

original operating manual

tracked mower HyCut

Order number: B00108 From mach. no.: Rev.: R01 Date: 2021-01-27



All rights reserved. This documentation is protected by copyright. Kersten Arealmaschinen GmbH reserves all rights that have not been expressly granted. This documentation may not be duplicated, disseminated or made publicly accessible in any other way without prior written consent and except in cases permitted by the law.

We reserve the right to make changes without prior notification. The original document was written in German. All translations are copies of the original document.

Copyright 2021 Kersten Arealmaschinen GmbH

Kersten Arealmaschinen GmbH
Empeler Straße 95
46459 Rees
Germany

Telephone: +49 2851 9234-10
Fax: +49 2851 9234-44
Info@kersten-maschinen.de
<http://www.kersten-maschinen.de/>

Information about this operating manual

This manual enables the safe and efficient handling of the machine. This manual forms part of the machine and must be kept close to the machine and within easy reach at all times.

All operating personnel must have carefully read through and fully understood this manual before using the machine. A basic requirement for safe working is adherence to all the safety and handling instructions in this operating manual.



There is a risk of accidents and material damage if the machine is used improperly!

Because the improper use of self-propelled equipment can result in accidents or pose other potential hazards, the initial commissioning of this Kersten machine requires mandatory training by competent, authorised personnel. Familiarise yourself with the machine's basic functions and the handling by choosing an even, level area free of any obstacles when using the machine for the first time.

- For further information, or if you have any problems, please contact your dealer, the importer or the manufacturer directly.
- Make sure to pass the safety instructions on to all other users.

In addition, all local occupational health and safety regulations and general safety regulations for the machine's area of application apply.

Further applicable documents

In addition to this operating manual, the following documents and the safety instructions that they contain must also be observed:

- Operating manual for the wireless remote control
- Operating manual for the combustion engine

Manufacturer customer service

For any technical information, please contact the machine manufacturer's customer service team:

Manufacturer's address	Kersten Arealmaschinen GmbH Empeler Straße 95 46459 Rees Germany
Service telephone	+ 49 2851 9234-10
Fax	+ 49 2851 9234-44
Email	Info@kersten-maschinen.de
Website	http://www.kersten-maschinen.de



Please have the following information at hand when making any queries:

- Machine / device type
- Machine order number
- If you are experiencing a problem: precise description or exact error message

1	Preface	6
2	Safety	7
2.1	Symbols in this operating manual	7
2.2	Pictograms	9
2.3	Intended use.....	11
2.4	Work areas and danger zones	11
2.5	Safety during the work processes	12
2.6	Mowing on slopes.....	14
2.7	Safety devices	15
2.7.1	Emergency shutdown with the emergency stop button	16
2.8	Safety markings.....	16
2.9	Residual risks	17
2.10	Environmental protection.....	20
3	Functional description	22
3.1	Overview.....	22
4	Transport, packaging and storage	25
4.1	Safety instructions	25
4.2	Transport inspection.....	25
4.3	Packaging.....	25
4.4	Transportation of the machine	26
4.5	Towing / Recovery.....	28
5	Assembly, setting up, installation, initial commissioning	30
5.1	Safety instructions	30
6	Operation	31
6.1	Safety instructions	31
6.2	Wireless remote control.....	31
6.3	Turning on the tracked mower	35
6.4	Moving off / turning on the mowing unit	36
6.5	Turning off the tracked mower	37
7	Maintenance	39
7.1	Safety instructions	39
7.2	Spare parts	39
7.3	Maintenance work	39
7.3.1	Checking that the safety devices are functioning correctly	39
7.3.2	Daily inspection	40
7.3.3	Maintenance after 20 operating hours / Longer periods of downtime.....	41
7.3.4	Maintenance after 100 operating hours / Longer periods of downtime.....	42
7.4	Changing the blades of the mowing unit	43
7.4.1	Changing a disc and all the blades on it	44
7.4.2	Changing opposite blades.....	45
7.5	Cleaning the air filter	46
7.6	Lifting up the chain	47

7.7	Setting the chain tension	49
7.8	Charging the batteries	51
7.8.1	48-volt charging device	52
7.8.2	24-volt charging device	53
7.8.3	12-volt charging device	54
7.9	Cleaning the machine.....	55
7.10	Measures after maintenance has been performed	55
7.11	Storage.....	56
8	Malfunctions / Troubleshooting	57
8.1	Safety instructions	57
8.2	Warning codes	57
8.3	Causes of malfunctions and how to remedy them	57
8.4	Petrol engine malfunction table	57
8.5	Control system malfunction table	59
8.6	Drive malfunction table.....	59
8.7	Mowing unit drive malfunction table	60
9	Dismantling, disposal	61
9.1	Safety instructions	61
9.2	Dismantling.....	61
9.3	Disposal.....	61
10	Technical Data	63
10.1	General information.....	63
10.2	Electric motors / batteries.....	63
10.3	Wireless remote control.....	64
10.4	Engine type	64
10.5	Declaration of Conformity.....	65

1 Preface

Dear Customer,

Thank you for choosing a quality product from Kersten.

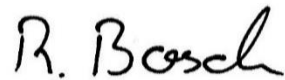
This product was manufactured according to the most up-to-date production processes and using comprehensive quality assurance measures as our target is only achieved when you are satisfied with your machine.

Please read this manual thoroughly and carefully before using the machine or attachment for the first time.

If there is any information in the safety data sheet or in the product-specific assembly or operating manual that you do not understand, please contact your vendor or the machine manufacturer directly.

Please keep this manual at hand at all times. You can then read the important information and instructions it contains when necessary.

We hope you enjoy using your new Kersten machine!



Dipl. Ing. (FH) Robert Bosch
Managing Director

2 Safety

2.1 Symbols in this operating manual

Safety instructions

The following occupational safety symbols are used with all information regarding occupational safety that indicate a risk to life and limb and usually consist of a pictogram, a signal word and a signal colour.

In this documentation, you will find an explanation of hazardous situations at the relevant points.

Please follow the information provided!

Ensure that you also follow all locally applicable safety and accident prevention regulations!

DANGER



Type and source of the danger

This symbol warns users of an imminent danger to the life and health of personnel.

Failure to follow the instructions and information provided can have a serious impact on the health of personnel, including life-threatening injuries, and may cause extensive material damage.

- Action that must be avoided so that the danger does not occur.

WARNING



Type and source of the danger

This symbol warns users of an impending danger to the life and health of personnel that may also cause environmental and material damage.

Failure to follow the instructions and information provided can have a serious impact on the health of personnel, including life-threatening injuries, and may cause extensive environmental and material damage.

- Action that must be avoided so that the danger does not occur.

CAUTION



Type and source of the danger

This symbol warns users of an impending danger to the health of personnel that may also cause environmental and material damage.

Failure to follow the instructions and information provided can have a minor or moderate impact on the health of personnel, including injuries, and may cause extensive environmental and material damage.

- Action that must be avoided so that the danger does not occur.

NOTICE**Type and source of the machine or system damage**

This symbol warns of a hazardous situation and identifies a notice on how to handle the machine or system.

Failure to follow the instructions and information provided may lead to extensive material damage.

- Action that must be avoided to prevent damage to the machine or system.

Tips and recommendations

This symbol draws users attention to useful tips and recommendation, as well as information on how to operate the machine efficiently and without any malfunctions.

Other types of identification

The following types of identification are used in this manual to identify instructions, results, lists, references and other elements:

Identification	Explanation
1., 2., 3. ...	Step-by-step instructions
➔	Results of actions taken
•	List in no particular order
[Button]	Operating elements (e.g. button, switch), display elements (e.g. signal lights)
“Display”	Display screen elements (e.g. buttons, assignment of function keys)

2.2 Pictograms

Follow the instructions in the operating manual



Only use the identified machine after having read the operating manual.

Wear protective workwear



This sign indicates that protective workwear must be worn in the area concerned. Protective workwear is close-fitting work clothes with a low tensile strength, close-fitting sleeves and without any protruding parts.

Wear safety shoes



This sign indicates that safety shoes must be worn in the area concerned. Safety shoes protect the feet from being crushed and from falling parts and stops the user from slipping on slippery surfaces.

Wear protective gloves



This sign indicates that protective gloves must be worn in the area concerned. Protective gloves protect the hands against friction, abrasions, punctures, cuts or deeper injuries and they protect the hands if they come into contact with hot surfaces.

Wear protective eyewear



This sign indicates that protective eyewear must be worn in the area concerned. Protective eyewear protects the eyes against flying parts and fluid splashes.

Operating manual and safety instructions



Read and observe the operating manual and all safety instructions before starting up the machine for the first time.



Never open or remove any protective devices while the engine is running.



Observe the information provided in the technical manual.
Note the lubrication points!



Do not touch any components until they have stopped moving completely.



Beware of parts flung from the machine while the engine is running.
Keep at a safe distance at all times!

2.3 Intended use

⚠ WARNING



Risk of injury / risk of environmental damage caused by improper use of the machine!

If the machine is used improperly, it may result in injury and can cause environmental and material damage (to the machine or system)!

- The HyCut tracked mower has been designed for usual or common mowing applications in the agricultural and forestry sectors, such as for the maintenance of green spaces and parks.
- Any use going beyond this is deemed to be improper use. The manufacturer does not assume liability for damage arising from such use. The operator bears the sole risk.
- Adhering to the intended use includes complying with the manufacturer's operating, maintenance and repair specifications.
- The HyCut tracked mower may only be used, maintained and repaired by people who are familiar with it and who have been instructed about the associated hazards.
- All applicable accident prevention regulations and any applicable general regulations regarding safety and occupational health must be observed and followed.
- Any damages caused as a result of unauthorised modifications made to the machine will be excluded from the manufacturer's liability.

