

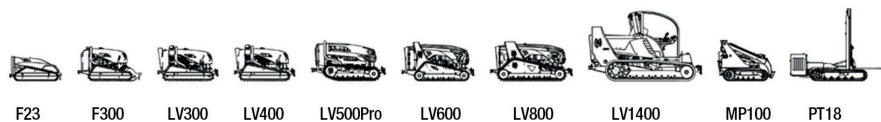
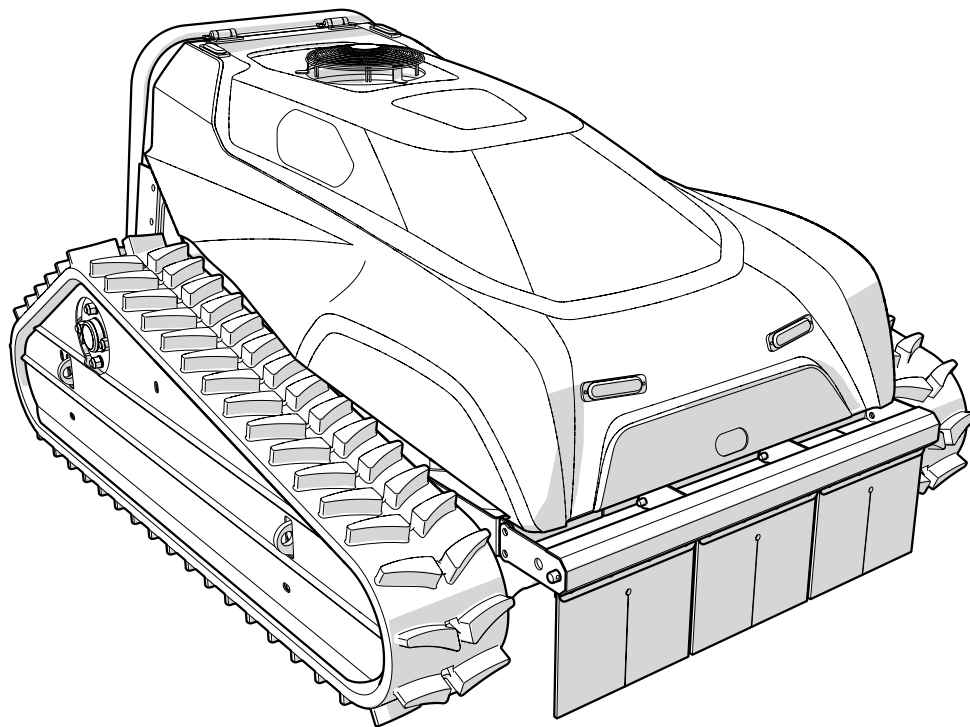


**ENGLISH**  
*Original instructions*

# USE AND MAINTENANCE MANUAL

## F23

MDB003AEN



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

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

	
<b>MADE IN ITALY - <a href="http://www.mdb srl.com">www.mdb srl.com</a></b>	
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<input type="text"/> <b>Designazione:</b> <input type="text"/>	
<b>Modello:</b> <input type="text"/>	<b>Anno:</b> <input type="text"/>
<b>Potenza:</b> <input type="text"/>	<b>Matricola:</b> <input type="text"/>
<b>Portata:</b> <input type="text"/>	<b>Peso:</b> <input type="text"/>
Conforme alle Direttive comunitarie CEE/2006/42/CE e successive implementazioni In conformity with ECC rules 2006/42/CE and subsequent implementation	
	

## 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.

**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.**

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**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.**







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# 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 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 contained in this chapter is intended to illustrate the main safety procedures to be adopted when using and operating 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.

**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



#### **DANGER**

Handle fuel with extreme care because it is highly flammable. In the event of combustion, explosions and fires can occur, with 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 oil and hydraulic oil reach high temperatures.
- › The hydraulic oil system pipes contain hot oil, which can cause scalding in the event of accidental skin contact.



#### **WARNING**

To avoid scalding by hot liquids, refrain from carrying out work on the machine until all hot parts 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

 **DANGER**



**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

 **DANGER**



**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 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
- › 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

### 1.1.18 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, filters and electrolyte liquid.**

- › Potentially toxic waste used in the machine includes oil, fuel, 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.**

#### 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.





<p><b>MOVE STRAIGHT BACK</b>                  Rotate both fists vertically indicating the direction of rotation of the wheels/tracks.</p>	
<p><b>DISTANCE TO BE COVERED</b>                  With your hands raised and facing inwards, move your hands laterally to indicate the distance to be covered.</p>	
<p><b>PERFORM THE MOVEMENTS SLOWLY</b>                  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).</p>	
<p><b>STOP</b>                  Stretch out your arm to the side, open your hand facing downwards and move your arm forward and back.</p>	
<p><b>EMERGENCY STOP</b>                  With both arms extended horizontally, open your hands facing down and move both arms back and forth.</p>	





STOP THE ENGINE  
Pass your thumb or forefinger over your throat.





***MDB***



***SINCE 1977***



## 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.mdbssl.com
Email	info@mdbssl.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 -20°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

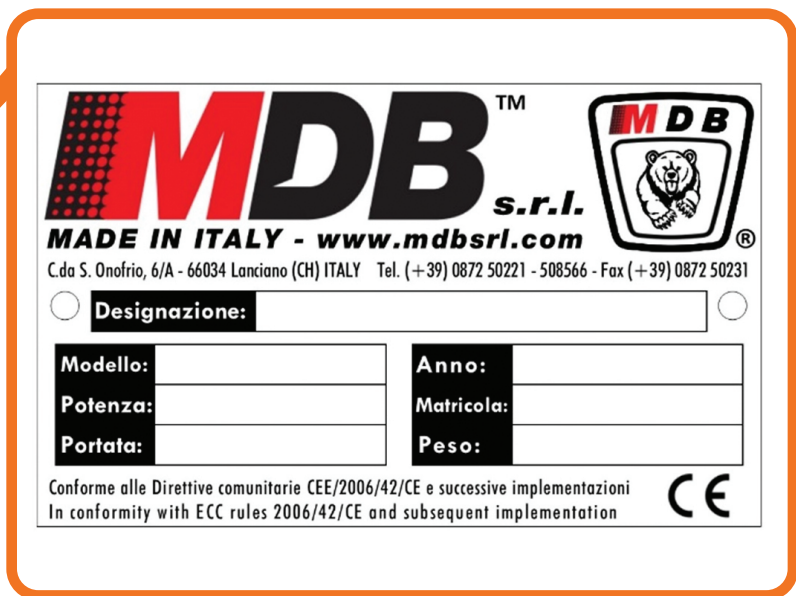
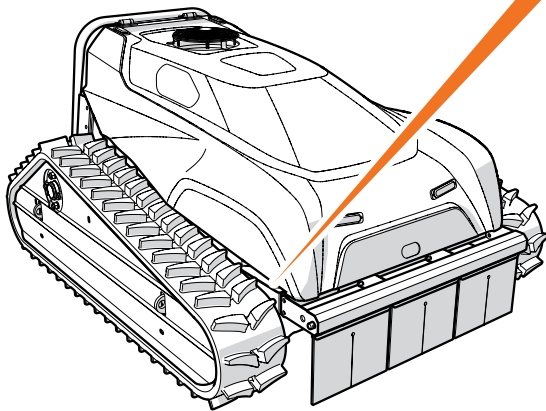
The nameplate is affixed to the machine in the area shown in the figure.

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.

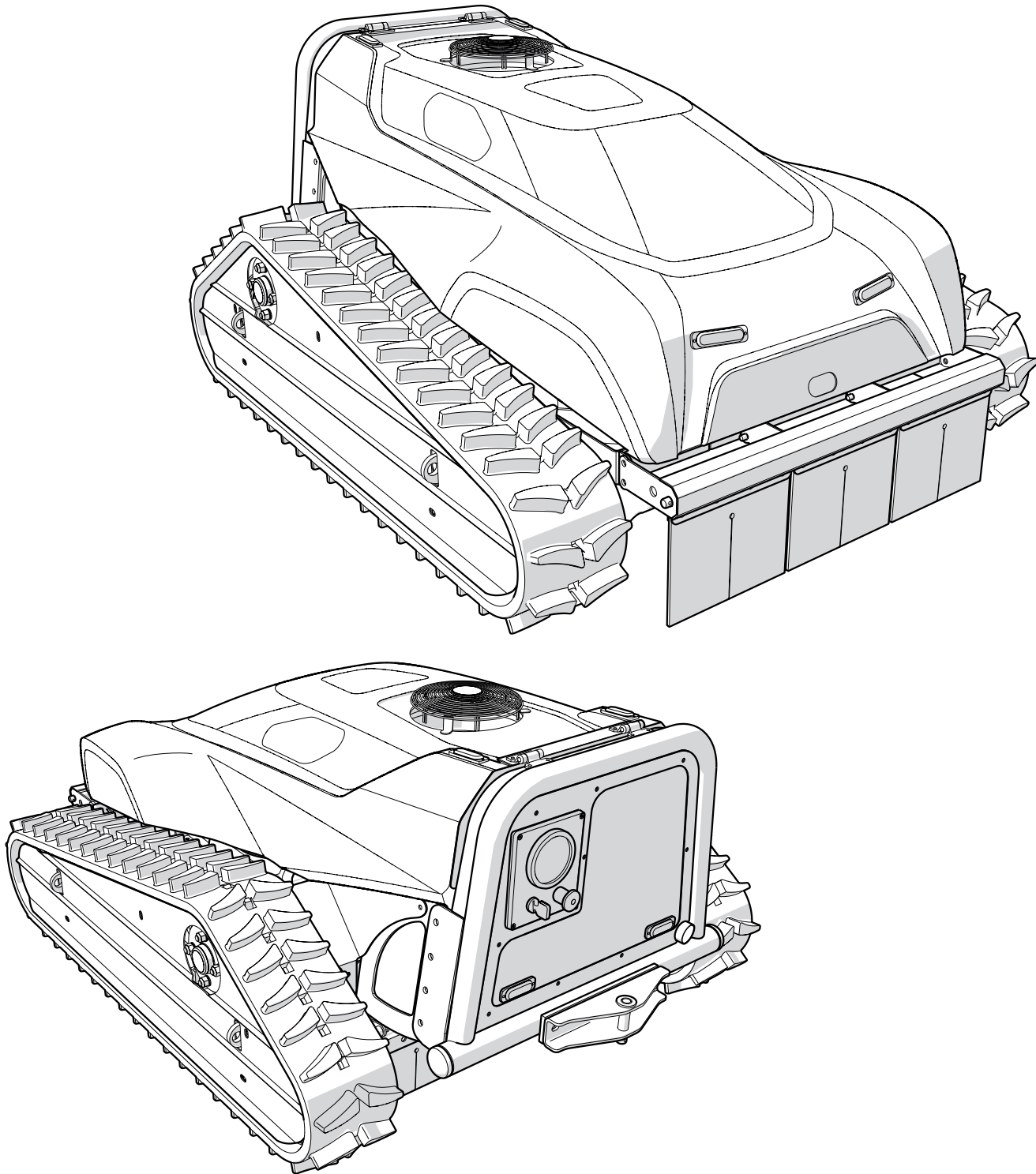


### 3.2 DESCRIPTION

The machine is designed for cutting plants with the characteristics indicated in paragraph "3.9 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".

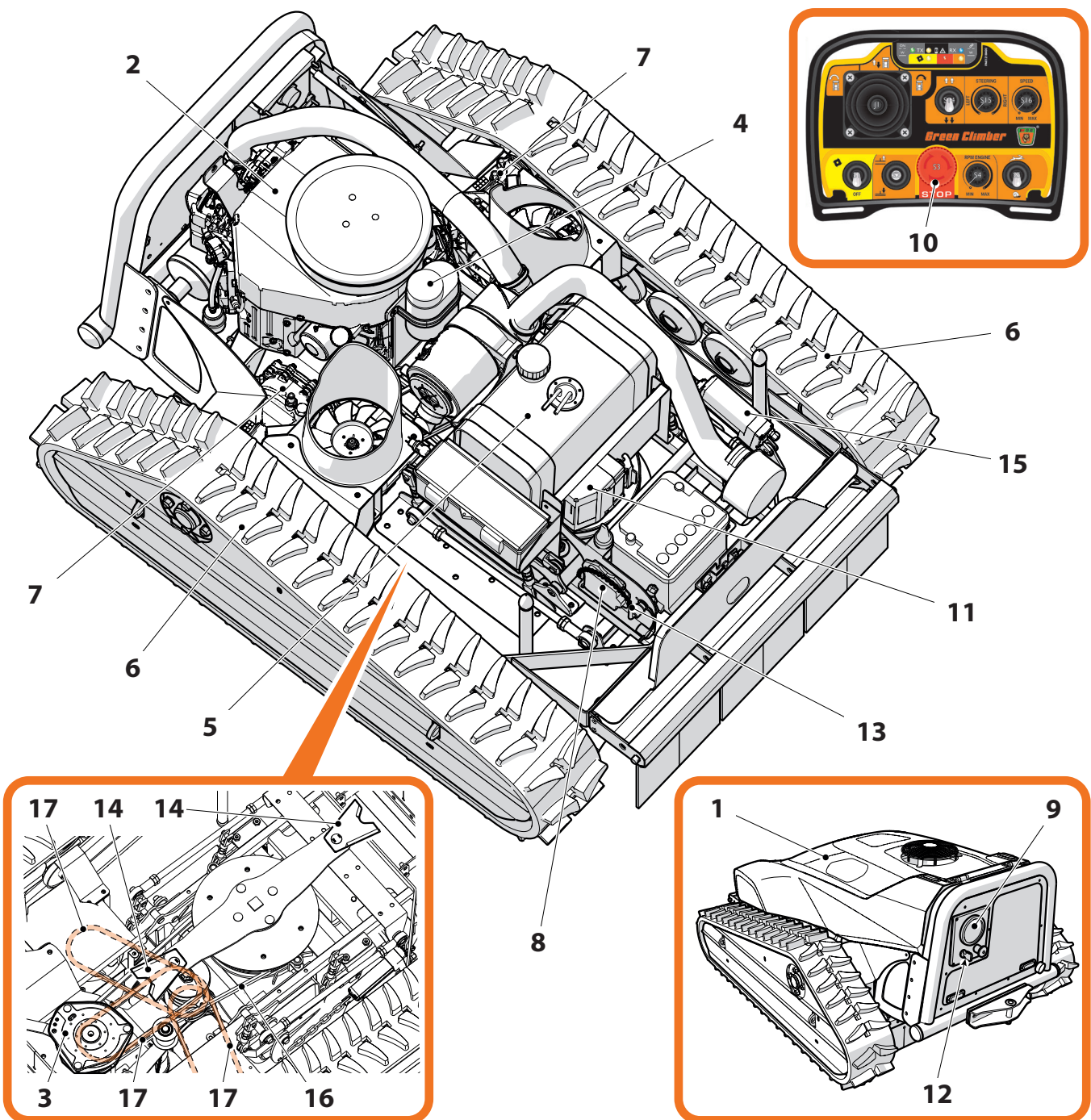






### 3.2.1 LIST OF UNITS

- 1 Bonnet
- 2 Engine
- 3 Clutch
- 4 Hydraulic oil tank
- 5 Fuel tank
- 6 Tracks
- 7 Track traction hydraulic units
- 8 Hydraulic unit control unit
- 9 Control panel
- 10 Radio control (transmitter)
- 11 Control unit (receiver)
- 12 Ignition key switch
- 13 "Battery disconnecter" key
- 14 Blades
- 15 Blade height adjustment cylinder
- 16 Blade drive belt
- 17 Hydraulic unit drive belts

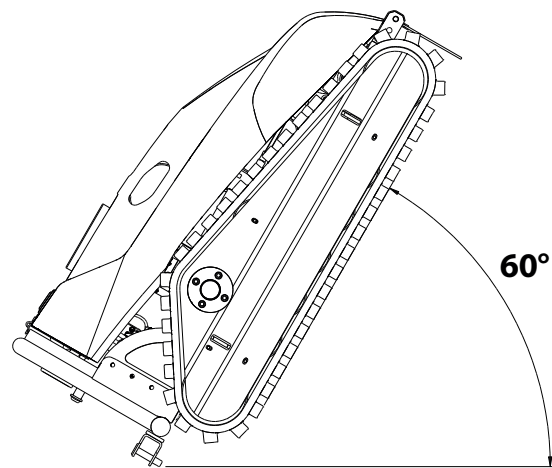
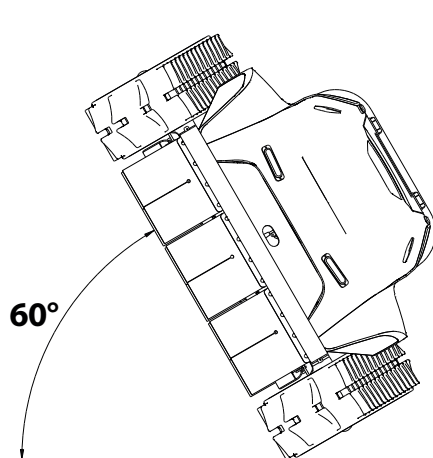
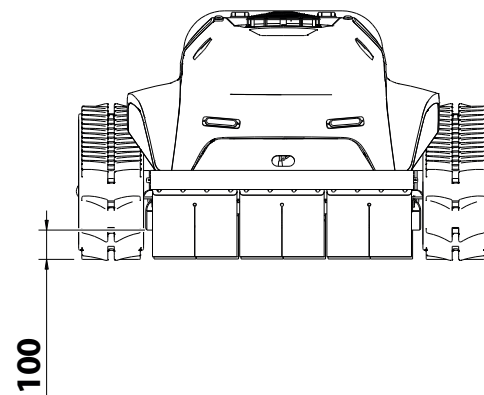
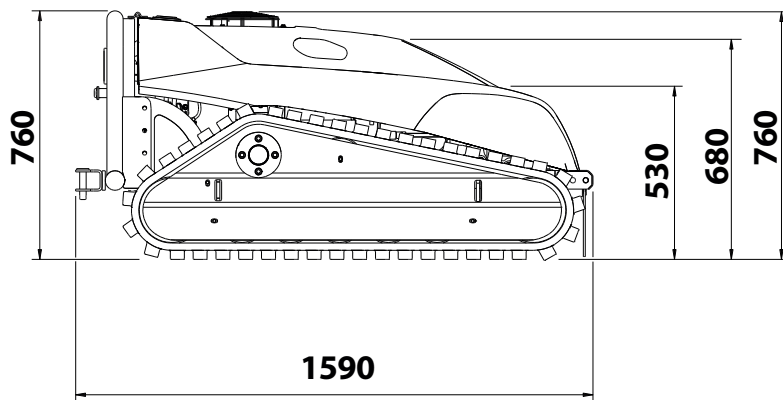
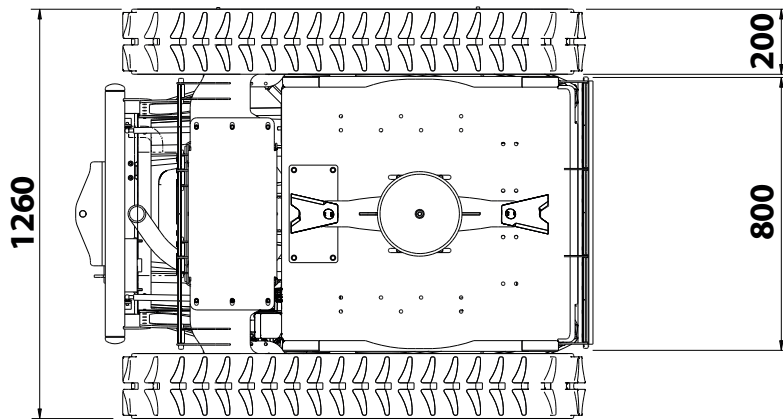




### 3.3 TECHNICAL SPECIFICATIONS

#### 3.3.1 DIMENSIONS

The dimensions of the machine are shown in the figure.





### 3.3.2 WEIGHT

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

### 3.3.3 OTHER TECHNICAL SPECIFICATIONS

Maximum speed	10 Km/h
Rpm	For this information see Annex B
Fuel tank capacity	21 l
Hydraulic oil tank capacity	1.2 l
Engine oil tank capacity	For this information see Annex B
Fuel type	For this information see Annex B
Hydraulic oil type	20W50 (ACEA A3/B3)
Engine oil type	10W40 (ACEA E4/E6/E7)
Type of grease for periodic lubrication	MU EP 2
Type of spark plug	For this information see Annex B
Battery	12 Volt - 44 Ah
Maximum permitted working slope	60°
Cutting width	800 mm
Cutting height	3 cm - 12 cm

### 3.3.4 ENGINE SPECIFICATIONS

For this information see Annex B



### 3.4 WORK AREA

The work area **A** where the machine operates must be cordoned off by appropriate signalling devices before the start of the work.

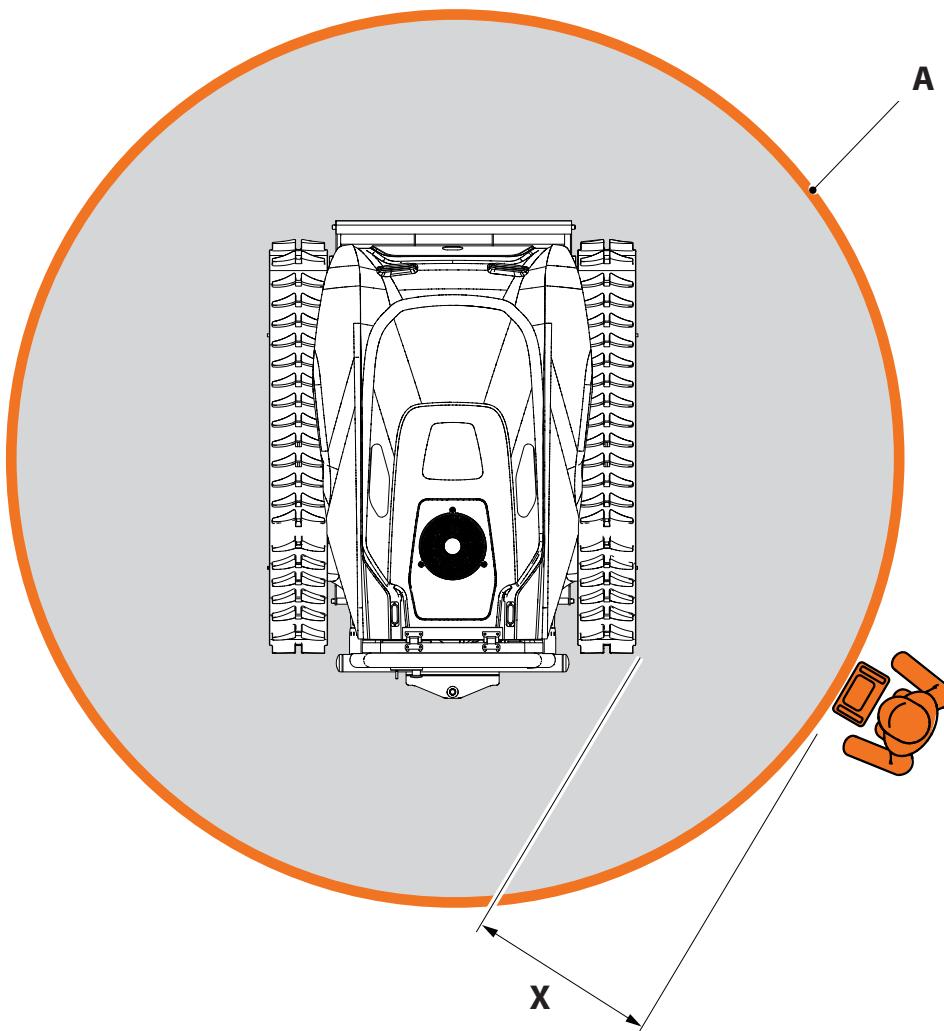


## WARNING

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

#### 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.



## DANGER



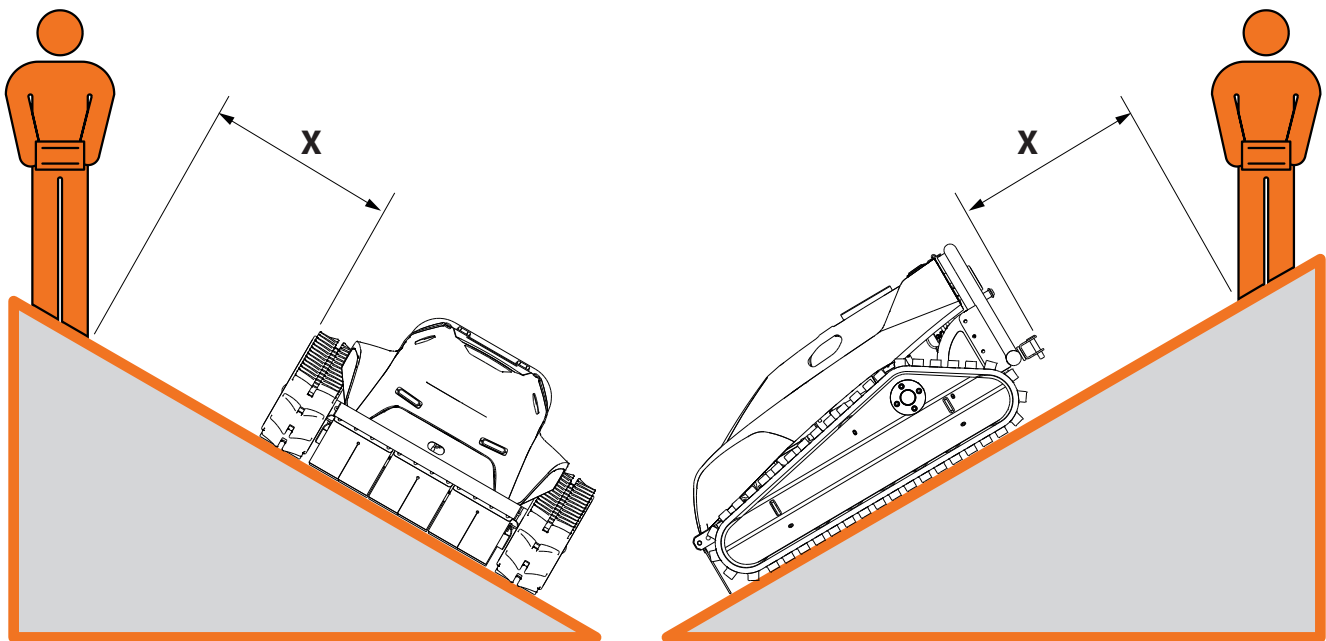
The front and rear side of the machine pose thrown-object hazards due to the rotation of the blades. For this reason, the operator must always be positioned as shown in the figure.

Wear the required personal protective equipment, as indicated in “3.12 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.

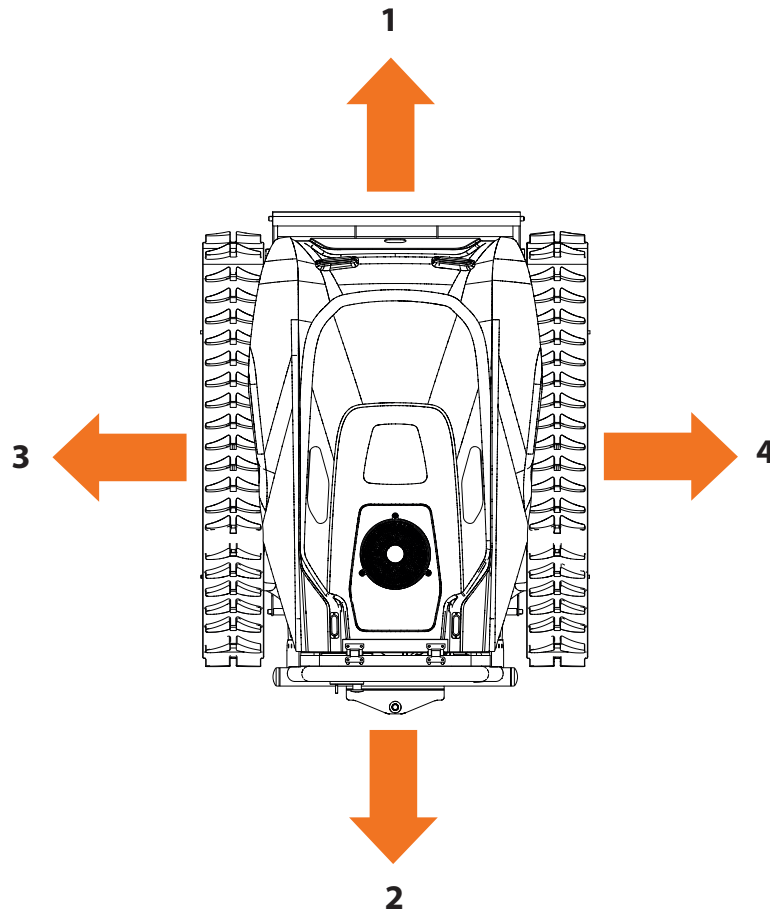
**! DANGER**

Never go beyond the maximum permitted working slope, as indicated in paragraph "3.3.3 Other 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 the permissible cutting limits, as indicated in paragraph "3.3.3 Other technical specifications".
- › Avoid operating the machine at high speed (see chapter 5).

