (see paragraph "6.1.1 Engine compartment bonnet").
- Insert a hex key into the square sectioned block **1** on the cap **2**.
- Unscrew the cap **2** and remove it.
- Extract the filter **3**.
- Visually check the cleanness of the filter **3**.
- If the filter is dirty, clean it as described below.



6.4.17 REPLACING THE HYDRAULIC OIL FILTER

Carry out the above replacement every 1000 hours of work.

NOTICE

This operation must only be carried out by MDB service centre technicians. For this reason, contact the MDB support service (see chapter 2).

6.4.18 CHECK THE SEPARATOR FILTER

Carry out this check every 8 working hours.

WARNING

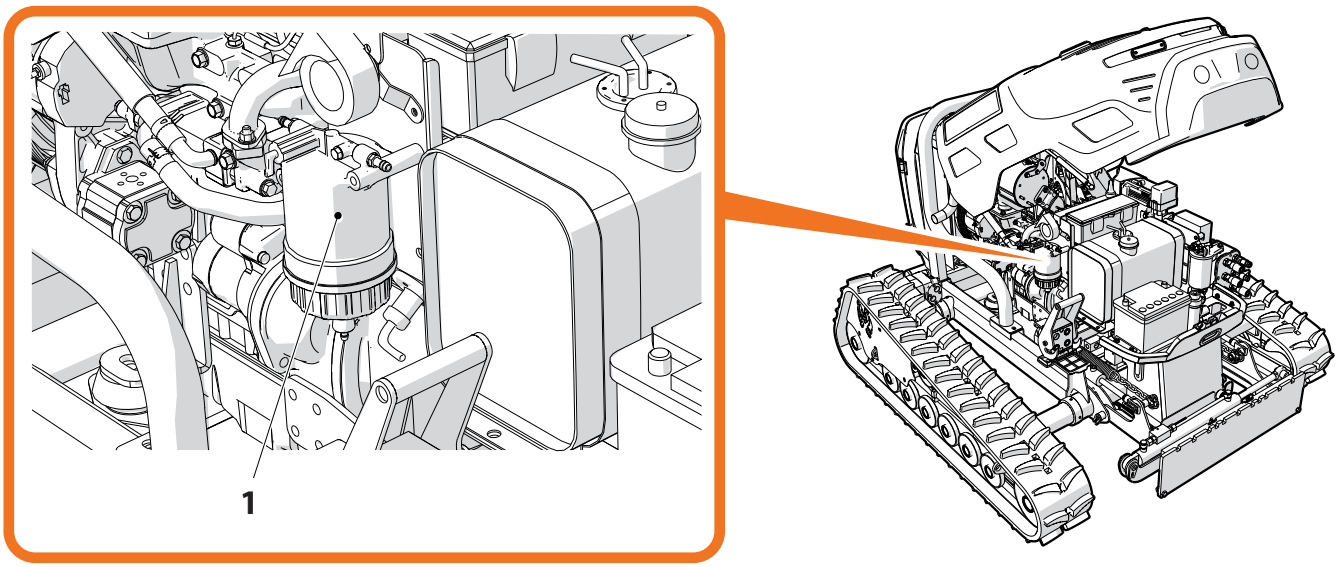
BURN HAZARD

The operator must wear the following personal protective equipment:

- Safety footwear
- Heat resistant gloves
- Protective clothing
- Safety goggles

Proceed as follows:

- Open the bonnet (see paragraph "6.1.1 Engine compartment bonnet").
- Identify the separator filter **1**.
- If the filter is dirty, clean it as described below.



6.4.19 CLEANING THE SEPARATOR FILTER

Proceed as follows:

- Clean the filter as shown in Annex B.

6.4.20 REPLACING THE SEPARATOR FILTER

Carry out the above replacement every 50 hours of work.

NOTICE

This operation must only be carried out by MDB service centre technicians. For this reason, contact the MDB support service (see chapter 2).

6.4.21 REPLACING THE FUEL FILTER

Carry out the above replacement every 250 hours of work.

NOTICE

This operation must only be carried out by MDB service centre technicians. For this reason, contact the MDB support service (see chapter 2).

