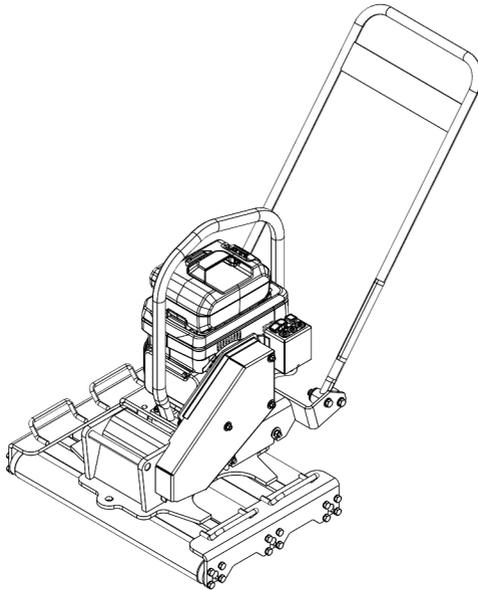


TOBROCO

GROUP

OPERATOR MANUAL

R21E VIBRATORY ROLLER



EN - Original Manual



Please carefully read and understand the contents of this manual. Failure to read the manual can result in serious damage, injury or death. Keep this manual with the machine at all times. Make sure that all operators of the machine have read and understood the contents of this manual.

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TOBROCO Machines BV reserves the right to change specifications and or parts without prior notice. The content of this manual can also be changed without prior notice.

For information about settings, maintenance or repairs not provided for in this manual, please contact the dealer.

TOBROCO Machines BV accepts no liability for damage and/or problems arising from the use of parts which have not been supplied by TOBROCO Machines BV.

This manual was created with the utmost care. TOBROCO Machines BV assumes no responsibility for any errors in this manual and/or the consequences of an erroneous interpretation of the instructions.

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Preface

This is the operator manual of the R21E. This document is for approved operators. Refer to *Approved operator* on page 31 for more information. This document gives the information that is necessary to operate and perform first-line maintenance on the machine.

The operator manual provides detailed operating procedures for safe, effective and proper use of the machine. Safe operation is detailed in chapter *Safety* on page 25. Specifications, first-line maintenance and troubleshooting information are also included in this manual.

Improper operation, inspection and maintenance of the machine can result in injury or death. Read and understand the contents of this manual completely and become familiar with the machine before operation. Contact the authorized TOBROCO Machines BV dealer with any questions about information in this manual, if extra manuals are required, or about availability of manuals in other languages.

Language



WARNING

If this machine is located in the United States of America:

- Only use the EN-US version of this document to use the machine or perform maintenance on the machine.
- If this document is not the EN-US version, please ask the TOBROCO Machines BV dealer for an EN-US copy.
- The original instructions in this document are created in English (EN-GB). All other language versions are translations of the original instructions. In the event of ambiguity and/or disputes, the English (EN-GB) text always takes precedence.

Manual storage

This document is a part of the machine. Make sure that the document is kept in a dry and clean location (e.g. in a document holder) on the machine.

Icons and signal words used in the document



Warns about a situation that will cause death, serious physical injury and/or heavy material damage if one does not obey the safety instructions.



Warns about a situation that can cause death, serious physical injury and/or heavy material damage if one does not obey the safety instructions.



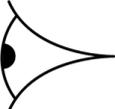
Warns about a situation that can cause material damage if one does not follow the safety instructions.



Provides additional information that is helpful to do a task or to avoid problems.



This symbol indicates required tools.

Icon	Meaning
	Indicates that the same part is also present at the opposite side.
	Use a grease gun to lubricate the pivot points.
	Visual inspection.
	Location of an eyelet to tie down the machine.

Icon	Meaning
	Location of an eyelet to lift the machine.

Illustrations

It is not always possible to show the exact configuration of the machine. The illustrations in this document show a standard set-up. They are for instruction and description purposes only.

Recommissioning

If the machine is resold, include this operator manual as part of the sale. If a used machine was purchased, or if the owner's address has changed, please provide the TOBROCO Machines BV dealer or TOBROCO Machines BV with the current owner's name and address, along with the machine model and serial numbers. This will allow the registered owner information to be updated, so that the owner can be notified directly in case of important product issues, such as a safety update program.

Version history

Every effort has been made to make this manual as accurate and complete as possible. If any errors or omissions are discovered, please bring this to the attention of TOBROCO Machines BV, so possible revisions can be made. This will enable the improvement of the documentation.

The instructions in this manual do not take into account different national regulations and laws. When operating the machine, it is the sole responsibility of the operator to make sure that all applicable (local) laws and regulations are obeyed.

During the lifetime of the machine, engineering improvements can result in the need to revise this manual. It is then at the discretion of TOBROCO Machines BV if a revision or new version of this manual is required.

The following table describes the main changes for each document version of this manual.

Version	Changes
R2401	Original edition.
R2402	Instructions revised (cleaning the machine; maintenance schedule; minor textual revisions).

Typographical conventions

- SI units of measurement are used. If necessary, the document shows imperial or other units of measurement in round brackets: ().
- The steps in procedures have numbers (123) if the sequence is important.
- Lists and steps with bullets (•) are used if the sequence is not important.
- Lists with letters (ABC) are used if the sequence is important.
- A text in round brackets (option) indicates that the section applies to an optional part of the machine.

EC DECLARATION OF CONFORMITY

The manufacturer

Name: TOBROCO Machines BV

Address: Industrielaan 2
5061 KC Oisterwijk
The Netherlands

declares under his sole responsibility that:

Description: Vibratory Roller

Category: Compaction machine

Make/Model: SAMAC R21E

Is in conformity with:

Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC.

Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

Directive 2000/14/EC of the European Parliament and of the Council of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors;

Category: compaction machine; guaranteed sound power level (Lwa): 104 dB(A).

The manufacturer keeps the technical documentation and is authorised to complete the technical file.

Oisterwijk,

A.J.J. Brock
(CEO)

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1 Introduction

The Vibratory Roller is suitable for compacting soil. It can be used for several applications. The machine's compact design offers good accessibility in restricted spaces.

The machine uses an electric power unit. The electric motor is powered by a battery.

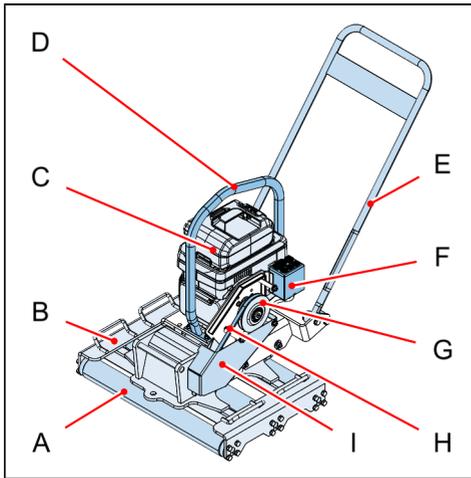
2 Description

This section provides an overview of the main components and functions.

2.1 Overview



Illustration(s) can differ from the actual configuration.