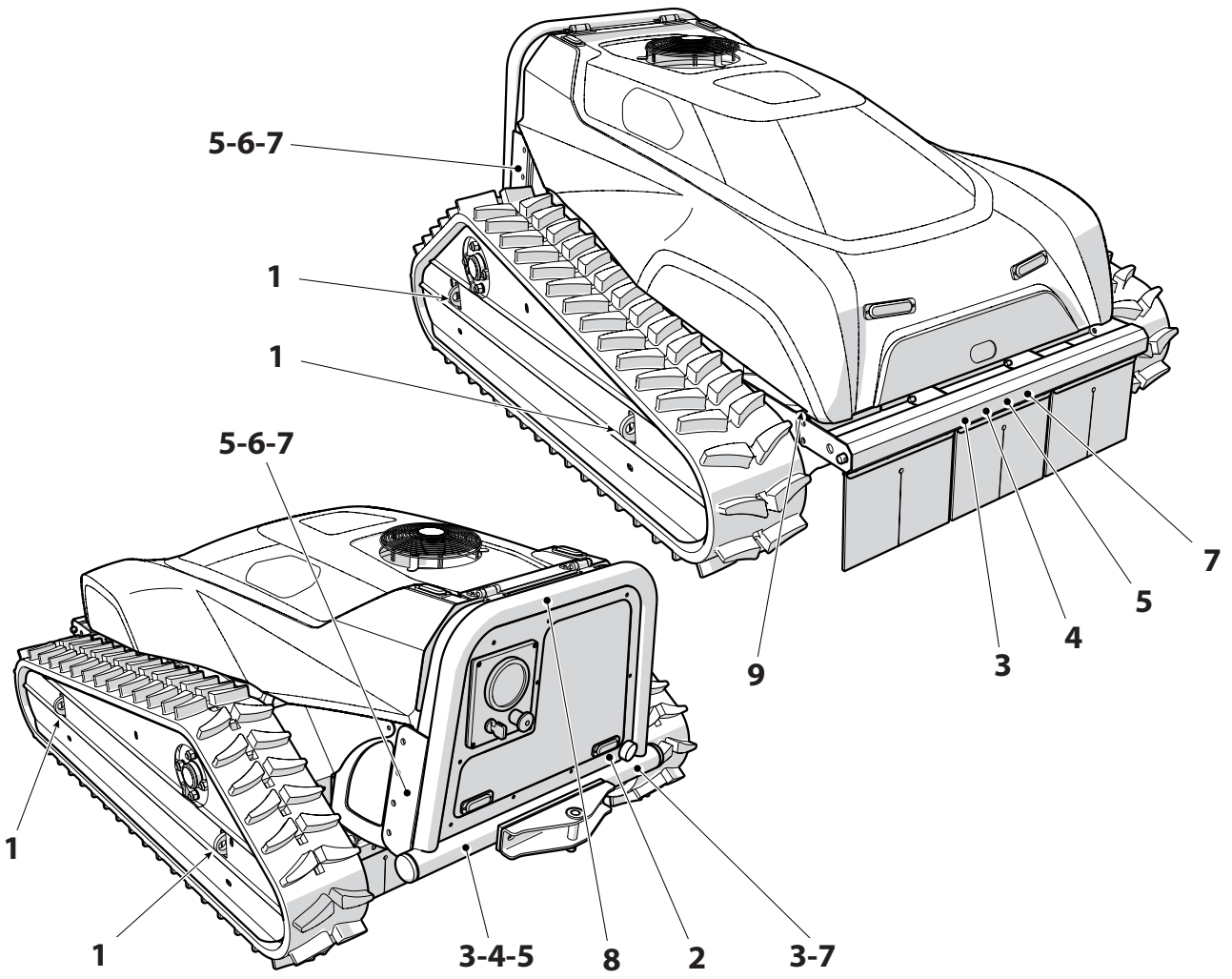
#### NOTICE

**For all other information see Annex B**



3.6 SAFETY SIGNS

1 	2 	3 	4 
5 	6 	7 	
8 			9 

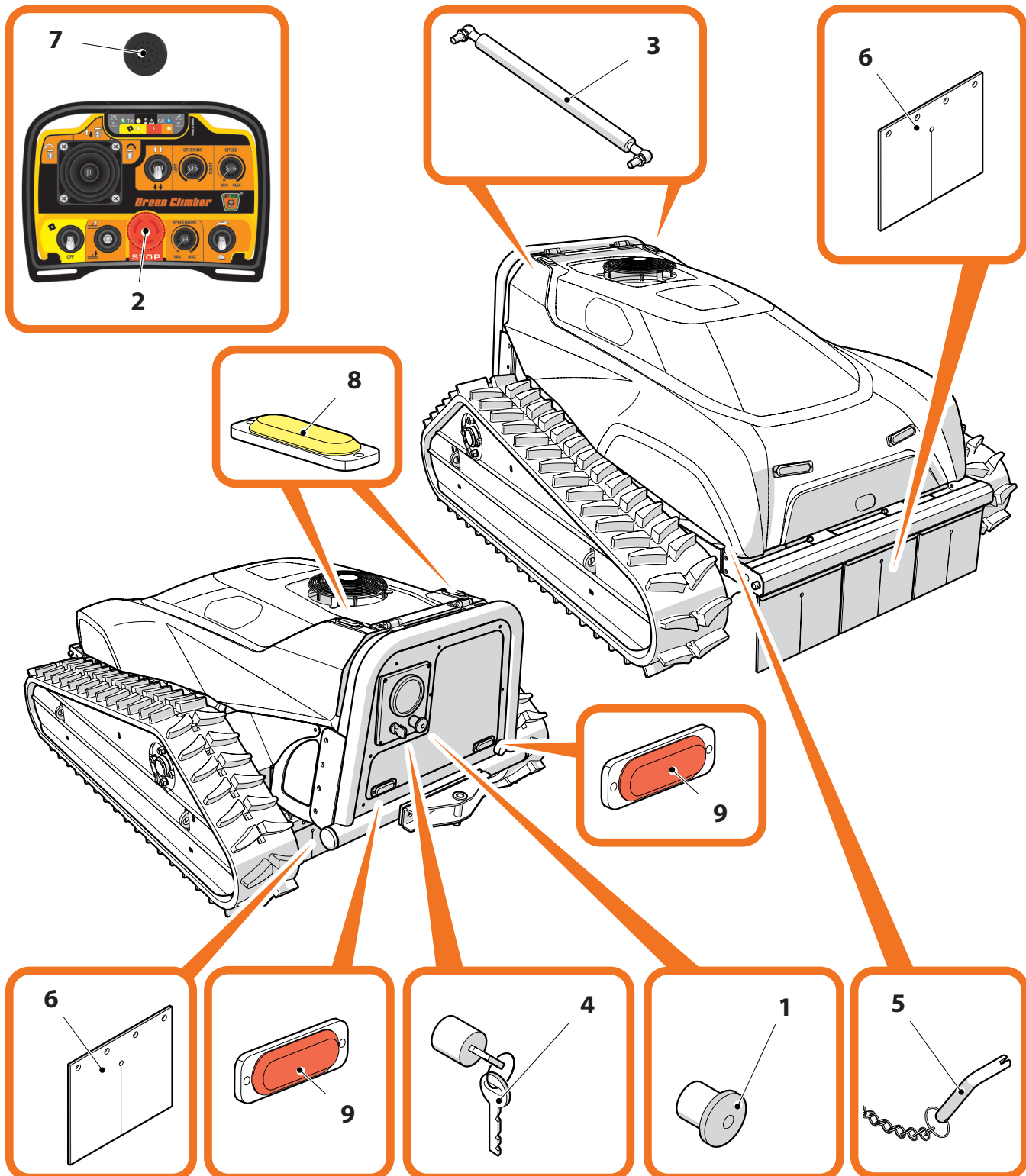






**3.7 SAFETY DEVICES**

- |   |  |   |                          |
|---|--|---|--------------------------|
| 1 | Control panel emergency button                         | 6 | Blade guard              |
| 2 | Remote control emergency button                        | 7 | Audible warning device   |
| 3 | Gas spring (bonnet maintenance position safety device) | 8 | Yellow lights (flashing) |
| 4 | Ignition key switch                                    | 9 | Red lights (steady)      |
| 5 | "Battery disconnecter" key                             |   |                          |







### 3.8 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 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.

#### 3.8.1 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 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".



### 3.8.2 MAINTENANCE TECHNICIAN

The maintenance technician 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 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.

### 3.9 PERMITTED USES

The machine is designed for cutting grass in gardens and landscaped areas.

The machine must only be used in a ventilated environment.

### 3.10 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.

### 3.11 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: **79.23 dB(A)**

Sound power level: **99.26 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.**



### 3.12 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.



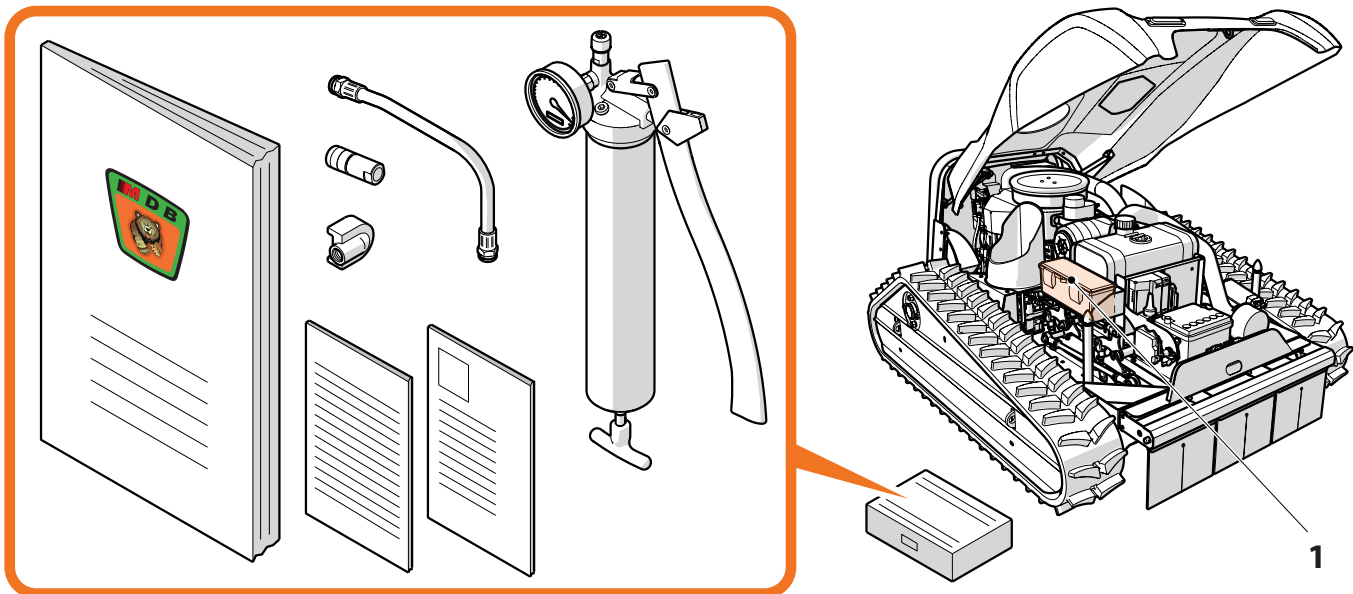
### 3.13 REMOTE CONTROL CASE, DOCUMENTATION AND EQUIPMENT

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 **1**, you must raise the bonnet, as shown in chapter 6.



### 3.14 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 tools are present)
- Annex F - Hydraulic unit use and maintenance manual



### 3.15 RESIDUAL RISKS



#### CAUTION

Pay attention to the operating range of the machine.

Move the machine with the blades switched off and in the raised position.

Avoid sudden manoeuvres (acceleration, deceleration or steering).

Do not use in adverse weather conditions.

Removal of nameplates and labels from the machine is prohibited.

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



#### WARNING

Do not work beyond the cutting height indicated in paragraph "3.3.3 Other technical specifications".

Do not use for towing operations.

During manoeuvres, keep away from any obstacles.

Do not leave the machine with the engine running.

Take the appropriate precautions when working on the engines.



#### DANGER

The blades pose a cutting hazard: keep limbs away from the working area of the blades.

It is forbidden to insert hands in the blade housing area.

Do not transport people.

Performing any kind of control, repair 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.



**DANGER**

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.

Always switch off the engine before refuelling.

Fill the fuel tank outdoors.

Strictly observe the maximum permitted working slope, as indicated in paragraph "3.3.3 Other technical specifications".

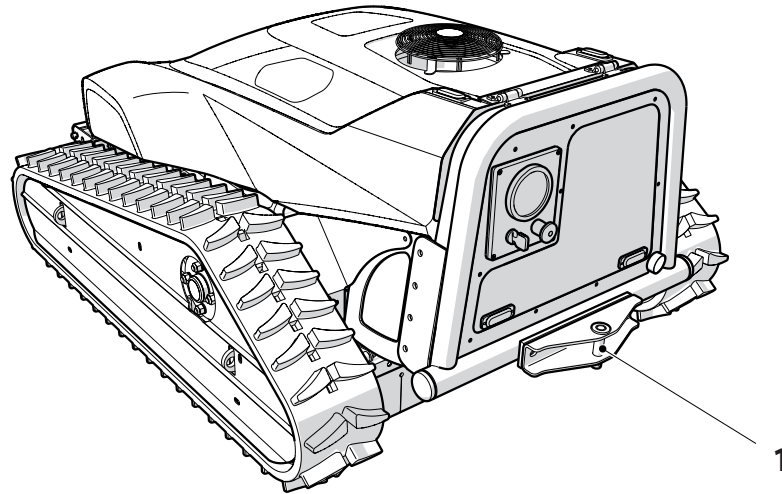
Some areas in the vicinity of the machine pose a thrown-object hazard, as indicated in paragraph "3.4.1 Operator position". For this reason, strictly observe the permitted operator position.



### 3.16 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 tow trailers and/or carts is strictly prohibited.



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## **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:

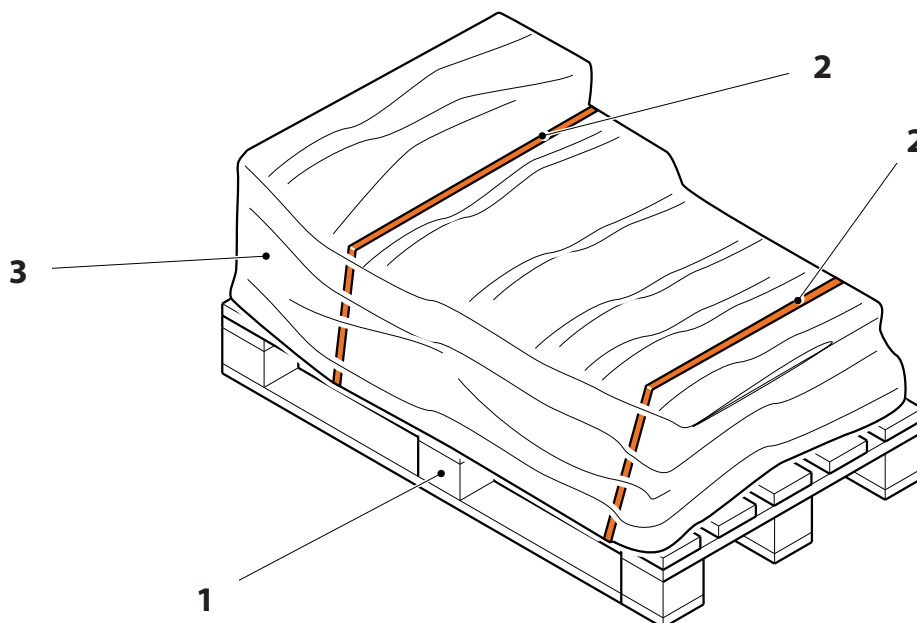
- › Safety footwear
- › Protective gloves
- › Safety helmet
- › Protective clothing
- › Safety goggles

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

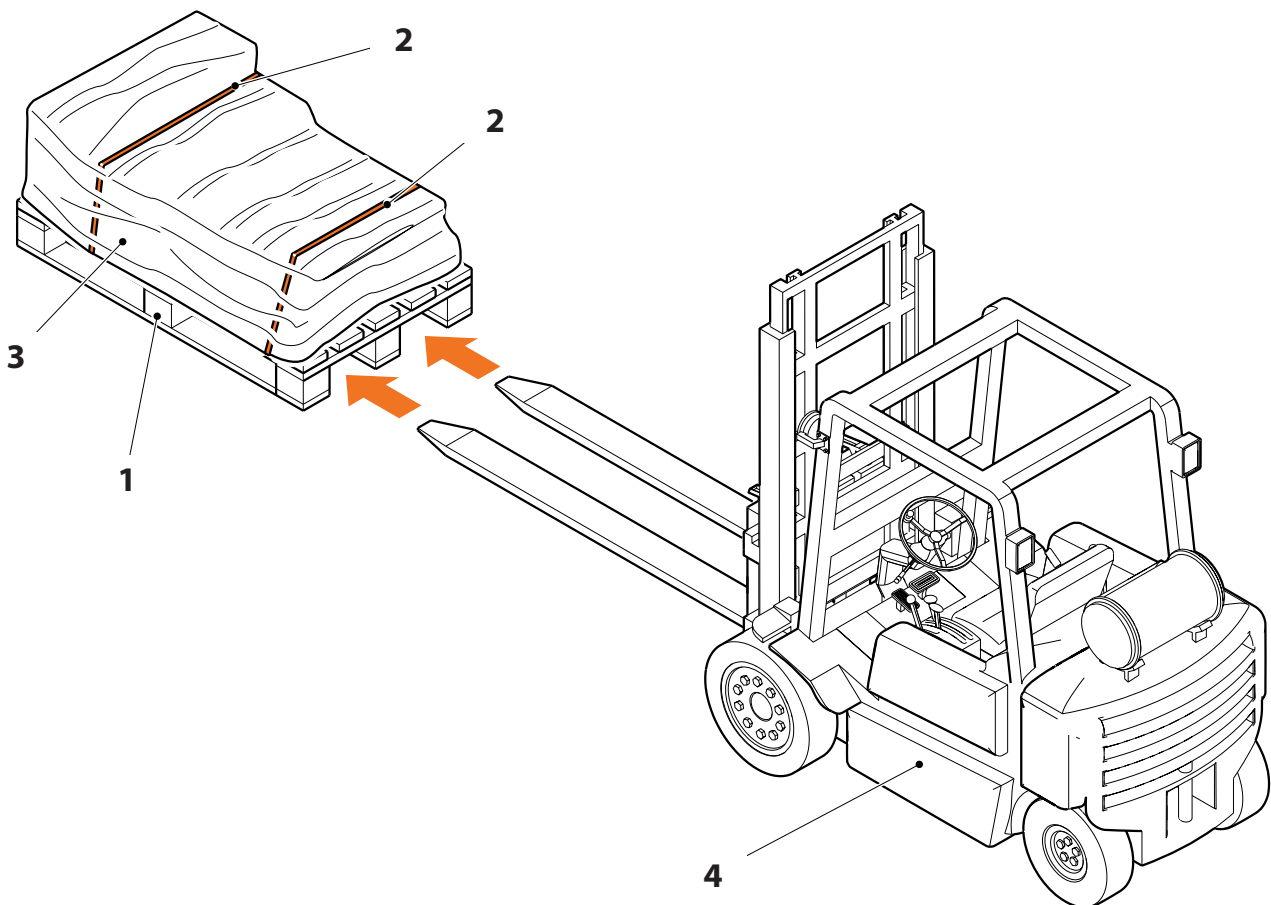
**For the weight of the machine, see the details given on the inside front cover of this manual.**



## 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 "5.3.4 Battery connection/presence check".
  - › If the fuel level is insufficient, proceed as indicated in paragraph "5.3.1 Refuelling".
- › Start the machine (see chapter 5 for the procedure).
- › Place the engine compartment in the up position (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 methods can only be used for lifting in the case of transfer of the machine to 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.

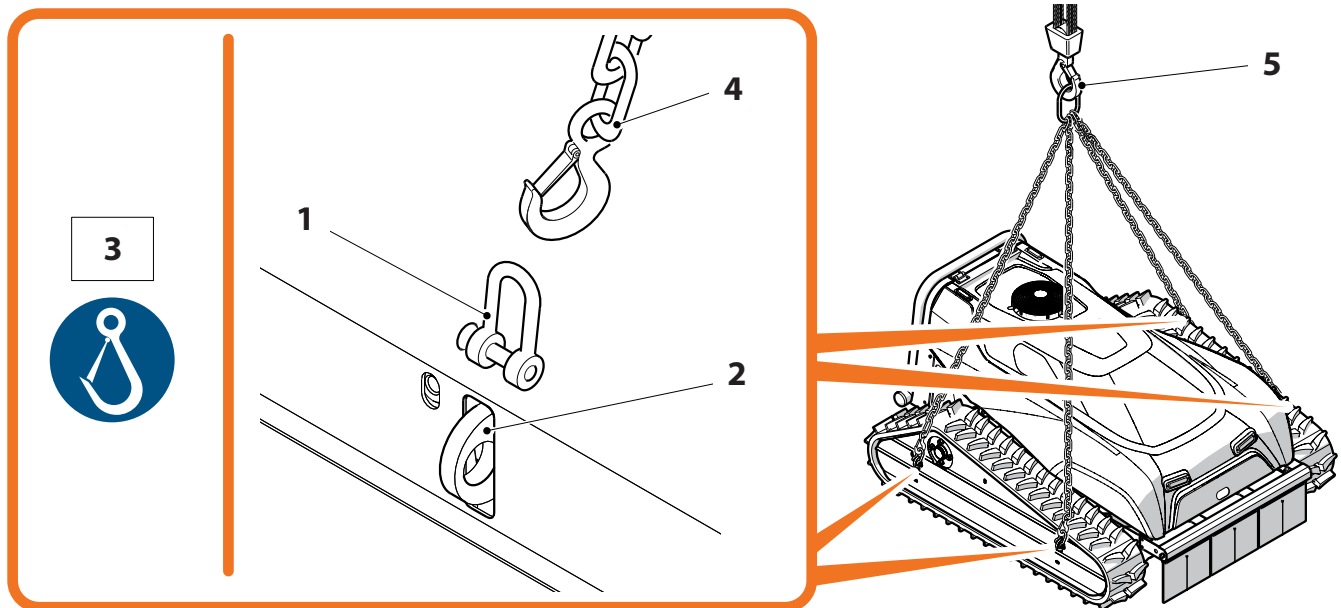
Lifting equipment (ropes or chains) is not supplied by MDB

The operator must wear the following personal protective equipment:

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

Proceed as follows:

- > 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



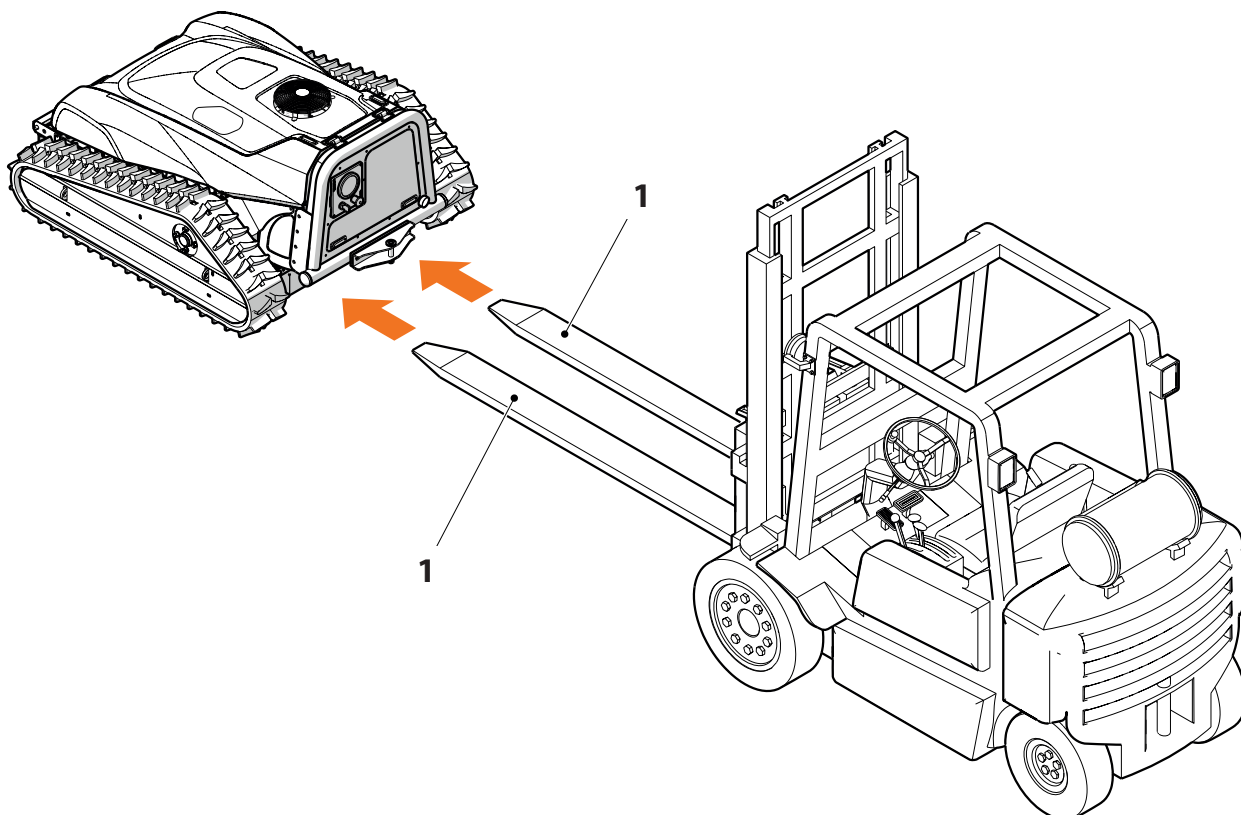
Proceed as follows:

- › 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.

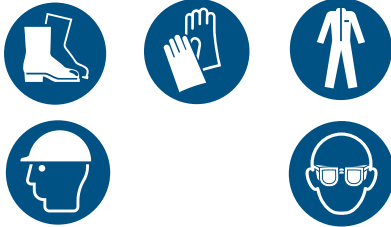


### 4.3 TRANSPORT

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:

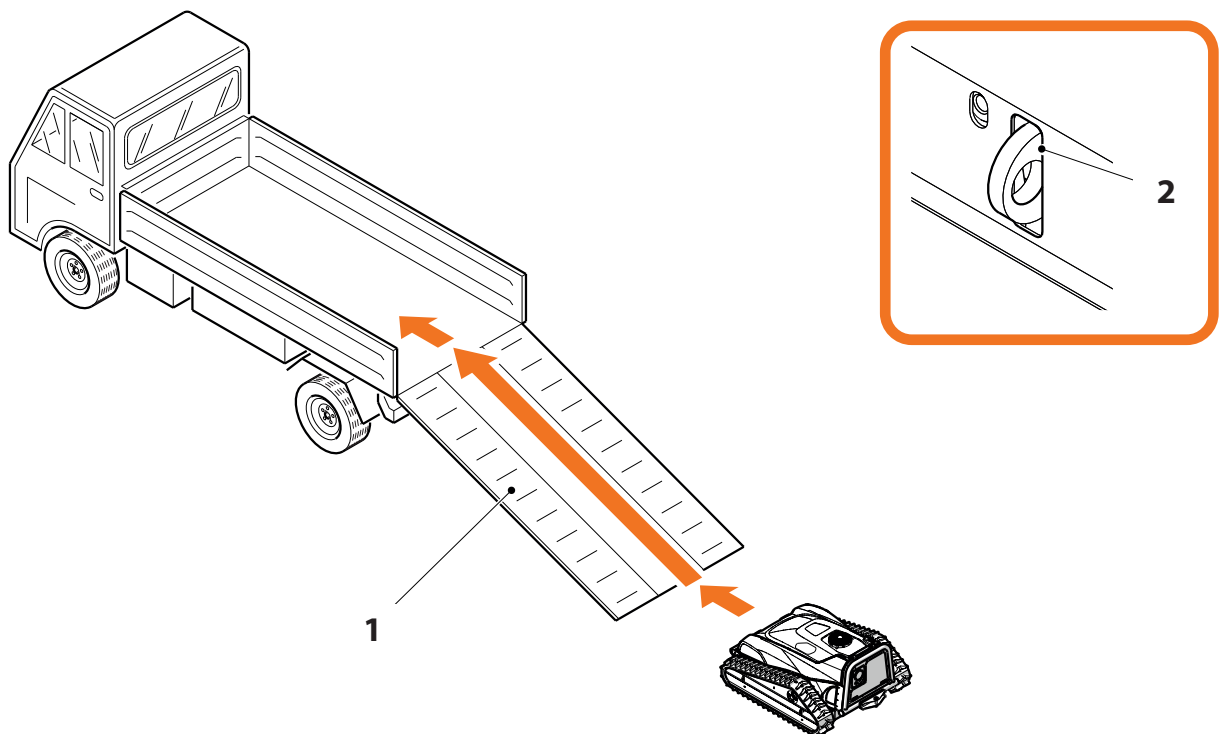
- > Safety footwear
- > Protective gloves
- > Safety helmet
- > Protective clothing
- > Safety goggles

#### NOTICE

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

Load the machine as follows:

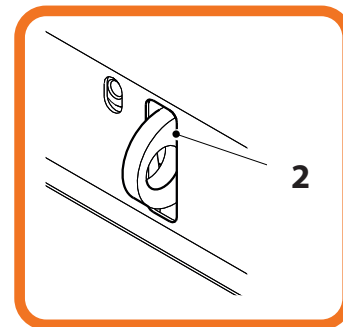
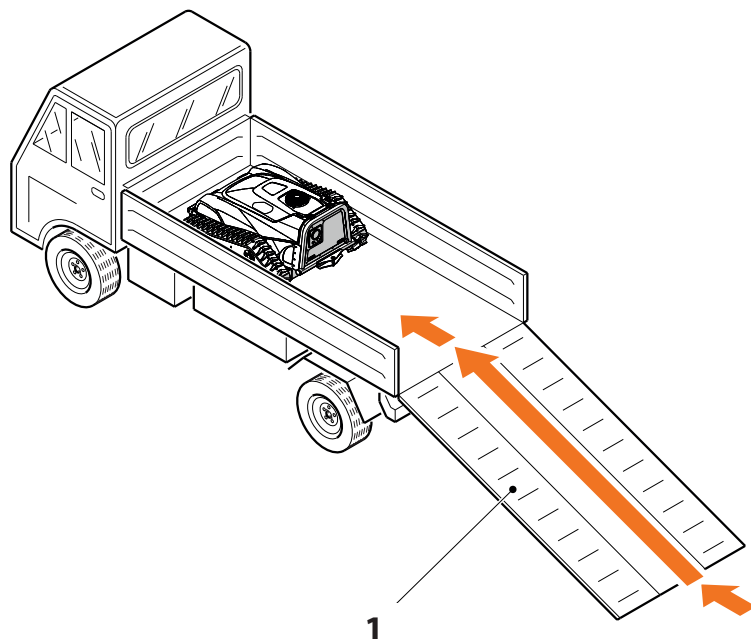
- > Start the machine (see chapter 5 for the procedure).
- > Pilot the machine slowly (see chapter 5 for the procedure) and move it up the ramps **1** until it is positioned in the desired zone on the transport vehicle.
- > Anchor the machine to the vehicle using ropes of an appropriate size which are then fixed to the eyelets **2**.
- > Start the machine (see chapter 5 for the procedure).





Unload the machine as follows:

- › Release the machine from the vehicle by 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 the paragraphs above (“4.2.1 Lifting with a crane, hoist or bridge crane” and “4.2.2 Lifting with a forklift”).