2.4 Work areas and danger zones

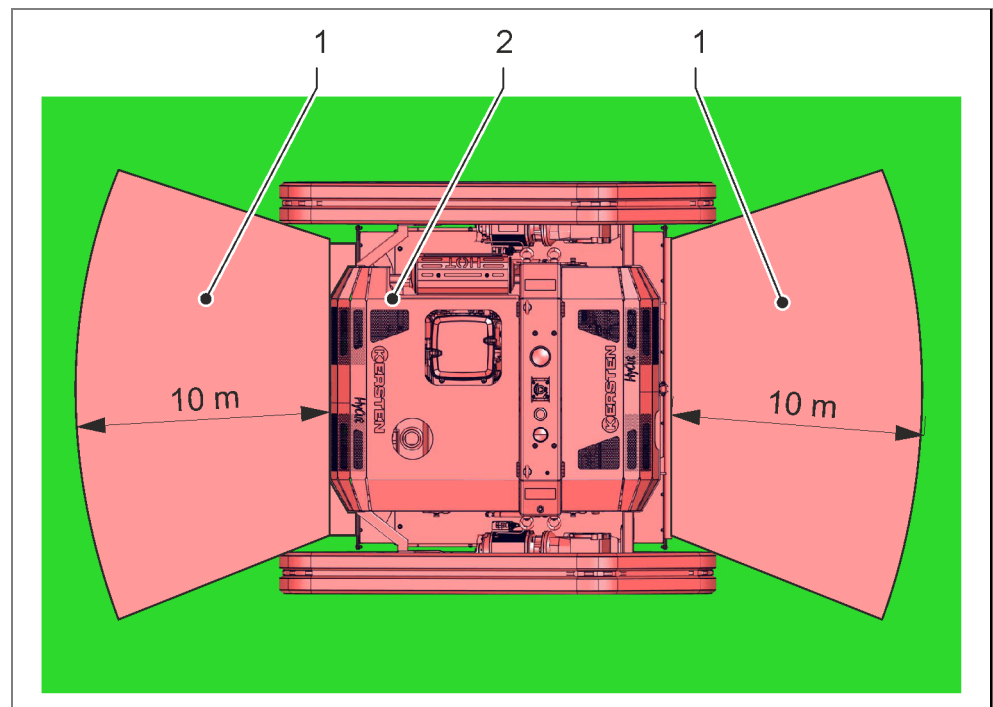


Fig. 1: Danger zones (view from above)

- 1 Ejection area of the cutting unit, max. 10 m
 - 2 HyCut tracked mower
- RED → Danger zone (staying in this zone is prohibited / forbidden)
 - GREEN → Work area (the entire area that needs to be cultivated)

WARNING



Risk of injury / risk of environmental damage from working / staying in the danger zone!

There is a risk of injury and environmental damage (to the machine and system) from working / staying in the danger zone!

- The user is responsible for protecting others present in the danger zone of the machine.
- Staying within the danger zone of the machine is forbidden! Ensure that all people leave the danger zone.
- If anyone approaches the danger zone, the machine must be stopped immediately.
- The operator must ensure that there are no people or material assets in the potential ejection area.
- Check the danger zone before turning on the mower and starting off. Pay particular attention to children and animals. The operator must ensure that they have sufficient visibility!
- In areas with poor visibility, stop the machine and ensure that nobody is in the danger zone.
- Remove any obstacles or debris from the area to be cultivated before starting work. Look out for and remove obstacles or debris during work to avoid collisions.
- When working in the immediate vicinity of public streets and roads, ensure that the ejection area of the mower is within the work area in order to reduce the risk of injury to others.
- When working in, or in the immediate vicinity of, public spaces, set up the relevant information and warning signs to make others in the area aware of the work being performed.

2.5 Safety during the work processes

WARNING



Risk of injury / Risk of environmental damage due to non-compliance with safety measures!

If the safety measures are not complied with, this can result in injury and environmental and material damage (to the machine)!

- Never leave the HyCut tracked mower unattended when it is moving.
- Follow the information and instructions in this operating manual and comply with all general occupational safety and accident prevention regulations.

- The HyCut tracked mower should never be operated by children under the age of 16, even if they are being supervised by an adult! Never allow children or teenagers to play with the machine.
 - The machine should be used by authorised personnel only.
 - Follow all applicable legal requirements when using the machine on public roads!
 - The HyCut tracked mower is not permitted for use on public roads.
 - Users should always wear close-fitting clothing. Avoid wearing loose clothing and wear sturdy footwear or safety shoes.
 - Only work in good light and visibility!
 - The information and warning signs attached to the machine contain important instructions for safe operation. You must observe them for your own safety!
 - The machine must be turned off before being transported outside of the work area on a vehicle or trailer!
 - Pay special attention when using rotating mulching blades - Keep at a safe distance!
 - Pay special attention to trailing mulching blades. Before starting any work on these, ensure that they have come to a complete stop!
 - If the mulching blades become blocked by a foreign object, the emergency stop button must be pressed immediately. Before cleaning the mowing unit with a suitable tool, the tracked mower must be turned off. To do this, turn the mower over and pull out the disconnect switch.
 - Driven parts pose a risk of crushing and shearing!
 - It is forbidden to use the machine to transport people and objects!
 - The contours of the terrain / slopes may affect the machine's handling, steering, braking ability and stability. Always adjust your working speed to the local conditions.
 - Never make unauthorised modifications to the machine as they may compromise its operational safety!
 - If the tracked mower is damaged in any way, the emergency stop button must be pressed immediately. Before repairing any damage, the tracked mower must be turned off. To do so, turn the mower over and pull out the disconnect switch.
 - When working on slopes, the accompanying person must stand above the vehicle at a sufficient distance from the HyCut tracked mower. We recommend that the operator wears crampons if necessary.
 - Always travel across slopes rather than up and down them wherever possible.
 - Do not use the machine on slopes in damp or rainy conditions.
 - If the steering malfunctions, stop the HyCut tracked mower immediately and turn off the engine. Repair the malfunction immediately.
 - Check the machine's operational safety before each use!
 - If the HyCut tracked mower starts slipping when on a slope, press the emergency stop button on the remote control immediately.
-

2.6 Mowing on slopes

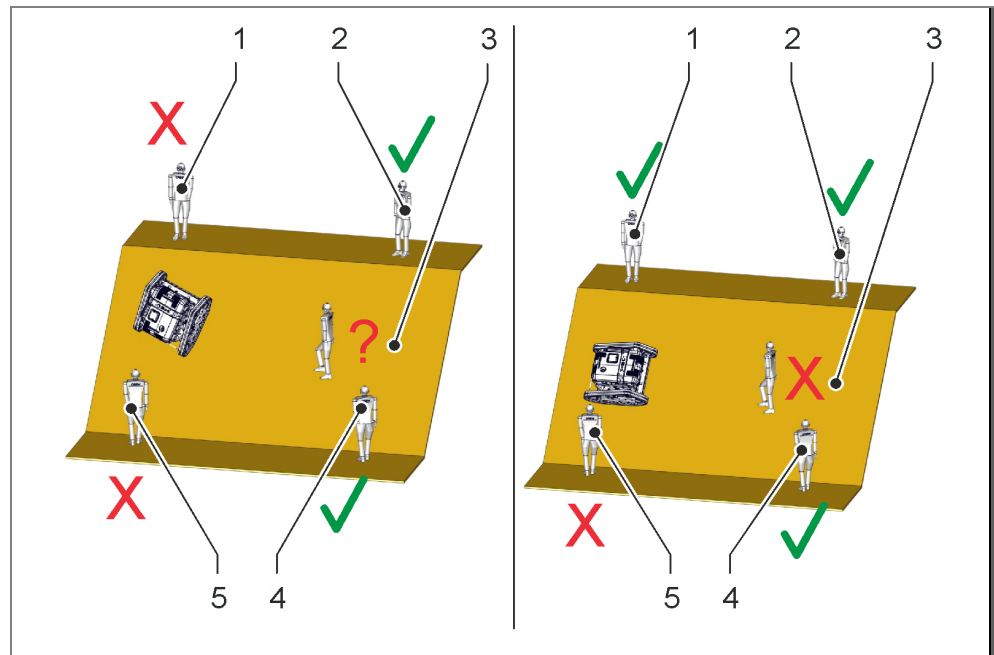


Fig. 2: Mowing on slopes

- 1 Position above the slope above the tracked mower
- 2 Position above the slope next to the tracked mower
- 3 Position on the slope
- 4 Position below the slope next to the tracked mower
- 5 Position below the slope downhill from the tracked mower

The figures above show the recommended and prohibited positions for when the tracked mower is being used on a slope.

- In any case, the position below the slope downhill from the tracked mower (5) is prohibited.
- When travelling vertically on a slope, the position above the slope above the tracked mower (1 in the left figure) is prohibited.
- The position on the slope (3) has a question mark next to it and should be avoided whenever possible.

WARNING



Risk of injury / risk of environmental damage when on a slope!

There is a risk of injury and environmental and material damage (on the machine) when mowing on a slope!

- Never leave the HyCut tracked mower unattended when it is moving.
- Follow the information and instructions in this operating manual and comply with all general occupational safety and accident prevention regulations.
- If the HyCut tracked mower starts slipping when on a slope, press the emergency stop button on the remote control immediately.