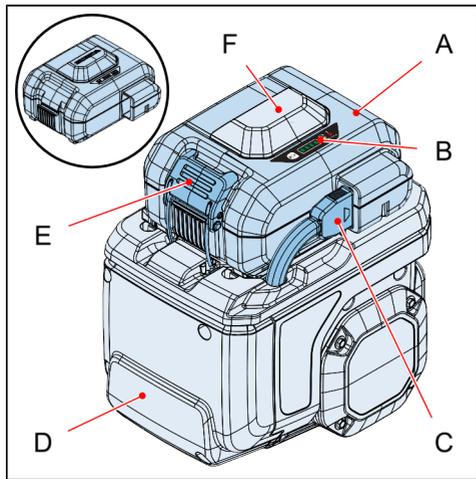


- A.** Rollers
- B.** Roller frame
- C.** Power unit
- D.** Lifting frame
- E.** Handle bar
- F.** Control panel
- G.** V-belt pulley
- H.** V-belt
- I.** Belt guard

2.2 Power unit



Illustration(s) can differ from the actual configuration.

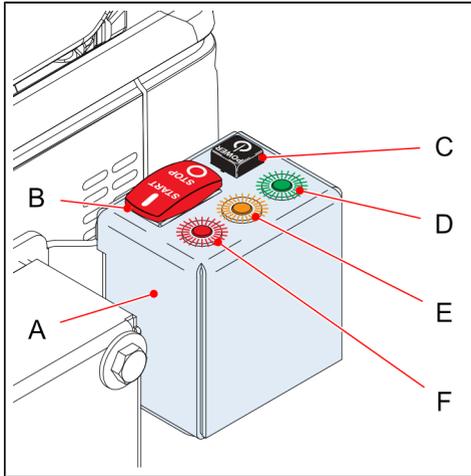


- A. Battery
- B. Battery indicator lights
- C. Battery connector
- D. Electric motor unit
- E. Battery clamp
- F. Grip

2.3 Control panel



Illustration(s) can differ from the actual configuration.



- A. Control panel unit
- B. Start/Stop switch
- C. Power switch
- D. Power indicator
- E. Alert indicator
- F. Error indicator

2.4 Battery management system (BMS)

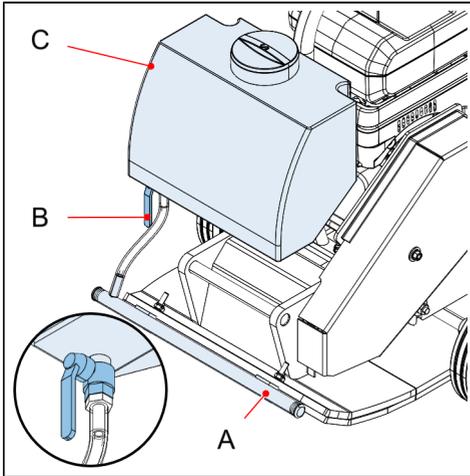
The battery is equipped with a battery management system (BMS). This system detects the battery conditions in real time during the use and charging of the battery.

The BMS warns in case of irregularities, stops the charging and discharging of the battery, adapt the battery cell balancing, and it offers self-diagnostics.

2.5 Water sprinkler system (Optional)



Illustration(s) can differ from the actual configuration.



- A. Water sprinkler
- B. Lever
- C. Water tank

The machine can be equipped with an optional water sprinkler system. This unit makes sure that the operator experiences less dust when using the machine on a dry surface. It is also used to cool the vibrating plate or rollers (if applicable) when used on hot asphalt.

The lever (B) enables water flow from the water tank (C) to the water sprinkler (A).

3 Applications



WARNING

- If operation near edges is required, always keep 2/3 of the machine on the load-bearing surface. This will prevent the machine from slipping or tipping over.
- Do not exceed the maximum slope angle for operation with the machine. This can cause injury or damage to the machine. Refer to *Technical Data* on page 21 for more information.



CAUTION

- The machine can only be operated in an environment between -15 °C and +40 °C.
- The machine can only be stored in an environment between -5 °C and +30 °C.
- The machine can only be charged in an environment between 5 °C and +30 °C.



The machine can be used for the following purposes:

- Soil compaction (cohesive, mixed and granular soils in confined areas)
- Asphalt compaction
- Paving stones



WARNING

It is **NOT** allowed to use the machine:

- on very cohesive soils
- on frozen soils
- in dry, flammable vegetation
- on hard, non-compressible soils
- on non-load-bearing soils
- in heavy rain on slopes
- in the vicinity of explosive substances
- in potentially explosive areas
- in tunnels or closed spaces

- as a support device (e.g. a makeshift ladder), support, or working surface for other tasks
- as a means of transportation for people or equipment.

4 Technical Data

4.1 General

Weight	146 kg
Roller frame dimensions	48 x 66 cm
Exciter oil	SAE 15W40 SJ/CG-4
Exciter housing oil	SAE 15W40 SJ/CG-4
Operating width	66 cm
Frequency	62 Hz
Impact force	8.2 kN

4.2 Electric motor


CAUTION

It is not allowed to modify the speed of the electric motor.

Make/model	Honda GXE2.0H 3-phase, brushless DC electric motor with forced air cooling	
Continuous rated power	1.6 kW	
Net power	1.8 kW	
	Torque	4.8 Nm @ 3600 rpm
	Current	27 A
	Voltage	72 V
Set speed	3600 rpm	
Operating temperature range	Between -15 °C and 40 °C	

4.3 Battery specifications

Model	Honda DP72104Z
Length	233 mm
Width	268 mm
Height	150 mm
Mass	6.4 kg
Type	Rechargeable lithium-ion battery
Voltage	DC 72 V
Power capacity	720 Wh
Rated capacity	10.0 Ah
Compatible battery charger	Honda CV7285Z
Charging temperature range	5 °C-30 °C (41 °F-86 °F)
Charging time (full)*	Full charge takes approximately 1.5 hours, depending on temperature and battery age.
Operating temperature range	-15 °C-40 °C (5 °F-104 °F)
Optimum storage temperature range	-5 °C-30 °C (23 °F-86 °F)

* Charging can take longer if a battery is charged, immediately after operation of the machine. The battery has to be cooled down first, before it can be charged.

4.4 Battery charger specifications

Model	Honda CV7285Z
Length	272 mm
Width	352 mm

Model	Honda CV7285Z
Height	270 mm
Mass	11.2 kg
Input voltage	AC 100 V-240 V
Input frequency	50/60 Hz
Output voltage	DC 82.8 V
Output current	8.5 A
Compatible battery type	Honda DP72104Z
Charging temperature range	5 °C-30 °C (41 °F-86 °F)
Charging time (full)*	Full charge takes approximately 1.5 hours, depending on temperature and battery age.

* Charging can take longer if a battery is charged, immediately after operation of the machine. The battery has to be cooled down first, before it can be charged.

5 Safety



WARNING

This chapter is about security and safe operation of the machine. Carefully read all safety messages in this manual and the safety signs on the machine. Keep safety labels in good condition. Replace missing or damaged safety labels. Make sure that new equipment, components and repair parts include the correct safety labels. Replacement safety labels are available via the TOBROCO Machines BV dealer.