WARNING

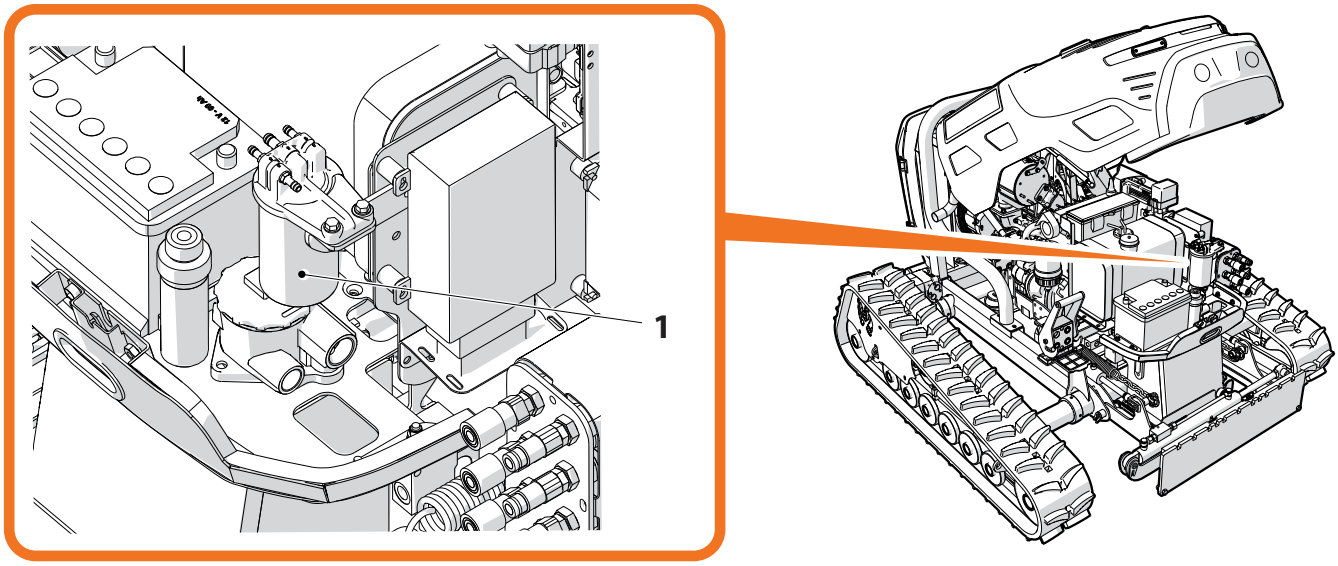
BURN HAZARD

The operator must wear the following personal protective equipment:

- Safety footwear
- Heat resistant gloves
- Protective clothing
- Safety goggles

Proceed as follows:

- Open the bonnet (see paragraph "6.1.1 Engine compartment bonnet").
- Locate the fuel filter **1**.
- Contact the MDB support centre.



6.4.22 CLEANING THE PARTICLE FILTER

Every 6000 hours of work, carry out the cleaning mentioned above.

WARNING

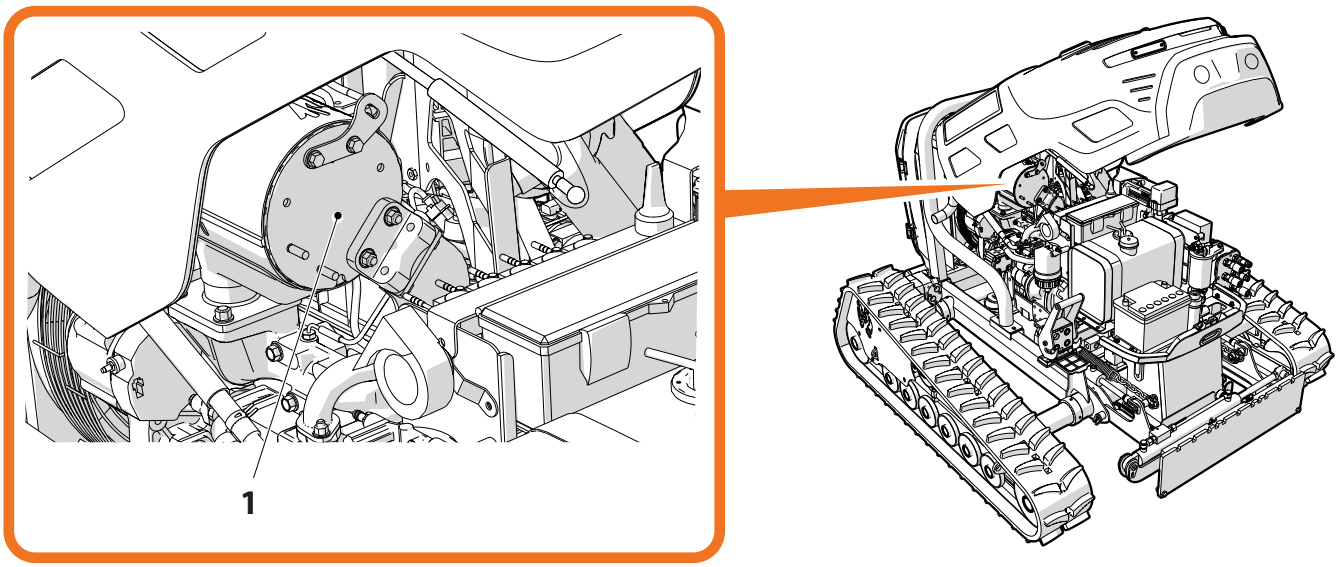
BURN HAZARD

The operator must wear the following personal protective equipment:

- Safety footwear
- Heat resistant gloves
- Protective clothing
- Safety goggles

Proceed as follows:

- Open the bonnet (see paragraph "6.1.1 Engine compartment bonnet").
- Locate the particle filter **1**.
- Then clean the particulate filter as indicated in annex B.



6.4.23 REPLACING THE PARTICULATE FILTER

Carry out the above replacement every 9,000 hours of work.

NOTICE

This operation must only be carried out by MDB service centre technicians. For this reason, contact the MDB support service (see chapter 2).