- The operator must always be familiar with the local conditions, particularly the slopes, and change their position accordingly. The distances in relation to the danger area described must be observed (see Chapter 2.4 Work areas and danger zones on Page 11).
- Do not mow on slopes with a gradient of more than 50° (120%). The mower can travel on slopes with a maximum gradient of 50° under optimal conditions.
- Mowing damp grass or dry sand must be avoided if possible. The tracked mower may start to slip uncontrollably depending on how damp the grass is, the grain size of the sand and the slope inclination. The machine can usually not be stopped in such situations. As such, uncontrollable slipping must be avoided at all costs.
- Check the area to be mowed for any foreign objects.
- Check the area to be mowed for any steps or holes that may destabilise the tracked mower.
- Always manoeuvre the mower carefully and drive it downhill slowly.
- When on a slope, mow horizontally in one direction and then use the drive lever to reverse the direction of travel at the end of each row.
- Set the speed on the rotary potentiometer on the remote control. This prevents an “oversteering” of the drive lever.
- Never leave the mower on a slope with the engine running.
- Never stand below the tracked mower.
- Never drive the tracked mower outside of your field of vision. When driving over hills, the tracked mower must be stopped near the hilltop. Change your position so that you have a clear view of the other side of the hill.
- Do not start or stop the engine suddenly when moving uphill or downhill. Take particular care when changing direction on slopes.

2.7 Safety devices

DANGER



Risk of death or injury due to non-functioning safety devices!

With non-functioning or overridden safety devices, there is a risk of severe injuries or even death.

- Before starting the work, ensure that all safety devices are fully functional and have been installed correctly.
- Never override or disable safety devices.
- Take care to ensure that all safety devices are always accessible.

2.7.1 Emergency shutdown with the emergency stop button

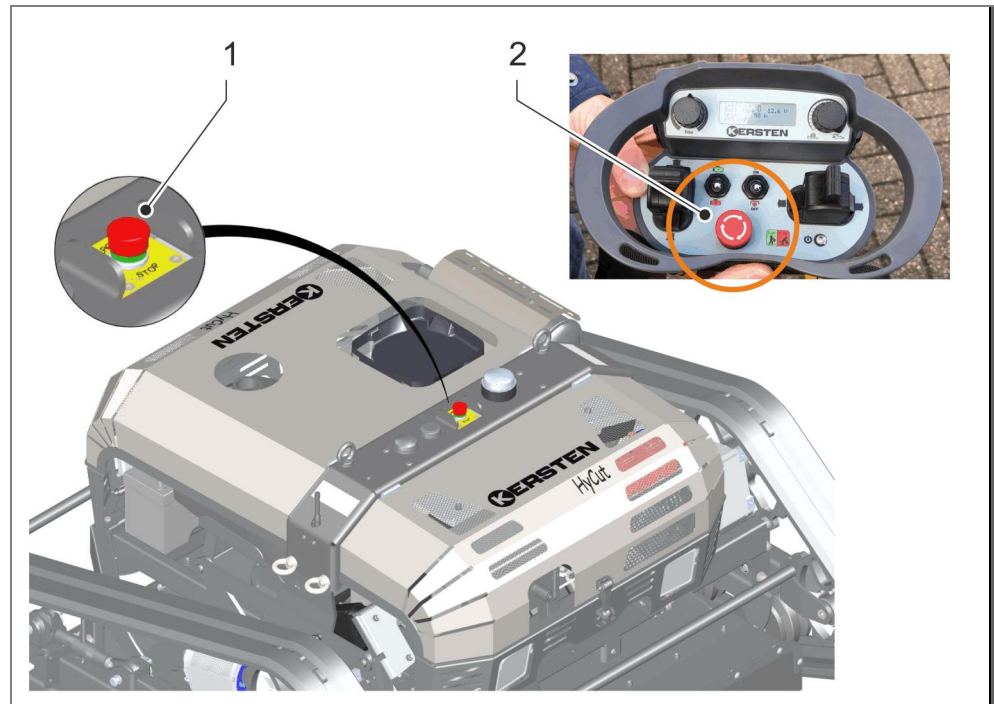


Fig. 3: Emergency stop button

- 1 Tracked mower emergency stop button
- 2 Remote control emergency stop button

There is an emergency stop button on the top of the tracked mower (1) and on the remote control (2). In an emergency, press the emergency stop button on the tracked mower (1) or remote control (2) immediately.

- The HyCut tracked mower will come to a complete stop
- The power supply to the engine controllers remains
- The combustion engine will shut down
- The blade drive will stop



Perform the following steps before starting up the mower again!

- Remedy the cause of the malfunction / dangerous situation.
- Make sure that the emergency stop button is back in its starting position.

2.8 Safety markings

The following symbols and signs can be found in the work area. They refer to the immediate environment in which they are installed.

⚠ WARNING**Risk of injury due to illegible or missing signage!**

Missing and illegible stickers and signs can have serious health consequences or even cause fatal injuries.

- All safety, warning and operating signs must always be legible.
- Replace any damaged signs or stickers immediately.

2.9 Residual risks

The machine has been designed and built according to the latest state of the art and in accordance with all currently applicable safety requirements. Nevertheless, there are residual risks that mean that you must still act carefully. We have listed the residual risks and the resulting behaviours and measures below.

Improper transport

NOTICE**Material damage caused by improper transport**

If transported improperly, transported objects may fall or overturn. This can result in significant material damage.

- Proceed carefully when unloading the transported objects upon delivery and during internal transport and observe the symbols and information on the packaging.
- Only use the attachment points provided.
- Only remove the packaging from the machine shortly before assembling.

Debris and objects lying around

⚠ CAUTION**Risk of injury caused by debris and objects lying around!**

Debris and objects left lying around may cause personnel to slip and trip. Tripping can cause injuries.

- Keep the work area clean at all times.
- Remove any objects that you no longer need from the work area and, in particular, from the ground.
- Remove all tools and parts from the work area.

Cleaning agents

⚠ WARNING**Risk of injury caused by cleaning agents and substances being handled improperly**

The improper handling of cleaning agents or substances may have serious health effects or can even cause fatal injuries.

-
- Read the applicable material safety data sheets and manufacturer instructions for the cleaning agents and substances
 - Wear corresponding personal protective equipment (e.g. gloves, safety shoes, protective suit, respirator, protective eyewear, etc.)
 - Ensure that the surrounding environment is sufficiently ventilated
 - Handle any warm cleaning agents and substances carefully. Coming into contact with them can cause burns and scalding
 - Clean any parts, assemblies and components to remove any adhering oil, grease and other contaminants
 - Avoid skin contact with cleaning agents and substances
 - Do not inhale any vapours produced by cleaning agents and substances
 - Do not handle close to open flame and do not smoke
-

Noise level

Like the warning information provided in the documentation, all applicable noise protection regulations must be observed. The noise level on site depends on the local ambient noise. The operator must check the noise level at regular intervals.

WARNING



Risk of injury due to noise!

The noise levels occurring in the work area can cause severe hearing damage.

- Covers, insulating materials and other insulating parts should not be removed and should be replaced if damaged.
 - If the daily noise exposure level of 85 dB(A) is exceeded, the operator must wear hearing protection.
 - Only stay in the danger zone for as long as is necessary.
-

Moving parts

DANGER



Risk of death and injury due to moving parts!

If moving parts are handled improperly, there is a risk of death and injury, as well as material damage to the machine and system.

- Do not reach into or handle moving parts when the machine is in operation.
- Never open the covers when the machine is in operation.
- Observe the follow-up time: before opening the covers, take care to ensure that all parts have stopped moving.
- Wear close-fitting protective clothing with low tensile strength in the danger zones.

Sharp edges and corners

CAUTION



Risk of injury due to sharp edges and corners!

Sharp edges and corners can cause skin abrasions and cuts.

- Be careful when working in the vicinity of sharp edges and corners.
- If in any doubt, wear protective gloves.

Operating materials / Resources / Lubricants / Oils

WARNING



Risk of injury due to the improper handling of operating materials and resources!

The improper handling of operating materials and resources can have serious health consequences or can even cause fatal injuries.

- Read the applicable material safety data sheets and manufacturer instructions for the operating materials and resources.
- Wear corresponding personal protective equipment (e.g. gloves, safety shoes, protective suit, respirator, protective eyewear, etc.).
- In the event of accidental eye contact, rinse the eyes thoroughly with plenty of water and consult a doctor.
- If any materials or resources come into contact with the skin, clean thoroughly with plenty of water.
- Ensure that the surrounding environment is sufficiently ventilated.
- Handle any warm materials and resources carefully. Coming into contact with them can cause burns and scalds.
- Clean any parts, assemblies and components to remove any adhering oil, grease and other contaminants.
- Avoid skin contact with operating materials and resources.
- Do not inhale any vapours produced by operating materials and resources.
- Do not handle close to an open flame and do not smoke.

2.10 Environmental protection

WARNING



Risk of environmental damage due to the improper handling of operating materials and resources, as well as cleaning agents and substances!

Handling operating materials, resources, cleaning agents and substances improperly can cause extensive environmental and material damage.

- Read the applicable material safety data sheets and manufacturer instructions for the operating materials, resources, cleaning agents and substances.
- Store any operating materials and resources that are hazardous for the water or soil, such as parts, assemblies and components contaminated with oil, in secured areas or collecting basins.
- Bind any emitted operating materials, resources, cleaning agents and substances with a binding agent and dispose of them according to local regulations.
- Clean any parts, assemblies and components to remove any adhering oil, grease and other contaminants.
- Do not let any emitted operating materials and resources and cleaning agents and substances seep into the soil or flow into the sewage system.

The following environmentally hazardous substances are used:

Lubricants

Lubricants such as greases and oils contain toxic substances. These should not be released into the environment. They must be disposed of by a specialist waste disposal company.