WARNING

Some parts and components are sourced from third-party suppliers and can therefore show additional safety information that is not included in this operator manual.

5.1 Liability



CAUTION

TOBROCO Machines BV is not responsible for direct and indirect damage caused by operator error, lack of maintenance or any other use other than described in this document.

The liability of TOBROCO Machines BV is also void when modifications or extensions are applied to the machine or to accessories without the written consent of TOBROCO Machines BV.

It is the responsibility of the owner to make sure that:

- Only approved operators operate and perform operator maintenance on the machine.
- Only approved service engineers perform other service tasks on the machine.

5.2 General safety rules

 WARNING

- All instructions regarding the correct use, residual risk, installation, operation and maintenance contained in this operator manual must be noted and observed.
- Never modify or disable safety devices that are installed on the machine. This can lead to serious injuries or damage to the machine.
- It is not allowed to adjust the pre-set speed(s) of the electric motor. This can cause damage to the electric motor.
- Always switch off the machine when it is not in operation.
- If applicable: make sure that the belt guard is correctly installed onto the machine. An exposed V-belt or pulley can cause serious injuries.
- Do not use this machine for purposes other than described in this operator manual.
- Make sure that the operator knows the worksite hazards and the (local) laws and regulations. The information in this document does not replace any applicable (local) laws or regulations.
- If local laws or regulations are stricter than national laws, the local laws or regulations will prevail.
- Compaction work can cause damage to nearby buildings. The operator must always check the surroundings before using the machine.
- When operating the machine on a slope, always make sure that the machine is facing the bottom of the slope and the operator is at the top side of the slope.
- The operator should never leave a working machine unattended.
- Keep body parts and clothing away from moving parts.
- Always wear personal protective equipment when working with the machine. Refer to *Personal protective equipment* on page 33.

- Avoid skin contact with oils and lubricants. Wear protective clothing, such as safety glasses and gloves. Upon contact, wash immediately with soap and water. In case of contact with eyes, rinse immediately with running water for at least 10 minutes and immediately get medical attention. Provide sufficient water and soap and make sure that there is assistance in vocal range when performing work.
- Make sure that there is enough ventilation and aeration when the machine is used in partially closed areas.
- Keep children away from the machine at all times.
- Do not make any modifications to the machine without the written consent of TOBROCO Machines BV.
- Make sure that all maintenance is done correctly and at the correct maintenance intervals. Refer to *Maintenance* on page 55.
- Do not smoke when working with the machine or when servicing the machine.
- Before starting the machine, make sure that all maintenance tools are removed from the machine. A loose tool or object can be flung from the machine and cause serious injury or damage.
- Make sure that the machine cannot fall over, slip, slide, roll or tip over during operation and when the machine is not in operation.
- If the machine falls over during operation, first switch off the machine before attempting to place it back into the operating position.
- The operator should be aware of what to do in case of an emergency.

 **CAUTION**

- Never work on hard surfaces (e.g. solid rock or hardened concrete).
- When working in trenches: always make sure that the trench is wide enough. When working in a narrow trench, the rollers can get caught between the sides of the trench. This can cause severe damage to the machine.
- Make certain that the machine is only steered by using the handle bar. Only push the machine. Never press the machine into the materials that are being compacted.

5.3 Before starting the machine

 **WARNING**

- Walk around the machine and inspect it before using it. Look for damage, loose or missing parts, leaks, damaged safety labels, etc. Do not use a machine with defective, missing or damaged components or operator controls.
- Replace a lost or damaged operator manual.
- To make sure that operations are safe: replace damaged or worn-out parts with genuine service parts.
- To minimize the risk of fire: daily remove all trash and debris from the machine. The operator's area, such as the handholds, must be free of oil, dirt, ice and loose objects.
- Make sure that all safety provisions on the machine are present and function correctly.
- Do not start the machine if there is any indication that maintenance or service work is in progress, or if a warning tag is attached to the controls.
- Warn all nearby personnel before starting the machine.
- Before working near power lines (either above-ground or buried cable type), always contact the power utility and establish a safety plan with them.

- Terrain and soil conditions at the worksite, approaching traffic, weather-related hazards and any above- or below-ground obstacles and hazards should be observed and monitored by all work crew members.
- Remove jewellery, tie back long hair, and do not put on loose-fitting garments that can be caught in moving parts of the machine.
- Do not use starting aids. Starting aids can cause injury or damage.
- Do not start the machine or operate controls from a location other than the operator's area.
- Only start the machine and operate the controls when the operator is located in the operator's area.
- Do not short-circuit the machine. Obey the instructions in *Operation* on page 45. If these instructions are not followed, this can cause unwanted and sudden movement of the machine. This can cause injury.
- If applicable: make sure that the direction lever is in the [MID/Stationary]-position.
- Poor visibility can cause accidents. Always make sure that the working surface is clearly visible.

5.4 During operation



DISREGARDING ANY OF THESE FACTORS CAN RESULT IN DEATH OR SERIOUS INJURY, OR DAMAGE TO THE MACHINE.

- Poor visibility can cause accidents. Always make sure that the working surface is clearly visible. Use a signal person if the operator cannot see the entire work area clearly and whenever the operator's view is obstructed.
- Do not use the machine too close to an excavation or ditch. Make sure that the surrounding ground has adequate strength to support the machine.
- When having to operate the machine in ditches or pitches, always pay attention to the side walls. These can collapse due to vibration.

- If applicable: snow accumulation can hide potential hazards. Use care while operating the machine.
- The operator must remain alert for possible hazardous conditions.
- Be aware of any overhead obstacles.
- Be aware of people moving through the work area.
- Only the operator is allowed on the machine during operation. Keep bystanders away from the machine.
- Always wear personal protective equipment. Refer to *Personal protective equipment* on page 33.
- Keep hands, head and feet inside the operator's area when operating the machine.
- Only start the machine while keeping a firm grip on the machine's control handle(s).
- Control the machine cautiously and gradually until fully familiar with all the controls and handling. New operators must first operate the machine in an open area away from bystanders. Practice with the controls until the machine can be operated safely and efficiently.
- When the machine is damaged, malfunctions or the operator hears an unusual noise, stop the machine immediately and make sure that no person uses it. Make sure that the damage is repaired and/or the problem solved before using the machine again.
- Always observe the technical specifications of the machine during operation. Refer to *Technical Data* on page 21.
- Adjust the machine speed to the applicable working conditions.
- Never put body parts near moving parts. Moving parts can cause injury.
- Do not use the machine to lift or transport people. Do not allow others to ride on the machine, because they can fall off or cause an accident.
- If applicable: look over both shoulders to the rear before using the machine in reverse.

5.5 Approved operator



WARNING

- If the operator is not yet 18 years old, supervision by another approved operator who is > 18 years old is required.
- Only approved operators are allowed to perform the work shown in this document.

All operators of the machine must:

- be mentally and physically capable to perform the tasks described in this document.
- know, understand and adhere to the instructions described in this document.
- be over the age of 16.