WARNING

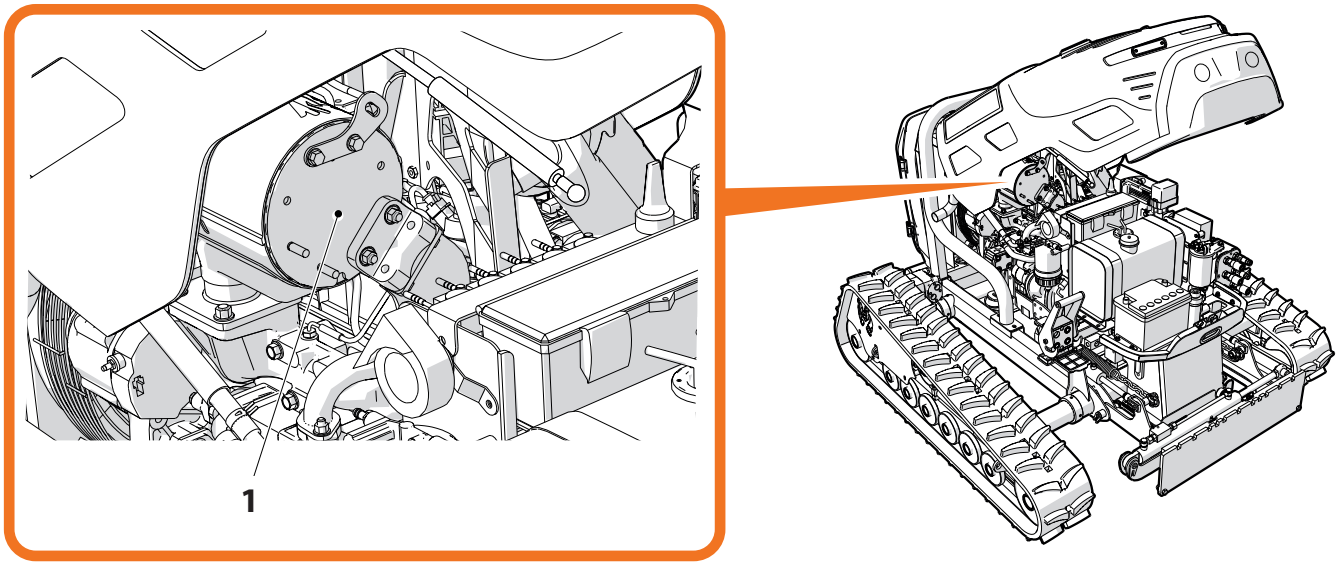
BURN HAZARD

The operator must wear the following personal protective equipment:

- Safety footwear
- Heat resistant gloves
- Protective clothing
- Safety goggles

Proceed as follows:

- Open the bonnet (see paragraph "6.1.1 Engine compartment bonnet").
- Locate the particulate filter **1**.
- Contact the MDB support centre.



6.4.24 TRACK CHECK AND TENSIONING

Carry out this check every 8 working hours.

CAUTION

The operator must wear the following personal protective equipment:

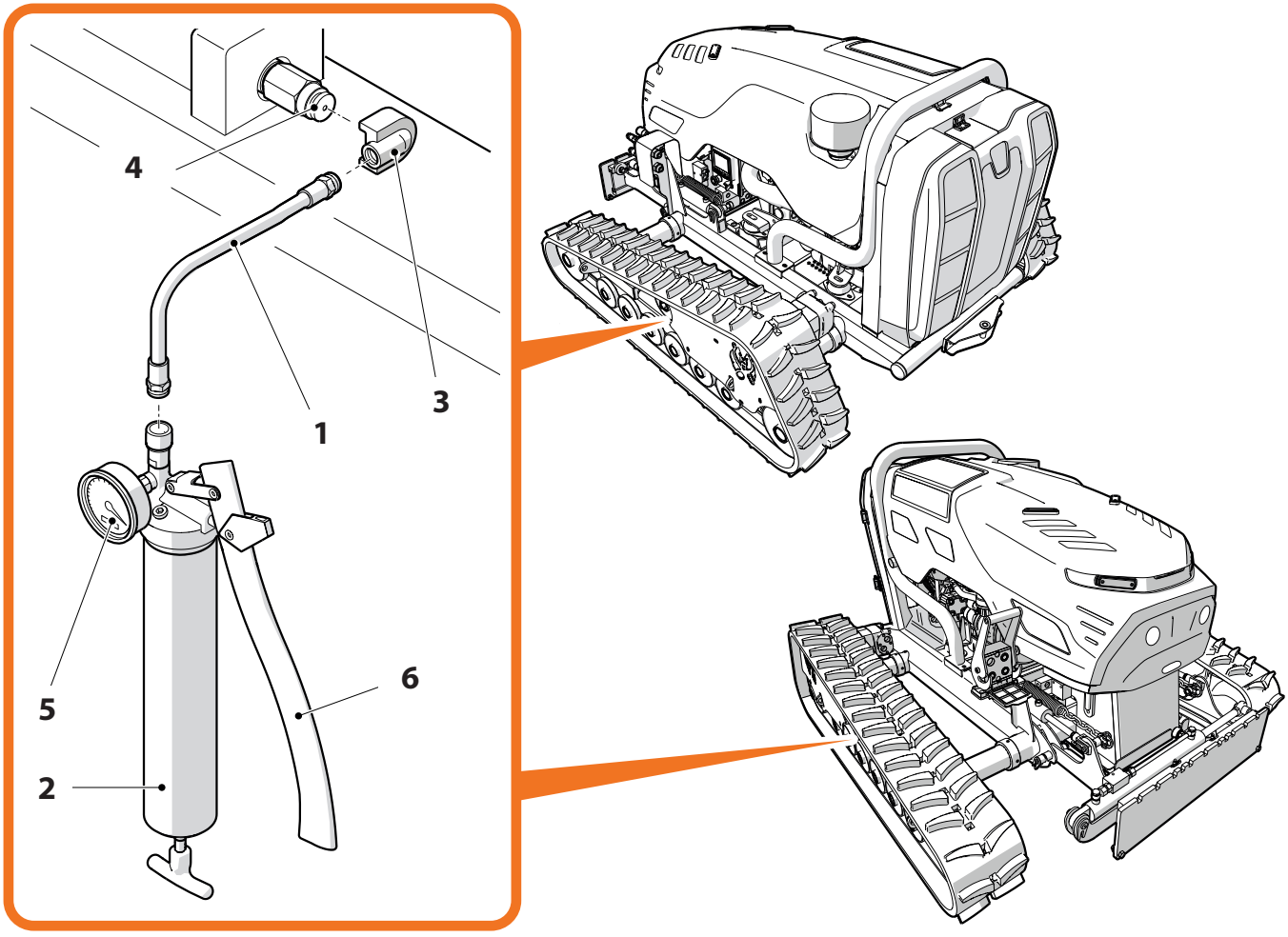
- Safety footwear
- Gloves
- Protective clothing

Proceed as follows:

- Connect the tube **1** to the pump **2**.
- Connect the fitting **3** to the tube **1**.
- Connect the fitting **3** to the grease nipple **4**.
- Check that the pressure gauge **5** displays a pressure of 180 bar.
- If the pressure is lower, operate the lever **6** of the pump **2**, until the pressure reaches 180 bar.
- Do the same on both tracks.