Oils

Oils (such as lubricating, hydraulic or cleaning oils) should not be released into the environment. Oils can have long-term harmful effects when released into water. They must be disposed of by a specialist waste disposal company.

Observe the safety data sheets provided by the manufacturers.

Electronic parts

Electronic parts can contain toxic substances. These should not be released into the environment. They must be disposed of by a specialist waste disposal company.

Accumulators and batteries

Accumulators and batteries contain toxic heavy metals. They are classed as toxic waste and must either be disposed of at municipal collection points or by a specialist waste disposal company.

Improper transport

NOTICE



Material damage caused by improper transport

Clean any parts, assemblies and components to remove any adhering oil, grease and other contaminants. This can result in significant material damage.

- Proceed carefully when unloading the transported objects upon delivery and during internal transport and observe the symbols and information on the packaging.
- Only use the attachment points provided.
- Only remove the packaging from the machine shortly before assembling.

Debris and objects lying around

CAUTION



Risk of injury caused by debris and objects lying around!

Debris and objects left lying around can cause personnel to slip and trip. Tripping can cause injuries.

- Keep the work area clean at all times.
- Remove any objects that you no longer need from the work area and, in particular, from the ground.
- Remove all tools and parts from the work area.

Cleaning agents

WARNING



Risk of injury caused by cleaning agents and substances being handled improperly

The improper handling of cleaning agents or substances can have serious health effects or can even cause fatal injuries.

- Read the applicable material safety data sheets and manufacturer instructions for the cleaning agents and substances.
- Wear corresponding personal protective equipment (e.g. gloves, safety shoes, protective suit, respirator, protective eyewear, etc.).
- Ensure that the surrounding environment is sufficiently ventilated.
- Handle any warm cleaning agents and substances carefully. Coming into contact with them can cause burns and scalding.
- Clean any parts, assemblies and components to remove any adhering oil, grease and other contaminants.
- Avoid skin contact with cleaning agents and substances.
- Do not inhale any vapours produced by cleaning agents and substances.
- Do not handle close to open flame and do not smoke.

3 Functional description

3.1 Overview

The HyCut tracked mower has been designed for the following tasks.

- Mowing and mulching

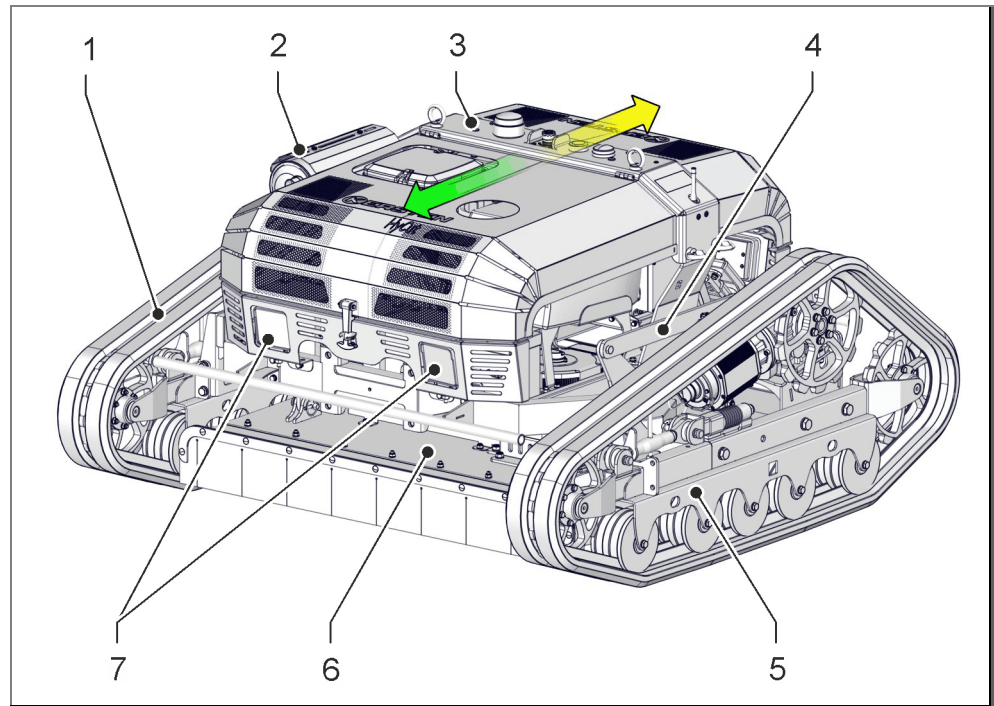


Fig. 4: Overview 1

- 1 Right caterpillar track
- 2 Exhaust
- 3 Frame with emergency stop button, flashing light and antenna
- 4 Mulching/mowing unit height adjustment
- 5 Left caterpillar track
- 6 Mulching/mowing unit
- 7 Headlights

Driving directions:

Green → Forwards drive

Yellow → Reverse drive

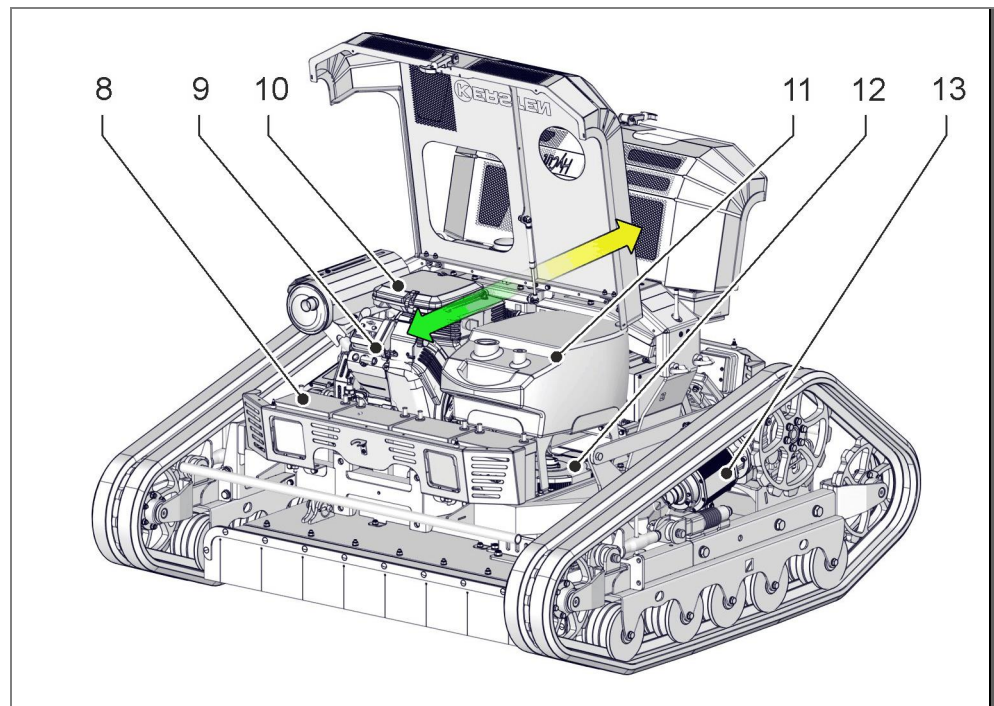


Fig. 5: Overview 2

- 8 Four back-up batteries connected in series
- 9 Combustion engine
- 10 Air filter
- 11 Fuel tank
- 12 Mowing drive electric motor
- 13 Left caterpillar drive electric motor

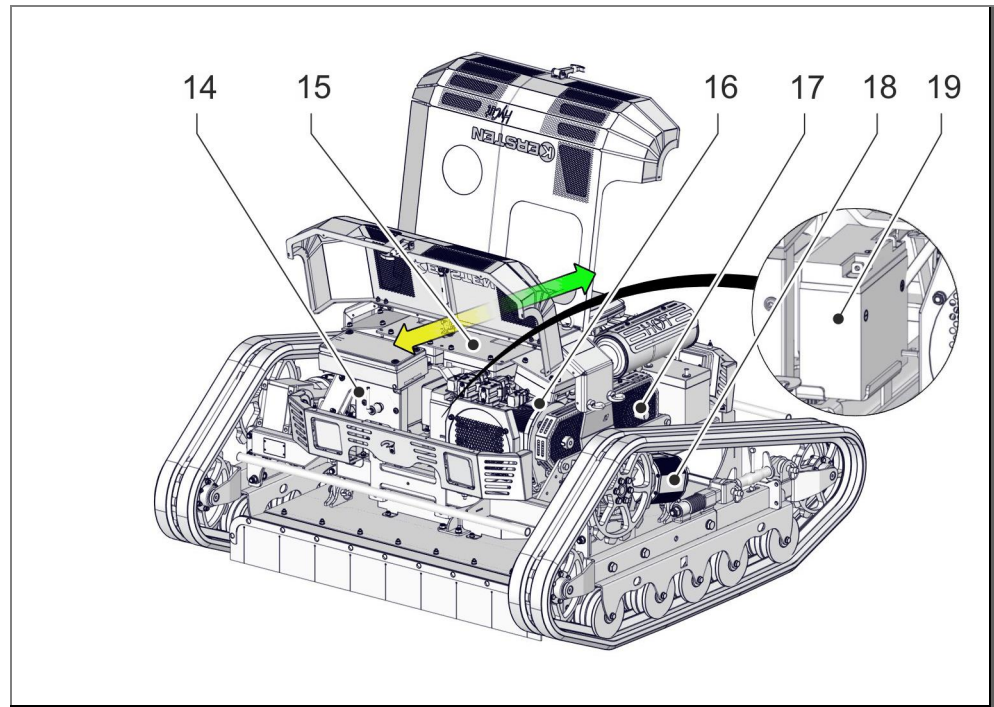


Fig. 6: Overview 3

- 14 Disconnect switch
- 15 Four motor controller
- 16 Generator
- 17 Toothed belt drive between the combustion engine and generator
- 18 Right caterpillar drive electric motor
- 19 12-volt battery

The remote-controlled tracked mover is primarily designed for mowing areas on slopes up to a gradient of $50^\circ = 120\%$.