5.6 Battery safety



WARNING

Avoid risks of fire and short-circuiting due to overheating!

Keep the battery away from heat sources.

Suitable extinguishing agents are: carbon dioxide extinguishers (CO₂) or appropriate foam.

Wear suitable personal protective equipment when extinguishing battery fires. Toxic fumes can be released.



WARNING

If the battery shows signs of leakage, be sure to avoid contact with eyes and exposed skin. Use suitable personal protective equipment and non-flammable absorbent materials when cleaning spilled fluids. Refer to *Personal protective equipment* on page 33.

 **WARNING**

- If battery fluid or other materials come into contact with exposed skin, immediately flush with plenty of water.
- If battery fluid or other materials come into contact with the eyes, flush the wide-opened eyes extensively with water for at least 10 minutes. Seek further medical aid from a doctor.
- If the operator inhales fumes or liquids, immediately seek out fresh air. Seek further medical aid from a doctor.
- If battery fluid or other materials are swallowed, do **NOT** induce vomiting, but seek immediate medical aid from a doctor.

 **CAUTION**

- Never fully discharge the battery. This will cause serious damage to the battery.
- When storing the battery, make sure that it is 25 %-75 % charged. Otherwise there is a risk of the battery deteriorating during storage.

5.7 Electrical energy

 **WARNING**

Stay away from high-voltage electric lines. Serious injury or death can result from contact or proximity to high-voltage electric lines. The machine does not have to make physical contact with power lines for any current to be transmitted. Use a spotter and hand signals to keep away from power lines that are not clearly visible to the operator.

 **WARNING**

Depending upon the voltage in the power line and atmospheric conditions, strong current shocks can occur if the machine is within 3 m (10 ft.) to the power line. Very high voltage and rainy weather can further increase the safe operating distance.

 **WARNING**

If the machine comes into contact with a live wire:

- Warn others not to approach or touch the machine.
- Have the live wire de-energized.
- Do not approach the machine until the wire has been safely de-energized.

- If applicable: work on the machine's electrical system must be performed by licensed technicians only.
- If applicable: inspect and check the machine's electrical equipment at regular intervals. Problems that are found, such as loose connections or scorched cables, must be repaired before using the machine.
- If applicable: only use proper, original equipment fuses/circuit breakers with the specified current rating. Immediately switch off the machine, if there is any indication of a problem with the electrical system.

5.8 Personal protective equipment

 **WARNING**

Always use approved protective equipment. Operators and all other persons in the working area must wear protective equipment, including, at a minimum:

- Protective helmet (also, tie back long hair).
- Hearing protection
- Impact resistant eye protection with side protection
- Respiratory protection, when appropriate
- Protective gloves
- Safety goggles
- Protective boots
- Appropriate work overall or similar (not loose-fitting) clothing that covers arms and legs

 **WARNING** Even with the use of personal protective equipment, it is still possible that residual risks are present when using the machine. The operator can still be exposed to:

- Heat, noise and carbon monoxide
- Operator errors (incorrect lifting of the machine, incorrect operation of the machine)
- Leaking battery fluids

 **WARNING** Use insulated tools when working on the machine.

 **WARNING** If damaged parts of the battery must be handled, always wear rubber gloves.

 **WARNING** Avoid contact with eyes and skin and avoid inhalation. Use a safety shower and/or eye bath if the operator comes into contact with battery liquids.

5.9 Safety labels

 **WARNING**

- If a safety label is damaged or not clearly visible or legible, immediately apply new safety labels. Contact the dealer for more information.
- It is possible that some of these labels in the table below are not present on the machine.

Label	Description
	<ul style="list-style-type: none"> • The operator must carefully read the manual and its safety instructions before using the machine. The operator must know how to operate the machine safely. • Make sure that the manual is always accessible.

Label	Description
	<p>Hot surface hazard: risk of burns.</p>
	<p>To avoid injury and damage, the operator should keep hands, tools and other objects away from the V-belt when the machine is switched on.</p>
	<ul style="list-style-type: none"> • Always use personal protective equipment (hearing protection). • Risk of hearing damage.
	<p>Location of an eyelet to lift the machine.</p>
	<p>Max. noise level indicator.</p>
	<p>Dispose of the machine in accordance with (local) laws and regulations.</p>
	<p>Risk of fire.</p>
	<p>Do not expose the battery charger to rain or wet circumstances.</p>
	<p>Keep flames, sparks and open fire away from the battery.</p>

5.10 New (safety) label application

Before applying new (safety) labels, the applicable surfaces on the machine must be free of dirt, dust, grease and foreign material(s). Remove the smaller portion of the backing paper of the (safety) label and apply the exposed adhesive to the clean surface, while maintaining proper position and alignment. Peel off the rest of the backing paper and apply pressure by hand to smooth out the surface of the (safety) label.



WARNING

When replacing a machine part that has a (safety) label on it, make sure that the replacement part also has the same (safety) label on it.

5.11 Slopes



WARNING

- When possible, do **NOT** operate the machine on slopes. This can cause personal injury to the operator, or damage to the machine.
- When operation on a slope is necessary, always make sure that the machine is facing the bottom of the slope and the operator is at the top side of the slope.

5.12 Terrain

- Make sure that the terrain is firm and can hold the weight of the machine.
- Do not operate the machine on dangerous terrain. This can cause the machine to slip or tip over. Dangerous terrains include:
 - Close to the edges of ditches or banks, which can collapse under the weight of the machine, especially when the ground is loose or wet.
 - Terrain of which the conditions are unknown.
 - Soft terrain, such as landfills.

5.13 Fire hazards

- Keep sparks or open fire away from the machine.
- Do not smoke while working on the hydraulic systems.

- Keep the machine away from combustible substances.
- Avoid strong oxidizing agents and corrosives.
- The machine must be cleaned on a regular basis to avoid the build-up of flammable debris, such as leaves, straw, etc. Accumulated debris creates a fire hazard.
- The machine has several components that operate at high temperatures under normal operating conditions. These conditions make it extremely important to avoid circumstances where explosive dust or gases can be ignited by sparks or heat.
- Only add fluids to the machine in well-ventilated areas. Completely switch off the machine.
- Take care to avoid spilling combustible fluids, such as oil on the machine.
- Keep fluid reservoir caps locked tight and do not start the machine until these caps have been secured.
- It is recommended to mount a 2.27 kg (5 lbs.) or larger, multi-purpose "A/B/C" fire extinguisher within reach of the operator. Periodically check the fire extinguisher and make sure that worksite crew members are trained in its use.
- Oil leaks can ignite on hot components. Repair any damaged or leaking components before using machine.

5.14 Vibration hazards



- During normal and correct use of the machine, the operator is exposed to (strong) vibrations. Regular and frequent exposure to vibrations can cause, contribute to, or aggravate injuries or disorders to the operator's fingers, hands, wrists, arms, shoulders and/or nerves and blood supply, or other parts of the body.
- Regular and frequent exposure to vibrations can also cause debilitating and/or permanent injuries or disorders that can develop gradually over periods of weeks, months or even years. Such injuries or disorders can include damage to the blood circulatory system, damage to the nervous system, damage to joints, and possibly damage to other parts of the operator's body.