## 5 OPERATION AND USE

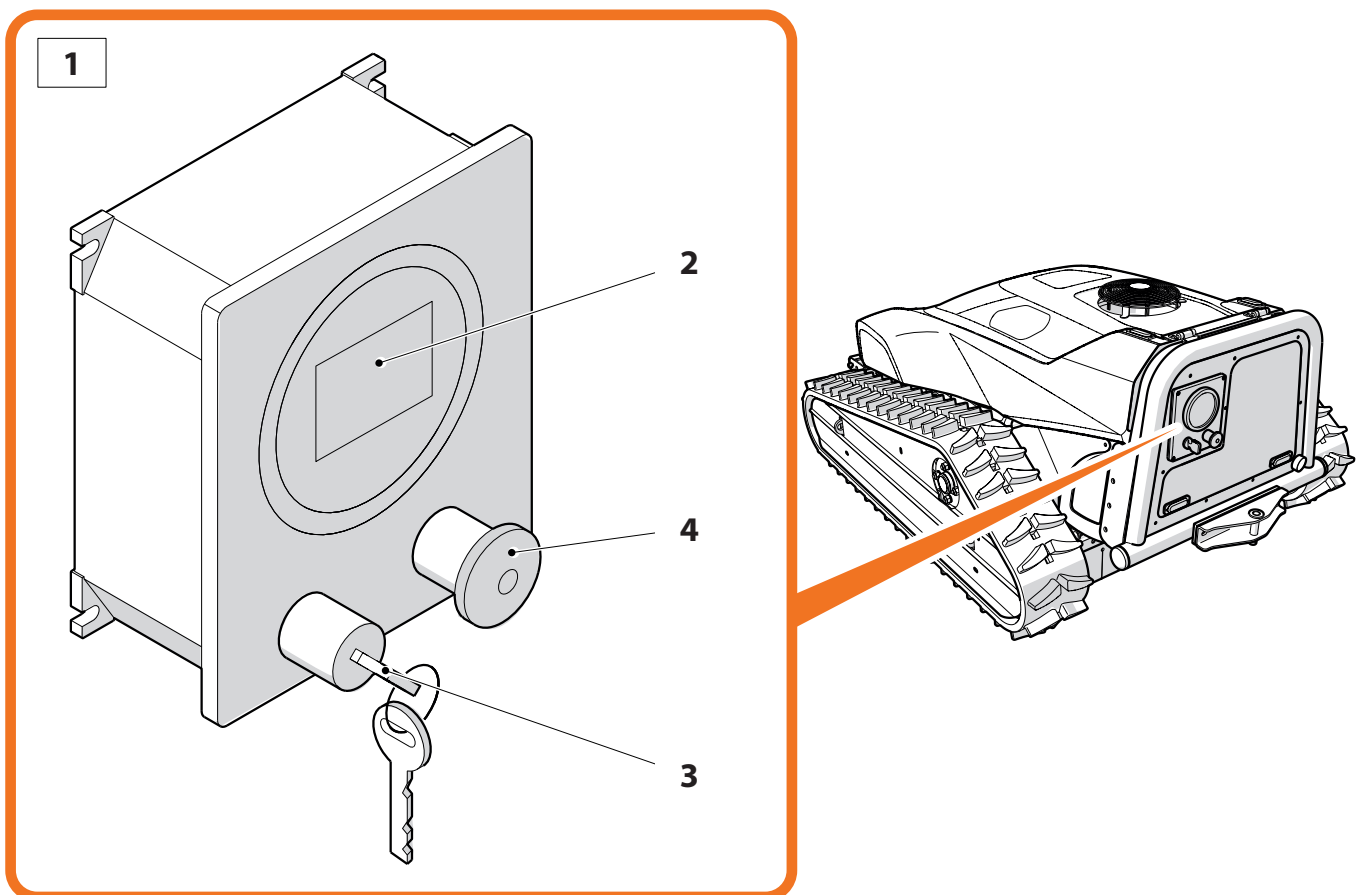
### NOTICE

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**
- › Key switch for ignition **3**
- › Emergency button **4**



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

- › Low engine oil pressure
- › Charging alternator voltage (D+)
- › Engine temperature
- › Air filter
- › Active alarm
- › Glow plug activation (if present)
- › Hydraulic oil level

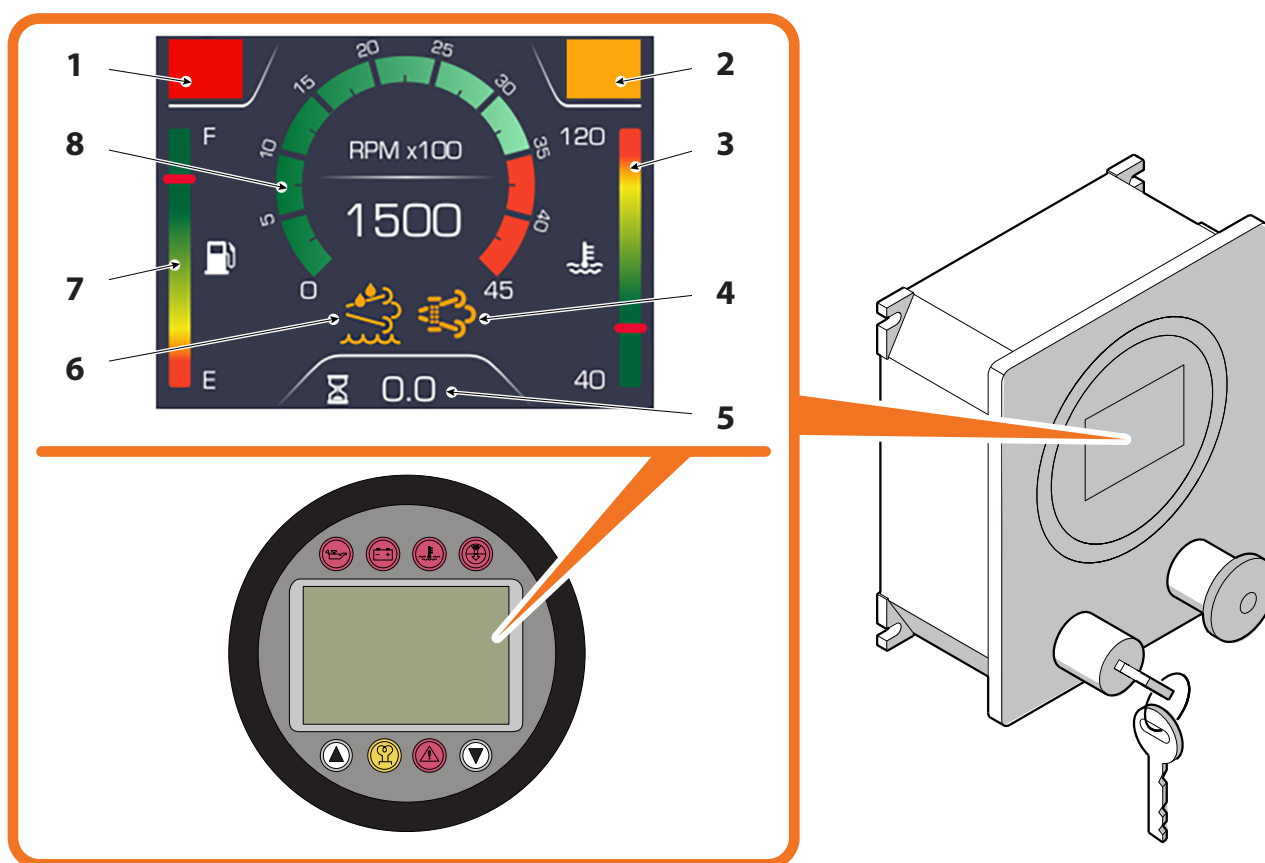
For a detailed description of the alarms, see paragraph "5.1.3 Alarms"



### 5.1.1 DISPLAY

On startup, the display shows the initial logo for a few seconds, after which it switches to the main screen, as shown in the figure. The following parameters are displayed:

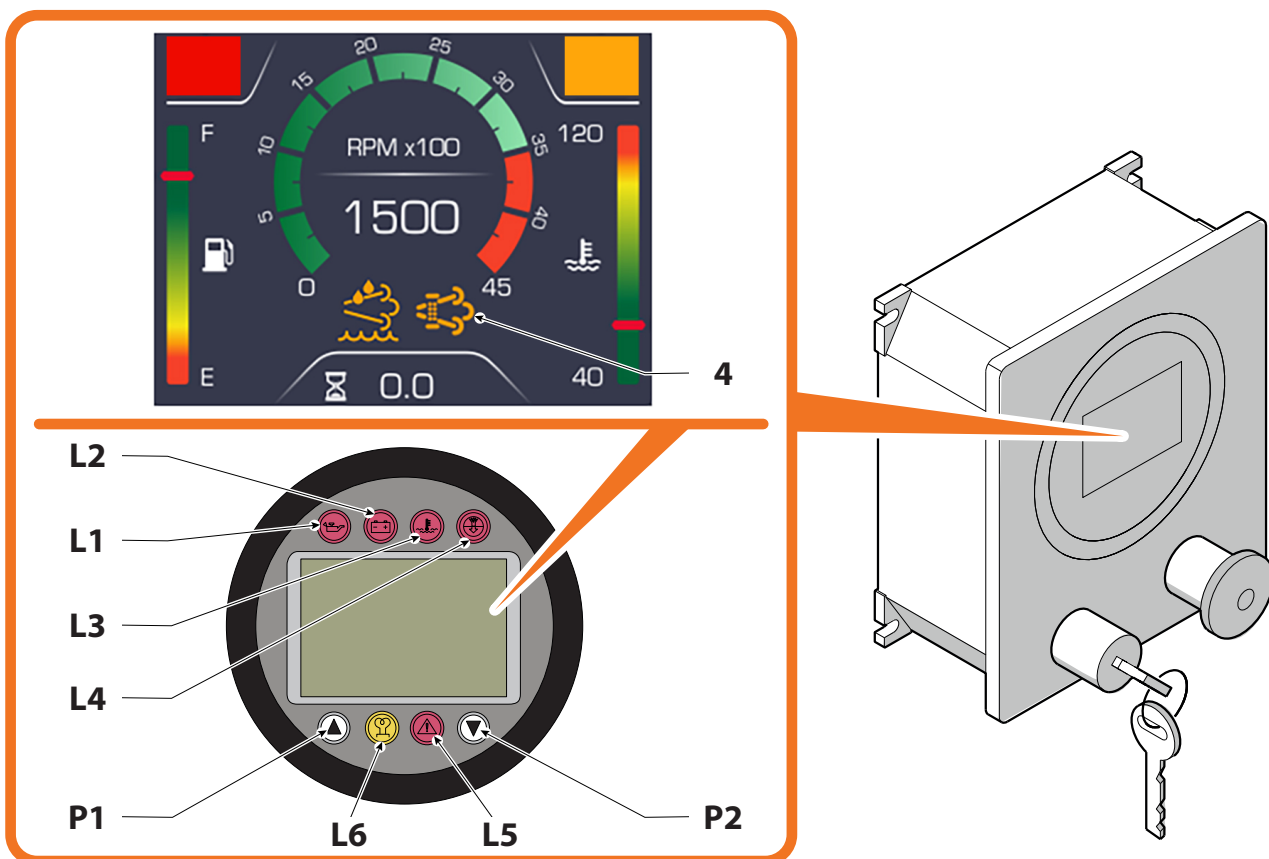
- 1 Warning panel: displays the machine control indicator lights:
- 2 Warning panel: displays the machine control indicator lights:
- 3 Engine water temperature: shows the engine temperature in degrees centigrade.
- 4 DPF regeneration: indicates the need for regeneration of the particulate filter (if present).
- 5 Engine rpm: indicates the engine speed detected by the alternator signal.
- 6 HV circuit (SCR): indicates that the SCR catalyst (if present) is in an alarm state.
- 7 Fuel level: indicates the fuel level as a percentage and graphically.
- 8 Hour meter: shows the machine operating hours.





The following table gives the function buttons and warning lights on the display.






<b>Operating buttons</b>	<b>P1</b>	Increase button. Output button if pressed and held
	<b>P2</b>	Decrease button. Input button if pressed and held. If the "DPF Regeneration" light <b>4</b> is on (if present), press and hold to activate stationary regeneration of the machine. If regeneration is in progress, press and hold to stop the procedure.
<b>Indicator lights</b>	<b>L1</b>	Low engine oil level LED (digital input)
	<b>L2</b>	Battery charger malfunction LED
	<b>L3</b>	High engine water temperature LED (digital input)
	<b>L4</b>	Clogged air filter LED (digital input)
	<b>L5</b>	Active alarm LED. If on, it indicates that the engine Redlamp is active.
	<b>L6</b>	Glow plugs activated LED (if present)

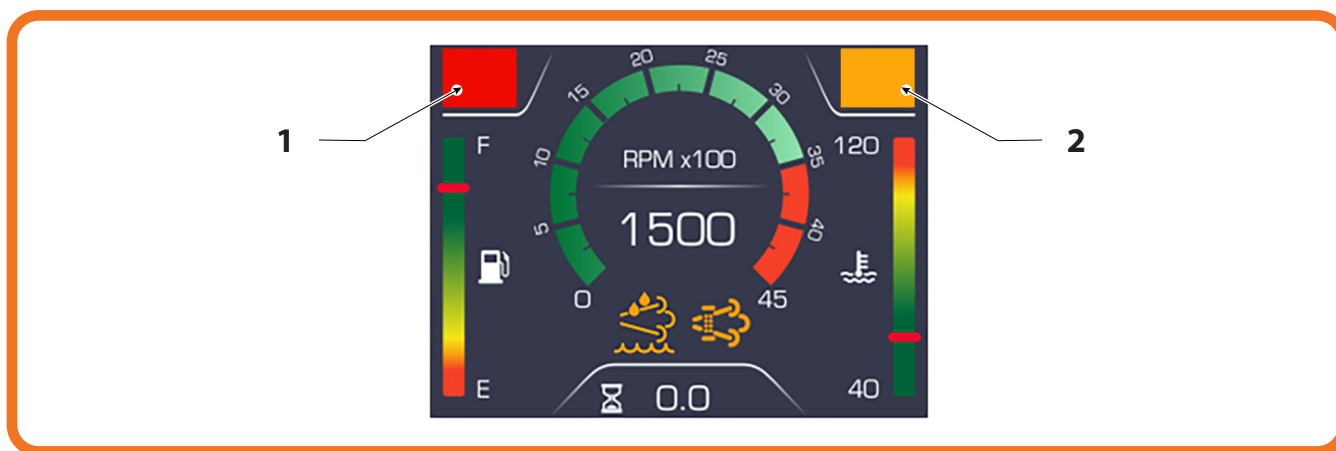




**WARNING PANEL**

Boxes **3** and **8** show the machine's indicator lights.  
The indicator lights displayed are as follows:

Reference	Icon	Function	Description
1		Warning lamp	Indicates that the engine control unit WARNING LAMP is active
		Low fuel	Indicates low fuel from an active digital contact.
		Battery voltage	Indicates a battery voltage level above the set alarm threshold.
		Battery voltage	Indicates a battery voltage level below the set alarm threshold.
2		Hydraulic oil	Indicates a hydraulic oil alarm

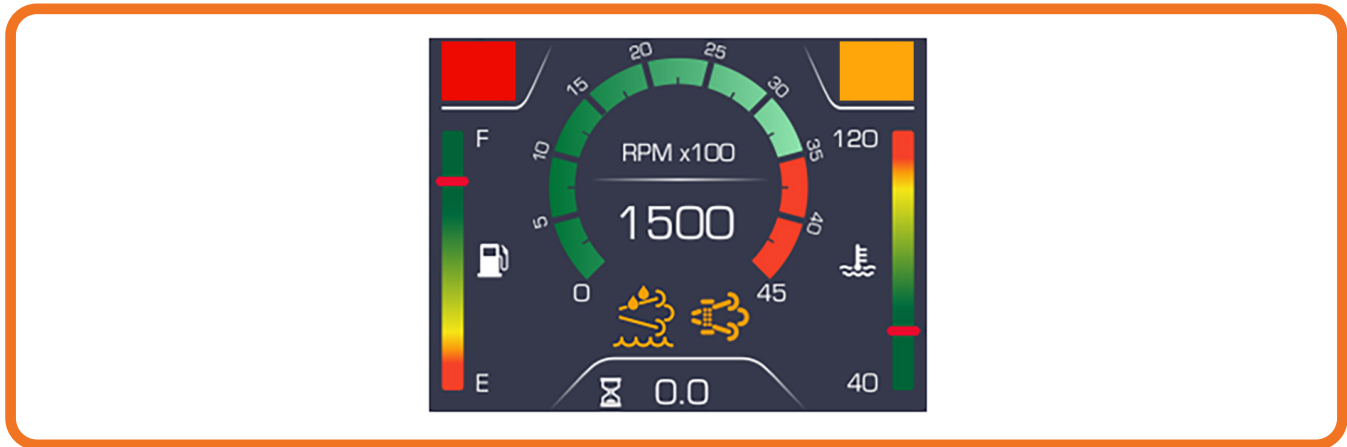




## PARAMETERS

The control panel monitors the running engine for the following parameters:

- › Engine rpm above set threshold
- › Alternator voltage above set threshold
- › Engine oil pressure switch open



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

- › High engine temperature
- › Low engine oil pressure
- › Low battery charger alternator voltage
- › High engine rpm
- › High battery voltage
- › Low battery voltage
- › Clogged air filter

## NOTICE

For a detailed description of the alarms, see paragraph “5.1.3 Alarms”

The parameters that automatically shut down the machine without causing damage to the engine are:

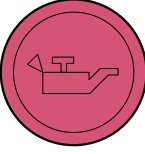
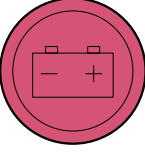
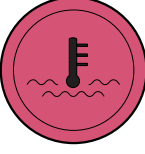
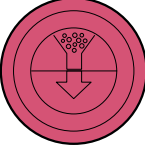


- › High engine water temperature
- › Low engine oil pressure



## INDICATOR LIGHTS

The display includes indicator lights that display the status of the main machine parameters.

The following table gives a detailed description of what the lights indicate.

Icon	Function	Description
	Engine oil level	When the engine is started, this light indicates low engine oil pressure. The engine is shut down automatically. Check the oil level and, if necessary, contact the MDB support service (see chapter 2).
	Battery voltage	When the engine is started, this light indicates faulty battery charging. Check the alternator belts and, if necessary, contact the MDB support service (see chapter 2).
	Engine temperature	This light indicates that the engine temperature is above the permitted value. The engine is automatically switched off to protect it from damage. Check the coolant level and clean the radiator.
	Clogged air filter	This light indicates that the air filter is clogged. Clean or replace the air filter.
	Alarm	This light indicates an active alarm.
	Glow plugs (if present)	This light indicates the glow plug status (if present). When the key switch is turned to START, the engine activates a glow plug heating cycle before starting (if present).

### 5.1.2 PROGRAMMING MENU

The machine programming menu is divided into:

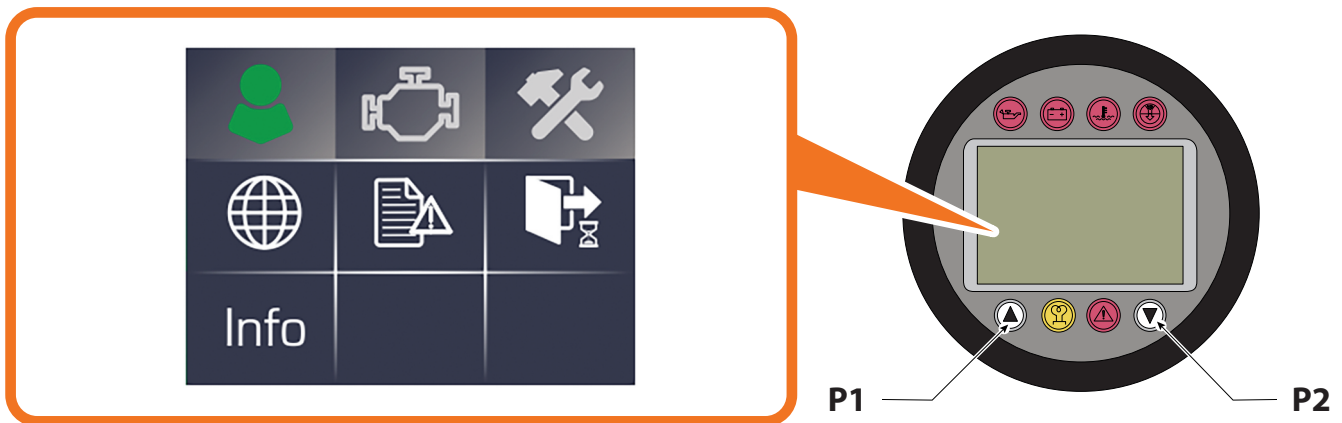
- › Basic menu.
- › Advanced menu.

The basic menu is used by the operator to change some control panel parameters.

The advanced menu is reserved for MDB service technicians, and is therefore password protected.

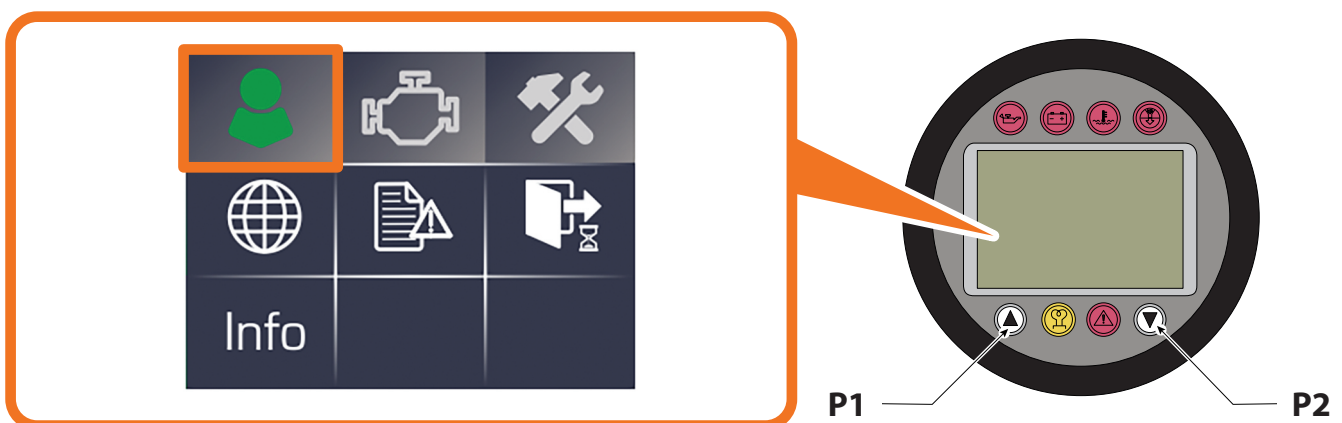
#### BASIC MENU

- › Press and hold buttons **P1** and **P2** at the same time for five seconds. "000" will appear on the display.
- › Press button **P1** to confirm the password.
- › The display shown in the figure appears.
- › The configurable pages are:
  - › Basic general set-up
  - › To return to the menu press button **P1** for five seconds







#### BASIC GENERAL SET-UP

- › Press button **P2** for five seconds to confirm the menu page. The first icon of the various pages to be configured is automatically selected.
- › Press button **P1** to scroll forward and/or press button **P2** to scroll back through the various icons.
- › Press button **P2** for five seconds to confirm the choice and enter the page to be configured.

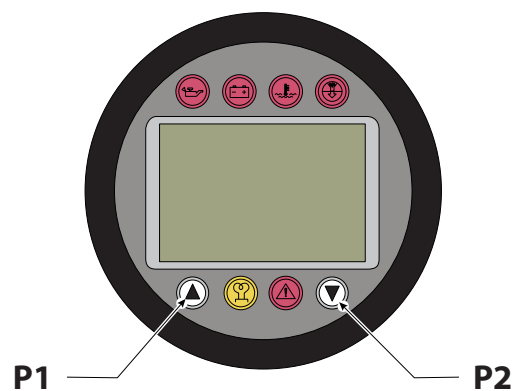




The following pages are configurable:

Icon	Page	Description
	Language	Enter this page to change the programming menu language.
	Alarm log	Enter this page to view a list of the ten most recent alarms and hours worked when each occurred. Use buttons P1 and P2 to scroll through the list. Note: all the alarms that have occurred can be seen in the Basic general set-up page. Note: the alarms that have occurred can be deleted in the Basic general set-up page.
	Main menu exit time	Access this page to change the length of time before exit from the main menu when no keys are pressed.
	Information	Access this page to view detailed information on the software.

- › You can change the selected parameters on each page using buttons **P1** and **P2**.
- › To confirm a parameter, press and hold button **P2** for five seconds.
- › To exit without saving any changes, press and hold button **P1** for five seconds.
- › To return to the main page, press and hold buttons **P1** and **P2** at the same time for five seconds.





### 5.1.3 ALARMS

#### READING FAULT CODES

##### MIL (malfunction indicator light)

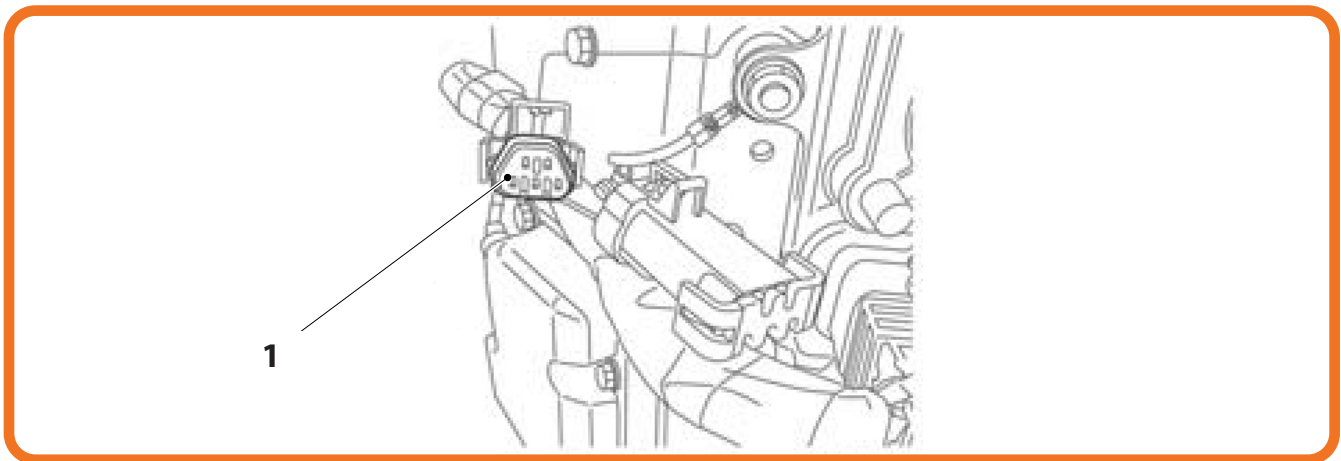
If the ECU detects problems in the EFI system, the equipment MIL comes on.  
The MIL indicates problems in the EFI system.

##### Reading the fault code with the diagnostic tool

The DTC (diagnostic trouble code), as part of the EFI system, indicates the trouble.  
The DTC can be considered a diagnostic tool. The tool is available for the SAE J1939 standard.

To display the fault code, connect the diagnostic tool to the engine at the diagnostic connector **1**, then turn the ignition switch to the RUN position. See the Diagnostic Tool Manual to check its operation.

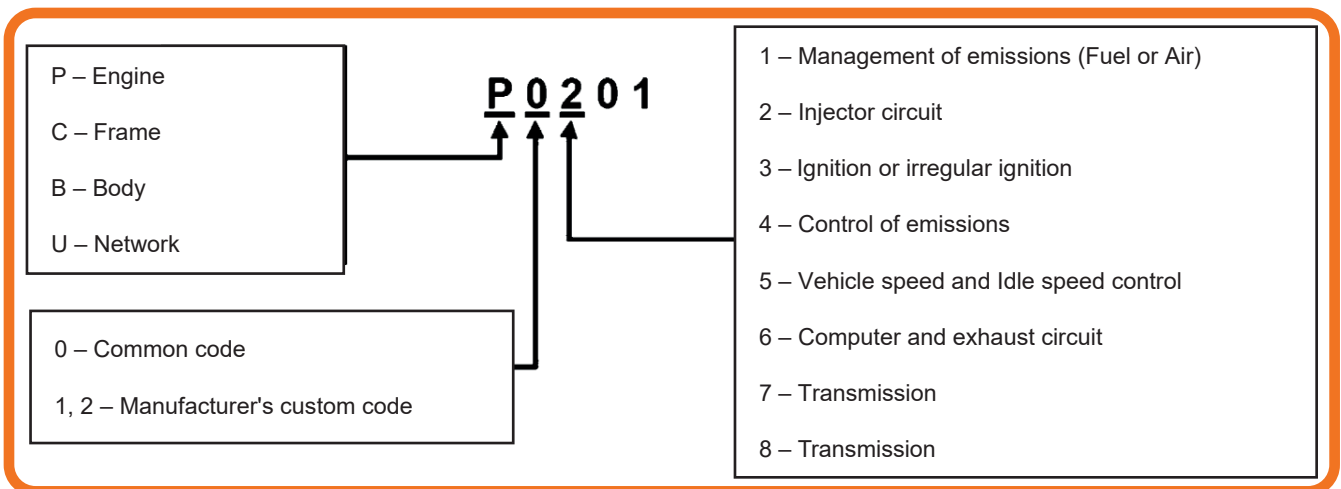
When the diagnostic tool indicates DTC, see the diagnostic troubleshooting code table in this manual. The table describes the symptom and indicates the pages to consult. Check the symptom and read the pages.



##### Information on the diagnostic trouble code (P code) (reference information)

DTCs (P codes) have a letter of the alphabet followed by 4 digits.

The initial letter indicates the section where the trouble is occurring. The 4 digits refer to a specific problem.





## DIAGNOSTIC TROUBLESHOOTING CODE TABLE

## NOTICE

For the page references, see Annex B

- › If the ECU detects a problem in the EFI system, the ECU provides diagnostic codes.
- › If the ECU provides codes, go to the page in the table and carry out the checks.