NOTICE

If there are cuts or damage on the tread of the tracks, replace them, as described in paragraph "6.5.1 Track replacement".



6.4.25 PERIODIC LUBRICATION

Lubricate the points indicated in the figure every 8 working hours.

CAUTION

The operator must wear the following personal protective equipment:

- Safety footwear
- Gloves
- Protective clothing

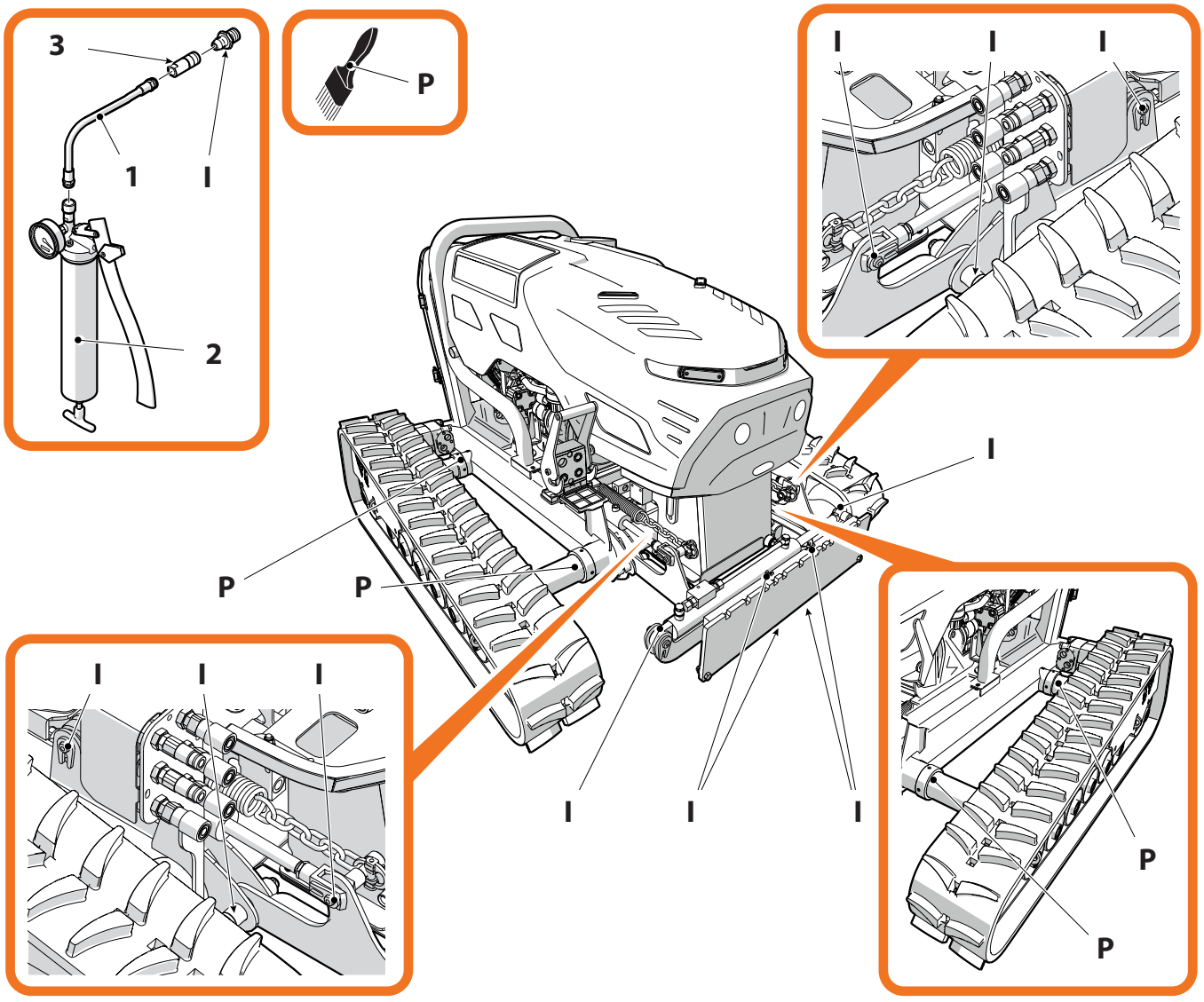
Proceed as follows:

- Connect the tube **1** to the pump **2**.
- Connect the fitting **3** to the tube **1**.
- Connect the fitting **3** to the relevant grease nipple **I**.

NOTICE

The zones indicated with P require manual lubrication.

See paragraph "3.3.4 Other technical specifications" for the type of product to use.



6.4.26 CHECKING TIGHTENING ELEMENTS

Carry out the following checks every 8 working hours.

- Check the tightness of all screws.
- Check the tightness of all nuts.
- Check all cotter pins.
- Check all O-rings.
- Check that all clevis pins are secured with a cotter pin.
- Check that all the clevis pins are secured with an O-ring.

6.4.27 CHECKING WORKING COMPONENTS

Carry out the following checks every 500 working hours.

- Check the state of wear and/or deformation of the tool carriage.

NOTICE

In the case of excessive wear and deformation, make with the necessary replacements.

These replacements must only be carried out by MDB service centre technicians. For this reason, contact the MDB support service (see chapter 2).

6.4.28 COOLING SYSTEM CHECK

Carry out the following checks every 8 working hours.