 **WARNING**

- The operator should immediately stop using the machine and seek medical attention if any of the following symptoms occurs: numbness, persistent recurring discomfort, burning sensation, stiffness, throbbing, tingling, pain, clumsiness, weakened grip, whitening of the skin, or any other unspecified symptom.
- Should the operator continue to use the machine after any of these symptoms has occurred, this can increase the risk of symptoms becoming more severe and/or permanent.

 **WARNING**

To prevent an unnecessary increase in vibrations, it is recommended to use and maintain the machine as follows:

- If the machine is equipped with vibration-absorbing handles: keep the handles in a central position and avoid pressing the handles into the end stops.
- The only bodily contact with the machine should be the operator's hands. Avoid any other bodily contact with the machine. Do not support any part of the operator's body against the machine or lean onto the machine to increase the feed force.
- If the machine suddenly starts to vibrate strongly, immediately stop using the machine. Find and remove the cause of the vibrations before putting the machine back into operation.

6 Transport and storage

WARNING

- Do not transport the machine when it is in operation. Always switch off the machine before transporting (lifting or moving) the machine.
- Make sure that the electric motor has completely cooled down before transporting the machine.
- Remove the battery from the machine if it is transported or stored. Refer to *Replacing the battery* on page 59.
- Make sure that the machine cannot roll away during transport or storage.

CAUTION

- Make sure that the machine cannot tip over during transport or storage.
- Always observe (local) laws and regulations.

CAUTION

If the battery is transported:

- Place it on a level location.
- Fixate it so it cannot move during transport.
- Make sure that the battery is not upside-down, this can cause water and dirt to enter the battery.
- Do no stack batteries on top of each other.

CAUTION

Do **not** tow the machine. This will cause damage to the machine.

CAUTION

When possible, store the machine in a dry location. Humidity can cause rust and corrosion.

 **CAUTION**

- Use suitable lifting gear to move the machine.
- All lifting gears must be dimensioned for the weight of the machine and be in compliance with all (local) regulations. Refer to *Technical Data* on page 21 for more information.
- Make sure that the rollers are undamaged and correctly attached before lifting the machine.
- Do **not** use any part of the handle bar to lift the machine for transport.

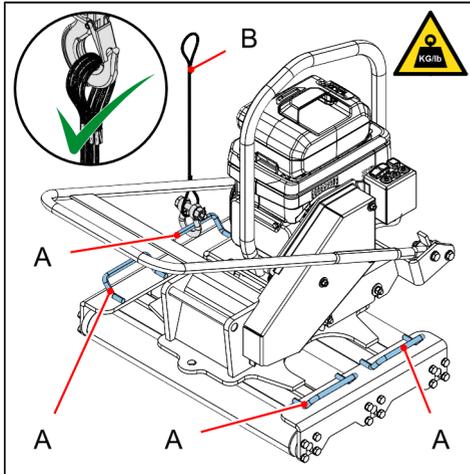


For the weight of the machine, refer to *Technical Data* on page 21 or the identification plate on the machine.

6.1 Lifting the machine



Illustration(s) can differ from the actual configuration.



! WARNING

Incorrect lifting can lead to serious injury. During lifting:

- Only lift the machine using suitable lifting gear (B).
- Only use the handles on the roller frame (A) to lift the machine. Do not attach the suitable lifting gear (B) to other parts of the machine, e.g. the handle bar. Make sure that the suitable lifting gear is correctly installed and the machine cannot tip over.
- No people should be present below or in the immediate vicinity of the machine.
- Do not climb onto or lean into the machine during lifting.

6.2 Storing the machine



CAUTION

- When storing the machine, remove the battery from the machine. Store the machine, battery and battery charger separately.
- When storing the battery, make sure that it is 25 %-75 % charged. Otherwise there is a risk of the battery deteriorating during storage.
- If the battery is stored for a prolonged period of time, annually check its charge state. If the charge state has reached less than 25 %, charge the battery until it is 25 %-75 % charged.
- Always install the protective cover onto the battery connector. This prevents dust and dirt from entering.



CAUTION

- Clean the machine before it is stored. Refer to *Cleaning the machine* on page 57.
- When possible, store the machine, battery and battery charger in a dry location. Humidity can cause rust and corrosion.



CAUTION

- Make sure that the machine cannot tip over during storage.
- Do not stack batteries on top of each other.

7 Commissioning

**CAUTION**

Before using the machine, the operator must always perform a few checks.

1. Make sure that the machine is not damaged.



If the machine is damaged upon delivery, contact the dealer immediately.

2. Make sure that all parts are present.



If the machine is missing parts upon delivery, contact the dealer immediately.

3. Make sure that the battery is correctly installed and is undamaged. Refer to *Replacing the battery* on page 59.
4. Make sure that the battery is fully charged. Refer to *Charging the battery* on page 50.
5. Make sure that the machine is not leaking any oil.

**WARNING**

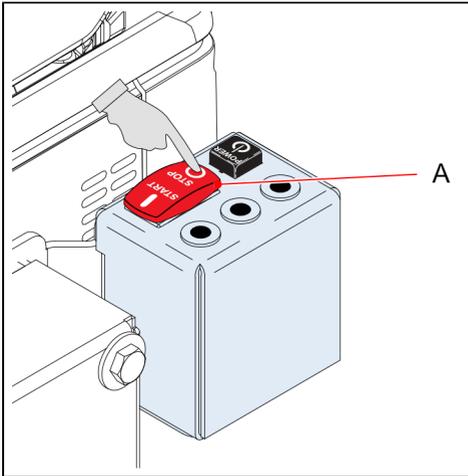
If a leak is discovered, it is not allowed to use the machine until the leakage has been fixed.

8 Operation

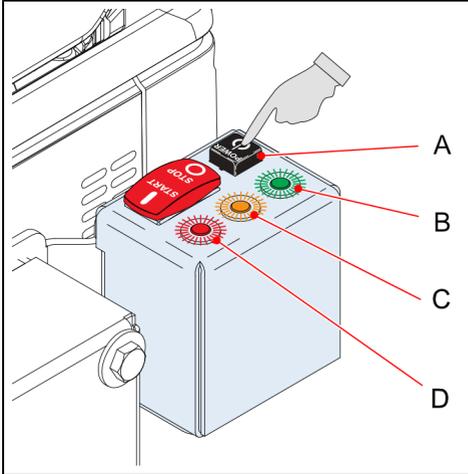
8.1 Starting the machine

**WARNING**

Make sure that the machine cannot fall over when the machine is started. Keep a good grip on the guiding handle when starting the machine.