Parts or functions	SPN	FMI	DTC	Problems	Page
Throttle valve position sensor	3464	4	P0658	TPS_1 Earth leakage	Replace the throttle body.
		3	P0659	TPS_1 Power wiring short circuit	
	3465	4	P2670	TPS_2 Earth leakage	
		3	P2671	TPS_2 Power wiring short circuit	
	5374	13	P210A	Lower mechanical stop adjustment not in tolerance.	
			P210B	Lower return spring control error	
			P2109	Lower position not reached.	
	5377	13	P210E	Adjustment condition exceeded	
			P2110	Adjustment of Limp home mode not in tolerance	
			P2111	Upper position not reached	
			P2112	Upper return spring control error	
	51	13	P2113	Throttle flap error or ETC drive jammed	
6650	13	P2114	Ratio between TPS_1 and TPS_2		
Intake air pressure sensor	106	4	P0107	Earth leakage	
Intake air temperature sensor	105	4	P0112	Earth leakage	
		3	P0113	Short circuit to positive	
Cylinder head temperature sensor	110	4	P0117	Earth leakage	3-38 ~ 3-39
		3	P0118	Power wiring short circuit	
		2	P0116	TCO sensor stuck invalid entry.	
		0	P0217	Overtemperature detected	
Manual throttle intake	29	4	P0222	Earth leakage	3-58 ~ 3-59
		3	P0223	Power wiring short circuit	



Parts or functions	SPN	FMI	DTC	Problems	Page
Crankshaft position sensor	636	9	P0335	Loss of synchronisation	3-41 ~ 3-42
		8		Crankshaft sensor diagnosis	
		2		Crankshaft peak detected	
Injector #1	651	5	P0201	Circuit open	3-52 ~ 3-53
		4	P0261	Earth leakage	
		3	P0262	Power wiring short circuit	
Injector #2	652	5	P0202	Circuit open	3-53 ~ 3-54
		4	P0264	Earth leakage	
		3	P0265	Power wiring short circuit	
Fuel pump	1075	4	P0231	Earth leakage	3-48
		3	P0232	Power wiring short circuit	
		5	P1513	Circuit open	
Ignition coil #1	1268	5	P0351	Earth leakage Circuit open	3-56
		3	P2301	Power wiring short circuit	
Ignition coil #2	1269	5	P0352	Earth leakage Circuit open	3-57
		3	P2304	Power wiring short circuit	
Electronic throttle valve control	5376	0	P0666	ETC transmission overtemperature detected.	Replace the throttle body.
		16	P0667	ETC transmission overheating detected	
	5375	4	P2102	ETC_transmission short circuit diagnosis on PIN 1 earth leakage	
		3	P2103	ETC_transmission short circuit diagnosis on PIN 1 power wiring short circuit	
	5378	4	P210C	ETC_transmission short circuit diagnosis on PIN 2 earth leakage	
		3	P210D	ETC_transmission short circuit diagnosis on PIN 2 power wiring short circuit	
	5419	12	P1515	ETC_transmission short circuit between PIN 1 and PIN 2	
		5	P2100	ETC transmission circuit open	
3464	2	P2101	Throttle position controller signal not in tolerance.		
Main relay	2634	3	P0687	Power wiring short circuit	3-60 ~ 3-61
		4	P0686	Earth leakage	
		5	P0685	Circuit open	



Parts or functions	SPN	FMI	DTC	Problems	Page
Battery voltage	168	0	P0563	Battery voltage too high	3-64 ~ 3-65
		1	P0562	Battery voltage too low	
Reference voltage for ECU	3597	5	P0641	VCC_1 Earth leakage Circuit open	Replace the throttle body.
		3	P0643	VCC_1 Power wiring short circuit	
	3598	5	P0651	VCC_2 Earth leakage Circuit open	
		3	P0653	VCC_2 Power wiring short circuit	
Malfunction indicator light	5080	4	P06D2	Earth leakage	3-62 ~ 3-63
		5	P0650	Circuit open	
Internal ECU	629	12	P0600	Microprocessor self-diagnosis SPI error	Replace the throttle body.
Blade Relay	701	5	P251A	Circuit open	Refer to the equipment manual.
		4	P251B	Earth leakage	
		3	P251C	Power wiring short circuit	
Excessive engine speed	190	0	P0219	Engine speed above maximum	-



**ECU BACK-UP**

› The ECU performs back-up operations such as the following when it detects problems in the EFI system.

Parts or functions	SPN	FMI	DTC	Range or criteria applicable to the signals	Backup
Throttle valve position sensor	3464	4	P0658	ECU has detected an invalid TPS_1 condition.	If one sensor is faulty, ECU uses the other sensor. If both sensors are faulty, ECU activates limp home mode by stopping the spring.
		3	P0659		
	3465	4	P2670	ECU has detected an invalid condition in TPS_2.	
		3	P2671		
	5374	13	P210A	The ECU self-diagnosis detects a condition outside the valid range.	Internal diagnosis
		7	P210B		
		1	P2109		
		5377	13		
	5377	13	P2110		
		1	P2111		
7		P2112			
51	13	P2113	Throttle valve failure or ETC actuator stuck	The filtering result is provided	
6650	13	P2114	Ratio between TPS_1 and TPS_2	Internal diagnosis	
Intake air pressure sensor	106	4	P0107	12.5 kPa (0.127 kg/cm <sup>2</sup> , 1.81 psi) ≤ range within which the sensor can detect ≤ 121.2 kPa (1.236 kg/cm <sup>2</sup> , 17.57 psi)	
Intake air temperature sensor	105	4	P0112	The standard sensor voltage depends on the ambient temperature.	If the intake air temperature is incorrect, the calibrated value of 20°C (60°F) is used.
		3	P0113		
Cylinder head temperature sensor	110	4	P0117	0.049 V < discharge voltage range < 4.951 V	
		3	P0118		
		2	P0116	Invalid sensor input.	
	0	P0217	The standard cylinder head temperature is below 160°C (320°F).	The engine shifts to low idle speed if above 160°C (320°F).	
Manual throttle intake sensor	29	4	P0222	0.4V < usable discharge voltage < 4.6V	If the manual throttle intake sensor is faulty, the engine switches to low idle speed
		3	P0223		



Parts or functions	SPN	FMI	DTC	Range or criteria applicable to the signals	Backup
Crankshaft position sensor	636	9	P0335	The 24-2 pedal configuration is maintained during operation. Crankshaft sensor distance range: $1 \pm 0.5$ mm	The engine stops and does not restart.
		8		24-2 pedal configuration	
		2		Crankshaft peak detected	
Injector #1	651	5	P0201	The injector self-diagnosis checks the signal and power supply connections	If injector #1 is faulty, the engine operates with only injector #2 active.
		4	P0261		
		3	P0262		
Injector #2	652	5	P0202		If injector #2 is faulty, the engine operates with only injector #1 active.
		4	P0264		
		3	P0265		
Fuel pump	1075	4	P0231	The transmission self-diagnosis on the ECU lower side checks the connection to the fuel pump relay.	The engine stops due to lack of fuel pressure.
		3	P0232		
		5	P1513		
Ignition coil #1	1268	5	P0351	The ignition transmission self-diagnosis checks the signal and power supply connections.	If ignition coil #1 is faulty, the engine operates with only ignition coil #2 active.
		3	P2301		
Ignition coil #2	1269	5	P0352		If ignition coil #2 is faulty, the engine operates with only ignition coil #1 active.
		3	P2304		
Electronic throttle valve control	5376	0	P0666	Microprocessor self-diagnosis	No other action from the ECU.
		16	P0667		
	5375	4	P2102		Mechanical limp home mode.
		3	P2103		
	5378	4	P210C		
		3	P210D		
	5419	12	P1515		
		5	P2100		
3464	2	P2101	ECU control error management function		



Parts or functions	SPN	FMI	DTC	Range or criteria applicable to the signals	Backup
Main relay	2634	3	P0687	The transmission self-diagnosis on the ECU lower side checks the connection to the main relay.	The engine stops due to lack of power.
		4	P0686		
		5	P0685		
Battery voltage	168	0	P0563	10 V ≤ usable voltage ≤ 17 V	If the battery voltage is out of normal range, the engine will shift to low idle speed.
		1	P0562		
Reference voltage for ECU	3597	5	P0641	4.4 V ≤ usable range for VCC_1 ≤ 5.6 V	If VCC_1 is faulty, the ECU uses the VVC_2 signal. If VCC_1 and _2 are faulty, the engine switches to low idle speed.
		3	P0643		
	3598	5	P0651	4.4 V ≤ usable range for VCC_2 ≤ 5.6 V	If VCC_2 is faulty, the ECU uses the VVC_1 signal. If VCC_1 and _2 are faulty, the engine switches to low idle speed.
		3	P0653		
Malfunction indicator light	5080	4	P06D2	The transmission self-diagnosis on the ECU lower side checks the connection to the MIL indicator light	No other action from the ECU
		5	P0650		
Internal ECU	629	12	P0600	Microprocessor self-diagnosis	Only the code is issued.
Blade Relay	701	5	P251A	The transmission self-diagnosis on the ECU lower side checks the connection to the blade relay	No other action from the ECU.
		4	P251B		
		3	P251C		
Excessive engine speed	190	0	P0219	Engine speed above maximum	The engine shifts to low idle speed.



## REDUCED POWER MODE

When the ECU detects the following engine conditions, the ECU reduces the engine speed to low idle speed (reduced power mode). An engine that has switched to reduced power mode must be serviced as soon as possible. Use in reduced power mode for prolonged periods leads to engine failure.

### Reduced power mode troubleshooting table

Symptom	SPN	FMI	DTC	Cause of the problem	Solution
Engine overheating (MIL on)	110	0	P0217	Debris or dust in the inner cover	Clean (see Periodic maintenance chapter)
		2,3,4	P0116 P0117 P0118	Temperature sensor or circuit malfunction	See Cylinder head temperature sensor in the troubleshooting procedure section.
Low oil pressure (if an oil switch is present) (MIL off/Oil light on)	N/A	N/A	N/A	Low oil level	Add oil (see Periodic maintenance chapter)
				Oil pressure switch or circuit malfunction	See wiring diagram.
				Lubrication system malfunction	See Lubrication system chapter.
Faulty battery voltage (MIL on)	168	0.1	P0562	Battery low or broken.	See Battery in the Troubleshooting section of the OEM service manual. See the Charging system troubleshooting procedures section in the Kawasaki engine service manual.
			P0563	Power supply or charging system malfunction	
Manual throttle intake sensor malfunction (MIL on)	29	3.4	P0222 P0223	Sensor or circuit malfunction	See Manual throttle intake sensor in the troubleshooting procedure section. See the OEM service manual.
Excessive speed detected (MIL on)	190	0	P0219	The engine receives too much air. Unstable ECU performance.	Turn the ignition switch off and then turn it back on. See the Excessive speed condition section.
Internal Malfunction ECU/throttle body (MIL on)	See the ECU back-up table			Throttle valve control malfunction	Replace the throttle body.
				Throttle valve position sensor malfunction	





**EFI SYSTEM TROUBLESHOOTING TABLE**

Problem	Symptom or possible causes	
The engine does not run		Crankshaft position sensor problem
		Ignition coil problem
		The spark plug is dirty or broken, or the electrode distance is incorrect
		Incorrect spark plug specification
		Problem with ECU earth and power supply
		ECU problem
		Absence or lack of fuel
		Injector problem
		Fuel pump problem
		Fuel pump relay problem
		The fuel filter is dirty or clogged
		Fuel line clogged
Faulty operation at low speed	Weak spark	Ignition coil problem
		The spark plug is dirty or broken, or the electrode distance is incorrect
		Incorrect spark plug specification
		ECU problem
	incorrect fuel/air mixture:	Lack of fuel
		The spark plug is dirty or broken, or the electrode distance is incorrect
		The fuel filter is clogged.
		Fuel pump problem
	unstable idle speed:	Fuel pressure too low or too high
		Injector problem
		Throttle sensor problem (throttle body)
		MAP sensor problem (throttle body)
	Engine stalls easily	The spark plug is dirty or broken, or the electrode distance is incorrect
		Throttle sensor problem (throttle body)
		Ignition coil problem
		MAP sensor problem (throttle body)
Fuel pump problem		
Injector problem		
Fuel pressure too low or too high		
Fuel line clogged		

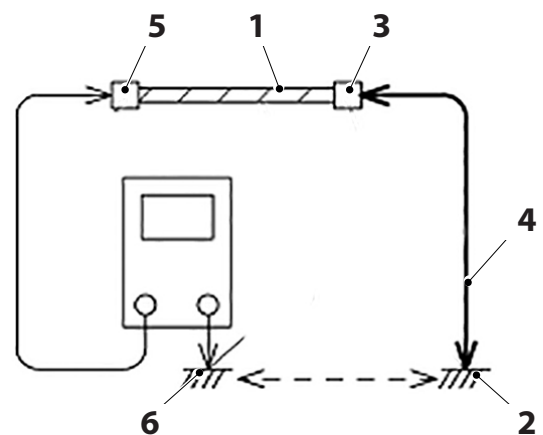


Problem	Symptom or possible causes	
Faulty operation at low speed	Poor acceleration	Fuel pressure too low
		Water or foreign bodies in fuel
		Fuel filter or pump screen clogged
		Fuel pump problem
		Injector problem
		Throttle sensor problem (throttle body)
		MAP sensor problem (throttle body)
		The spark plug is dirty or broken, or the electrode distance is incorrect
	Stumbling	Ignition coil problem
		Fuel pressure too low
		Injector problem
	Overload	Throttle sensor problem (throttle body)
		MAP sensor problem
Irregular running or lack of power at high speed	incorrect combustion	Unstable fuel pressure
		Injector problem
		Ignition coil problem
	incorrect fuel/air mixture	The spark plug is dirty or broken, or the electrode distance is incorrect
		ECU problem
		Air filter clogged, gasket damaged or missing
		Water or foreign bodies in fuel
		Injector clogged
		Fuel line clogged
		Fuel pump problem
		MAP sensor problem (throttle body)
	Throttle sensor problem	
	autoignition	Poor or incorrect fuel quality
		Incorrect spark plug
		Ignition coil problem
		ECU problem
		MAP sensor problem (throttle body)

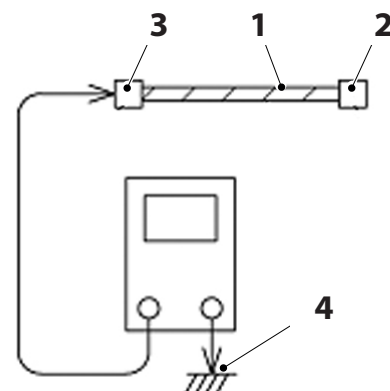
### GENERAL INFORMATION

- › Always check the battery condition before replacing EFI parts.  
A fully charged battery is necessary for accurate testing of the EFI system.
- › The problem could involve one part or, in some cases, all parts. Never replace a defective part without determining what CAUSED the problem. If the problem was caused by another component or components, they must also be repaired or the new replacement part will soon fail.
- › Measure the coil resistance when the EFI component is cold (at room temperature).
- › Check that all connectors on the circuit are clean and tight, check for traces of burning, fraying, short-circuits, etc. Damaged wires or defective connections can lead to the reappearance of problems and unstable EFI system operation.
- › If the wiring has deteriorated, replace it.
- › Disconnect each connector [A] and check for corrosion, dirt and damage.
- › If the connector is corroded or dirty, clean it thoroughly. If it is damaged, replace it.
- › Make sure the connectors are securely fitted.
- › Check the continuity of the wire harness.
  
- › Use the wiring diagram to identify the wire that could be the cause of the problem.
- › Connect an ohmmeter at the ends of the wires.  
If the meter reading is not close to 0, the wire is defective. Replace the main or secondary wire or wire harness.

- › If the two ends of a wire harness **1** are distant, ground **2** one end **3** using a jumper cable **4** and check the continuity between the other **5** and the earth connection **6**.  
This allows you to check the continuity of a long wire harness. If the wire harness is open, repair or replace it.



- › When checking the earth leakage of a wire harness **1**, open one end **2** and check the continuity between the other end **3** and the earth connection **4**.  
If there is continuity, the wire harness has an earth leakage and must be repaired or replaced.  
This allows you to check the continuity of a long wire harness. If the wire harness is open, repair or replace it.



- › Reduce the number of suspect positions by repeating the continuity test.
  - › If no faults are found in the wire harness or connectors, the EFI parts may be the cause of the problem.
  - › If a fault is found, replace the EFI part in question.
  - › If there are no faults in the wire harness, connectors and EFI parts, replace the ECU (throttle body)



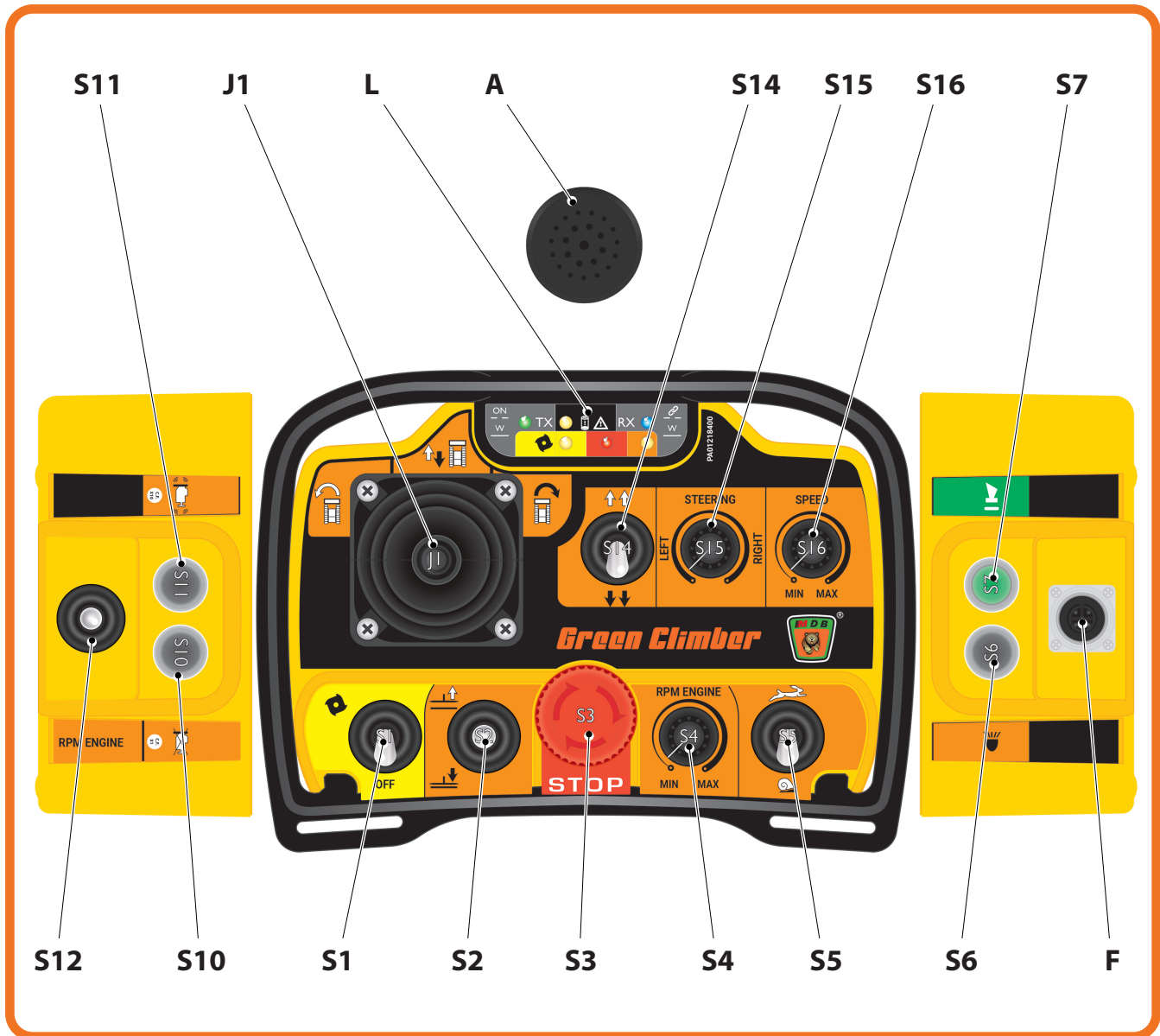
## 5.2 REMOTE CONTROL

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.

### 5.2.1 DESCRIPTION OF THE REMOTE CONTROL

Control	Description
<b>A</b>	Audible warning signal (machine status warning signal that operates in tandem with some of the LED functions)
<b>L</b>	LED signal lights
<b>F</b>	Serial socket for a control cable to connect the remote control and the control unit (used only in the case of radio signal interference or damage to the remote control batteries)
<b>J1</b>	Steer right - Steer left / Machine forward movement - Machine reverse movement
<b>S1</b>	Blades on / Blades off
<b>S2</b>	Blade height adjustment
<b>S3</b>	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
<b>S4</b>	Engine speed regulator
<b>S5</b>	High-speed selector / Low-speed selector
<b>S6</b>	Work light on / Work light off (if present)
<b>S7</b>	Remote control On button / Remote control-Control unit connection button / Horn (works only when the remote control and the control unit are connected)
<b>S10</b>	Engine kill switch
<b>S11</b>	Engine start button
<b>S12</b>	Auxiliary engine rpm selector (not used)
<b>S14</b>	Normal J1 commands / Reversed J1 commands
<b>S15</b>	Right trajectory correction/Left trajectory correction
<b>S16</b>	Speed regulator



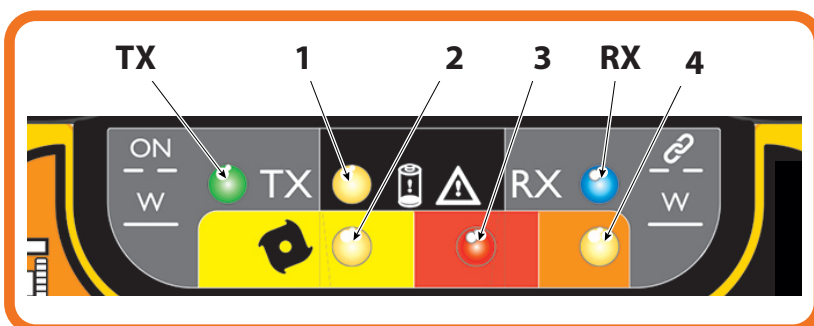


**5.2.2 REMOTE CONTROL LEDS**

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	The remote control is seeking a connection with the control unit
1	Yellow on black background	Two flashes in rapid proximity with a twenty second pause	Low battery
2	Yellow on yellow background	On	Blade start function active
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	Two-second audible signal: high engine temperature (above 95°C) (Wait for reset operation)
4	Yellow on orange background	On	Two-second acoustic signal: clogged air filter; scheduled maintenance intervention signal.
		Flashing	One-second acoustic signal: minimum fuel level
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 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 disconnect" key is in the OFF position and disconnect it.

Proceed as follows:

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



### 5.3.1 REFUELLING

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



**DANGER**



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 come too close to the refill cap to avoid inhaling harmful vapours.

The operator must wear the following personal protective equipment:

- › Safety footwear
- › Protective gloves
- › Protective clothing
- › Safety goggles
- › Mask

See Annex B for the type of product to use.

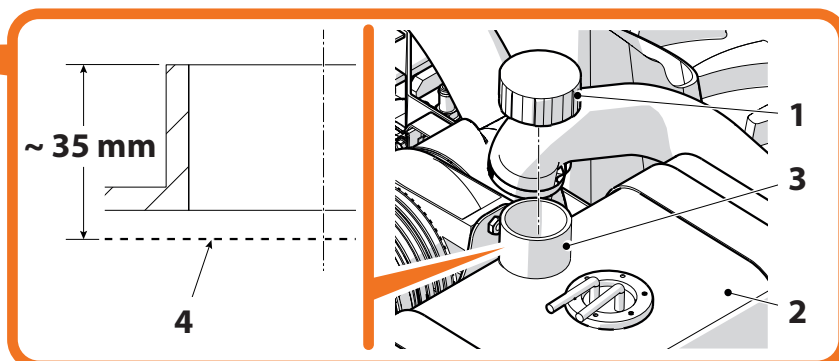
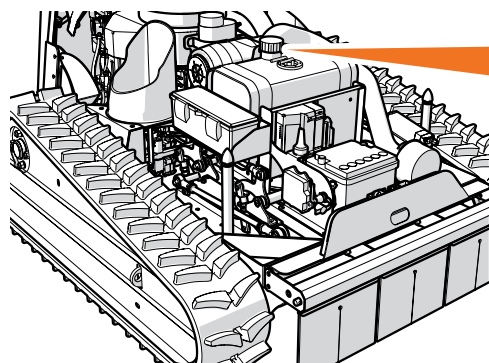
**NOTICE**

See paragraph “3.3.3 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 empties completely.

Proceed as follows:

- › Open the bonnet (see chapter 6).
- › Unscrew the cap **1**.
- › Use a funnel and pour the fuel into the tank **2** through the inlet tube **3**.
- › Visually check the level of the added fuel, ensuring that it reaches the level mark **4**.
- › Screw on the cap **1**.
- › Close the bonnet.







### 5.3.2 REFILLING ENGINE OIL

Proceed as follows:

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

### 5.3.3 REFILLING HYDRAULIC OIL

Proceed as follows:

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

### 5.3.4 BATTERY CONNECTION/PRESENCE CHECK



**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 bonnet (see chapter 6).
- › Turn the "battery disconnect" key to OFF and remove it (see the paragraphs below for the procedure).
- › Locate the battery.
- › Connect the connection cables to the respective battery terminals.
  - › Note the negative and positive connections, identified by the respective symbols.



**If the machine does not have a battery, install one with the specifications indicated in paragraph "3.3.3 Other technical specifications".**



## 5.4 START-UP

The machine can be started in two different modes:

- › Manual start
- › Remote control start

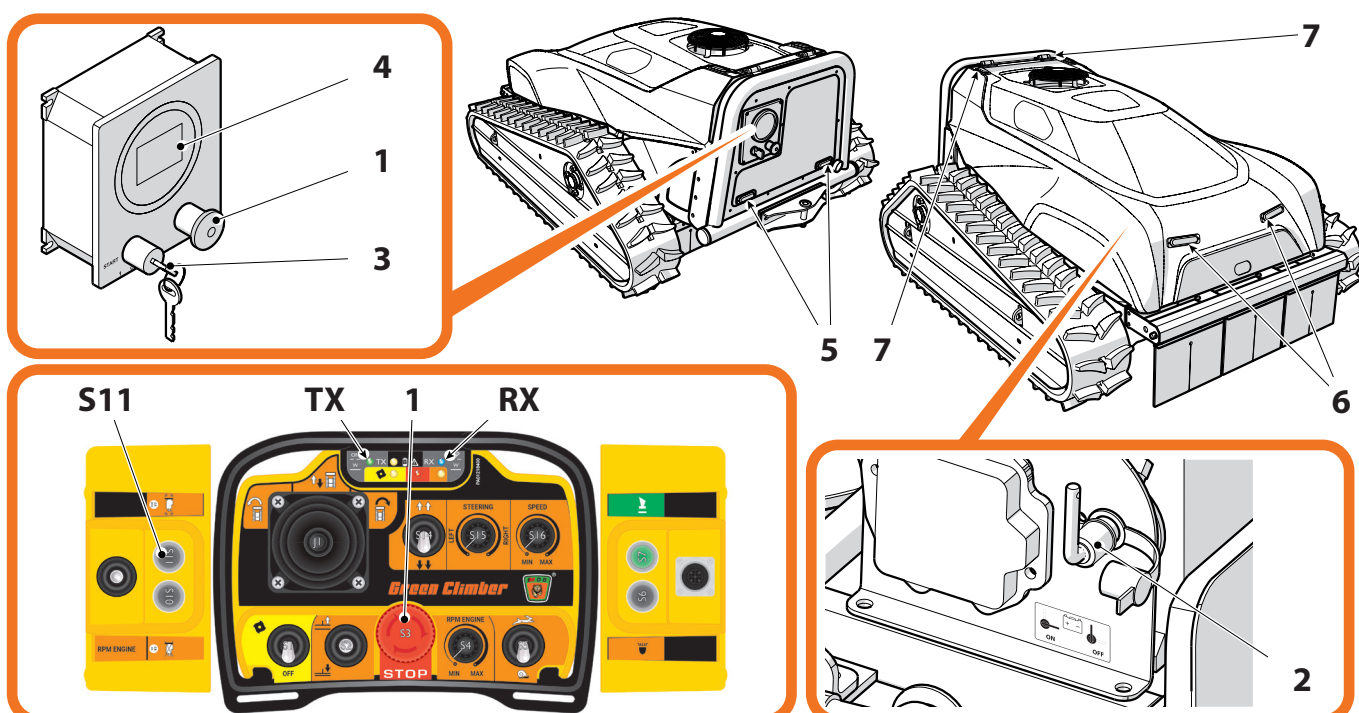
### 5.4.1 MANUAL START

- › Check that emergency button **1** is not pressed.
- › Open the bonnet (see chapter 6).
- › Insert the “battery disconnecter” key **2** and turn it to ON.
- › Close the bonnet.
- › Insert the ignition key **3** and turn it to 1.
  - › The red lights **5** turn on steadily, the white lights **6** turn on steadily and the yellow lights **7** flash.
  - › Wait until the MDB logo disappears from the display **4**.
- › Press button **S11** 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 **S11** once more to confirm the selection.
  - › Once the connection is been confirmed, the **TX** and **RX** LEDs remain on steadily.
- › Turn the ignition key **3** to START.
  - › The engine starts.
- › Release the ignition key **3** which will return to 1.
  - › This is necessary for the hydraulic system to operate correctly

**The starting operation can be repeated for a maximum of twenty consecutive seconds. If the engine has not started, wait one minute before repeating the operation.**

## NOTICE

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



### 5.4.2 REMOTE CONTROL START

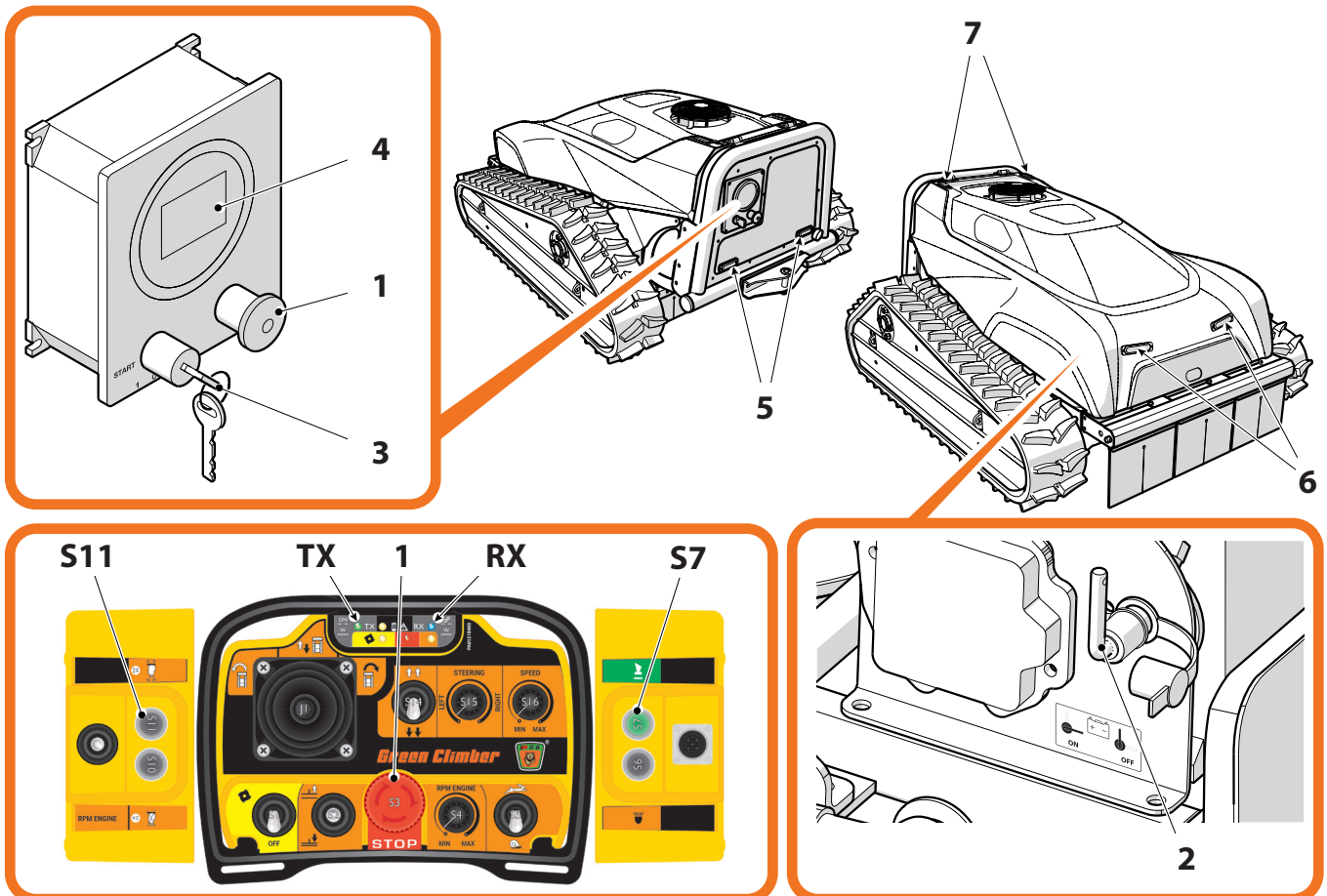
Proceed as follows.