- Check that all tubes are in a good state of preservation.
- Check that there are no leaks in the system.

6.4.29 HYDRAULIC SYSTEM CHECK

Carry out the following checks every 8 working hours.

- Check that all tubes are in a good state of preservation.
- Check that there are no leaks in the system.

6.4.30 ELECTRICAL SYSTEM CHECK

Carry out this check every 8 working hours.

WARNING

Short circuits can cause fires.

Do not use the machine if it has loose, bent and/or damaged cables or wires.

Check in particular:

- The integrity of the electrical cables.
- The integrity of the conduits and protective sheaths on the electrical cables.
- The proper functioning of the emergency buttons (see chapter 3).
- The proper functioning of the switches and buttons on the control panel and remote control.
- The proper functioning of the remote control unit.

FUSE REPLACEMENT

The machine's fuses are located in three different areas **A**-**B**-C.

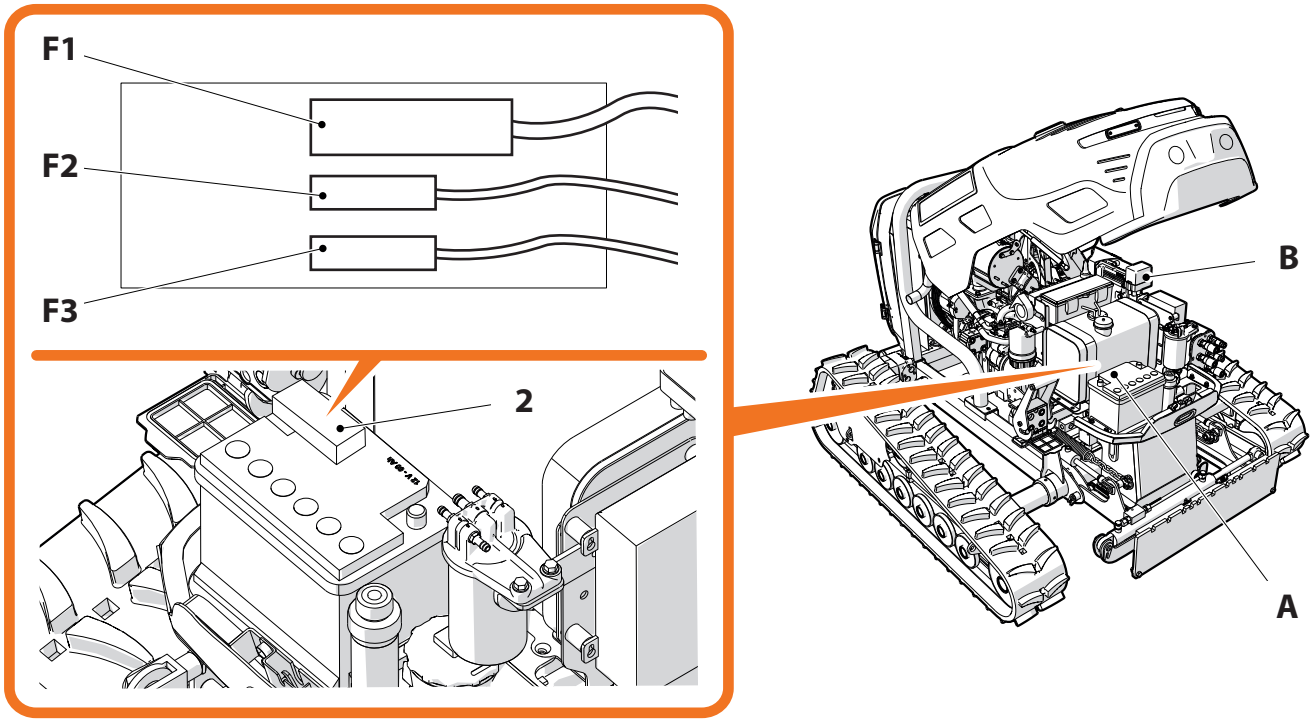
WARNING

Short circuits can cause fires.

Do not use the machine if it has loose, bent and/or damaged cables or wires.

For the fuses in zone **A** proceed as follows:

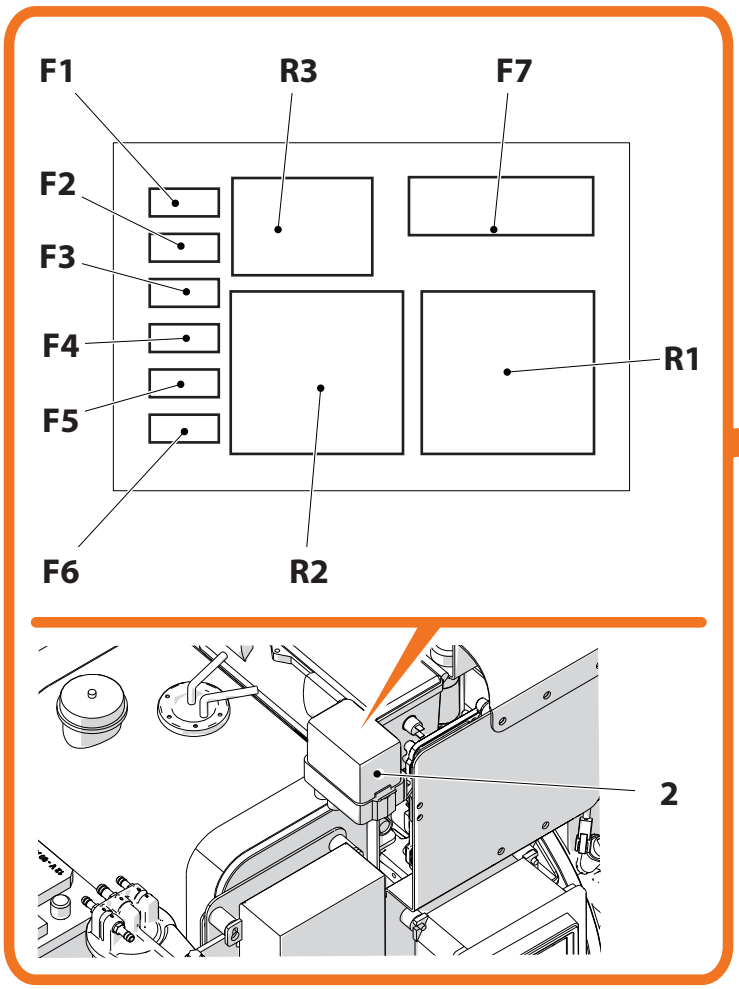
› Open the bonnet (see paragraph "6.1.1 Engine compartment bonnet").
› Remove the cover **2**.
› Identify the damaged fuse and replace it, using the replacement fuse kit.