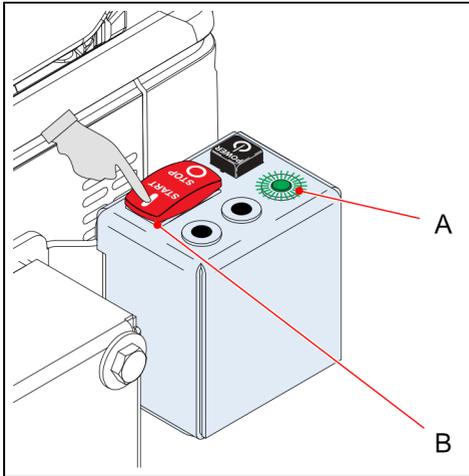
1. Make sure that the [Start/Stop]-switch (A) is in the [0]-position.



2. Press the [Power]-switch (A).

 **WARNING**

All indicators on the control panel will light up for a few seconds. Then, only the [POWER]-indicator (B) remains ON. Refer to *Battery troubleshooting* on page 64 for an overview of possible [ALERT]- or [ERROR]-indicators (C and D).



3. Press the [Start/Stop]-switch (B) into the [I]-position to start the machine.



The [POWER]-indicator light (A) is constantly ON. The machine is now ready to be used.

8.2 During operation



WARNING

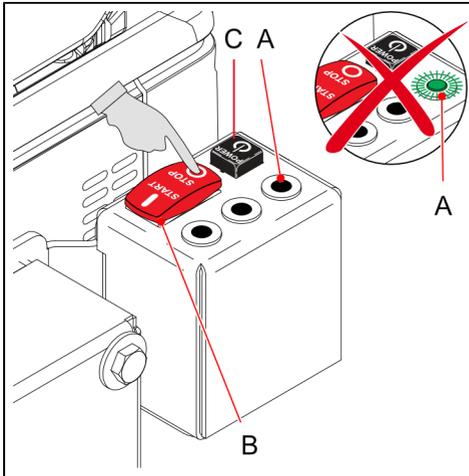
Make sure not to damage any gas, water or electricity lines and/or tubes.



For an overview of the components of the machine, refer to *Description* on page 15.

- The operator must always be positioned behind the machine.
- Always use the handle bar to operate the machine.
- Grab the handle bar with both hands and walk slowly, guiding the machine as it moves forwards.
- Make sure that the rollers are always positioned parallel to the ground.
- Do not force or overload the machine during operation.

8.3 Switching the machine off



1. Press the [Start/Stop]-switch (B) into the [0]-position.
2. Press the [Power]-switch (C) to switch off the machine.



The [Power]-indicator light (A) will now be OFF.

8.4 Battery and battery charger

8.4.1 General



WARNING

Hazardous electrical voltage!

- The battery charger must only be operated by trained operators.
- Make sure that the electrical installation is suitable for the battery charger.
- Before charging the battery, inspect the battery charger and the battery itself for damage. Do not use the battery charger or battery if there is evidence of damage. Contact the dealer.
- The battery charger and its power cable can become warm during charging.

- Do not touch uninsulated or exposed battery components.
- Do not charge the battery if there is a risk of a lightning storm or if the electrical socket is damaged or dirty.
- Do not use extension cords when charging the battery.

 **WARNING**

- Do not use the battery or battery charger near flammable or explosive substances.
- Do not expose the battery or battery charger to water or excessive humidity.
- Make sure that the battery and battery charger are free from dirt and dust before charging the battery. This applies especially for the battery connector of the battery charger.
- Do not allow children to play with the battery or battery charger.

 **WARNING**

Do **NOT** modify the battery or battery charger. This can result in death or serious injury and damage to the machine, battery or battery charger.

 **WARNING**

When storing the battery charger, do not leave it connected to an electrical socket.

 **CAUTION**

- Repeatedly charging and (fully) discharging the battery, as well as storing the battery and not using it, will cause the battery to deteriorate.
- The battery must be removed from the battery charger, when the battery charger is transported or stored.

8.4.2 Charging the battery



Illustration(s) can differ from the actual configuration.



WARNING

Only use a compatible battery charger to charge the battery. Refer to *Battery specifications* on page 22.



WARNING

- Make sure that the machine has stopped completely and has completely been switched off.
- Make sure that the machine cannot tip over. This can cause serious injury or damage to the machine.
- Always remove the power cable of the battery charger from the electrical socket when the battery is fully charged.

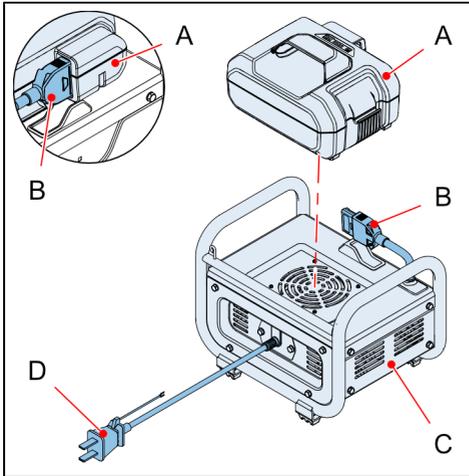


CAUTION

Make sure that the battery is correctly installed on the battery charger. This will make sure that the battery is cooled during the charging process. A safety feature of the battery charger will make sure that the charging process stops if the battery temperature is too high.



The current charge level of the battery can be checked at any time. Simply press the [Charge level]-switch on top of the battery, located next to the charge level indicator lights. The indicator lights will light up or flash to indicate the charge level of the battery.



1. If applicable, remove the battery from the machine. Refer to *Replacing the battery* on page 59.
2. Place the battery charger on a level and stable location.



CAUTION

Keep the battery charger at least 50 mm away from a wall.

3. Plug the power cable (D) of the battery charger into a suitable electrical socket.



The [Power]-indicator of the battery charger will light up.

4. Install the battery (A) onto the battery charger (C):

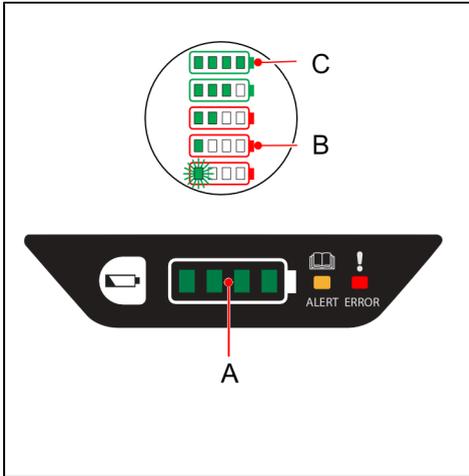
**CAUTION**

Make sure that the entire battery is correctly installed in the recess. If the battery is not installed correctly, it cannot be cooled during the charging process. The battery charger is equipped with a high temperature protection device that stops the charging process if the battery temperature is too high.

- a. Place the battery (A) onto the battery tray of the battery charger (C).
- b. Install the protective cover onto the battery connector (B).
- c. Connect the battery connector (B) of the battery charger to the battery (A).



All of the indicator lights on both the battery and the battery charger will light up for one second. Then, only the charge level indicator will show the charging state. The battery will then automatically start to charge.