A combustion engine (9) drives a generator (16) via a connecting toothed drive belt (17). This provides the electrical energy for the electrical caterpillar drives (13 and 18) and the electrical drive of the mulching/mowing unit (12). Between the generator (16) and the three drive motors (12, 13 and 18) there are four lead batteries connected in series as back-up batteries (8). These back-up batteries (8) can be used to operate the tracked mower temporarily without the combustion engine (9).

The tracked mower is operated via a wireless remote control (see Chapter 6.2 Wireless remote control on Page 31).

4 Transport, packaging and storage



The assembly, installation and initial commissioning should only be performed by an employee of the dealer or by a person authorised by them.

However, it may be that operators or maintenance personnel may be entrusted with handling packages as part of the installation. As such, it is essential that the information and instructions below are followed.

4.1 Safety instructions



Observe all safety instructions provided in the Safety chapter!

(See Chapter 2 Safety on Page 7)

4.2 Transport inspection

Check the delivery for completeness and damage immediately upon receipt.

Proceed as follows if you find any outwardly visible transport damage:

- Do not accept the delivery or only accept it under reservation.
- Note the extent of the damage on the transportation documents or on the transporter's delivery note.
- File a complaint.



File complaints for defects as soon as you notice them. Claims for damages can only be asserted within the applicable claim period.

4.3 Packaging

Handling packaging materials

Packaging materials must be disposed of according to all applicable legal provisions and local regulations.

NOTICE



Risk to the environment if disposed of incorrectly!

Packaging materials are valuable resources and in many cases can either be used again or processed and recycled. If packaging materials are disposed of incorrectly, they can pose a risk to the environment.

- Be sure to dispose of packaging materials in an environmentally-friendly way.
- Observe all locally applicable disposal regulations. If necessary, have a specialist waste disposal company take care of the disposal for you.

4.4 Transportation of the machine

NOTICE



Material damage due to improper handling!

Handling the machine improperly can cause damage.

- The machine must not be allowed to tip over or rotate around the horizontal axis.
- The vehicles, tools and lifting equipment used must be suitable for the weight of the transport units.
- The driver must be authorised to drive the vehicle.

Protective equipment

- Protective workwear
- Protective gloves
- Safety shoes

The following points must be observed when the machine is being transported:

- The loading, unloading and transportation of the machine must be performed with suitable transport vehicles and trailers approved for use on public roads.
- The transport vehicles must be suitable for the weight and dimensions of the machine that is to be transported.
- The machine must be attached to the marked attachment points.
- Sufficiently dimensioned lifting equipment / lashings must be used.
- The lifting equipment / lashings must not have any visible damage.
- For the transport, only vehicles, tools and lifting equipment / lashings that are functional, flawless and suitable for the load to be transported should be used.
- Do not stack the individual transport units on top of each other!

DANGER



Risk of death or injury due to the machine being transported incorrectly!

If the machine is transported incorrectly, there is a risk of death and injury, as well as a risk of material damage to the machine and system!

- When using crane systems and / or forklifts, the user / driver must be authorised to drive the vehicle.
- For transport, the machine should only be secured to the transport lugs / lashing points provided.
- The machine must not be allowed to tip over or rotate around its own axis when being lifted. Monitor the centre of gravity!
- Note the towing capacity of the towing vehicle and the permissible total weight of the trailer.
- The loading ramps must be secured against sliding / rolling away.
- The loading ramps must have a sufficient load-bearing capacity.

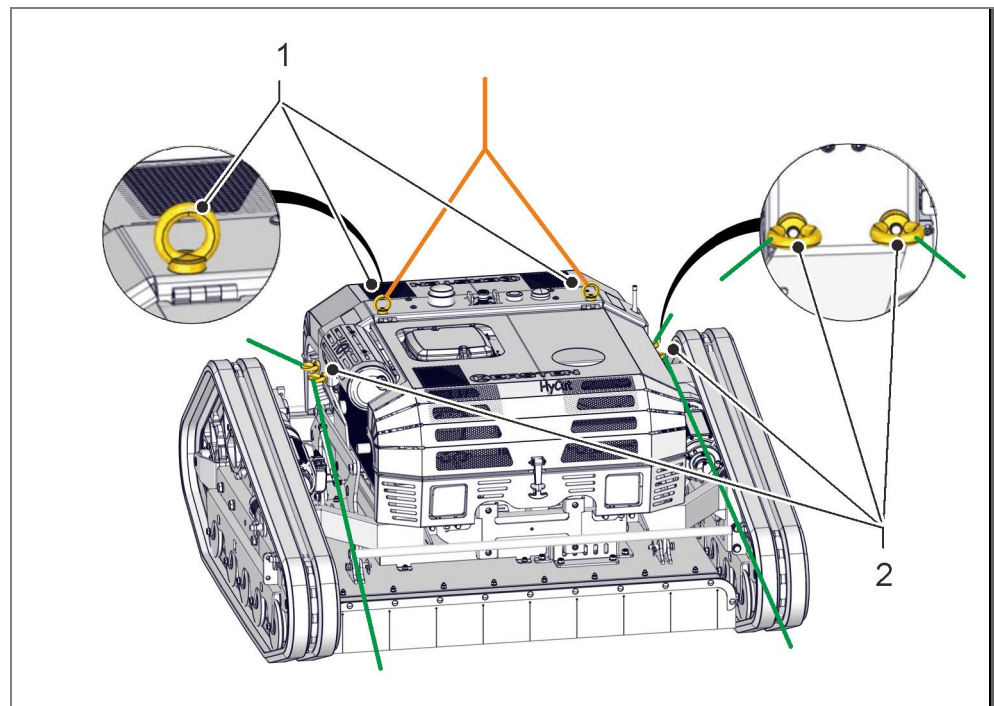


Fig. 7: Transport lugs / lashing points on the machine

- 1 Transport lugs
- 2 Lashing points

Only the existing transport lugs (1) should be used to transport / lift the machine.
Only the existing lashing points (2) should be used to lash the machine.

Only lifting equipment that is functional, flawless and suitable for the load to be transported should be used.

The following steps must be observed when transporting / lashing the machine:

1. Turn off the engine, turn the disconnect switch and pull out.
2. When lifting the machine with a hoist, only attach the lifting equipment to the transport lugs (1).
3. When lashing the machine with tensioning elements, only use the indicated lashing points (2).
4. Pre-tension the lashing / tensioning elements and ensure that they are in the correct position and that the load is distributed correctly.
5. Before unloading the machine, take care to ensure that there are no obstacles on the ground in front of the loading ramps, as this could cause a collision. When unloading multiple machines, move them far enough away from the loading zone.

4.5 Towing / Recovery

DANGER



Risk of death or injury caused by manually disconnecting the engine brake for the two drives!

When manually disconnecting the engine brake for the two drives, there is a risk of death and injury, as well as a risk of material damage to the machine and system! The engine brake lever must remain pulled out for the entire duration of the brake deactivation!

- When towing / recovering, care must be taken to ensure that both people who are keeping the engine brake pulled out are not run over or drawn into the machine.
- All people involved in operating the machine must be instructed in detail before starting the work.

Both drive motors for the left and right drive chains close spring-loaded when there is no current flowing through them. This means that the drive chains cannot be moved when the drive motors have no power.

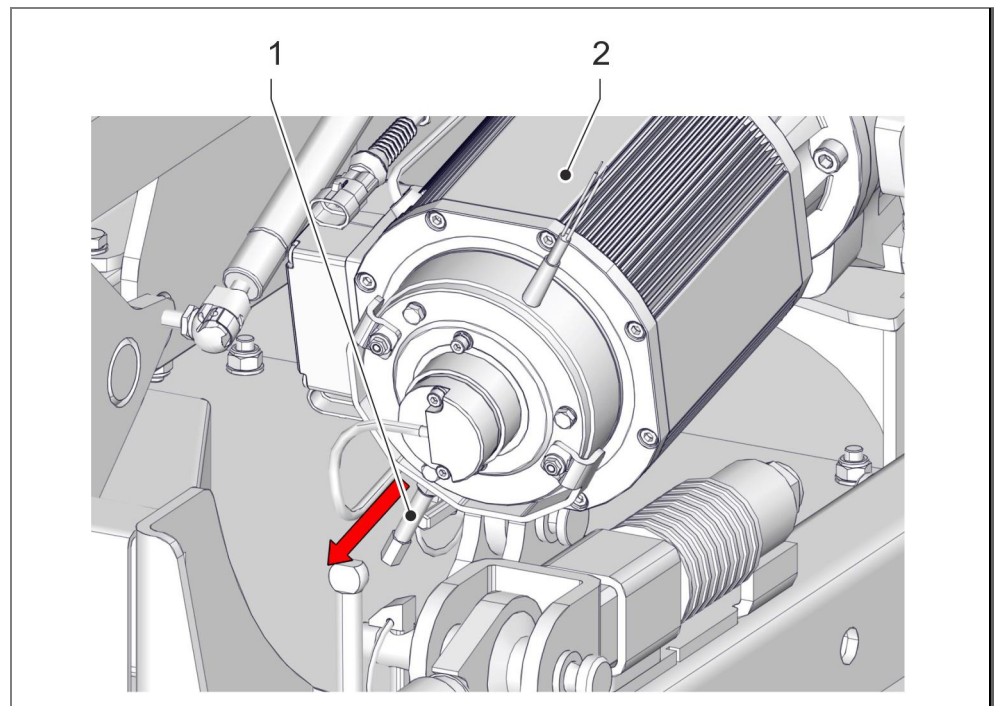


Fig. 8: Lever for opening the engine brake

- 1 Engine brake lever
- 2 Drive motor

Therefore, before the tracked mower can be towed / recovered with both drive motors (2), the spring-loaded brake must be mechanically opened by hand using the lever (1). To do so, the lever (1) must be pulled in the direction of the arrow and held there. If the lever (1) is released, the brake will be activated immediately and the vehicle can no longer be towed.