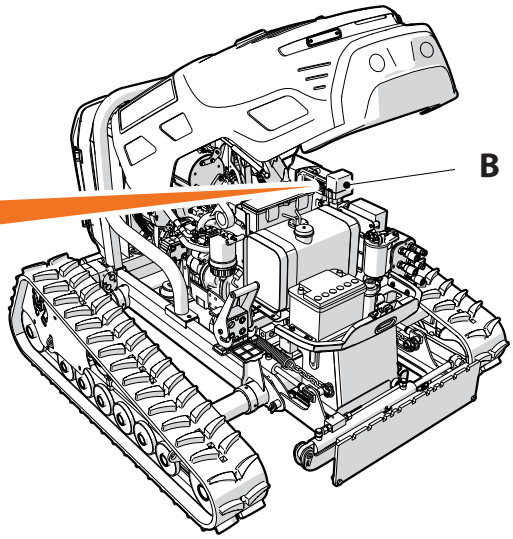


Fuse	Description	Amperage
F1	Machine power supply and start motor fuse (CAL2)	50 A
F2	Start motor relay fuse (Cable 52)	80 A
F3	Spark plug relay fuse (Cable 57)	60 A

For the fuses in zone **B** proceed as follows:

› Open the bonnet (see paragraph "6.1.1 Engine compartment bonnet").
› Remove the cover **2**.
› Identify the damaged fuse and replace it, using the replacement fuse kit.





Fuse	Description	Amperage
F1	Exhaust gas recirculation control relay power supply fuse	**20 A**
F2	Remote control battery charger fuse	**5 A**
F3	Working lights fuse	**5 A**
F4	Horn fuse	**5 A**
F5	Radiator cleaning fan fuse	**5 A**
F6	Position lights fuse	**5 A**
F7	Engine control unit power supply fuse	**20 A**
R1	Starter motor relay fuse	**50 A**
R2	Spark plug fuse	**50 A**
R3	Control panel fuse	**30 A**

6.5 UNSCHEDULED MAINTENANCE

NOTICE

Maintenance must only be carried out by a qualified and authorised person, referred to as the maintenance technician.

The maintenance technician must be sufficiently skilled and experienced to assess the condition of the machine and the effectiveness of personal protective equipment, based on technical norms.

Special maintenance must be carried out by specialised MDB technicians or authorised personnel.

6.5.1 TRACK REPLACEMENT

NOTICE

The tracks must be replaced when the tread thickness is between 5 mm and 6 mm.

They must be replaced, in any case, if cuts or damage are detected on the track tread.

Two maintenance technicians are required for this operation.

WARNING

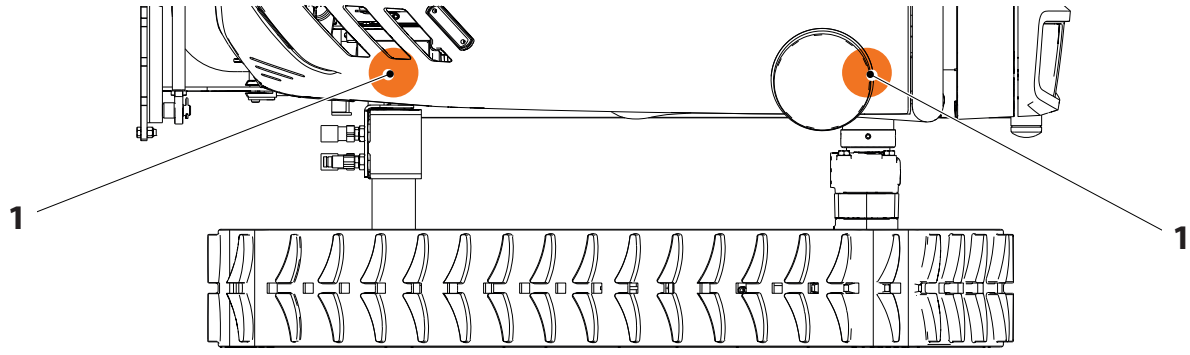
CRUSHING HAZARD

The operator must wear the following personal protective equipment:

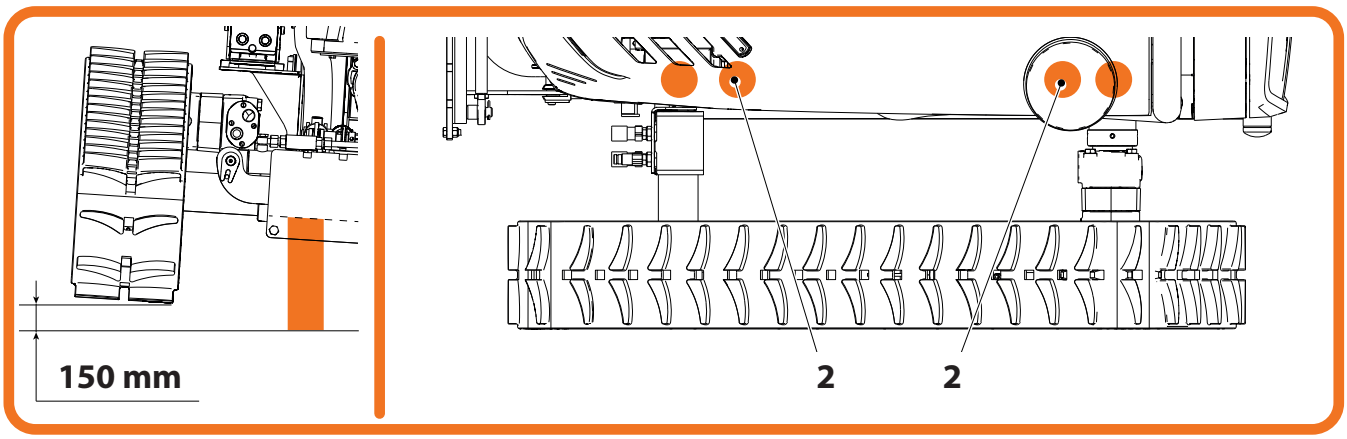
- Safety footwear
- Gloves
- Protective clothing

Proceed as follows:

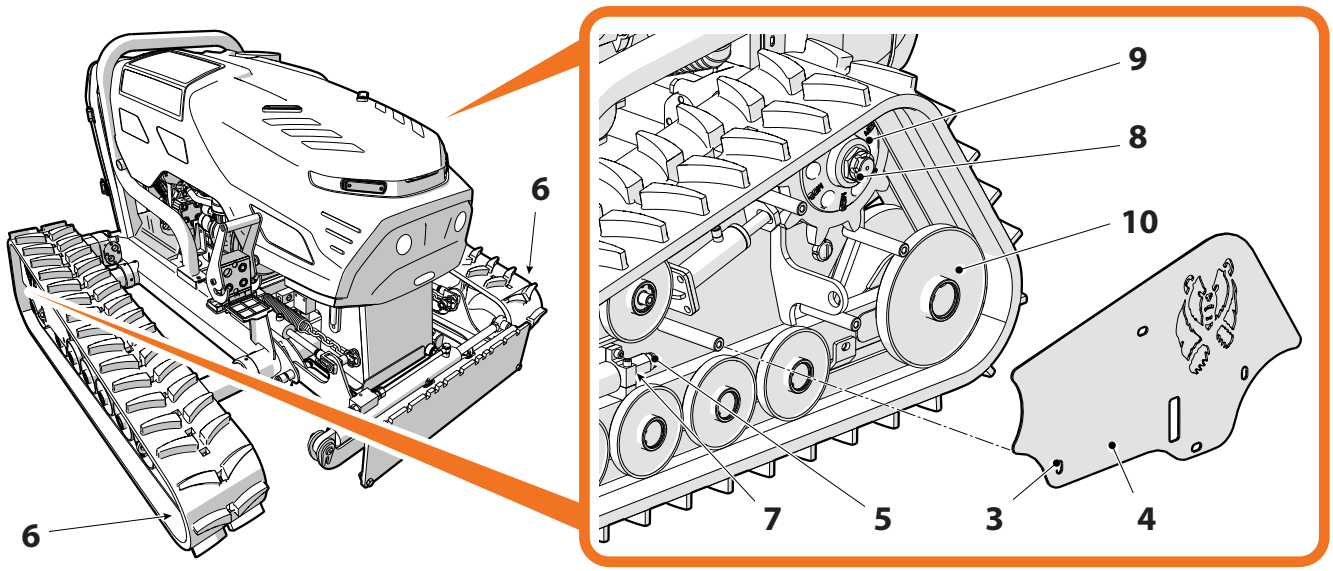
› Place the lifting jacks under the chassis in zones **1**.



› Lift the machine, leaving a gap of 150 mm between the track and the ground.
› Position the safety stands under the chassis in zones **2**.



› Undo the screws **3** and remove the casing 4.
› Unscrew the grease nipple **5**.
  › The front idle wheel **6** moves back.
  › The track loses tension.
  › Grease comes out from zone **7**. Remove the spilled grease with a cloth.
› Unscrew the bolt **8** and take out the drive wheel **9**, together with the track.
› Using a lever, extract the track from the seat on the front idle wheel **6**, on the rear idle wheel **10**, and then from the seat on the drive wheel **9**.
› Replace the worn track with a new one.
› Do the same on both tracks.



CAUTION **During reassembly, tighten the nut 8 with a torque wrench to 500 N/m.**

NOTICE **Once the track is replaced, proceed with tensioning, as described in paragraph "6.4.24 Track check and tensioning".**

6.6 PERIODIC CHECK AND INSPECTION LOG

Date	Hours of service	Work description	Person in charge	Stamp and signature

Date	Hours of service	Work description	Person in charge	Stamp and signature

7 TROUBLESHOOTING

7.1 TROUBLESHOOTING GUIDE

The following paragraphs list possible faults or anomalies and identify a correct solution to quickly resolve the problem.

NOTICE

In the event that the problem or its cause is not covered by the cases indicated, contact the authorised MDB dealer.

For the resolution of some problems, see chapter 6.