The charging indicator (A) can show 4 different states:

- Charging incomplete (B):
 - Indicator light constantly on: 25 % segment of full charge reached
 - Indicator light flashing: 25 % segment of full charge still charging
- Charging complete (C):
 - 4 indicator lights constantly on: 100 % battery charge reached
 - All lights switched off: charging has automatically stopped upon completion.

5. Wait until the battery is fully charged.



It is possible to disconnect the battery before it has fully charged.

6. Remove the battery (A) from the battery charger (C):
 - a. Disconnect the battery connector (B) of the battery charger from the battery (A).
 - b. Remove the battery (A) from the battery tray of the battery charger (C).
 - c. Install the protective cover onto the battery connector (B).
7. Unplug the battery charger (C) from the electrical socket.
8. Correctly store the battery charger.

9. If applicable, install the battery onto the machine. Refer to *Replacing the battery* on page 59.

9 Maintenance

 WARNING

- Read and observe all safety instructions before performing maintenance on the machine. Refer to *Safety* on page 25 for more information. Incorrect handling of the machine can result in injuries or damage to the machine.
- Only perform maintenance tasks when the machine is switched off and the machine is decommissioned. If this is not the case, this can result in serious injury or damage to the machine.
- Let the machine cool down before performing maintenance tasks. Use heat-resistant protective gloves if it is necessary to perform emergency work on the machine.

 CAUTION

- When cleaning the machine, make sure that water does not penetrate the machine. This can seriously damage the machine. This specifically applies to the air intake area and the electrical components.
- Do not use flammable liquids to clean the machine. Fumes from e.g. fuels or solvents can become explosive and cause serious injuries and damage to the machine.

9.1 Regular maintenance schedule

 **WARNING** Always remove the battery when maintenance is performed, unless the instructions explicitly state that the battery must be installed. Refer to *Replacing the battery* on page 59.

 **WARNING** During maintenance, there is always a risk that the machine unexpectedly starts.

To prevent injury, always observe the following:

- Make sure that the machine is completely switched off.
- Make sure that the battery has completely cooled down.

 **CAUTION** For a new machine, the operator must also perform the tasks that are mentioned in *Maintenance for a new machine* on page 57.

Interval	Maintenance task
Daily	Make sure that all controls and switches function correctly.
	Make sure that all indicator lights of the battery and control panel function correctly.
	Make sure that all safety labels are still present and legible. Replace damaged or worn safety labels. Contact the dealer.
	Make sure that the machine is clean and free from debris.
	Check for oil leakage.
	Check the bolts and nuts. Tighten, if necessary.
	Check the rollers for damage. Replace the rollers if they are too damaged. Refer to <i>Replacing the rollers</i> on page 61.

Interval	Maintenance task
	Perform a visual inspection for damage.
	Check the battery for damage and leakage.
	Check the charging level of the battery.
Every 100 hours	Check the rotational speed of the electric motor.
	Clean and grease the bearings of the vibrating mechanism.
Every 300 hours/ Every year	Replace the oil of the vibrating mechanism.
	Full maintenance inspection must be carried out by the dealer.
	Thorough visual inspection of the machine and battery.

9.2 Maintenance for a new machine

Interval	Maintenance task
After the first 25 hours	Replace the oil of the vibrating mechanism.
	Check the rotational speed of the electric motor.
	Inspect the battery for damage and leakage.

9.3 Cleaning the machine

 WARNING	<ul style="list-style-type: none"> • Make sure that the machine is completely switched off before cleaning it. • Make sure that water cannot reach the electrical parts of the machine. • If the machine is equipped with a removable battery, remove it before cleaning the machine.
----------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

 **CAUTION**

- Depending on the type of compaction machine, it is only allowed to clean either the vibrating plate, rollers or ramming shoe with water.
- All other parts of the machine should be cleaned using an air-pressure cleaner and/or a dry cloth.
- Use a safety distance of 50 cm between nozzle and machine.

 **CAUTION**

- If water is used for cleaning the machine, make sure that the machine is completely dry before it is used.

9.3.1 Cleaning the battery

 **CAUTION**

- Do not use water or an air-pressure cleaner to clean the battery.
- Clean the battery with a clean, dry cloth.

9.3.2 Cleaning the battery charger

 **WARNING**

Before cleaning the battery, always make sure that the battery charger is not plugged into an electrical socket.

 **CAUTION**

- Do not use water or an air-pressure cleaner to clean the battery charger.
- Clean the battery charger with a soft and clean, dry cloth.

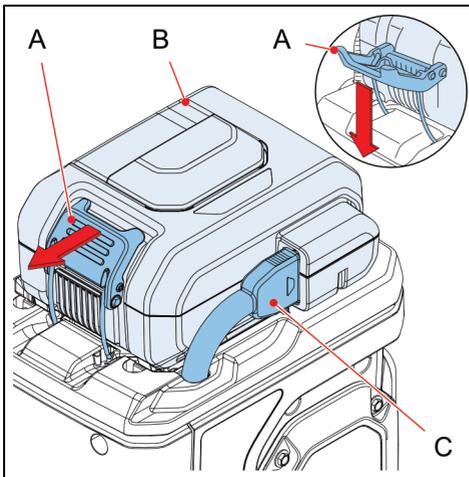
9.4 Replacing the battery



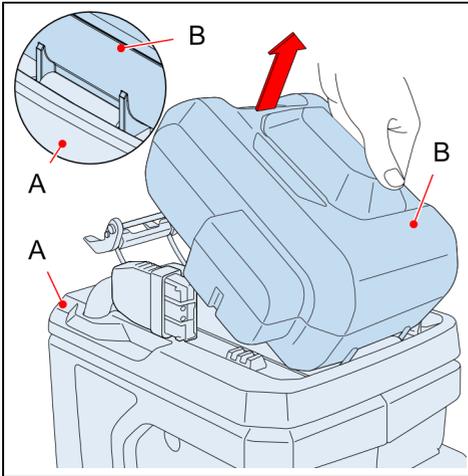
Illustration(s) can differ from the actual configuration.



- Make sure that the machine has stopped completely and has completely been switched off.
- Make sure that the machine cannot tip over. This can cause serious injury or damage to the machine.



1. Disconnect the battery connector (C) from the old battery (B).
2. Install the protective cover onto the battery connector (C).
3. Disconnect the battery clamp (A).



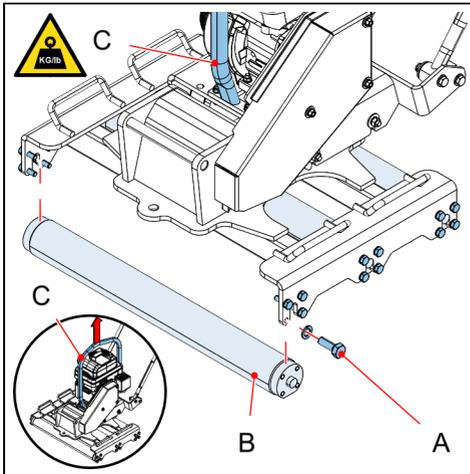
4. Remove the old battery (B) from the battery tray (A).
5. Install the new battery (B) by performing the steps in reverse order.