- › Check that emergency button **1** is not pressed.
- › Open the bonnet (see chapter 6).
- › Insert the "battery disconnecter" key **2** and turn it to ON.
- › Close the bonnet.
- › Insert the ignition key **3** 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.
  - › Wait until the MDB logo disappears from the display **4**.
- › Press button **S11** 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 **S11** 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 **S7**.
  - › The engine starts.

**The starting operation can be repeated for a maximum of twenty consecutive seconds. If the engine has not started, wait one minute before repeating the operation.**

## NOTICE

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





## 5.5 USE

### NOTICE

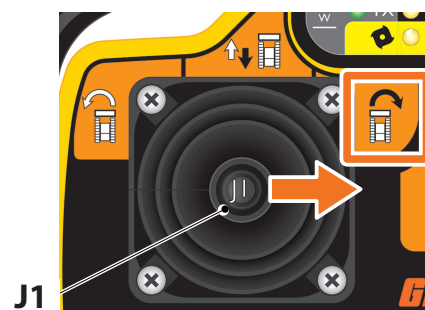
The procedures described below indicate the main controls necessary for the correct operation of the machine.

Proper understand the following procedures is necessary in order to perform the operations correctly and in complete safety.

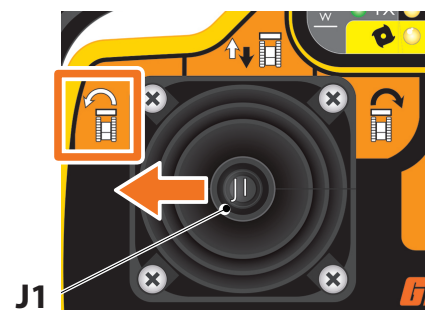
#### 5.5.1 MAIN CONTROLS

The main machine controls are listed below.

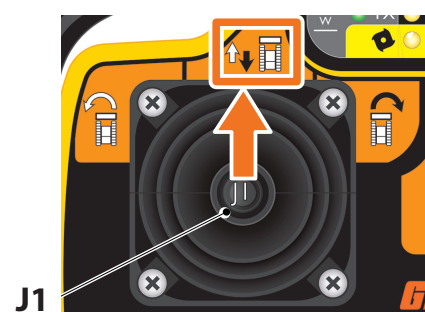
- › Move lever **J1** in the direction indicated by the arrow to steer to the right.



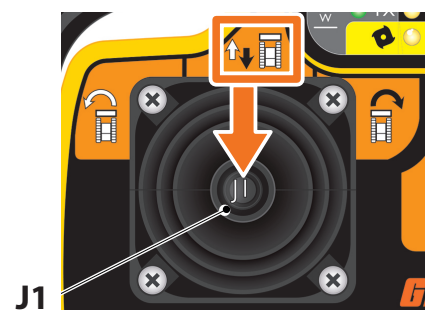
- › Move lever **J1** in the direction indicated by the arrow to steer to the left.



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

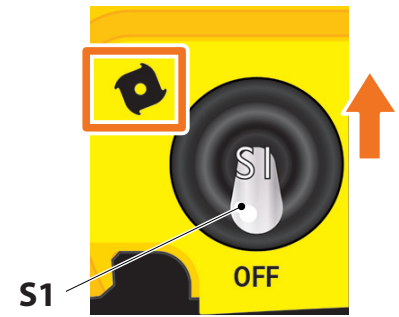


- › Move lever **J1** in the direction indicated by the arrow to move the machine backwards.





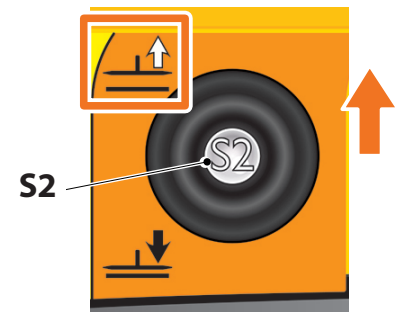
- › Press switch **S1** in the direction indicated by the arrow to turn on the blades.



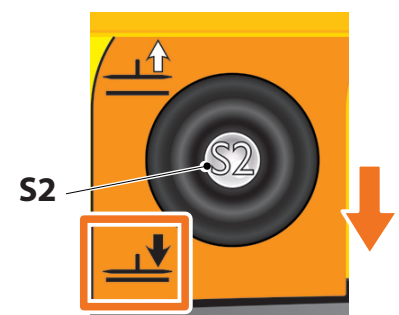
- › Press switch **S1** in the direction indicated by the arrow to turn off the blades.



- › Press switch **S2** in the direction indicated by the arrow to raise the blades.

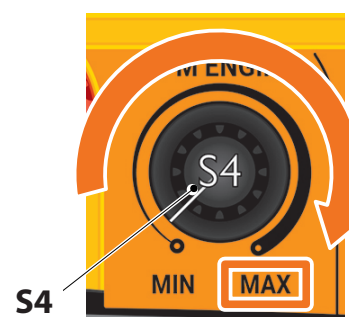


- › Press switch **S2** in the direction indicated by the arrow to lower the blades.

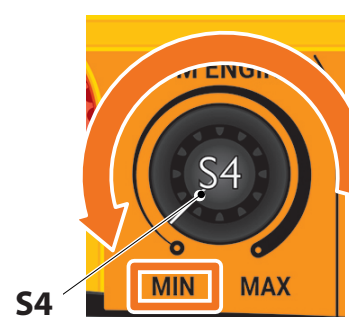




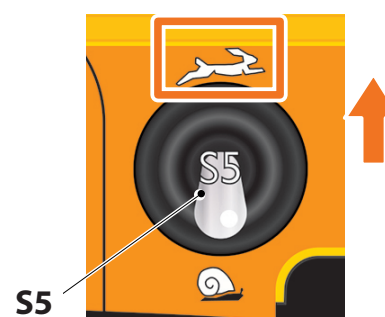
- › Turn knob **S4** in the direction indicated by the arrow to increase the engine speed.



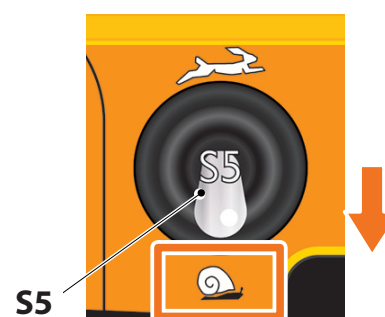
- › Turn knob **S4** in the direction indicated by the arrow to reduce the engine speed.



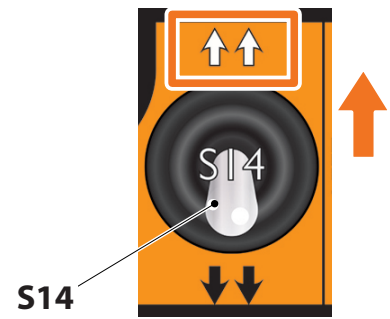
- › Press switch **S5** in the direction indicated by the arrow to select high machine speed.



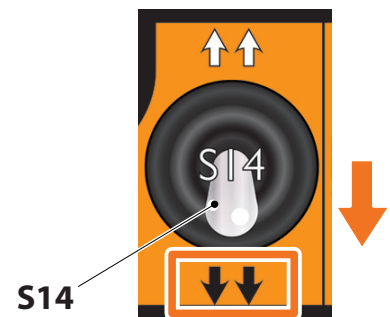
- › Press switch **S5** in the direction indicated by the arrow to select slow machine speed.



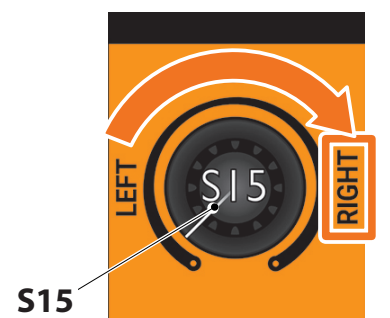
- › Turn switch **S14** in the direction indicated by the arrow to leave the J1 commands unchanged.
- › The control unit lets you reverse the direction of travel and steering.



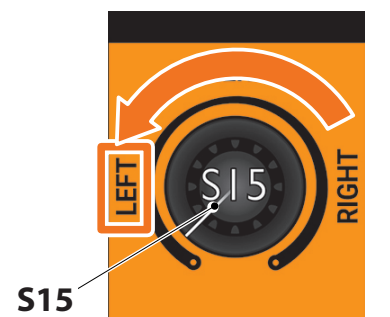
- › Turn switch **S14** in the direction indicated by the arrow to reverse the J1 commands.



- › This control knob enables the machine to move always in alignment with the direction of travel, by allowing the operator to correct the traction of the individual tracks (when necessary, depending on the working conditions).
- › Turn control knob **S15** in the direction indicated by the arrow to adjust the machine's trajectory to the right.

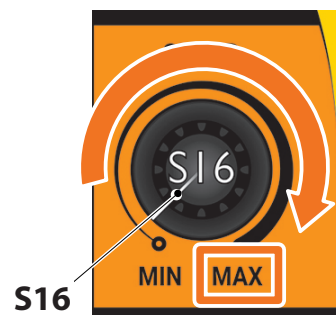


- › The knob can be adjusted to align the trajectory travelled by the machine with the machine axis. Once the path has been completed, simply return the control knob to its original position.
- › Turn control knob **S15** in the direction indicated by the arrow to adjust the machine's trajectory to the left.





- › Turn control knob **S16** in the direction indicated by the arrow to increase the machine speed.



- › Turn control knob **S16** in the direction indicated by the arrow to reduce the machine speed.







## 5.5.2 SAFETY GUIDELINES FOR USE

### MOVING THE MACHINE

#### NOTICE

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

Move the machine with the blades switched off and in the raised position.

Avoid sudden manoeuvres (acceleration, deceleration or steering).



#### CAUTION

Do not use in adverse weather conditions.

Operate the various controls (see paragraph "5.2.1 Description of the remote control") gradually in order to achieve smooth and constant work and a smooth stop.



#### WARNING

Do not use for towing operations.

During manoeuvres, keep away from any obstacles.

Do not leave the machine with the engine running.

The paths along which the machine works must be perfectly even and clear of obstacles.



#### DANGER

It is prohibited to use the machine along paths with precarious traction or stability.

Strictly observe the maximum permitted working slope, as indicated in paragraph "3.3.3 Other technical specifications".

Do not transport people.

Performing any kind of control, repair or maintenance operations on moving parts is prohibited.



#### DANGER

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.



## MOWING OPERATIONS

 **CAUTION**

Pay attention to the operating range of the machine.

 **WARNING**

Do not work beyond the cutting height indicated in paragraph "3.3.3 Other technical specifications".

During mowing operations, there must be no people within the machine's working area, as indicated in the paragraph "3.4 Work area".

When using the machine on sloping ground, always stand uphill from it, as indicated in paragraph "3.4 Work area".

Always maintain a minimum distance X of 3 metres from the machine, as indicated in paragraph "3.4 Work area".

 **DANGER**

The front and rear side of the machine pose thrown-object hazards due to the rotation of the blades. For this reason, the operator must always be positioned as shown in paragraph "3.4 Work area".

Wear the required personal protective equipment, as indicated in "3.12 Personal Protective Equipment".

Never go beyond the maximum permitted working slope, as indicated in paragraph "3.3.3 Other technical specifications".

 **DANGER**

The blades pose a cutting hazard: keep limbs away from the working area of the blades.



### 5.5.3 MOWING



#### WARNING

Use extreme caution during mowing operations.



#### WARNING

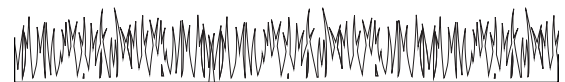
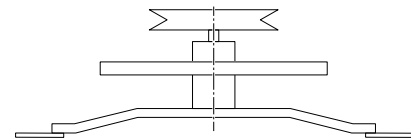
Do not stop the machine in work or transit areas.



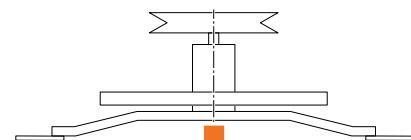
#### CAUTION

Move the controls gradually (see paragraph "5.2.1 Description of the remote control" and/or paragraph "5.3 Pre-start checks") in order to achieve steady and constant mowing.

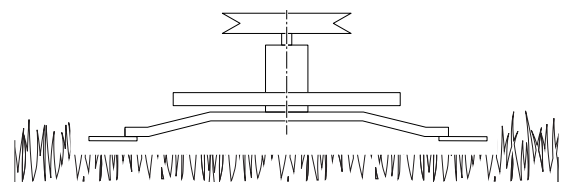
- › Approach the area to be mowed slowly.



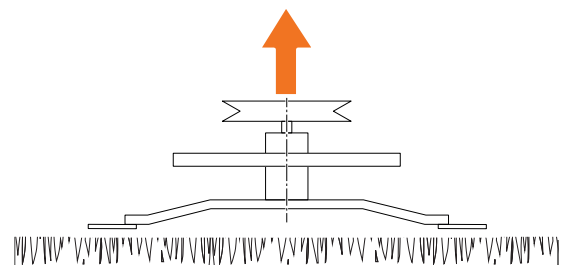
- › Lower the blades.



- › Start the blades.
- › Move the machine slowly until the mowing operations are completed.
- › Switch off the blades.



- › Raise the blades.

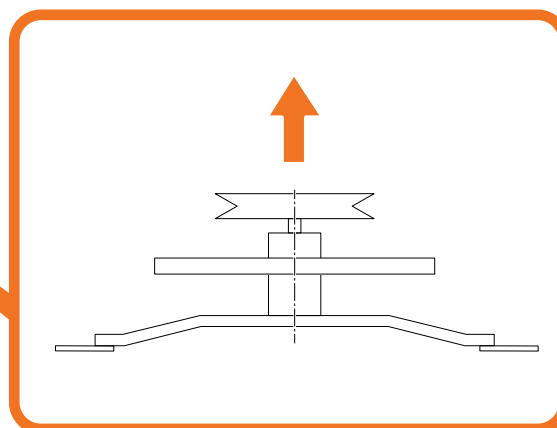
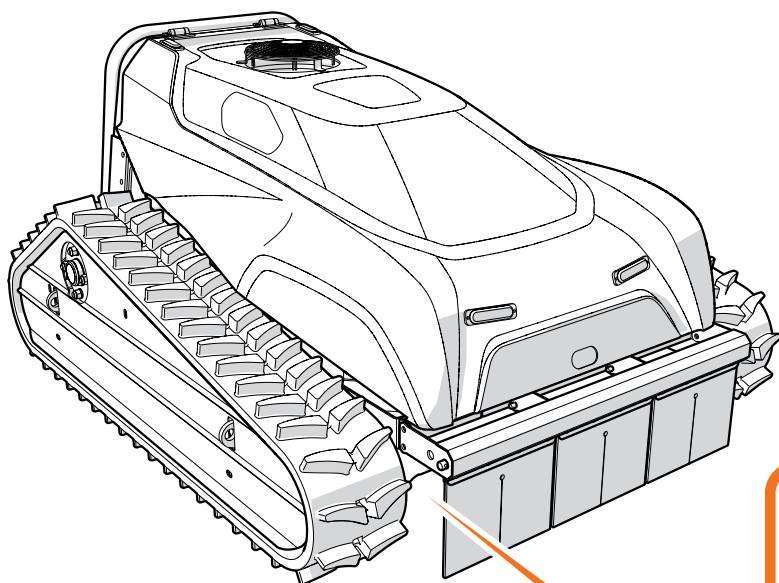




## 5.6 PARKING

Proceed as follows:

- › Identify the machine parking zone.
- › If necessary, switch off the blades (use the commands indicated in the previous paragraphs).
- › If necessary, raise the blades (use the controls indicated in the previous paragraphs).
- › Move the machine to the prepared zone (using the controls indicated in the previous paragraphs).



## 5.7 SHUTDOWN

The machine can be shut down in two different ways:

- › Manual shutdown.
- › Shutdown by remote control

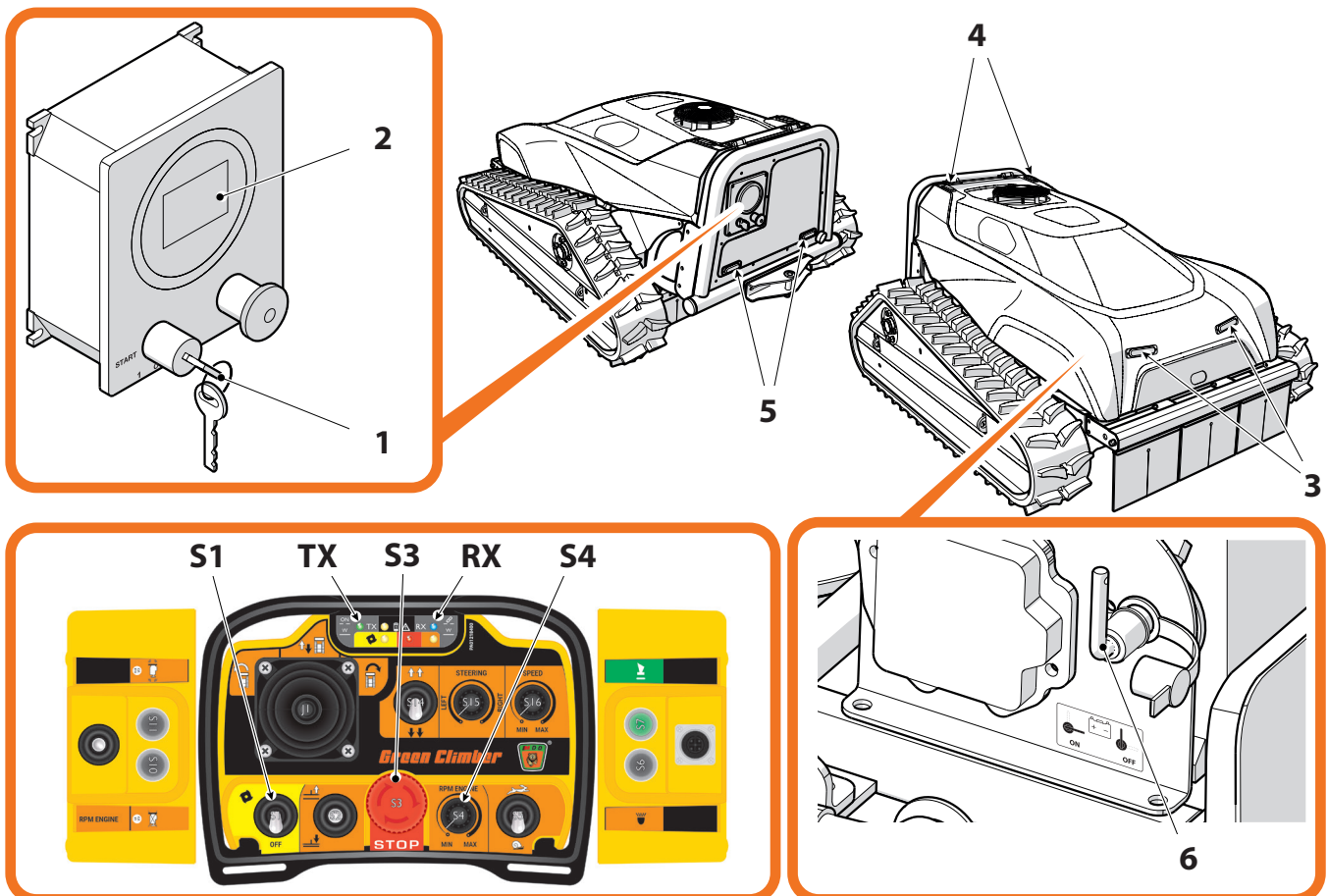
### NOTICE

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

#### 5.7.1 MANUAL SHUTDOWN.

Proceed as follows.

- › Turn the engine speed regulator **S4** to minimum.
- › If necessary, turn switch **S1** to the OFF position to switch off the blades.
- › Turn the ignition key **1** to 0.
  - › The **TX** LED flashes and the **RX** LED turns off.
  - › The engine stops.
  - › The display **2** turns off.
  - › The white lights **3** turn off, the yellow lights **4** turn off and the red lights **5** turn off.
- › Press button **S3** on the remote control to turn off the remote control.
  - › The **TX** LED turns off.
- › Remove the ignition key **1** and hand it over to the manager.
- › Open the bonnet (see chapter 6).
- › Turn the “battery disconnecter” key **6** to OFF.
- › Remove the “battery disconnecter” key **6**.
- › Close the bonnet.

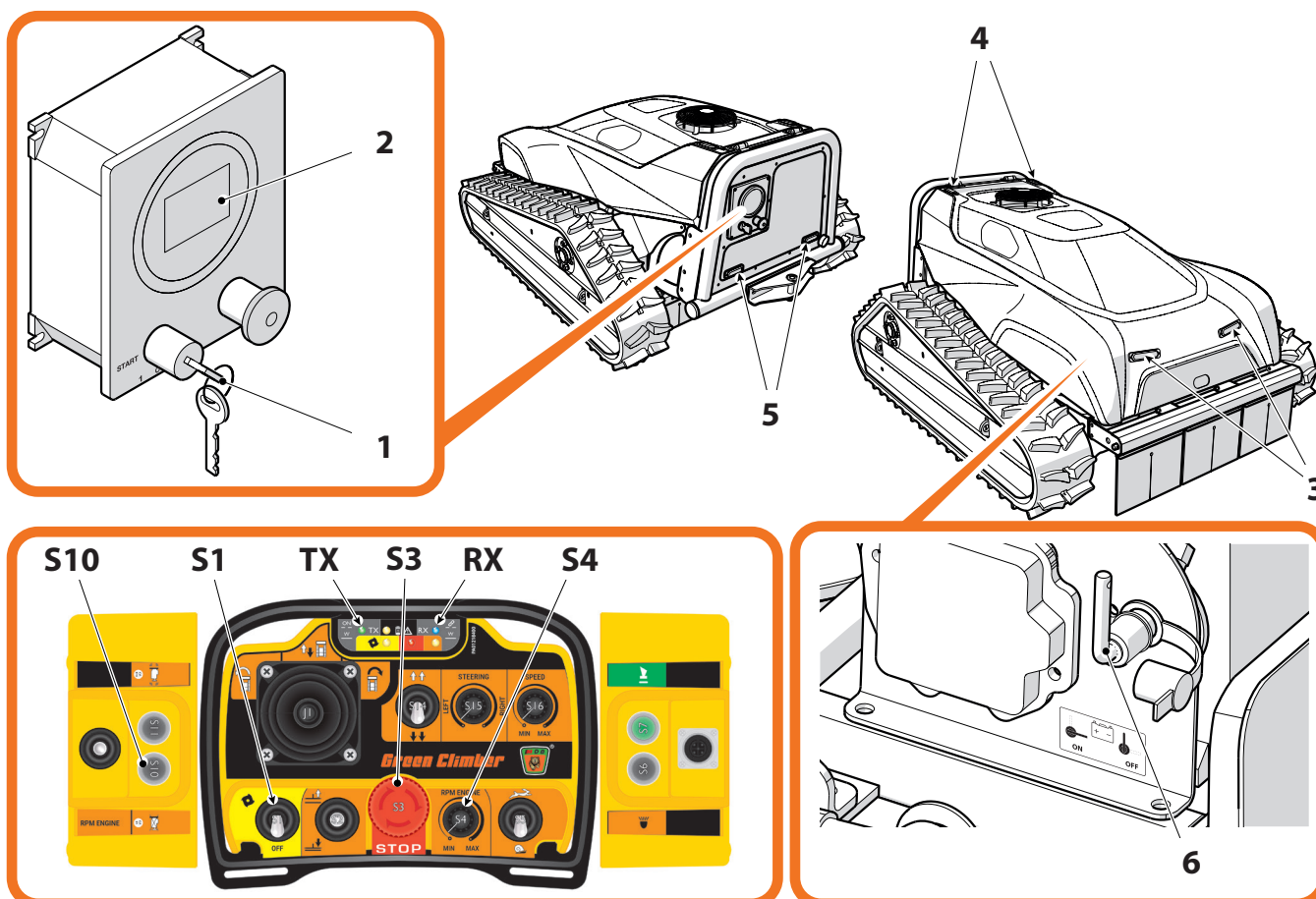




### 5.7.2 SHUTDOWN BY REMOTE CONTROL

Proceed as follows.

- › Turn the engine speed regulator **S4** to minimum.
- › If necessary, turn switch **S1** to the OFF position to switch off the blades.
- › Press the engine shutdown button **S10**.
  - › The engine stops.
- › Press button **S3** on the remote control to turn off the remote control.
  - › The **TX** and **RX** LEDs turn off.
- › Turn the ignition key **1** to 0.
  - › The display **2** turns off.
  - › The white lights **3** turn off, the yellow lights **4** turn off and the red lights **5** turn off.
- › Remove the ignition key **1** and hand it over to the manager.
- › Open the bonnet (see chapter 6).
- › Turn the “battery disconnecter” key **6** to OFF.
- › Remove the “battery disconnecter” key **6**.
- › Close the bonnet.
- › Place the remote control in the provided case.





## 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:

- › Place the machine on a level surface.
- › Put 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.**

**NOTICE**

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



### 6.1.1 ENGINE COMPARTMENT BONNET - BATTERY DISCONNECTOR

Some types of maintenance require the following operations:

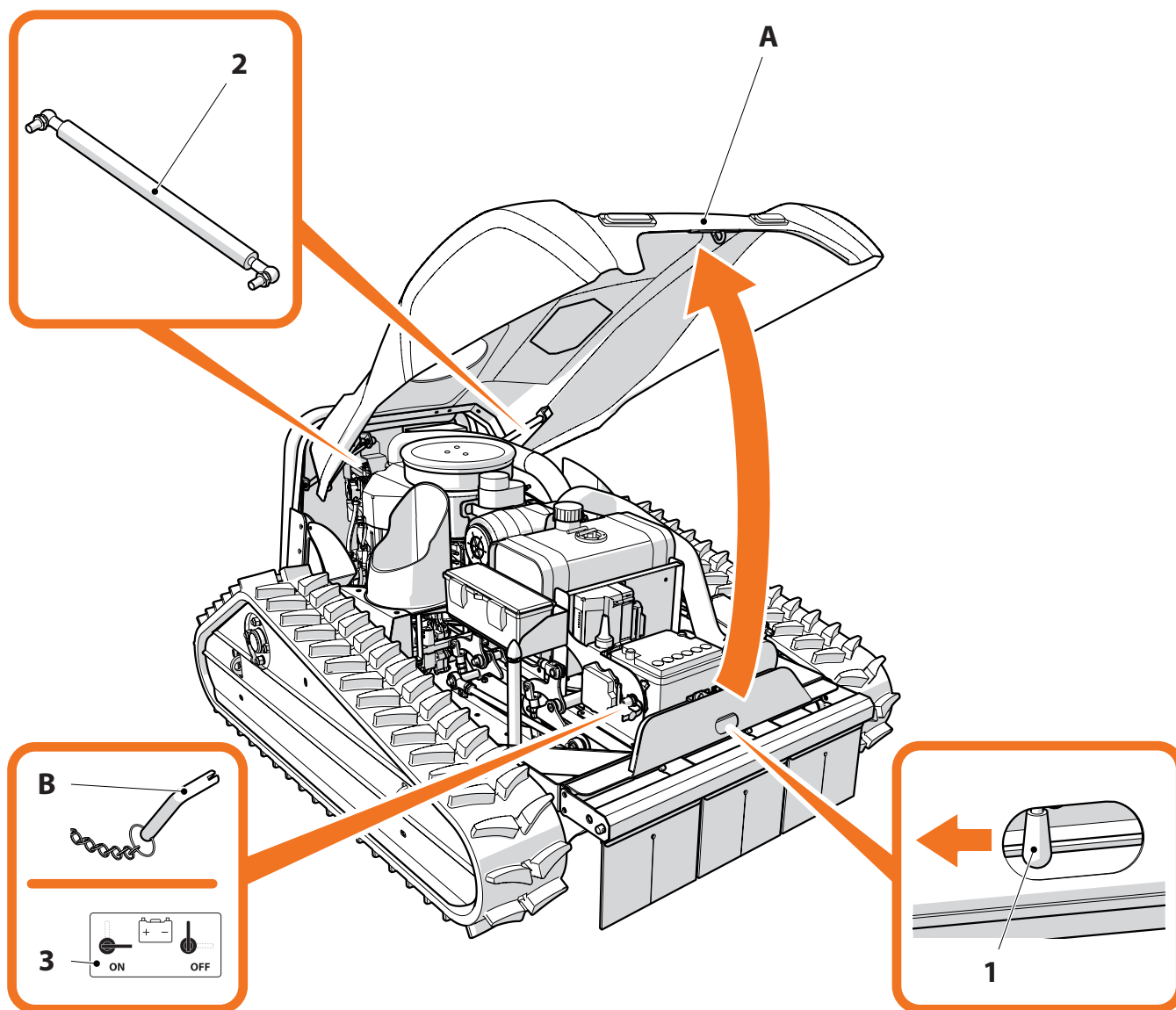
- › Opening the engine compartment bonnet **A**.
- › Disconnecting the "battery disconnecter" key **B**.