7.1.1 REMOTE CONTROL

Problem	Cause	Solution
The remote control does not work	The battery disconnector key is in the OFF position	Turn the battery disconnector key 5 to ON
	Low battery	Charge the battery
	The machine control panel is switched off	Switch on the machine control panel
	No remote control connection	Connect the remote control with the control unit
	Emergency button pressed	Reset the emergency button
	The remote control has a different serial number than the control unit	Use a remote control with the same serial number as the control unit
The remote control does not work (Operation LED flashing or off)	No radio signal	Check the remote control connection with the control unit
	Interference from other radio signals	Using the wired remote control
The remote control does not work (Battery LED off)	Damaged fuse	Replace the fuse
	Low battery	Charge the battery
The remote control does not work (Battery LED flashes intermittently)	Auxiliary control activated [used for optional tools (if present)]	Disable the auxiliary control [used for optional tools (if present)]
On-board remote control battery does not charge	Battery charger cables disconnected	Connect the charger cables

7.1.2 ENGINE

Problem	Cause	Solution
The machine does not turn on	Emergency button pressed	Reset the emergency button
	Ignition key not inserted or disconnected	Insert and connect ignition key
	No fuel	Fill the tank
	Damaged fuse	Replace the fuse
The engine starts but the machine does not move	Brakes locked / hydraulic oil cold	Move forward and backward repeatedly until the brakes release
	Pump or engine problem	Contact the authorised MDB dealer
	Speed control knob on remote control turned to zero	Turn the speed control knob to the desired speed
	Insufficient hydraulic oil	Top up the hydraulic oil to the right level
	Clogged fuel filter and pre-filter	Replace the fuel filter and pre-filter
The machine starts but does not move in a straight line	Direction control knob not centrally positioned	Turn the direction control knob to a central position
	Dirty or damaged pump solenoid valve	Contact the authorised MDB dealer
	Damaged pump or hydraulic motor	Contact the authorised MDB dealer
	Damaged fuse	Contact the authorised MDB dealer
The engine starts but the machine does not move (Indicator light on remote control off)	No remote control connection	Connect the remote control with the control unit
The engine shuts down	Kill switch fault	Contact the authorised MDB dealer
	No fuel	Fill the tank
	Emergency button pressed	Reset the emergency button
	The engine oil is below minimum level (indicator light on steady)	Restore the oil level in the engine
	Engine temperature too high (the indicator light shows that the engine temperature is above the maximum level)	Check coolant level and clean radiator
	No radio signal	Connect the remote control with the control unit

7.1.3 TRACKS

Problem	Cause	Solution
Detached track	Excessive track wear	Replace the track
	Track mechanical structure damage	
	Insufficient track tension	Tension the track
Track slow	Worn track rubber	Tension the track
	Insufficient track tension	
	Damage to the track tensioning system	Contact the authorised MDB dealer

7.1.4 AUDIBLE SIGNAL DEVICE

Problem	Cause	Solution
Intermittent signal while moving	Fuel low	Refill the tank
	Alternator problems	Contact the authorised MDB dealer
	Scheduled maintenance due	Carry out maintenance
Intermittent signal and the machine shuts down	Oil level low	Do not use the machine until the cause of the problem is resolved in order to avoid major damage. Contact the authorised MDB dealer
	High engine temperature	

7.1.5 INDICATOR LIGHTS

Problem	Cause	Solution
Battery voltage indicator light on	Battery voltage level is low	Recharge the battery or replace it if necessary
Air filter indicator light on	The air filter is clogged	Clean the air filter or replace it if necessary

7.1.6 MOVEMENT DEVICES

Problem	Cause	Solution
The machine moves but the tool carriage does not move	Auxiliary pump and/or distributor damaged and/or defective	Contact the authorised MDB dealer
The machine does not move but the tool carriage moves	Remote control speed regulator set to minimum	Turn the remote control speed regulator to maximum.
	Defective remote control	Contact the authorised MDB dealer
	Defective traction pump	Contact the authorised MDB dealer
	Track motor brakes defective	Contact the authorised MDB dealer
The machine is started and in motion, but the tool carriage moves	Low hydraulic oil level	Check for leaks and top up the hydraulic oil
	Remote control and machine control unit disconnected.	Check the connection between the remote control and the machine control unit and connect using the appropriate button

8 DISMANTLING

CAUTION

The work on the machine must be carried out by competent personnel trained in the correct intervention and handling methods.

8.1 TEMPORARY DECOMMISSIONING

In the event that the machine will not be used for an extensive period, it must be made inoperative and stored in a special environment, as follows.

- Store the machine in a dry, clean, frost-protected and well-ventilated environment.
- Carefully clean the machine with compressed air and soft fabric or microfibre cloths to completely remove any dust, moisture and processing residues.
- Check the hydraulic oil level. Top up the oil if necessary.
- Apply a thin layer of oil or grease to all uncoated moving parts.
- Disable the battery by turning the "battery disconnector" key to OFF.
- Deactivate the battery by disconnecting the cables.
- Treat all exposed electrical contacts with a suitable protective spray.
- Cover the machine to protect it from dust; do not use plastic sheets as they can cause condensation; use sheets made from vapour-permeable material.

8.2 PERMANENT DECOMMISSIONING - DISMANTLING

At the end of the machine's production life, dismantle it as follows.

NOTICE

Dispose of any chemicals, lubricants and used hydraulic oils, in compliance with the regulations in force in the country of use of the machine.

Dispose of the machine in such a way as to allow the recycling of the different materials, in compliance with the regulations in force in the country of use of the machine.

CAUTION

The machine contains potentially flammable liquids, such as fuel, hydraulic oil and battery acid.

- Empty the fuel tank completely.
- Completely drain the hydraulic oil tank and system circuit.
- Drain all the coolant from the radiator.
- Disassemble all the components, taking care to separate the different materials: steel, non-ferrous metals, fibreglass, plastic, rubber, etc.
- Dispose of fluids and solid materials with respect for the environment, consigning all the materials to specialised waste facilities.

NOTICE

If the disposal is carried out by a specialised company, this manual must be kept with the machine.