5 Assembly, setting up, installation, initial commissioning

5.1 Safety instructions



Observe all safety instructions provided in the Safety chapter!
(See Chapter 2 Safety on Page 7)

6 Operation

6.1 Safety instructions



Observe all safety instructions provided in the Safety chapter!
(See Chapter 2 Safety on Page 7)

6.2 Wireless remote control

All the functions of the HyCut tracked mower can be controlled via the supplied wireless remote control.



Fig. 9: Wireless remote control

- 1 Forwards / reverse drive lever
- 2 Emergency stop button
- 3 Trimming device for travelling on a slope
- 4 Combustion engine on / off
- 5 Mowing unit on / off
- 6 Display (cutting height, battery voltages, operating hours, blade drive)
- 7 Operator safety via tilt sensor
- 8 Potentiometer slow / fast
- 9 Right / left drive lever
- 10 Status LED

The forwards / reverse drive lever (1) moves the tracked mover forwards or backwards. The further away from the neutral position the drive lever (1) is moved, the faster the tracked mower will move forwards or backwards.

The right / left drive lever (9) moves the tracked mower left or right. The change of direction is done through differences in speed between the left and right rubber tracks.

You can adjust the speed within a range from zero to one hundred percent with the potentiometer (8).

The trimming device for travelling on a slope (3), can be used to set a speed difference between the left and right track drives. Using the trimming device can be useful when travelling across the slope.

The combustion engine can be turned on and off using the combustion engine on/off switch (4).

The mowing unit can be turned on and off with the mowing unit on/off button (5).

The display (6) displays information about the following points:

- Cutting height
- Battery voltages
- Operating hours
- Blade drive on / off

The emergency stop button (2) puts the mower in a safe, stopped state. It also turns off the electrical drives for both tracks, the mulching mower, the cutting height adjustment and the combustion engine.

There is a tilt sensor (7) integrated into the wireless remote control. The machine stops if the operator trips or falls or if the remote control is tilted more than 45°.

The status LED (10) provides information about the current status of the wireless remote control.

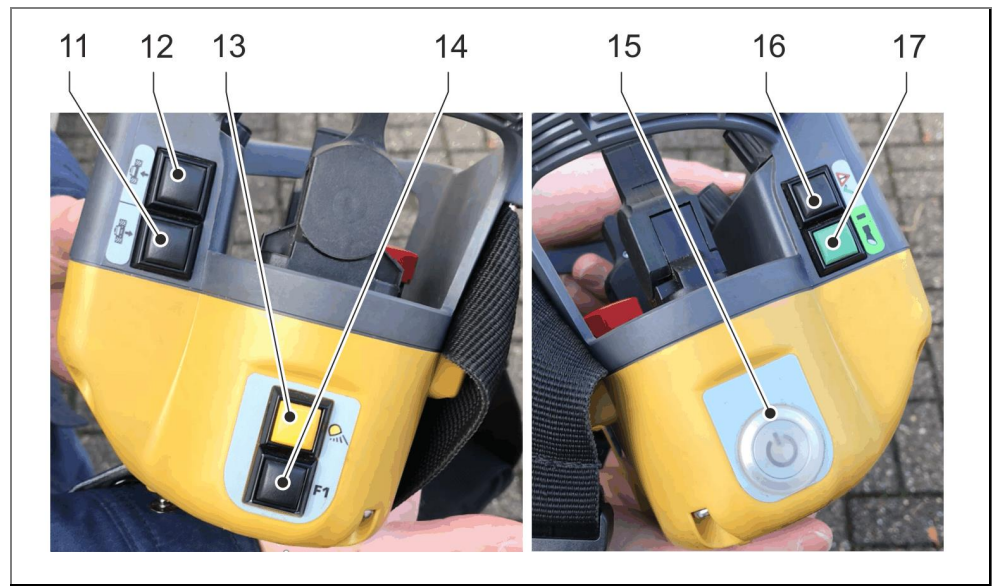


Fig. 10: Wireless remote control (side view)

- 11 Lower the mowing unit
- 12 Raise the mowing unit
- 13 Work lights on / off
- 14 No function
- 15 Remote control on / off
- 16 Acknowledge error
- 17 Horn button

The raise the mowing unit (12) and lower the mowing unit (11) buttons can be used to smoothly raise and lower the mowing unit electrically.

The work lights on / off button (13) has two functions.

- Button is pressed once: All four work lights (two on the front and two on the rear) are turned on.
- Button is pressed twice: Work lights change depending on the direction of travel. Only the two work lights in the direction of travel are turned on. When the direction of travel changes, the lights change.

The black button (14) has no function.

The remote control can be turned on and off with the remote control on/off switch (15).

The acknowledge error button (16) acknowledges pending error messages. Once the error message has been acknowledged, the machine will automatically restart and sound a horn when it is ready for operation.

The operator can use the horn button (17) to warn people in the surrounding area of the presence of the machine during operation. During the start-up process, the horn button (17) is used to establish a connection to the remote control.

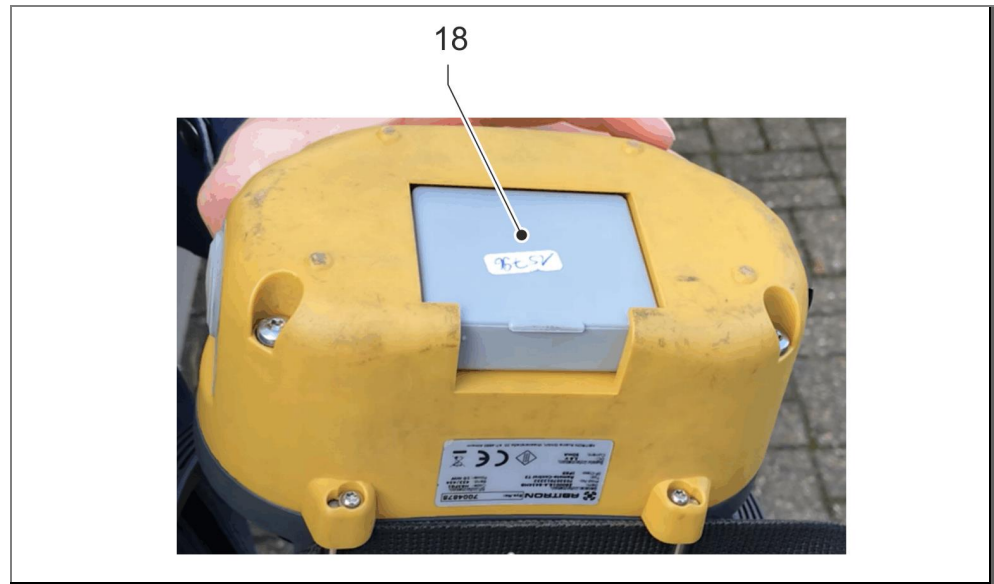


Fig. 11: Wireless remote control (below view)

18 Replaceable battery

The battery (18) on the bottom of the remote control can be replaced with another battery. There are two batteries (18) and a charging device included in the scope of delivery.

6.3 Turning on the tracked mower

DANGER



Risk of death and injury due to escaping exhaust gases in enclosed spaces and movements during and after the start-up process!

There is a risk of death and injury due to escaping exhaust gases in enclosed spaces and movements during and after the start-up process.

- The engine must not be operated in enclosed spaces.
- Do not use starting fluid when using electrical start-up aids (such as jump leads).
- Always make sure that there is sufficient ventilation.

You can find the part numbers in the following list in Chapter 6.2 Wireless remote control on Page 31.

1. Plug in and turn on the disconnect switch.
2. Turn on the remote control using the on / off switch (15).
3. Check to make sure that both emergency stop buttons are open.
4. After the “Stopped” message appears on the display, press the horn (17) to confirm that the connection between the remote control and the machine has been established.
5. The tracked mower is now ready to use and can be electrically driven with the drive lever (1 and 9), or you can push the toggle switch (4) up and turn on the combustion engine.