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

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

To disconnect the "battery disconnecter" key **B**, proceed as follows:

- › Turn the "battery disconnecter" key **B** to the OFF position (see the sticker **3**), and remove it.







## 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, as indicated on the hour meter (see chapter 5) and the table below.

Time interval (Hours)	Type of maintenance	See paragraph
3	"Checking belts"	6.4.19
8	"General machine cleaning"	6.4.2
8	"Checking engine oil"	6.4.3
8	"Checking the hydraulic oil level"	6.4.7
8	"Checking the air filter"	6.4.10
8	"Checking and tensioning the tracks"	6.4.18
8	"Periodic lubrication"	6.4.22
8	"Checking tightening elements"	6.4.23
8	"Hydraulic system check"	6.4.24
8	"Electrical system check"	6.4.25
8	"Checking blade sharpness"	6.4.21
40	"General checks"	6.4.1
50	"Checking the spark plugs"	6.4.16
50	"Changing the hydraulic oil and hydraulic unit filters"	6.4.9
100	"Replacing the spark plugs"	6.4.17
100	"Changing the engine oil"	6.4.5
100	"Checking the fuel filter"	6.4.14
200	"Changing the engine oil filter"	6.4.6
200	"Replacing the fuel filter"	6.4.15
250	"Replacing the external air filter"	6.4.12
250	"Changing the hydraulic oil and hydraulic unit filters"	6.4.9
500	"Replacing the internal air filter"	6.4.13
















6.3.1 CHECKLIST

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

Type of maintenance	Maintenance intervals							
	8	40	50	100	200	250	500	1000
"General machine cleaning"								
"Checking engine oil"								
"Checking the hydraulic oil level"								
"Checking the air filter"								
"Checking and tensioning the tracks"								
"Periodic lubrication"	•							
"Checking tightening elements"								
"Hydraulic system check"								



Type of maintenance	Maintenance intervals							
	8	40	50	100	200	250	500	1000
"Electrical system check"	 							
"Checking blade sharpness"	 							
"General checks"								
"Checking the spark plugs"								
"Replacing the spark plugs"								
"Changing the engine oil"								
"Checking the fuel filter"								
"Changing the engine oil filter"								
"Replacing the fuel filter"								
"Replacing the external air filter"								
"Replacing the internal air filter"								
"Changing the hydraulic oil and hydraulic unit filters"								



## 6.4 ROUTINE MAINTENANCE

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

### NOTICE

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, removing all grass clippings, 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 CHECKING ENGINE OIL

This check should be carried out 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 and remove the battery disconnecter (see paragraph "6.1.1 Engine compartment bonnet - Battery disconnecter").
- › 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 paragraph below.

### 6.4.4 TOPPING UP ENGINE OIL

## NOTICE

See paragraph "3.3.3 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.

### 6.4.5 CHANGING THE ENGINE OIL

This should be done every 100 hours of work.

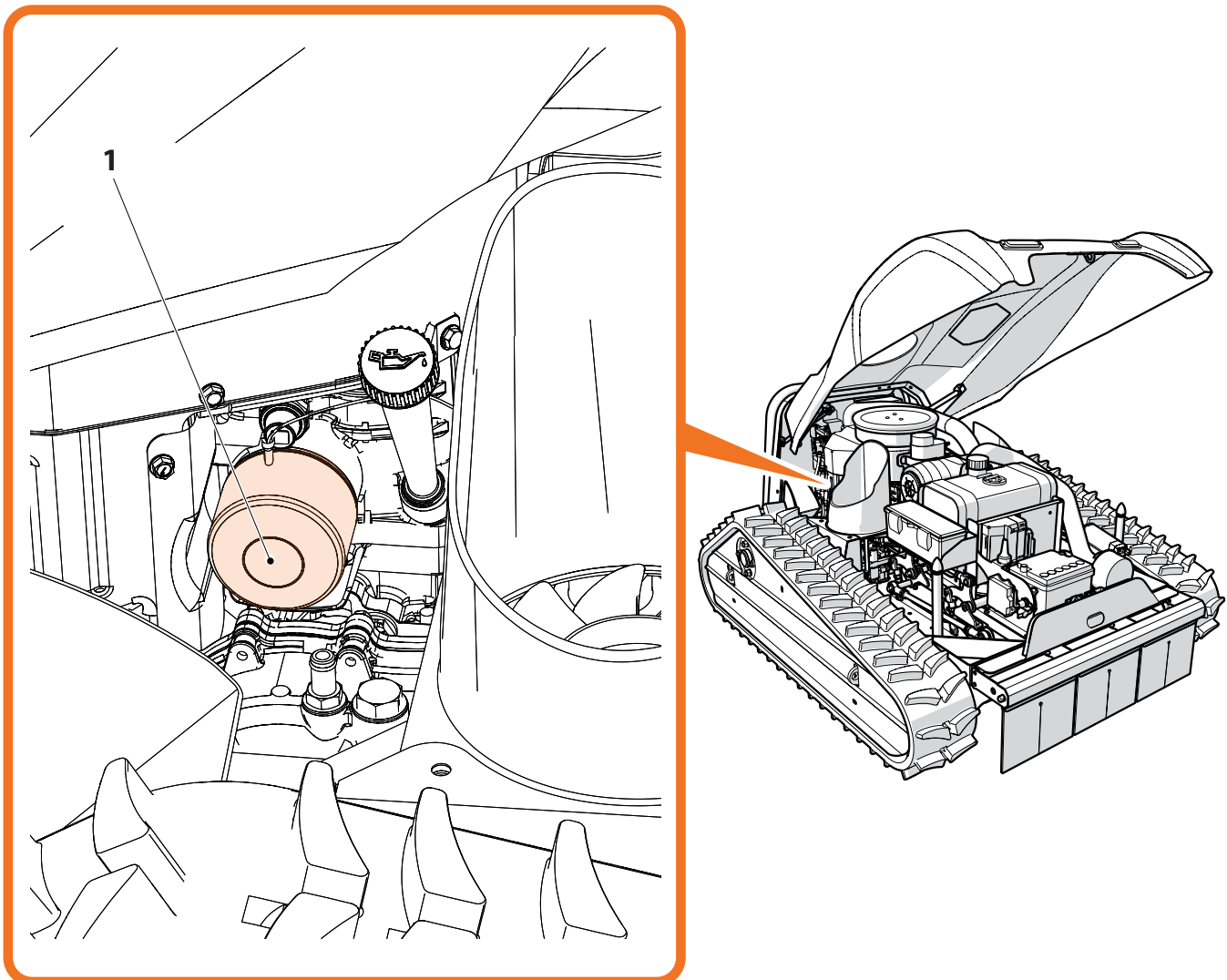
## NOTICE

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

### 6.4.6 CHANGING THE ENGINE OIL FILTER

The engine oil filter should be changed every 200 hours of work.

#### 1 Engine oil filter



## 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 THE HYDRAULIC OIL LEVEL

This check should be carried out every 8 working hours.

#### CAUTION

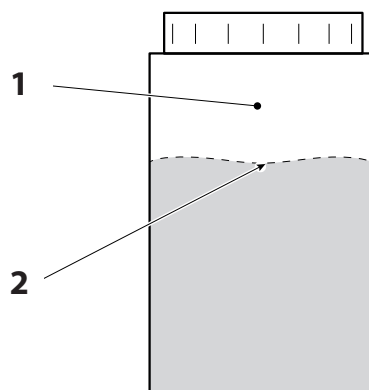
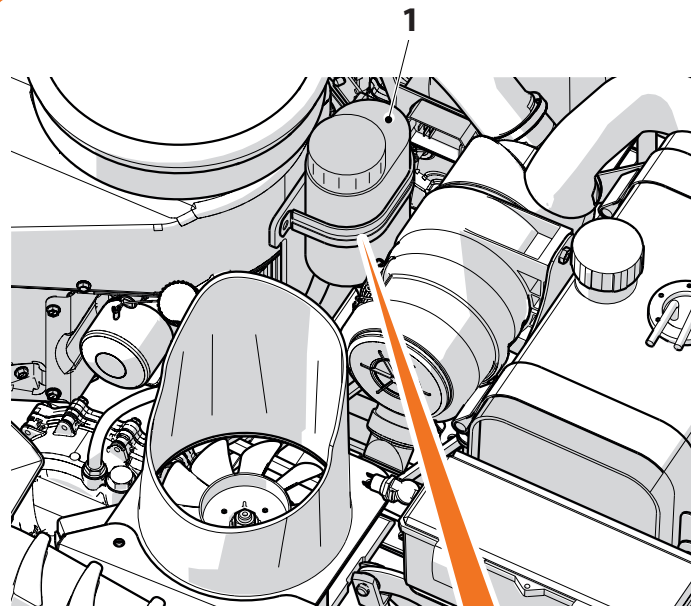
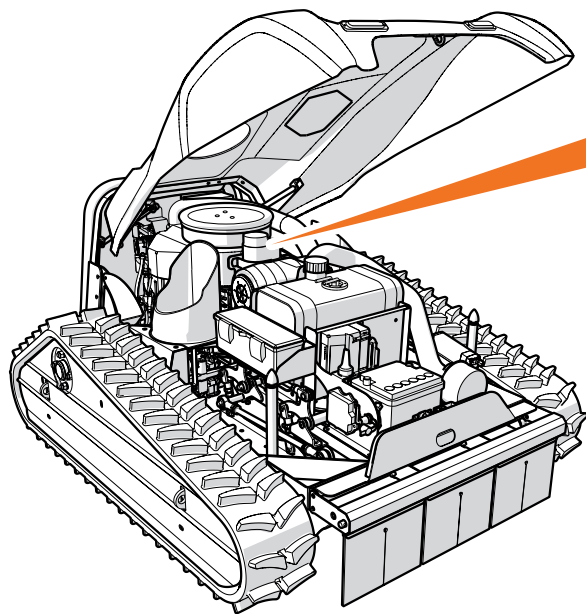


The operator must wear the following personal protective equipment:

- › Protective clothing
- › Safety footwear

Proceed as follows:

- › Open the bonnet and remove the battery disconnecter (see paragraph "6.1.1 Engine compartment bonnet - Battery disconnecter").
- › Visually check the oil level in the tank **1**.
- › If the oil is below the proper level **2** (two-thirds full), top it up as described below.





### 6.4.8 TOPPING UP THE HYDRAULIC OIL



## WARNING

### BURN HAZARD



The operator must wear the following personal protective equipment:

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

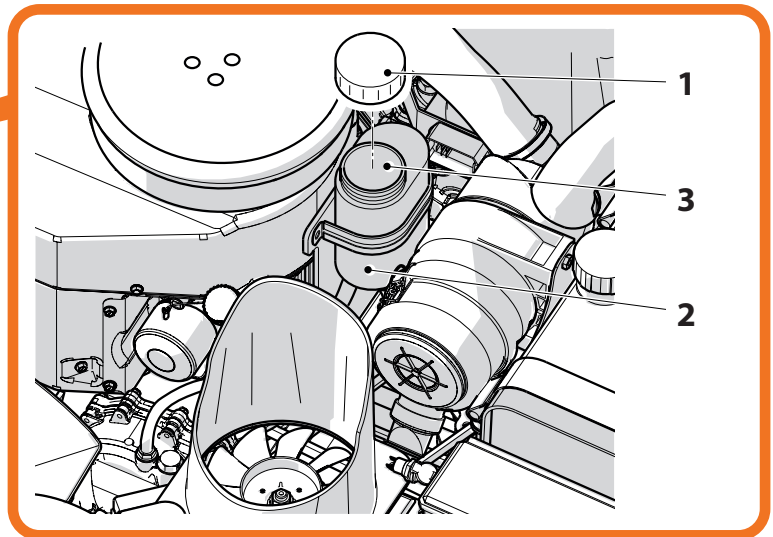
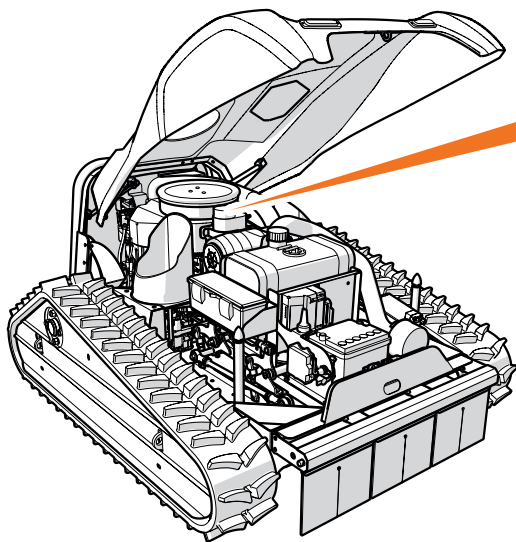
## NOTICE

See paragraph “3.3.3 Other technical specifications” for the type of product to use.

See paragraph “3.3.3 Other technical specifications” for the quantity of product to use.

Proceed as follows:

- › Unscrew the cap **1**.
- › Use a funnel and pour the oil into the tank **2** through the opening **3**.
- › Check the level of the input oil, as indicated in the previous paragraph.

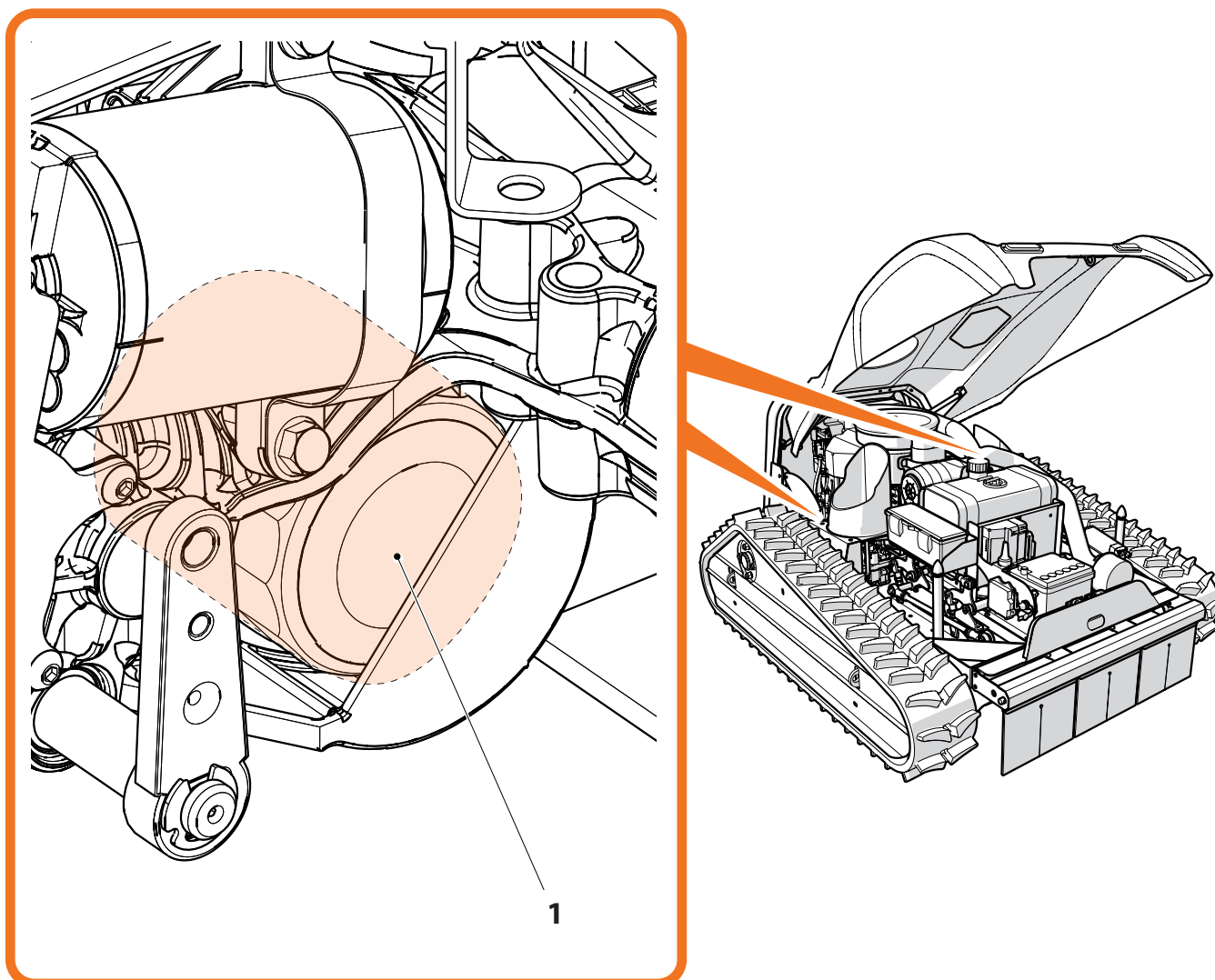




### 6.4.9 CHANGING THE HYDRAULIC OIL AND HYDRAULIC UNIT FILTERS

At 50 hours and then every 250 working hours proceed with the above-mentioned replacement.

#### 1 Track traction hydraulic unit filters



#### NOTICE

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

#### NOTICE

For more information, see Annex F.

### 6.4.10 CHECKING THE AIR FILTER

This check should be carried out every 8 working hours.

#### CAUTION

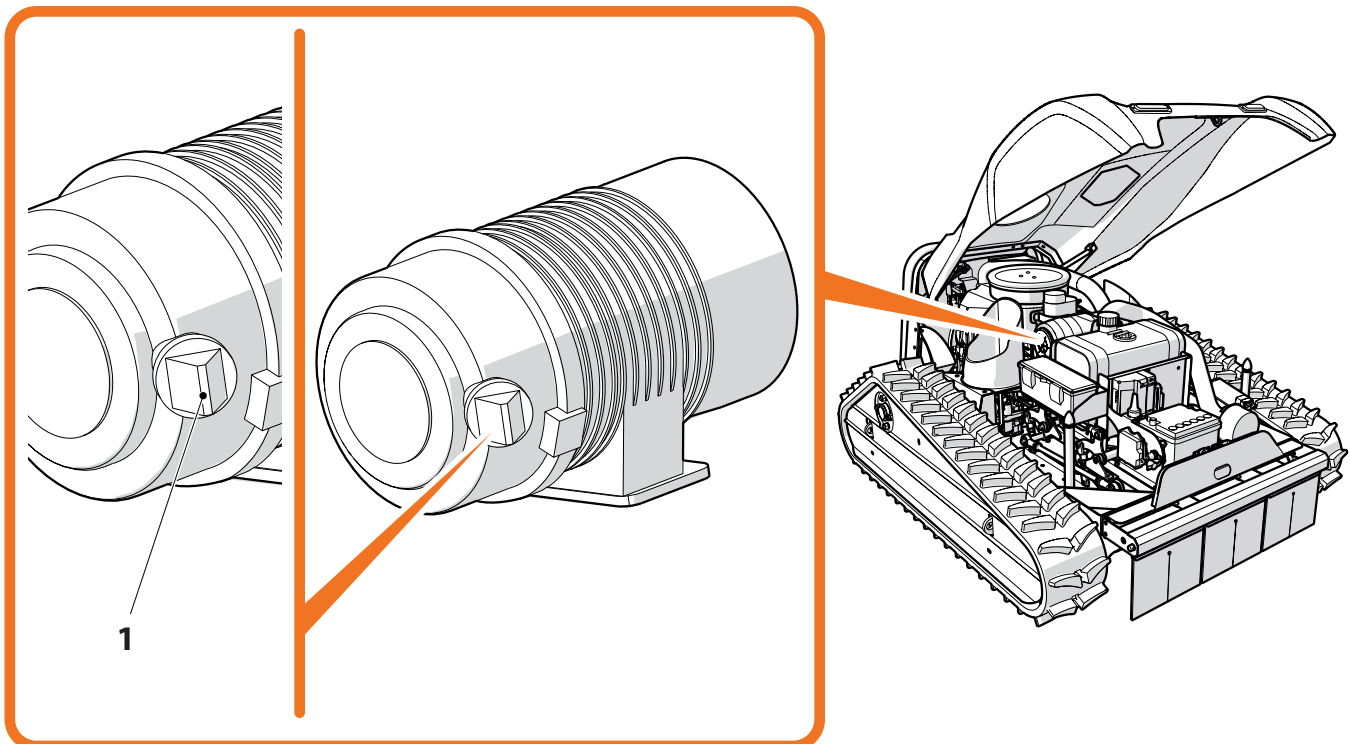


The operator must wear the following personal protective equipment:

- › Safety footwear
- › Gloves
- › Protective clothing
- › Safety goggles

Proceed as follows:

- › Open the bonnet and remove the battery disconnecter (see paragraph “6.1.1 Engine compartment bonnet - Battery disconnecter”).
- › 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.

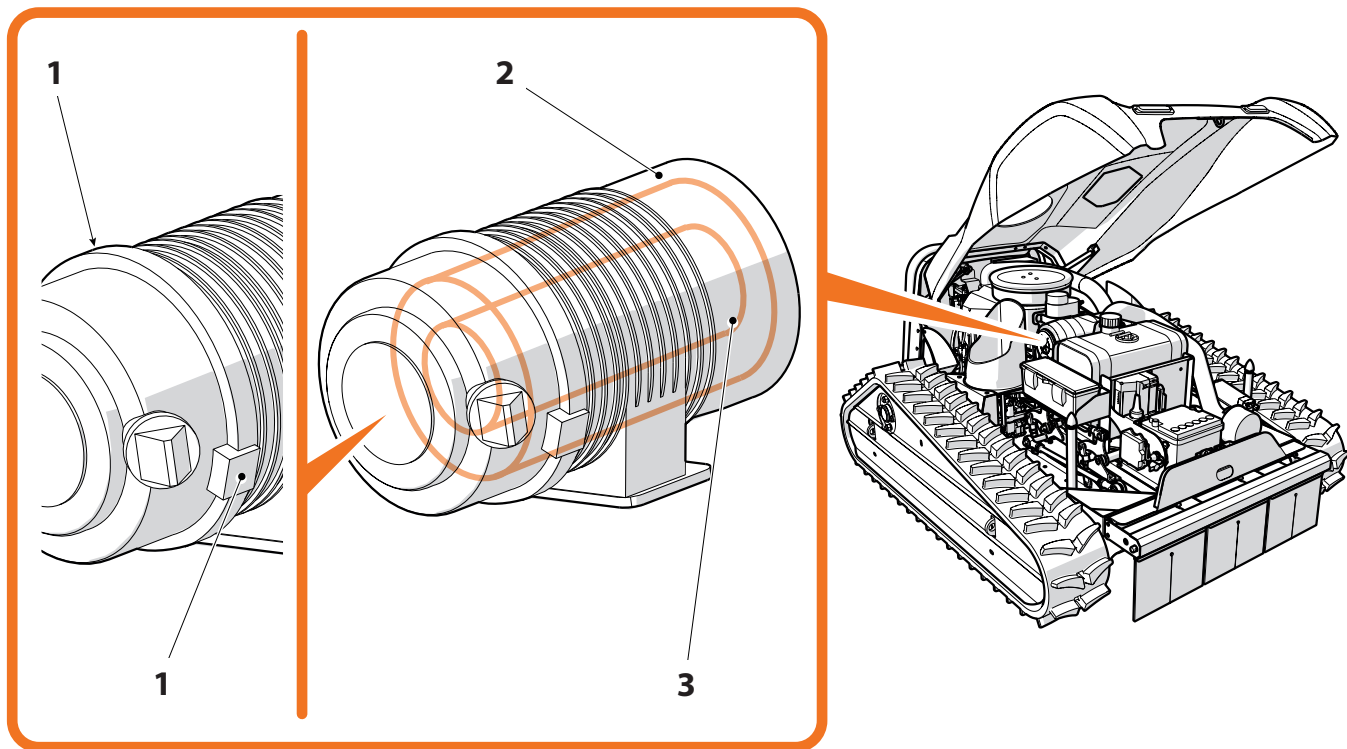




### 6.4.11 CLEANING THE AIR FILTERS

Proceed as follows:

- › Undo the clips **1**.
- › Remove the outer filter **2** and the inner filter **3**.
- › Move to an area with 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.



### 6.4.12 REPLACING THE EXTERNAL AIR FILTER

This should be done 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).

### 6.4.13 REPLACING THE INTERNAL AIR FILTER

This should be done every 500 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).

### 6.4.14 CHECKING THE FUEL FILTER

This check should be carried out every 100 working hours.

#### **WARNING**

#### **BURN HAZARD**

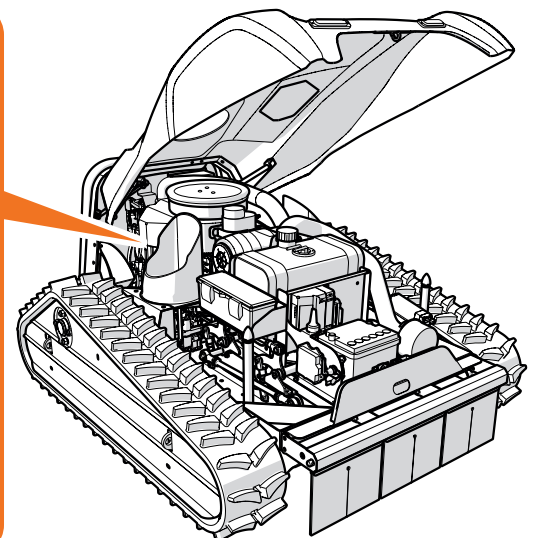
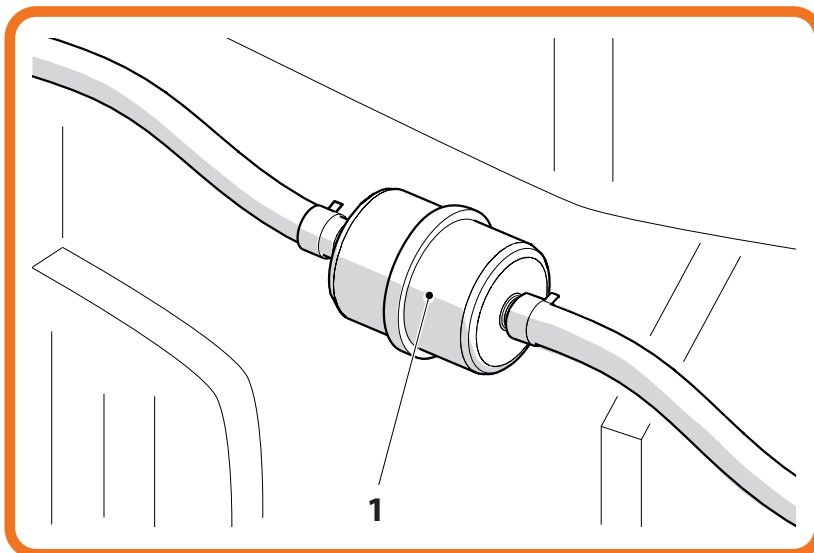


**The operator must wear the following personal protective equipment:**

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

Proceed as follows:

- › Open the bonnet and remove the battery disconnecter (see paragraph “6.1.1 Engine compartment bonnet - Battery disconnecter”).
- › Visually check the cleanness of the filter **1**.
- › If the filter is dirty, clean it as described below.



### 6.4.15 REPLACING THE FUEL FILTER

This should be done every 200 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 CHECKING THE SPARK PLUGS

This check should be carried out every 50 working hours.

#### **WARNING**

#### **BURN HAZARD**

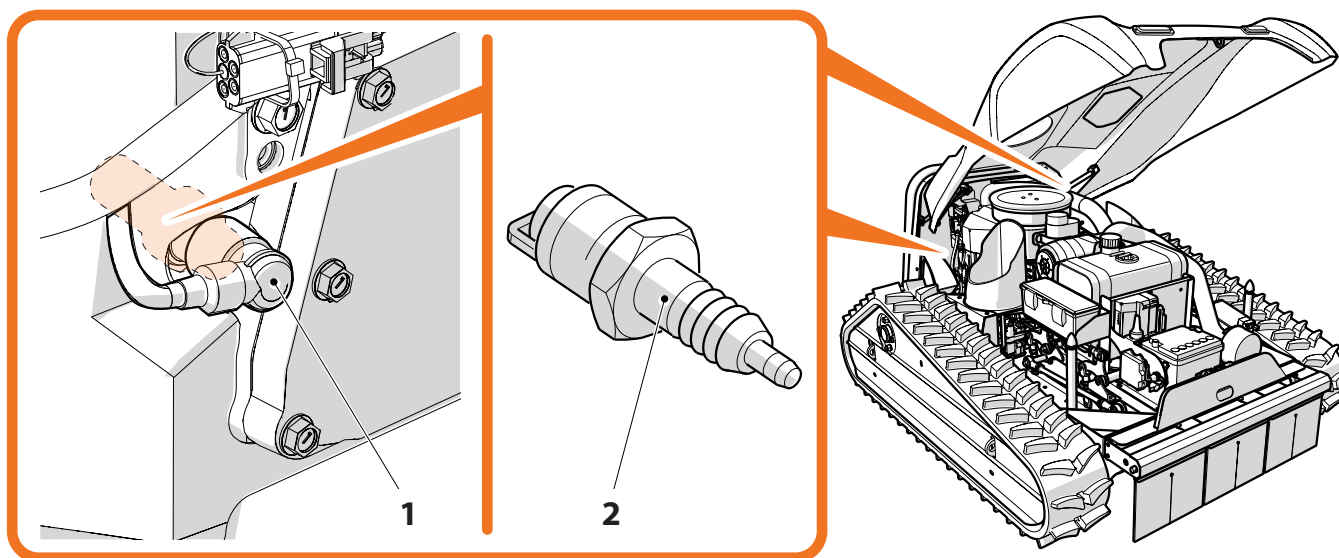
The operator must wear the following personal protective equipment:



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

Proceed as follows:

- › Open the bonnet and remove the battery disconnecter (see paragraph “6.1.1 Engine compartment bonnet - Battery disconnecter”).
- › Remove the caps **1** from the spark plugs **2** and disconnect them.
- › Unscrew the spark plug **2** with a spark plug wrench.
- › Visually check the state of cleanness and/or level of wear of the spark plug **1** as indicated in Annex B.
- › If the spark plug is dirty, clean it as indicated in Annex B.
- › If the spark plug is worn, follow the steps given below.
- › Do the same with both spark plugs.



### 6.4.17 REPLACING THE SPARK PLUGS

This should be done every 100 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 CHECKING AND TENSIONING THE TRACKS

This check should be carried out every 8 working hours.