9.5 Replacing the rollers



WARNING

- Make sure that the machine is completely switch off.
- Make sure that the machine cannot tip over.



1. Raise or tilt the machine with the lifting frame (C) until there is enough clearance to access the applicable roller (B).
2. Remove the bolts and washers (A) of the old roller (B) on both sides of the machine.
3. Install the new roller (B) by performing the steps in reverse order.

10 Troubleshooting

10.1 Troubleshooting procedure



If an error occurs that is not described in the table below, contact the dealer for more information.

Problem	Possible cause	Possible solution
Machine does not start.	[Start/Stop]-switch is in the [0]-position (OFF).	Set the [Start/Stop]-switch to the [I]-position (ON).
	Power switch is damaged.	Contact the dealer.
	Adjustment is incorrect.	
Machine does not accelerate, is difficult to start or runs erratically.	Problem(s) with the power supply.	Contact the dealer.
Machine overheats.	Cooling fins are dirty or blocked.	Remove dirt or debris from the cooling fins.
Battery [ALERT]-indicator flashes.	Possible battery malfunction.	Refer to <i>Battery troubleshooting</i> on page 64.
Battery [ERROR]-indicator is ON.	Possible battery malfunction.	
Battery [ERROR]-indicator flashes.	Possible battery malfunction.	
Battery charger [ERROR]-indicator is ON.	Possible battery charger malfunction.	Refer to <i>Battery charger troubleshooting</i> on page 66.
Power unit does not operate.	The battery is not attached correctly.	Refer to <i>Replacing the battery</i> on page 59. Make sure that the battery connector and battery are installed correctly.

Problem	Possible cause	Possible solution
	The battery level is too low.	Charge the battery. Refer to <i>Charging the battery</i> on page 50.
	The battery is dead.	Replace the battery. Refer to <i>Replacing the battery</i> on page 59.
Power unit [ERROR]-indicator is flashing.	Possible power unit malfunction.	Refer to <i>Power unit troubleshooting</i> on page 67.
Power unit [ALERT]-indicator is ON.	Possible power unit malfunction.	
Machine runs, but the machine does not vibrate.	Clutch is damaged.	Contact the dealer.
	V-belt is defect.	
Machine runs smoothly, but the vibrating is uneven.	Oil or grease on the clutch.	Dismantle the clutch and remove the oil or grease.
	Soil build-up on the rollers.	Clean the rollers. Refer to <i>Cleaning the machine</i> on page 57.
	Incorrect rotational speed of the electric motor.	Contact the dealer.
	Clutch is damaged.	
	V-belt is not correctly tensioned.	

10.2 Battery troubleshooting

Indicators shown	Possible cause	Possible solution
	 ALERT	 ERROR

Indicators shown	Possible cause	Possible solution
<ul style="list-style-type: none"> • [ALERT]-indicator flashes. • All charge level indicator lights are OFF. 	<ul style="list-style-type: none"> • High or low temperature protection. • CAN no communication protection. 	<ol style="list-style-type: none"> 1. Completely disconnect the battery. 2. Wait 5 minutes, then press the [Charge level]-switch on top of the battery, located next to the charge level indicator lights. 3. If the [ALERT]-indicator stops flashing, the battery can be used normally. 4. If the problem persists, contact the dealer.
		
<ul style="list-style-type: none"> • [ALERT]-indicator flashes. • First charge level indicator light flashes. 	<ul style="list-style-type: none"> • Undervoltage protection. 	<p>Contact the dealer.</p>
		
<ul style="list-style-type: none"> • [ALERT]-indicator flashes • Charge level indicators all OFF. 	<ul style="list-style-type: none"> • Overvoltage protection. 	<p>Contact the dealer.</p>
		

Indicators shown	Possible cause	Possible solution
<ul style="list-style-type: none"> [ERROR]-indicator is constantly ON. 	<ul style="list-style-type: none"> Overcurrent protection. Short-circuit protection. 	<ol style="list-style-type: none"> 1. Completely disconnect the battery. 2. Wait until all indicators are switched OFF. 3. Inspect the battery for foreign materials, which can hinder correct operation. 4. Press the [Charge level]-switch on top of the battery, located next to the charge level indicator lights. 5. If the [ERROR]-indicator is OFF, the battery can be used normally. 6. If the problem persists, contact the dealer.
		
<ul style="list-style-type: none"> [ERROR]-indicator flashes. 	<ul style="list-style-type: none"> Malfunction. 	<p>The battery is dead. Contact the dealer.</p>

10.3 Battery charger troubleshooting

Problem	Possible cause	Possible solution
Charging does not start.	The power cable of the battery charger is not connected to an electrical socket.	Connect the power cable to a suitable electrical socket.
	The battery connector of the battery charger is not connected to the battery.	Connect the battery connector of the battery charger to the battery.

Problem	Possible cause	Possible solution
Charging stops midway.	The battery is not cooling correctly. The high temperature protection device has intervened.	Correctly install the battery in the recess at the centre of the battery tray of the battery charger.
[ERROR]-indicator is ON.	Battery charger output error: <ul style="list-style-type: none"> • Overvoltage • Undervoltage • Current abnormality 	Contact the dealer.
	Battery charger temperature error.	
	Battery charger voltage error.	
	Short circuit in the battery charger.	
	CAN communication error.	
	Internal voltage error.	

10.4 Power unit troubleshooting

Problem	Possible cause	Possible solution
[ALERT]-indicator flashes.	Protection function is activated.	Contact the dealer.
	The [Power]-switch was pressed while the [Start/Stop]-switch was in the [I]-position.	Set the [Start/Stop]-switch in the [0]-position. Then, press the [Power]-switch again.
[ALERT]-indicator flashes and [Power]-indicator is ON.	Power unit becomes hot.	Stop using the power unit and allow it to cool down.

Problem	Possible cause	Possible solution
[ERROR]-indicator is ON.	Protection function is activated.	Contact the dealer.

11 Environment

The life cycle of the R21E depends on maintenance, operating hours and use, and environmental conditions, such as dust, pollution, humidity or temperature. Good maintenance will keep the R21E in a good and reliable condition for a long time.

11.1 Decommissioning and waste disposal

**CAUTION**

Make sure that the battery is fully discharged before it is disposed.

At the end of its life cycle, let a qualified company with the required permits dismantle the machine. This will make sure that the dismantling and waste disposal is done in accordance with applicable (local) laws and regulations.

12 Terms of warranty

The warranty is subject to the following limitations. The warranty period for products supplied by TOBROCO Machines BV starts on the date shown on the purchase document.

The warranty conditions can depend on the agreement made with the TOBROCO Machines BV dealer.

For more information, ask the TOBROCO Machines BV dealer about the applicable warranty duration and conditions.

13 Appendix

13.1 Dealer details

The dealer of this R21E is:

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13.2 Machine-specific information

Serial number:
Operating hours:
Customer:
Specific information:

13.3 Maintenance Log

Model: **Serial number:**

Date	Maintenance provided by	Hours	Service procedure

Date	Maintenance provided by	Hours	Service procedure

TOBROCO

GROUP

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