Manual start

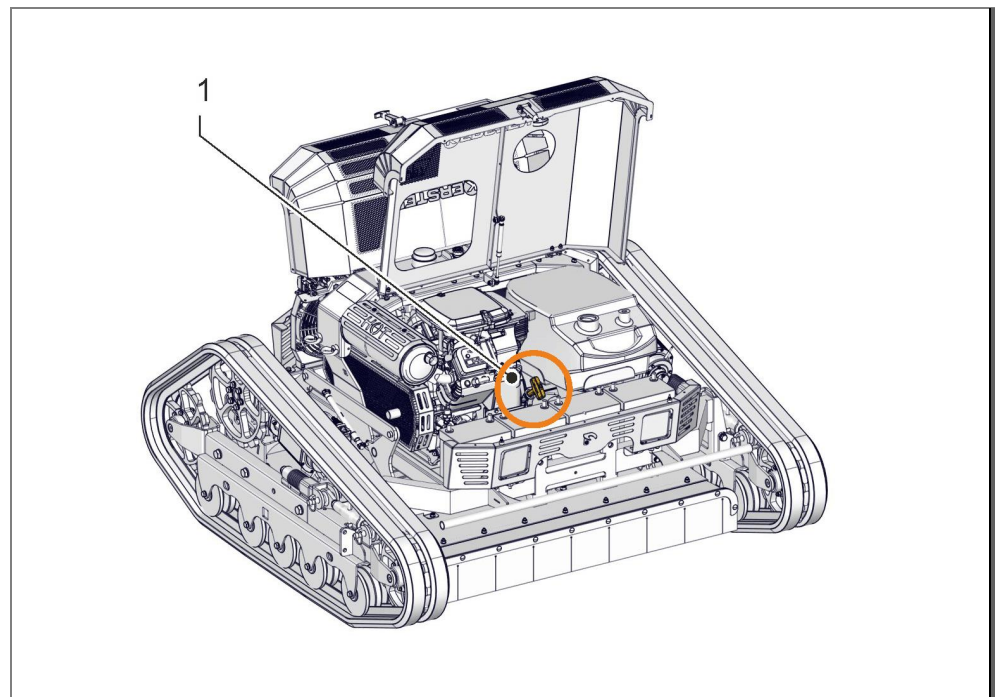


Fig. 12: Recoil starter

1 Recoil starter

If the 48-volt voltage is too low, the combustion engine can be started manually. To do so, put the toggle switch in the middle position and start up the engine with the recoil starter (1). Slowly pull out the recoil starter (1) until you feel resistance and then pull it through with the longest possible stroke.

6.4 Moving off / turning on the mowing unit

Before moving off / turning on the mowing unit, the tracked mower must be turned on (see Chapter 6.3 Turning on the tracked mower on Page 35).

You can find the part numbers in the following list in Chapter 6.2 Wireless remote control on Page 31.

- You should choose a clear and flat area the first time that you use the mower.
- Ensure that there is no-one in front of or behind the machine!
- Reduce the speed by turning down the potentiometer on the remote control (set to "Slow").
- To move forwards, slowly push the forwards / reverse drive lever (1) on the remote control forwards. The further forwards the drive lever is moved, the faster the machine will move. To reduce the speed or stop the machine, let go of the drive lever or move it to its central position.
- To move backwards, slowly push the forwards / reverse drive lever (1) on the remote control backwards. The further backwards the drive lever is moved, the faster the machine will move. To reduce the speed or stop the machine, let go of the drive lever or move it to its central position.
- To adjust the direction of travel to the left or right, move the right / left drive lever (9) in the direction in which you want the mower to move. If only the right / left drive lever (9) is moved without the forwards / reverse drive lever (1), the tracked mower will turn on the spot.
- In order to select the direction of travel and the right speed, the drive lever must be kept in the corresponding position!
- The mowing unit is turned on and off with the mowing unit button (5) on the remote control. The combustion engine must be started up before the mowing unit can be turned on.
- The mowing unit can only be turned on when it is in a clear and predetermined operational area.
- The mowing unit cannot be turned on outside of this area!
- Never turn on the mowing unit if there are children or animals in the work area.
- If you notice that the mowing unit does not reach the desired speed when it is turned on, turn it off immediately. If the mowing unit is in use, the initial torque may be too high. Always turn on the mowing unit when it is not loaded. To do so, raise the mowing unit if necessary (largest cutting height).
- The tracked mower is equipped with a load management system. If the mowing unit is subjected to a high load / stress, the speed of the tracked mower is automatically reduced. If the load / stress on the mowing unit is reduced, the speed of the tracked mower will increase to the previous value again.

6.5 Turning off the tracked mower

⚠ DANGER



Risk of death or injury due to escaping exhaust gas in enclosed spaces!

There is a risk of death and injury, as well as a risk of material damage to the machine and system, due to escaping exhaust gases in enclosed spaces!

- The engine must not be operated in enclosed spaces.
- Do not use starting fluid when using electrical start-up aids (such as jump leads).
- Always make sure that there is sufficient ventilation.

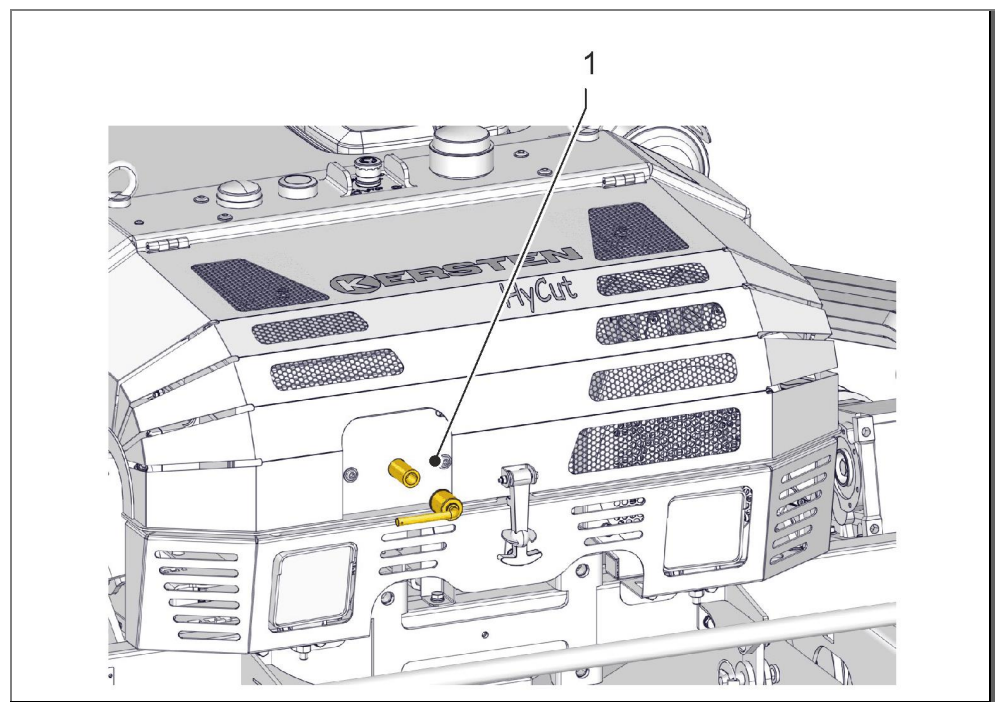


Fig. 13: Battery disconnect switch

1 Battery disconnect switch

You can find the part numbers in the following list in Chapter 6.2 Wireless remote control on Page 31.

Follow the steps below to turn off the engine:

- Turn off the mowing unit using the mowing unit on/off toggle switch (5) on the remote control.
- Turn off the combustion engine using the combustion engine on/off button (4) on the remote control.
- Turn off the remote control using the remote control on / off button (15) on the side of the remote control and wait until the status LED (10) goes off.
- Turn off and pull out the battery disconnect switch on the tracked mower.

**Notice**

If the tracked mower is inactive but the control unit is turned on, a horn signal will be sounded after a short amount of time. This is to alert the user to the fact that the control unit is still turned on. If the engine has been turned off but the control unit is on, the batteries will discharge in a short space of time.

- Wherever possible, park the mower on a flat surface.
- Secure the tracked mower against unauthorised use, turn off and pull out the battery disconnect switch.

During longer periods of downtime, follow the instructions provided by the engine manufacturer. You can find more detailed information about this in the engine manufacturer's manual.

7 Maintenance

7.1 Safety instructions



Observe all safety instructions provided in the Safety chapter!
(See Chapter 2 Safety on Page 7)

7.2 Spare parts

Incorrect spare parts

DANGER



Risk of death or injury due to incorrect spare parts being used!

This symbol warns users of an imminent danger to the life and health of personnel.

If incorrect or defective spare parts are used, there is a risk of death and injury as well as a risk of material damage to the machine and system!

- Only use original spare parts produced by the manufacturer or spare parts approved by the manufacturer.
- In case of any uncertainties or doubt, contact our customer service team / the manufacturer's customer service team (see Manufacturer customer service on Page 3).

Procurement of spare parts

Spare and wear parts must be ordered through the customer service team (see Manufacturer customer service on Page 3).

7.3 Maintenance work

7.3.1 Checking that the safety devices are functioning correctly

Personnel:

- Operating personnel

Protective equipment:

- Protective workwear
- Protective gloves

The planning, execution and documentation of inspections must be performed by the operator and in accordance with all applicable laws and regulations.

In order to ensure a safe operation of the machine, all safety devices must be checked:

Safety guards (covers)	
Interval	When commissioning, when turning on the machine
Scope	Visual inspection for integrity
Inspector	Operating personnel
Measures to take in the event of a malfunction	<ul style="list-style-type: none"> Block off the danger zone Carry out any repairs

Emergency stop button	
Interval	When turning on the system and then once every four years as part of the electro-technical test in accordance with BGV A3 [Regulation A3 of the Employer's Liability Insurance Association].
Scope	Operative readiness
Inspector	Operating personnel
Measures to take in the event of a malfunction	<ul style="list-style-type: none"> Do not put the machine into operation Disconnect the system from the mains and secure it against being turned on again Have the repairs carried out by a qualified electrician

7.3.2 Daily inspection

Personnel:

- Private and commercial operators

Protective equipment:

- Protective workwear
- Protective gloves
- Protective eyewear

The planning, execution and documentation of inspections must be performed by the operator and in accordance with all applicable laws and regulations.

In order to ensure a safe operation of the machine, all safety devices must be checked:

The following aspects must be checked each day:

- Before each use, all safety elements and moving parts must be checked for wear.
- Check the engine oil level before commissioning the machine.
- Check the air filter for contamination, blow the filter clean from the inside out or replace it if it is heavily contaminated or damaged (see Chapter 7.5 Cleaning the air filter on Page 46).