#### CAUTION

The operator must wear the following personal protective equipment:



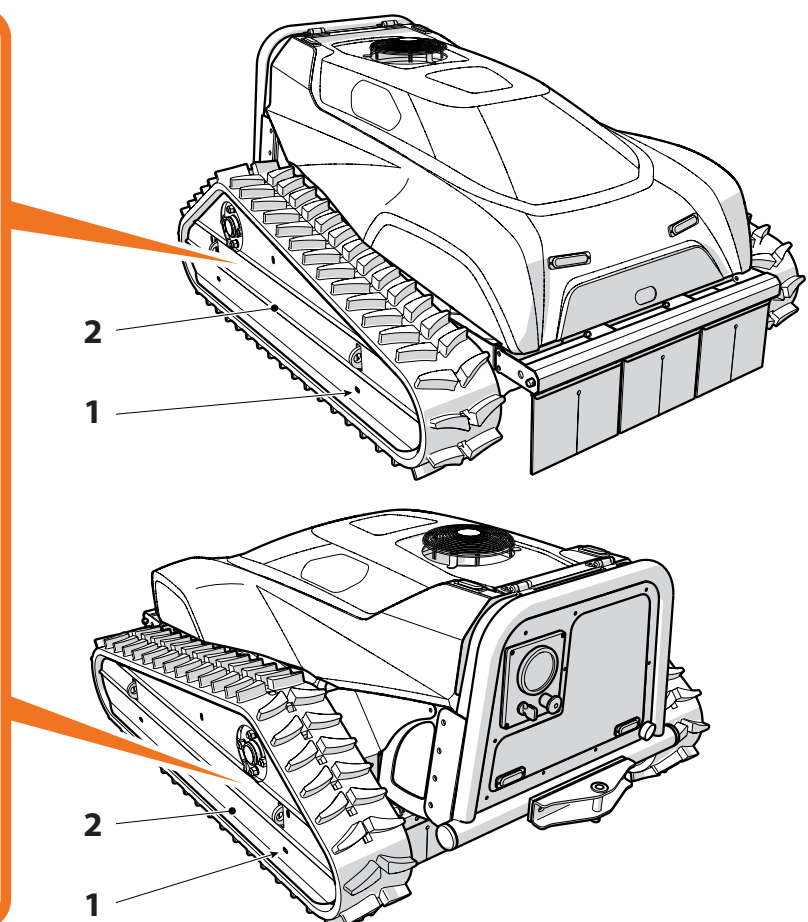
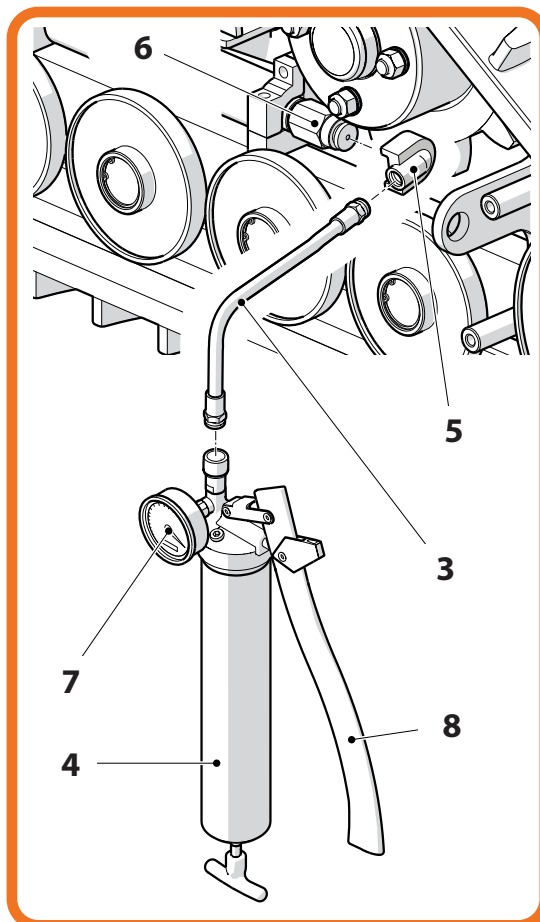
- > Safety footwear
- > Gloves
- > Protective clothing

Proceed as follows:

- > Undo the screws **1** and remove the casing **2**.
- > Connect the hose **3** to the pump **4**.
- > Connect the fitting **5** to the hose **3**.
- > Connect the fitting **5** to the grease nipple **6**.
- > Check that the pressure gauge **7** shows a pressure of 180 bar.
- > If the pressure is lower, operate the lever **8** of the pump **4**, 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 Replacing the tracks".





#### 6.4.19 CHECKING BELTS

Proceed with the above-mentioned check every 3 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).**

#### 6.4.20 BELT TENSIONING

### 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 CHECKING BLADE SHARPNESS

This check should be carried out every 8 working hours.



**WARNING**



**CUT HAZARD**

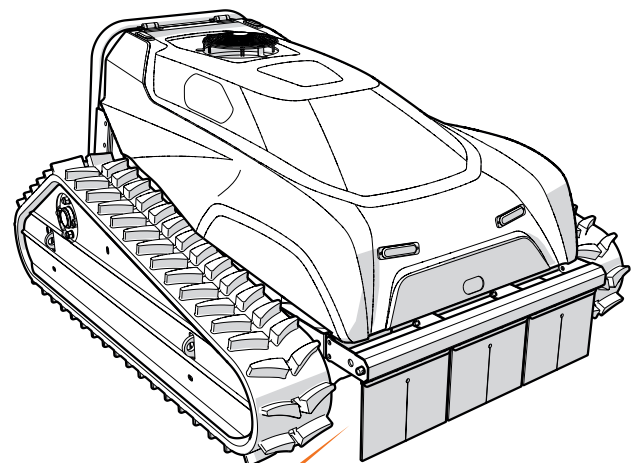
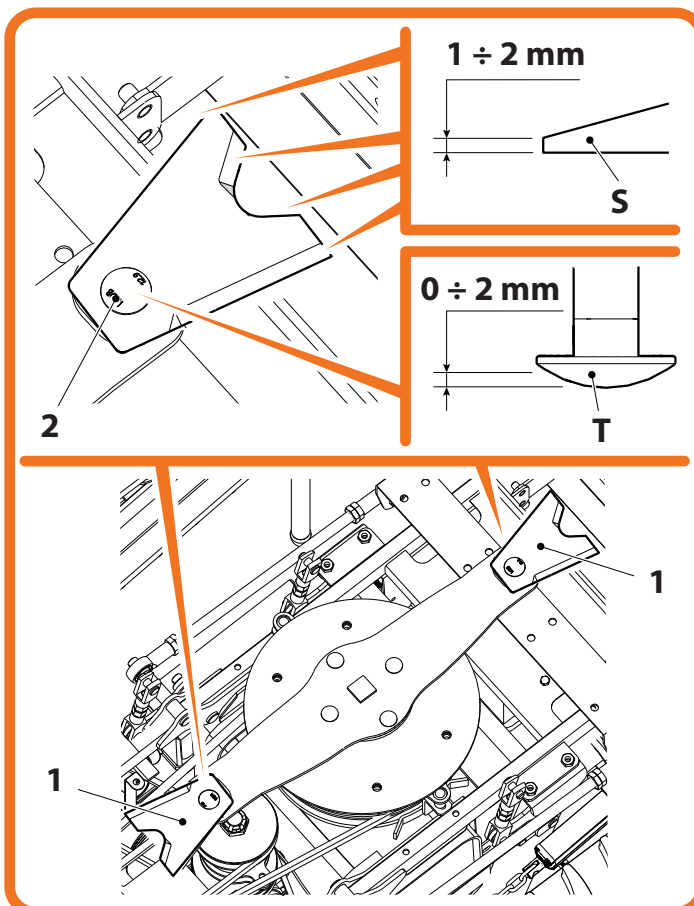
**CRUSHING HAZARD**

The operator must wear the following personal protective equipment:

- > Safety footwear
- > Gloves
- > Protective clothing

Proceed as follows:

- > Position the machine over an inspection pit or on a vehicle lift.
- > Open the bonnet and remove the battery disconnecter (see paragraph "6.1.1 Engine compartment bonnet - Battery disconnecter").
- > Access the lower part of the machine, where the blades **1** are located.
- > Check the cutting surface **S** of the blades **1**.
  - > The level of wear detected must be between **1 mm** and **2 mm**.
- > Check the surface **T** of the screw heads **2**.
  - > The level of wear detected must be between **0 mm** and **2 mm**.
- > If the blades and screws are excessively worn or damaged, proceed as indicated in paragraph "6.5.3 Replacing the blades".
- > If foreign bodies are found to be entangled in the blades during the control operations, remove them.





### 6.4.22 PERIODIC LUBRICATION

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

#### CAUTION

The operator must wear the following personal protective equipment:



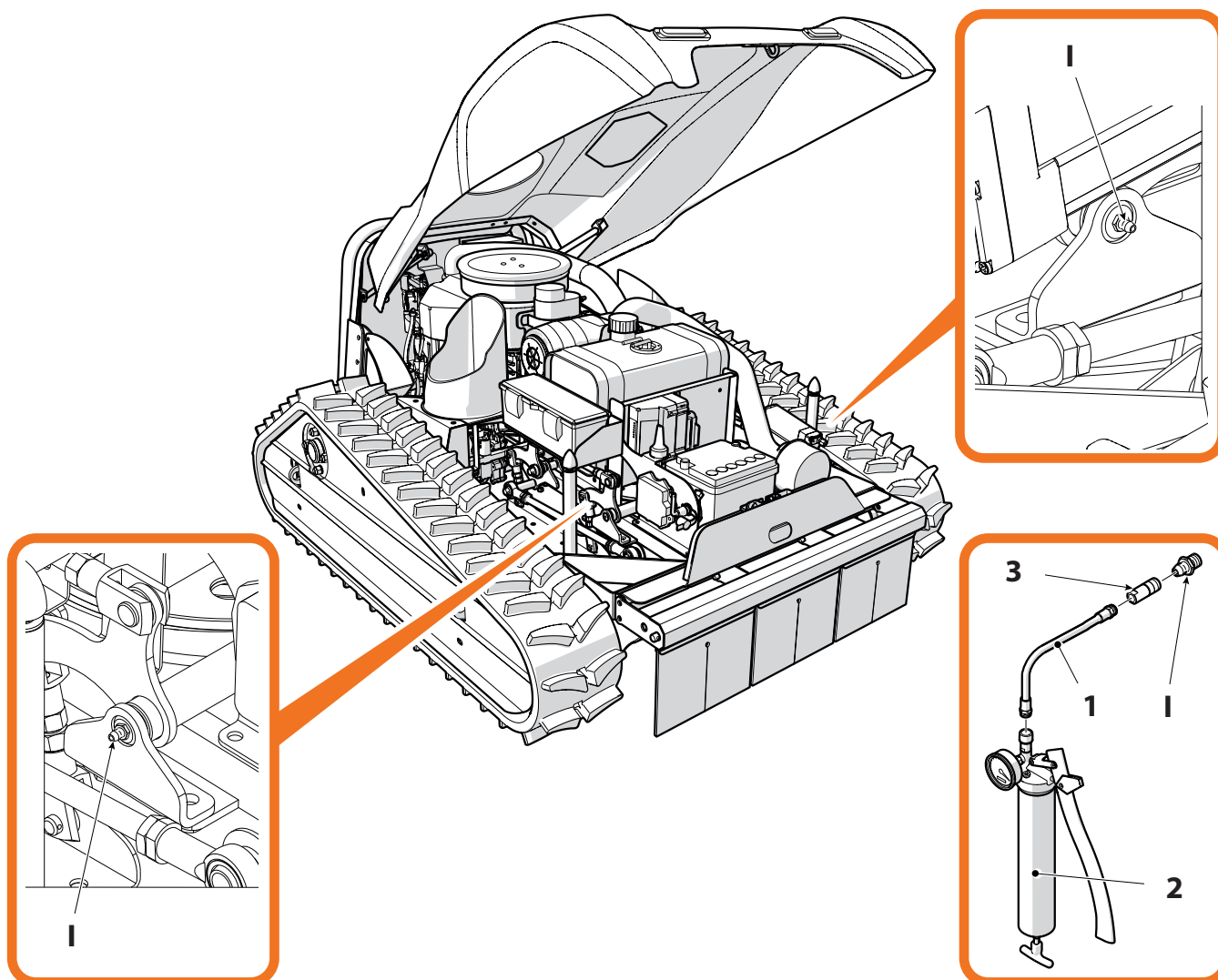
- › Safety footwear
- › Gloves
- › Protective clothing

Proceed as follows:

- › Open the bonnet and remove the battery disconnecter (see paragraph "6.1.1 Engine compartment bonnet - Battery disconnecter").
- › Connect the hose **1** to the pump **2**.
- › Connect the fitting **3** to the hose **1**.
- › Connect the fitting **3** to the relevant grease nipple **I**.

#### NOTICE

See paragraph "3.3.3 Other technical specifications" for the type of product to use.





### 6.4.23 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.

### 6.4.24 HYDRAULIC SYSTEM CHECK

Carry out the following checks every 8 working hours.

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

### 6.4.25 ELECTRICAL SYSTEM CHECK

This check should be carried out every 8 working hours.



**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 zones **A-B-C**.

### **WARNING**

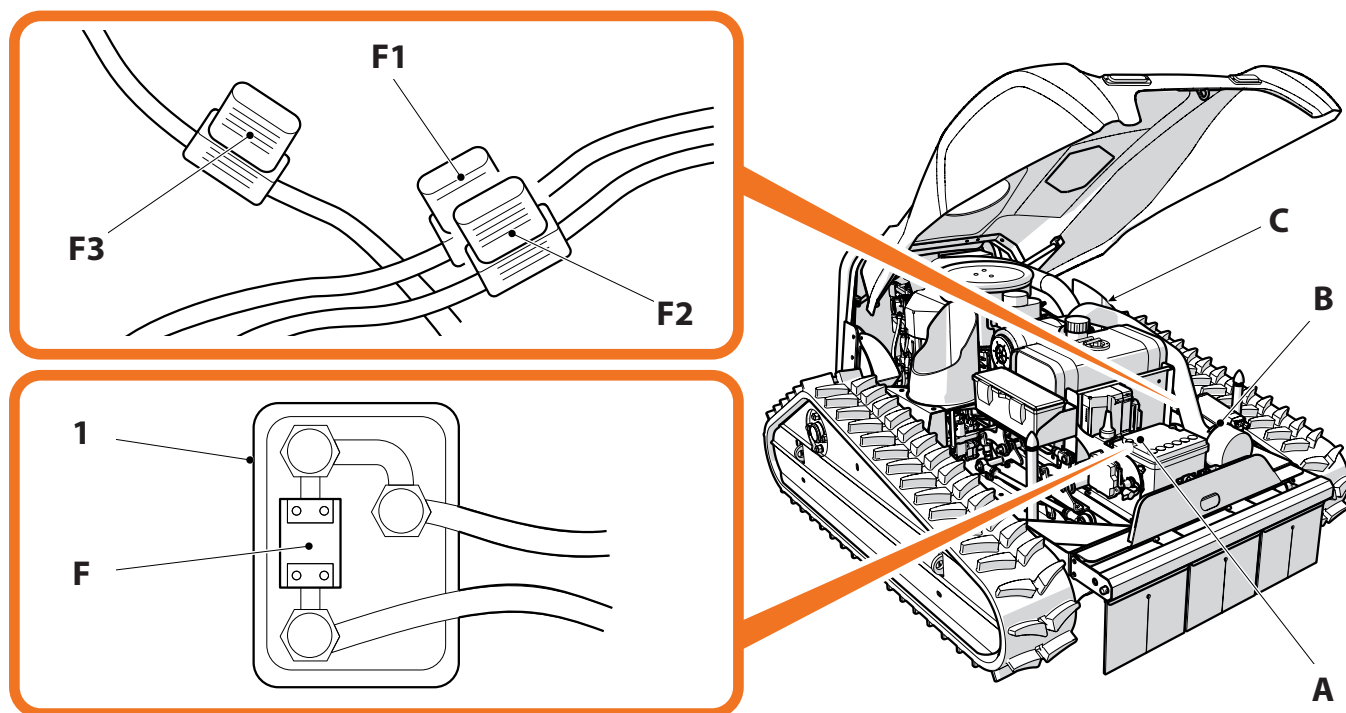
Short circuits can cause fires.

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



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

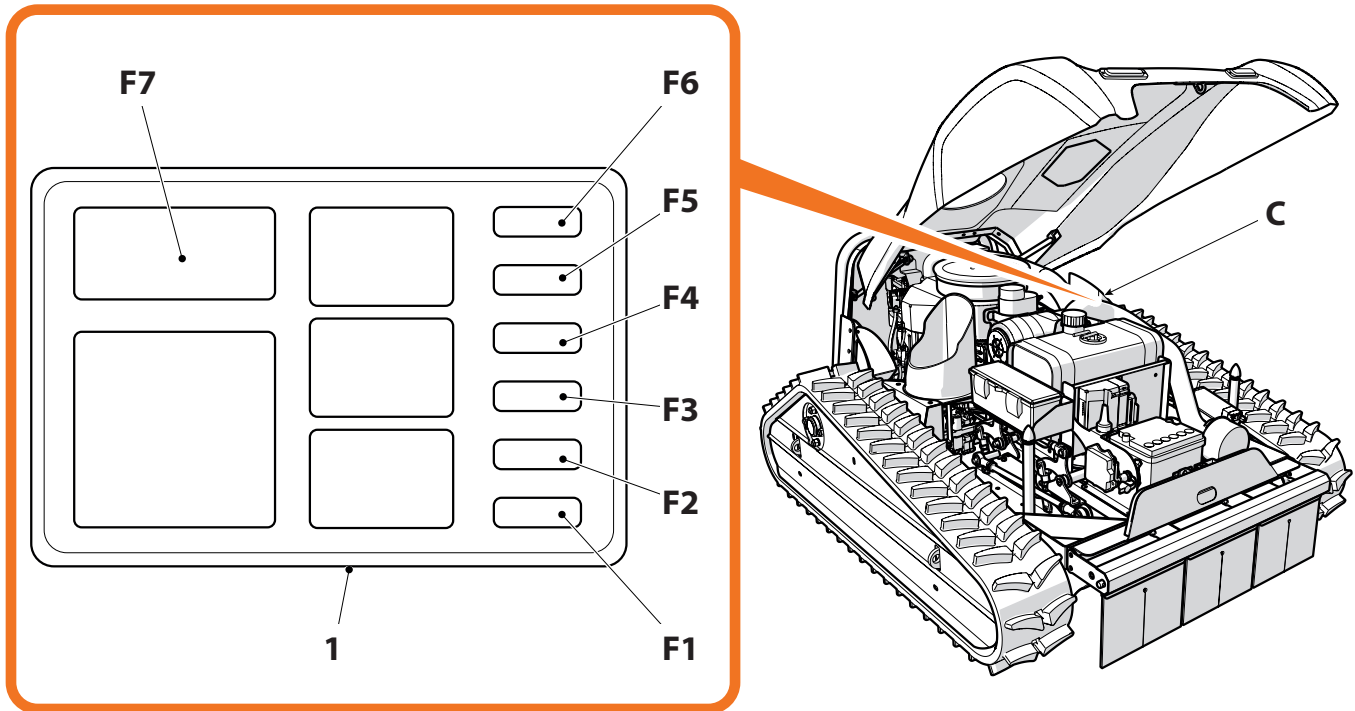
- › Open the bonnet and remove the battery disconnecter (see paragraph "6.1.1 Engine compartment bonnet - Battery disconnecter").
- › Remove the protective cover **1**.
- › Identify the damaged fuse and replace it, using the replacement fuse kit.



Fuse	Description	Amperage
F	Main system fuse	100 A
F1	Blade lifting actuator fuse	10 A
F2	Blade lowering actuator fuse	10 A
F3	Work light fuse (if present)	3 A

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

- › Open the bonnet and remove the battery disconnecter (see paragraph “6.1.1 Engine compartment bonnet - Battery disconnecter”).
- › Remove the protective cover **1**.
- › Identify the damaged fuse and replace it, using the replacement fuse kit.



Fuse	Description	Amperage
<b>F1</b>	Clutch fuse	<b>5 A</b>
<b>F2</b>	Horn fuse	<b>5 A</b>
<b>F3</b>	Control panel fuse	<b>5 A</b>
<b>F4</b>	Position lights and remote control battery charger fuse	<b>3 A</b>
<b>F5</b>	Left track drive hydraulic unit fuse	<b>30 A</b>
<b>F6</b>	Right track hydraulic drive unit fuse	<b>30 A</b>
<b>F7</b>	Main fuse	<b>80 A</b>



## 6.5 SPECIAL MAINTENANCE

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

### NOTICE

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 REPLACING THE TRACKS

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

### NOTICE

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



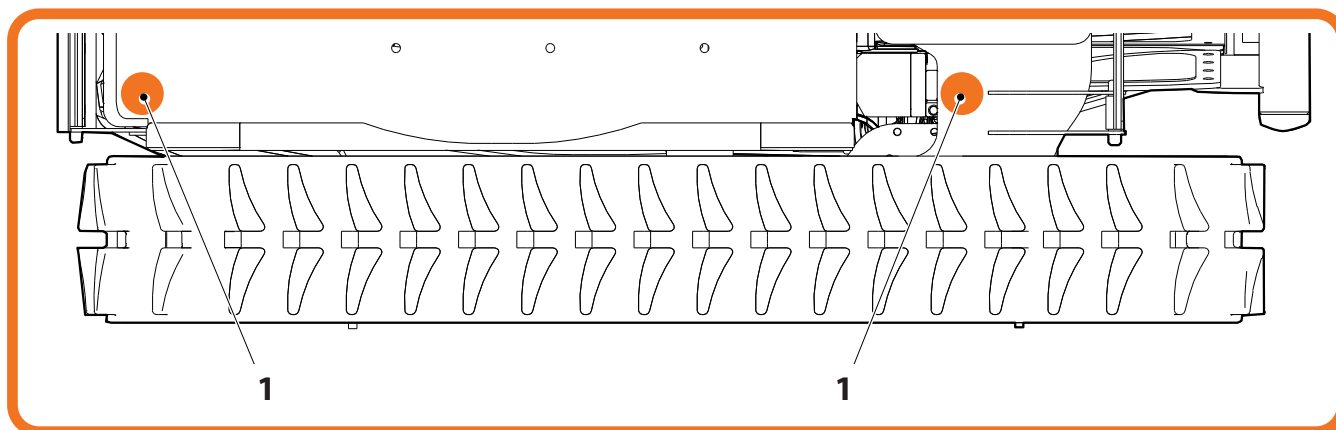
#### CRUSHING HAZARD

The operator must wear the following personal protective equipment:

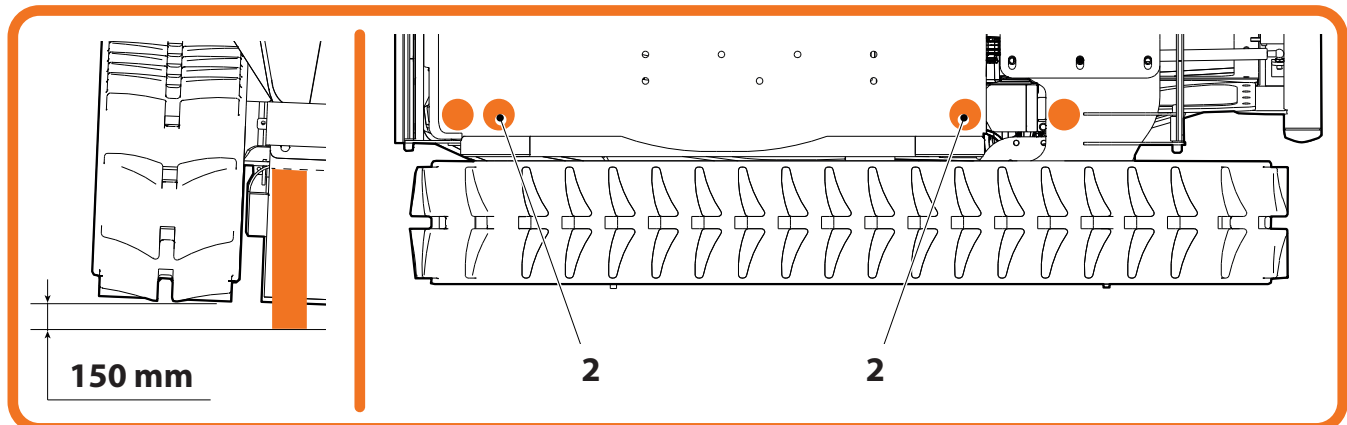
- › Safety footwear
- › Gloves
- › Protective clothing

Proceed as follows:

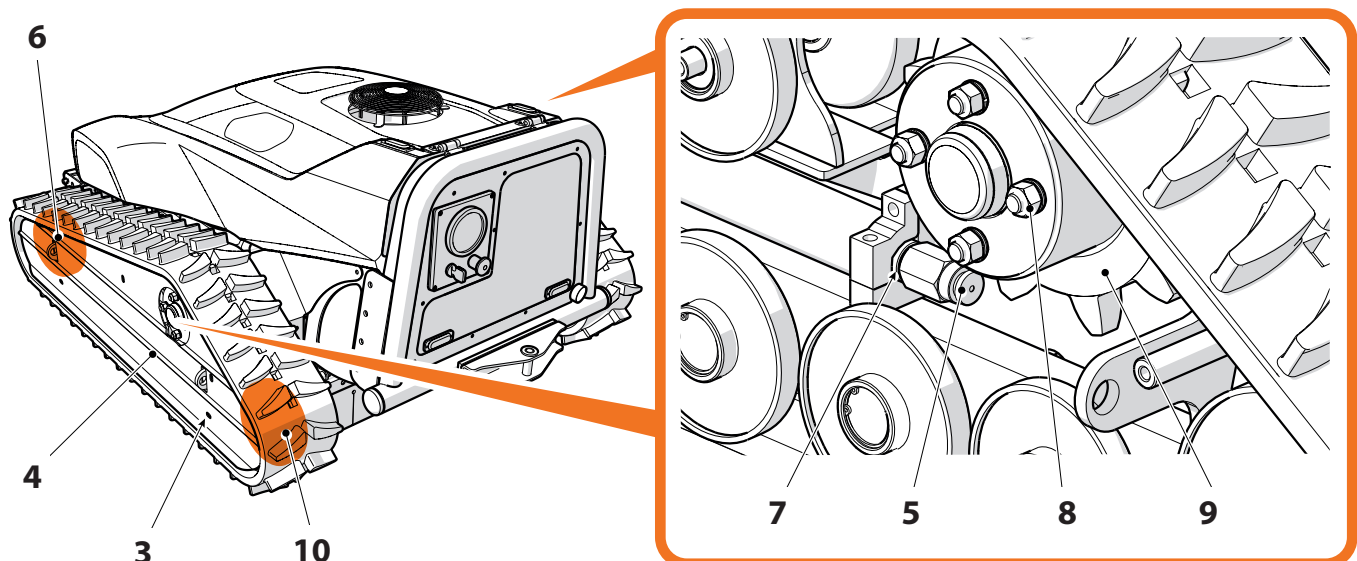
- › Place the lifting jacks under the chassis at the points indicated **1**.



- › Lift the machine, leaving a gap of 150 mm between the track and the ground.
- › Position the safety stands under the chassis at the points indicated **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 bolts **8** and remove 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 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 **6** with a torque wrench to 52 N/m.

**NOTICE**

Once the track is replaced, proceed with tensioning, as described in paragraph "6.4.18 Checking and tensioning the tracks".





## 6.5.2 REPLACING THE BELTS

### NOTICE

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

## 6.5.3 REPLACING THE BLADES



### WARNING

**CUT HAZARD**

**CRUSHING HAZARD**

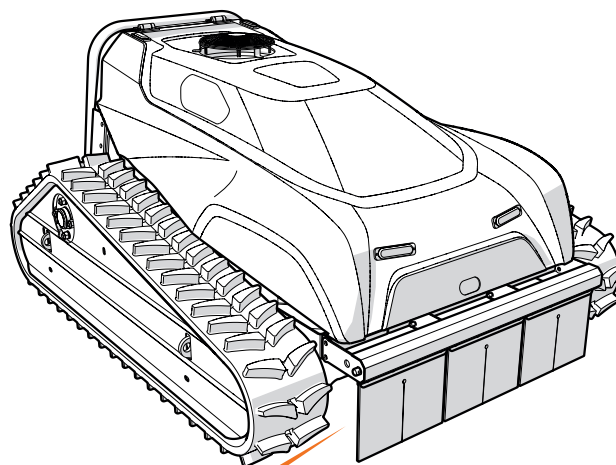
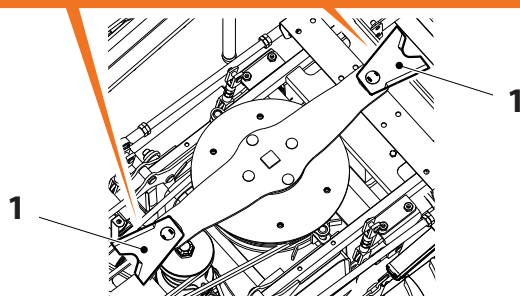
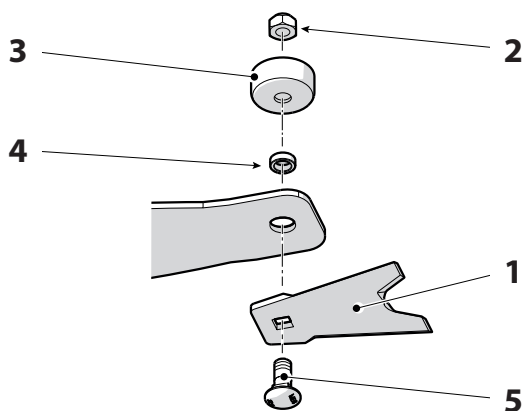
The operator must wear the following personal protective equipment:

- › Safety footwear
- › Gloves
- › Protective clothing



Proceed as follows:

- › Position the machine over an inspection pit or on a vehicle lift.
- › Open the bonnet and remove the battery disconnecter (see paragraph "6.1.1 Engine compartment bonnet - Battery disconnecter").
- › Access the lower part of the machine, where the blades **1** are located.
- › Unscrew the nut **2** and remove the bushings **3** and **4**.
- › Remove the worn blade **1** and replace it with a new one.
- › Remove the screw **5** and replace it with a new one.
- › Do the same with both blades.





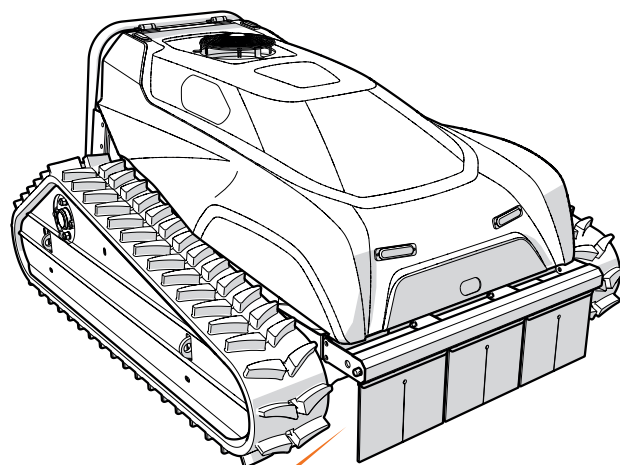
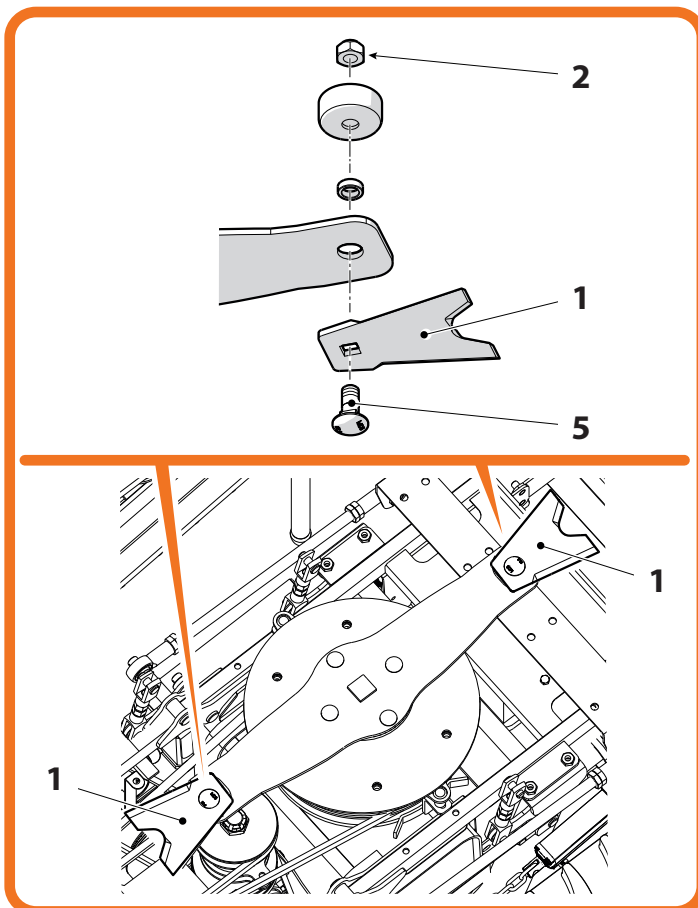
**CAUTION**

When refitting the blades 1, tighten the nuts 2 with a torque wrench to between 226 and 233 N/m.

**CAUTION**

It is strictly necessary to replace both blades 1 at the same time.

When replacing the blades 1, replace both screws 5 at the same time.

**NOTICE**

The blades 1 and screws 5 must be replaced with original MDB parts. For this reason, contact the MDB support service (see chapter 2).







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## 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
<b>The remote control does not work</b>	The battery disconnecter key is in the OFF position	Turn the battery disconnecter 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
<b>The remote control does not work (Operation LED flashing or off)</b>	No radio signal	Check the remote control connection with the control unit
	Interference from other radio signals	Using the wired remote control
<b>The remote control does not work (Battery LED off)</b>	Damaged fuse	Replace the fuse
	Low battery	Charge the battery
<b>The remote control does not work (Battery LED flashes intermittently)</b>	Auxiliary control activated [used for tools (if present)]	Disable auxiliary command [used for tools (if present)]
<b>On-board remote control battery does not charge</b>	Battery charger cables disconnected	Connect the charger cables



## 7.1.2 ENGINE

Problem	Cause	Solution
<b>The engine does not start</b>	No remote control connection	Connect the remote control with the control unit
	Main fuse failure	Replace the fuse
<b>The engine starts but the machine does not move</b>	Emergency button pressed	Reset the emergency button
	No fuel	Fill the tank
	Clogged fuel filter	Replace the fuel filter Contact the authorised MDB dealer



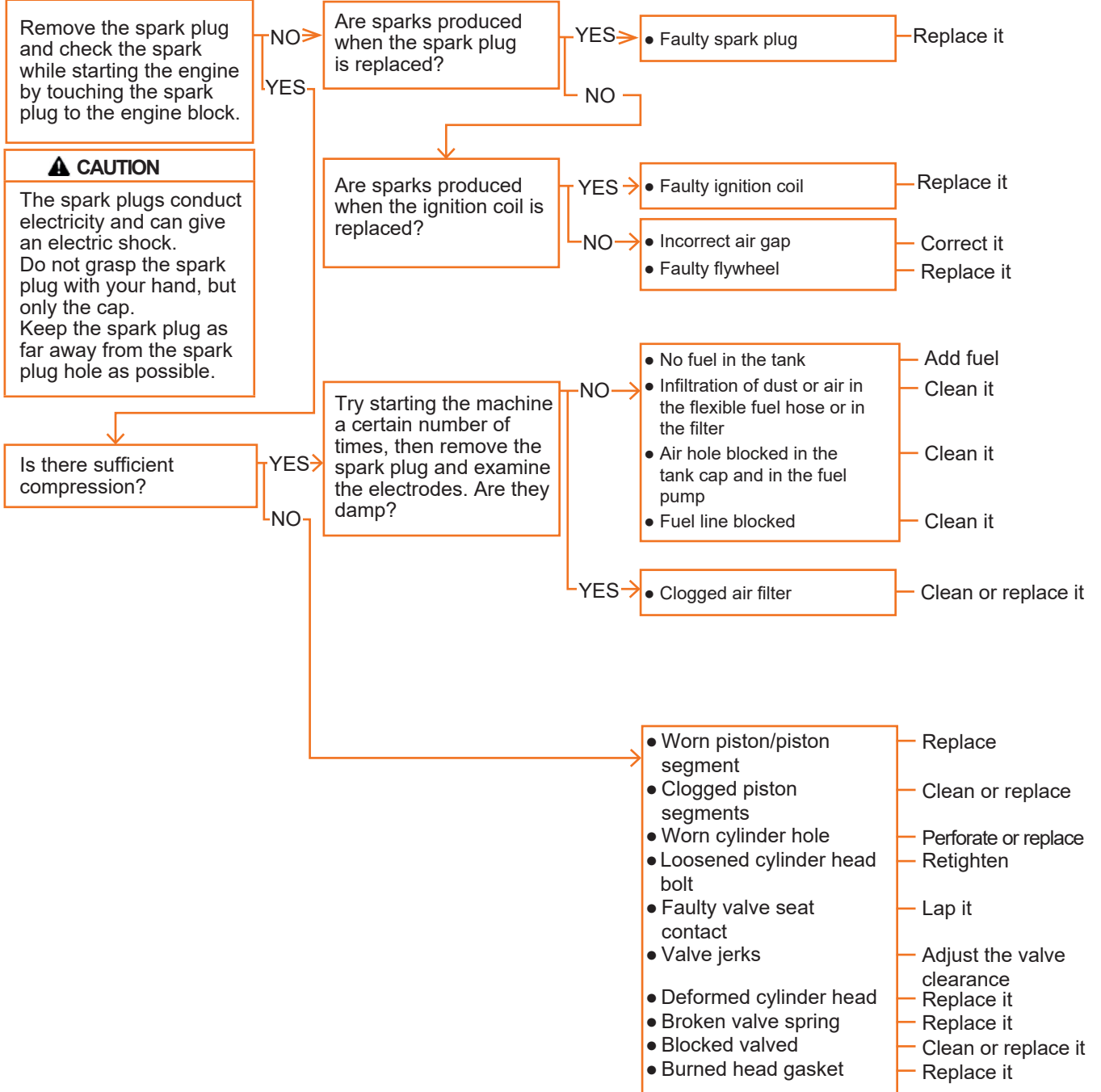
### ENGINE TROUBLESHOOTING

In the case of engine malfunctions, check that the engine is being used correctly. If malfunctions persist even with correct engine use, systematically troubleshoot starting from the simplest points.

This flowchart shows the typical troubleshooting procedures.

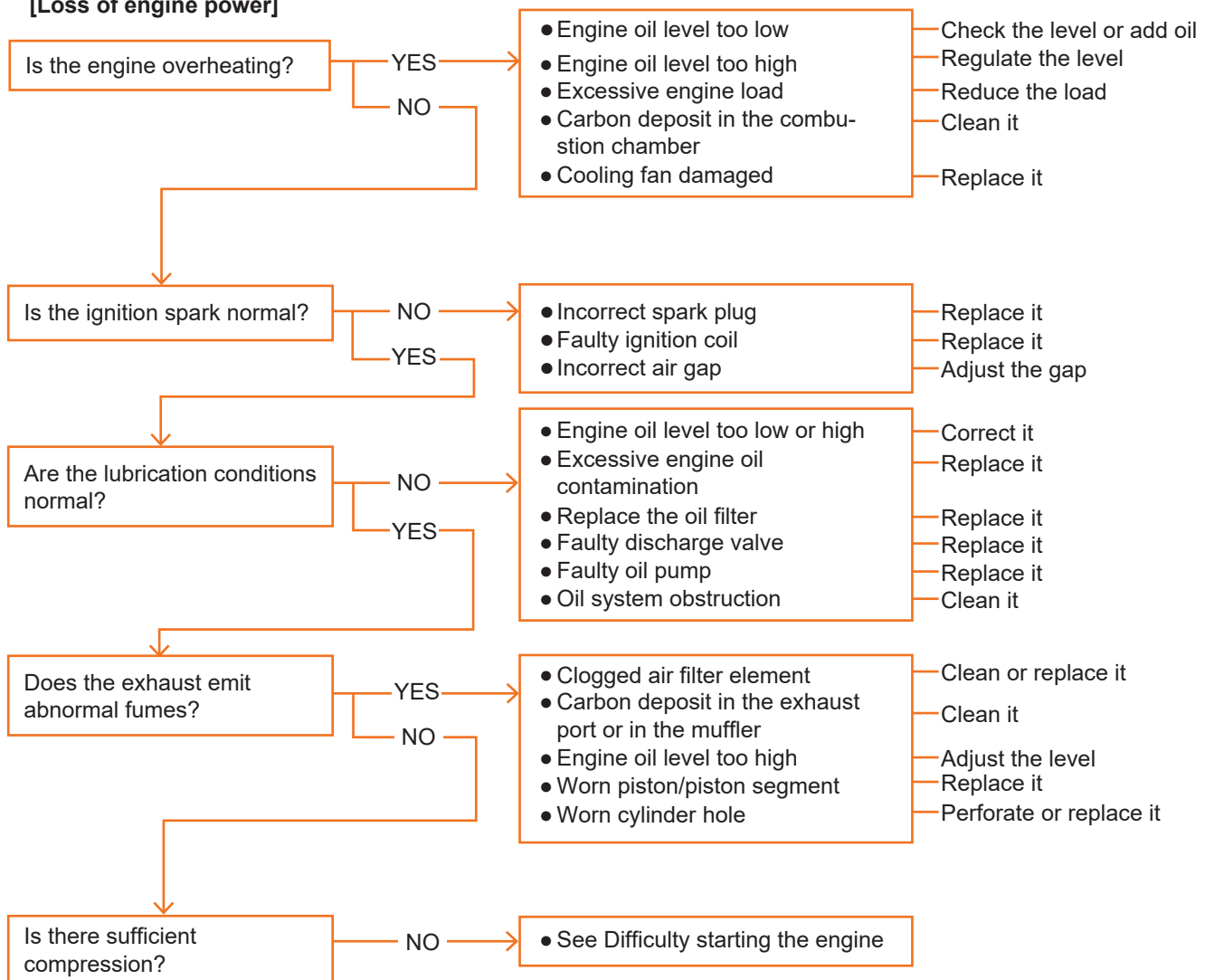
If not necessary, do not take the engine apart unless it is the cause of the malfunction.

#### [Difficult engine start]

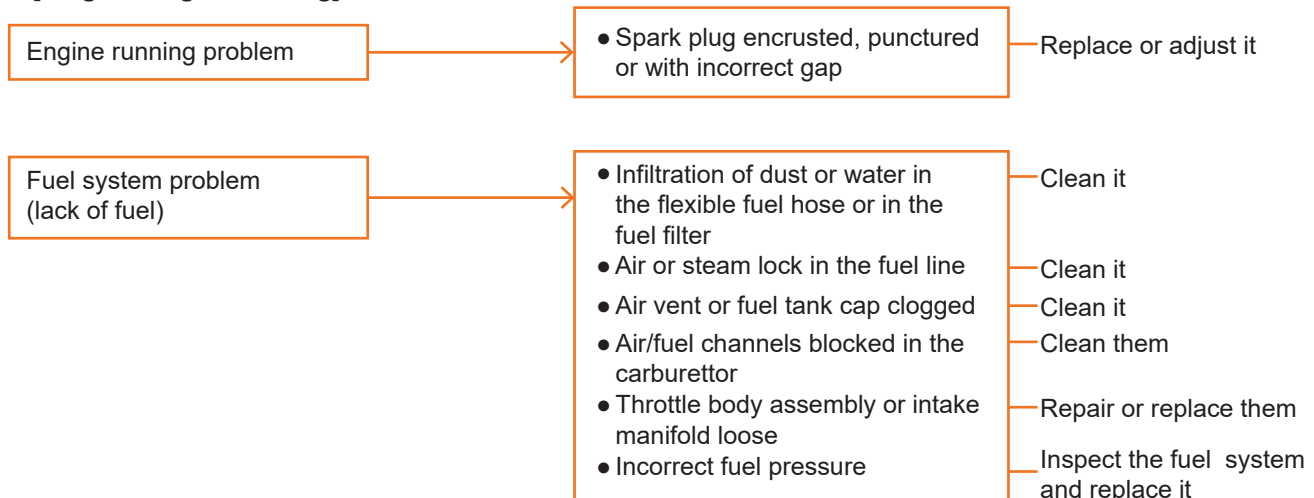




**[Loss of engine power]**



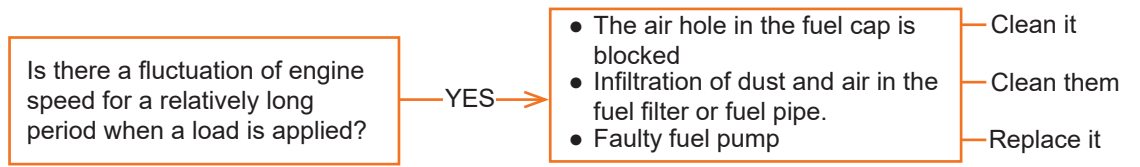
**[Irregular engine running]**



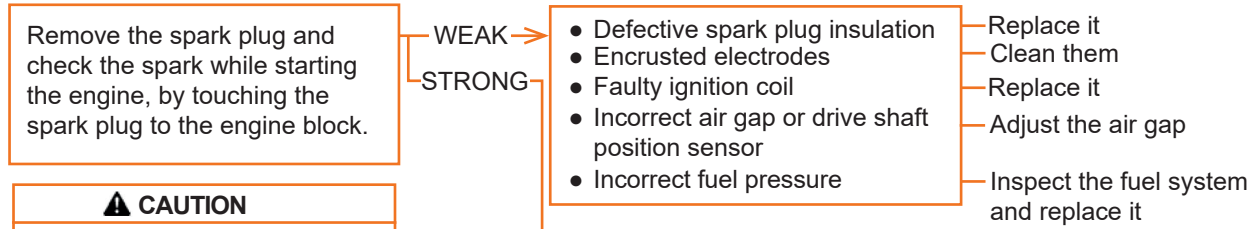




[engine malfunction at high speed]

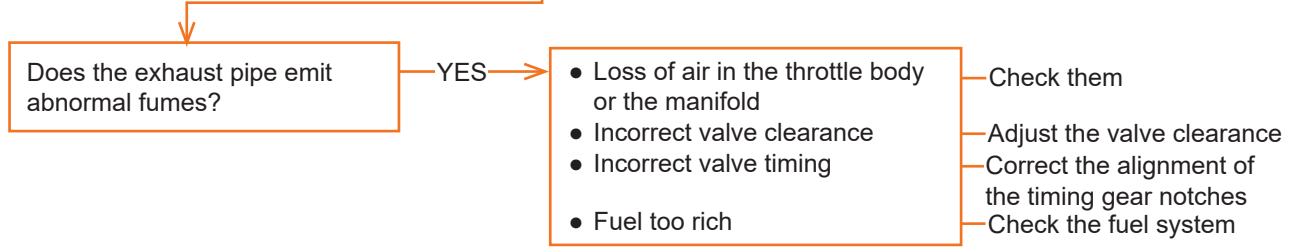


[engine malfunction at low speed]

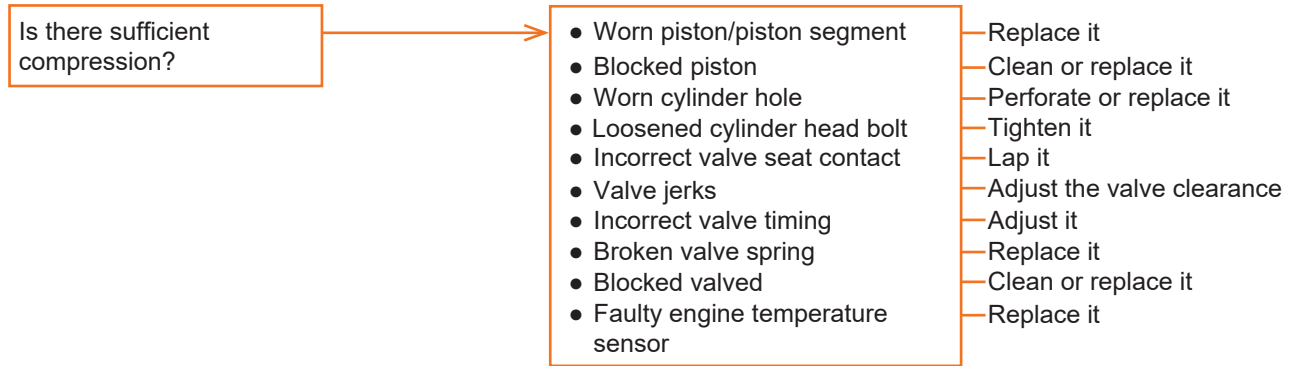


**CAUTION**

The spark plugs conduct electricity and can give you an electric shock. Do not grasp the spark plug with your hand, but only the cap. Keep the spark plug from the spark plug hole as possible.

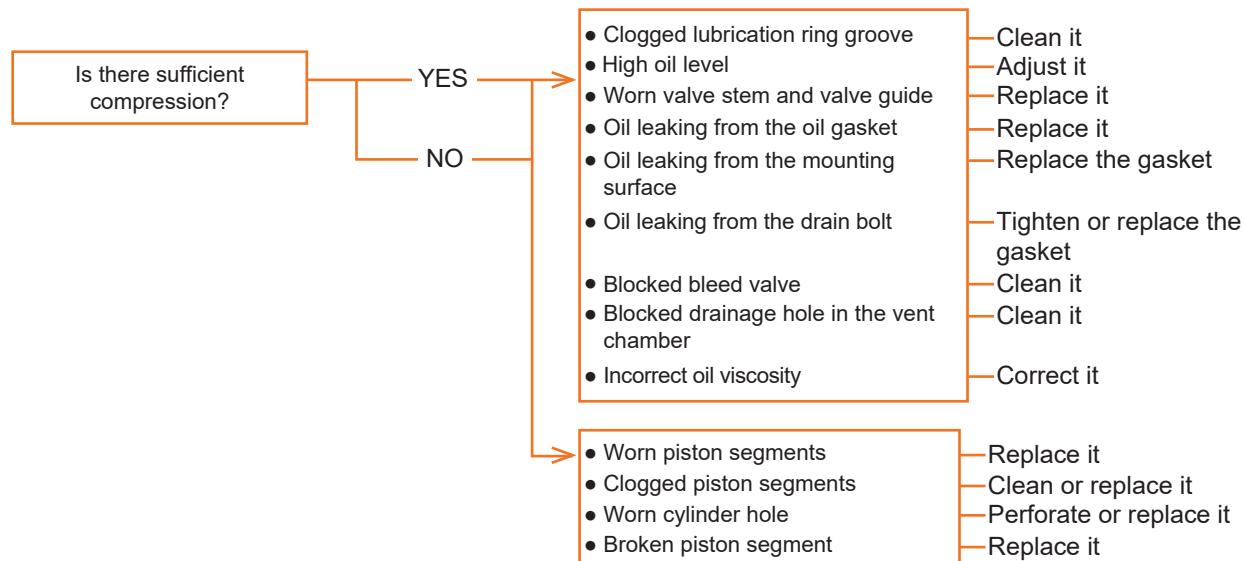


[excessive fuel consumption]

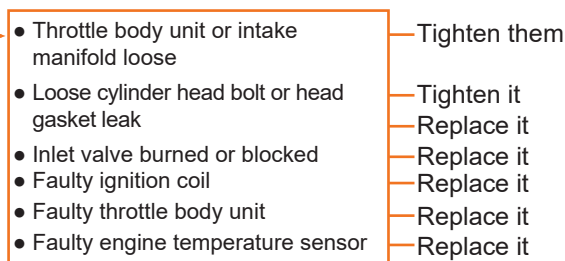




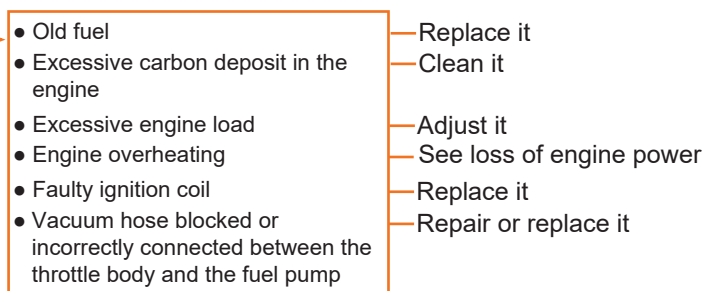
**[excessive oil consumption]**



**[engine backfires]**



**[The engine is knocking]**





**EFI SYSTEM TROUBLESHOOTING**

The troubleshooting guide shows the correlation between the systems and the inspection points that could cause the problem.

Actions ↓		SYMPTOMS →															
		The engine does not start	The engine starts but cuts out	The engine is working but loses power	The engine does not switch to idle speed	The engine runs irregularly	The engine loses power	The engine does not maintain a constant speed (peaks)	The engine overheats	The engine knocks	The engine backfires	The engine has post-ignition	Excessive exhaust fumes	Excessive fuel			
Check the fuel pump		●	●	●	○												
Check the fuel pump relay		●	○														
Injector	Auditory check	●	○	●	○	○					○	○					
	Check the injector signal	○		○			○	○	○	○	○	○					
Check the drive shaft position sensor		●	●														
Check the fuel pressure		●	●	●	●	○	●	●	●	●	○	●	●				
Check for fuel leaks		○	○	○	○	●	●	●		○	●						
Clean the fuel system		○	○	○	●	●	○	○		○	○	●	●				
Check the fuel filter		○	○	○	○	●	○			○	○	○	●				
Check the engine temperature sensor		○	○			○	○	○	○	●	●	●	●				
Check the air intake vacuum hose		○	○	●	●	○	○	●	○	●	○	○	○	●			
Check the throttle valve			●	●	●	●											
Check the wiring		●	●	○	●	●	○	●	●	●	●	●	○				
Check for air leaks		○	○	●	●	○	●	●	●	○	○		○				
Replace the ECU		●	○	○	○	○	●	○	○	○	●	○	●	●			

**NOTE**

○ Only for problems in the electronic injection system. The ignition system and engine must first be in a satisfactory condition.

- : Main inspection points
- : Secondary inspection points



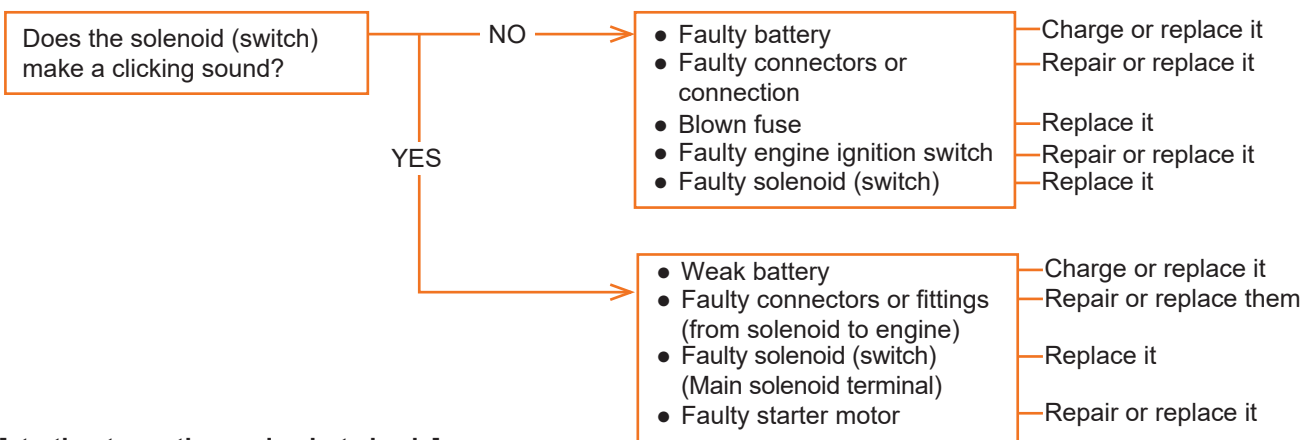
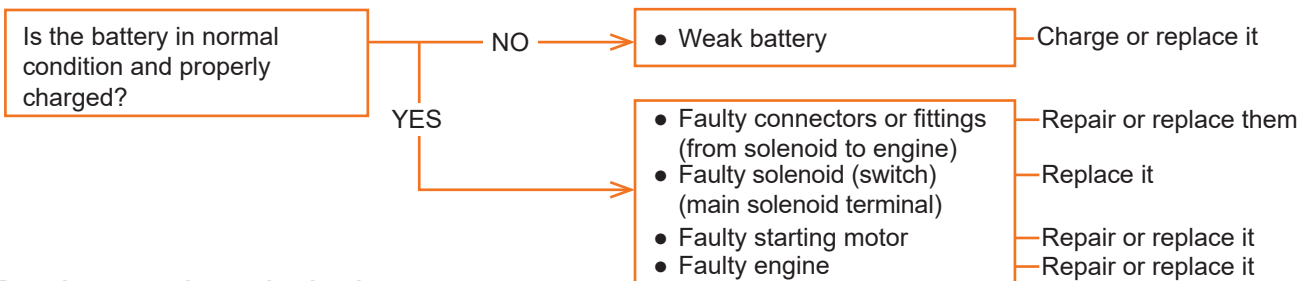
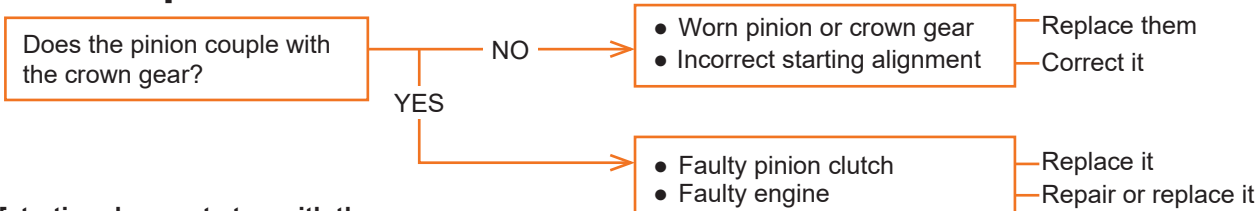
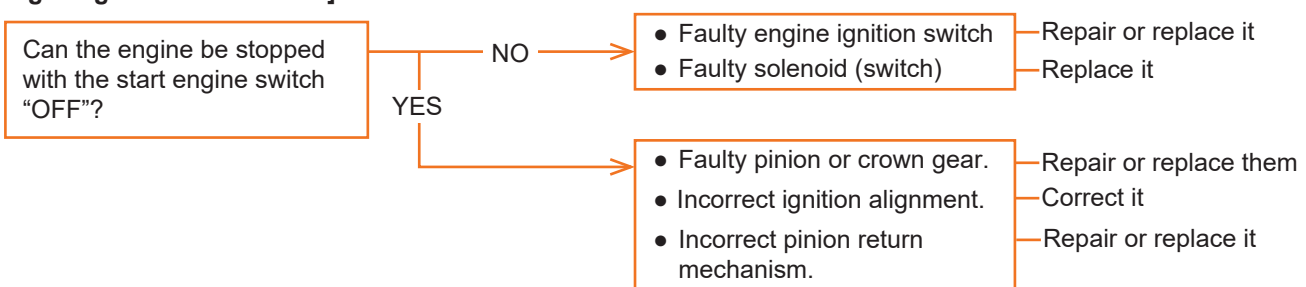
- › Remove the spark plug caps.
- › Put the engine in "START" position and check its condition.

**WARNING**

The rotating parts of the engine can cause serious injury. Since the engine could start during the test, do not touch any rotating engine parts or equipment.

**NOTICE**

If the engine does not stop running by switching it to OFF, disconnect the negative cable (-) from the battery as soon as possible.

**[starting does not turn the engine]****[starting turns the engine but slowly]****[starting turns the engine but it does not start]****[starting does not stop with the engine ignition switch "off"]**



### 7.1.3 TRACKS

Problem	Cause	Solution
<b>Detached track</b>	Excessive track wear	Replace the track
	Track mechanical structure damage	
	Insufficient track tension	Tension the track
<b>Track slow</b>	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
<b>Intermittent signal while moving</b>	Fuel low	Refill the tank
	Alternator problems	Contact the authorised MDB dealer
	Scheduled maintenance due	Carry out maintenance
<b>Intermittent signal and the machine shuts down</b>	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
<b>Battery voltage indicator light on</b>	Battery voltage level is low	Recharge the battery or replace it if necessary
<b>Air filter indicator light on</b>	The air filter is clogged	Clean the air filter or replace it if necessary



## 7.1.6 CUTTING DEVICES

Problem	Cause	Solution
<b>The machine moves but the blades do not move</b>	Worn drive belts	Replace the belts Contact the authorised MDB dealer
	Clutch fuse failure	Replace the fuse
<b>The machine does not move but the blades move</b>	Remote control speed regulator set to minimum	Turn the remote control speed regulator to maximum.
	Engine - traction belt broken	Replace the belt. Contact the authorised MDB dealer
<b>Grass cutting is uneven</b>	Broken or excessively worn blades	Replace the blades Contact the authorised MDB dealer



## 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 disconnect" key to OFF.
- › Deactivate the battery by disconnecting the cables.
- › Disconnect the spark plugs.
- › 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.
- › 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.



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