- Check the track tension (see Chapter 7.7 Setting the chain tension on Page 49).
- Carry out a trial run before each use.
- Clean the machine after each use (see Chapter 7.9 Cleaning the machine on Page 55).
- Check the 12-volt and 48-volt battery voltage (see Chapter 7.8 Charging the batteries on Page 51).

7.3.3 Maintenance after 20 operating hours / Longer periods of downtime

DANGER



Risk of death or injury due to a machine in operation!

A machine in operation can pose a risk of death and injury, as well as a risk of material damage to the machine and system!

- Before any maintenance work can be carried out, the machine must be disconnected from the power supply and secured against being turned on again. To do this, turn off the battery disconnect switch and pull it out.

The planning, execution and documentation of inspections must be performed in accordance with all applicable laws and regulations.

In order to ensure a safe operation of the machine, all safety devices must be checked:

Lubrication points

Personnel:

- Private and commercial operators

Protective equipment:

- Protective workwear
- Protective gloves
- Protective eyewear
- Use grease or oil to lubricate the moving parts of the machine at regular intervals during the season and at the start and end of each season.
- Clean the air filter after 20 operating hours maximum and after just a few hours in very dusty conditions.
- Replace the air filter if it is dirty or damaged.

7.3.4 Maintenance after 100 operating hours / Longer periods of downtime

⚠ DANGER**Risk of death or injury due to a machine in operation!**

A machine in operation can pose a risk of death and injury, as well as a risk of material damage to the machine and system!

- Before any maintenance work can be carried out, the machine must be disconnected from the power supply and secured against being turned on again.

The planning, execution and documentation of inspections must be performed in accordance with all applicable laws and regulations.

In order to ensure a safe operation of the machine, all safety devices must be checked:

Lubrication points

Personnel:

- Private and commercial operators

Protective equipment:

- Protective workwear
- Protective gloves
- Protective eyewear

- Remove the fan housing every 100 operating hours, or at least once a year - preferably before the start of the season - and clean the cooling fins, as well as the baffles, cooling air screen and oil cooler needed for the air circulation.
- Clean the spark plug by removing any soot sediments with a wire brush and then check the electrode gap. The electrode gap should be approx. 1 mm. Replace the spark plug after 200 operating hours.

7.4 Changing the blades of the mowing unit

WARNING



Risk of injury / risk of environmental damage due to damaged and / or sharp mowing unit blades!

There is a risk of injury and environmental and material damage (on the machine) due to damaged and / or sharp mowing unit blades!

- Before changing the blades, the operator must put on the necessary personal protective equipment in the form of safety shoes, cut-resistant gloves and protective eyewear.
- When lifting / jacking up the tracked mower, sufficiently dimensioned hoists and load carrying devices must be used. The tracked mower must be secured against tipping over and / or falling / slipping.
- Never walk under suspended loads.
- Blades should only be changed in pairs. In any case, two blades with different weights should never be used at the same time. Using the machine with an unbalanced blade combination can cause vibrations, damage and even injuries.
- Blades must be inspected for damage and cracks before being reworked.
- Blades that are cracked or damaged should not be used again and should be immediately replaced by new ones.
- Blades should only be resharpened by expert companies.
- All screws and locking nuts should also be changed when the blades are changed.
- When the new blades are installed, care must be taken to ensure that the blades can move freely around the spacer sleeve. Blades that have been fixed in place too rigidly can quickly become damaged and / or even destroyed if they come into contact with foreign objects. Under certain circumstances, parts of the blade could be thrown out of the mower and injure anyone standing nearby!

There are two different methods for changing the blades. Either the entire disc and all the blades on it can be changed at once or opposite pairs of blades can be changed.

7.4.1 Changing a disc and all the blades on it

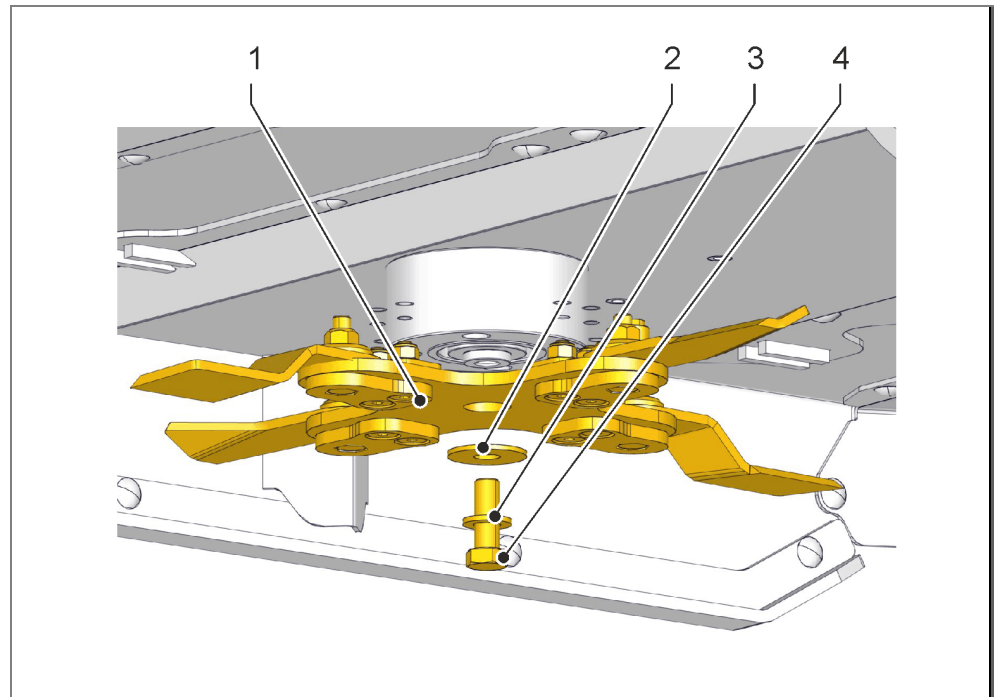


Fig. 14: Changing the disc of the mowing unit

- 1 Mowing unit blade disc
- 2 Washer
- 3 Wedge lock washer
- 4 Hexagon bolt

To remove the blade disc (1), proceed as follows:

1. Loosen and remove the hexagon bolt (4). Ensure that the blade disc (1) does not fall off here.
2. Remove the blade disc (1), washer (2) and wedge lock washer (3) by gently pulling them downwards.



WARNING

When mounting the blade disc (1), a new wedge lock washer (3) must be used!
Tighten the hexagon bolt (4) with a torque of 240 Nm in accordance with applicable standards.

7.4.2 Changing opposite blades

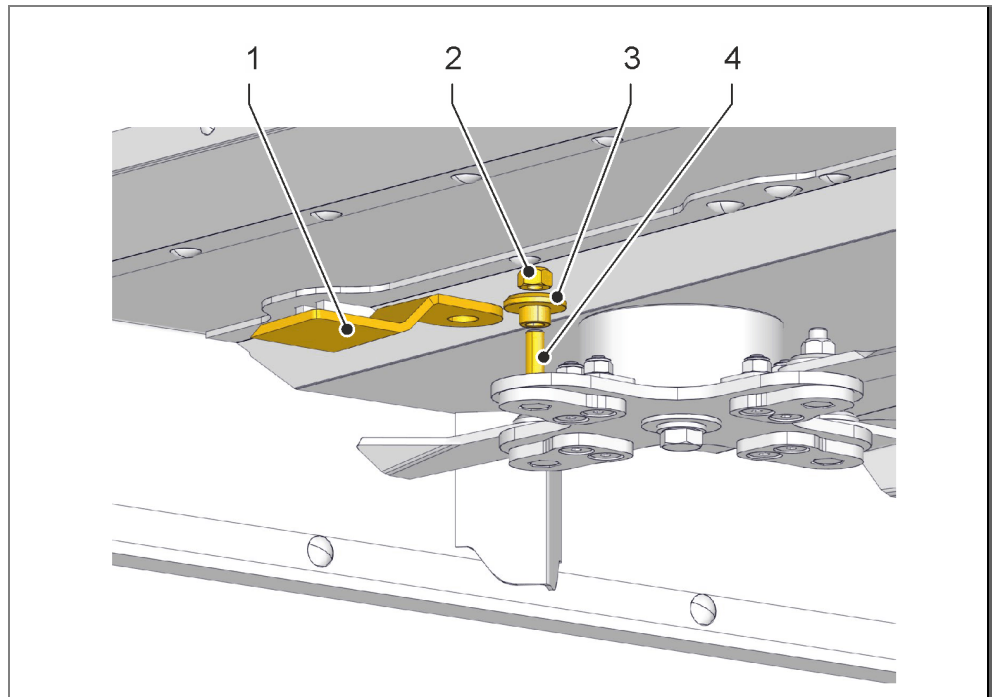


Fig. 15: Changing the blades of the mowing unit

- 1 Mowing unit blades
- 2 Locking nut
- 3 Spacer sleeve
- 4 Hexagon bolt

To remove the blades, proceed as follows:

1. Loosen the locking nut (2) and remove it from the hexagon bolt (4).
2. Remove the mowing unit blades (1) and spacer sleeve (3) from the top. Ensure that the hexagon bolt (4) does not fall off here.



WARNING

When installing the new blades (1), care must be taken to ensure that the blades (1) can move freely around the spacer sleeve (3).

New locking nuts (2) and hexagon bolts (4) must be used when the blades are changed!

Tighten the locking nut (2) with a torque of 120 Nm in accordance with applicable standards.

7.5 Cleaning the air filter

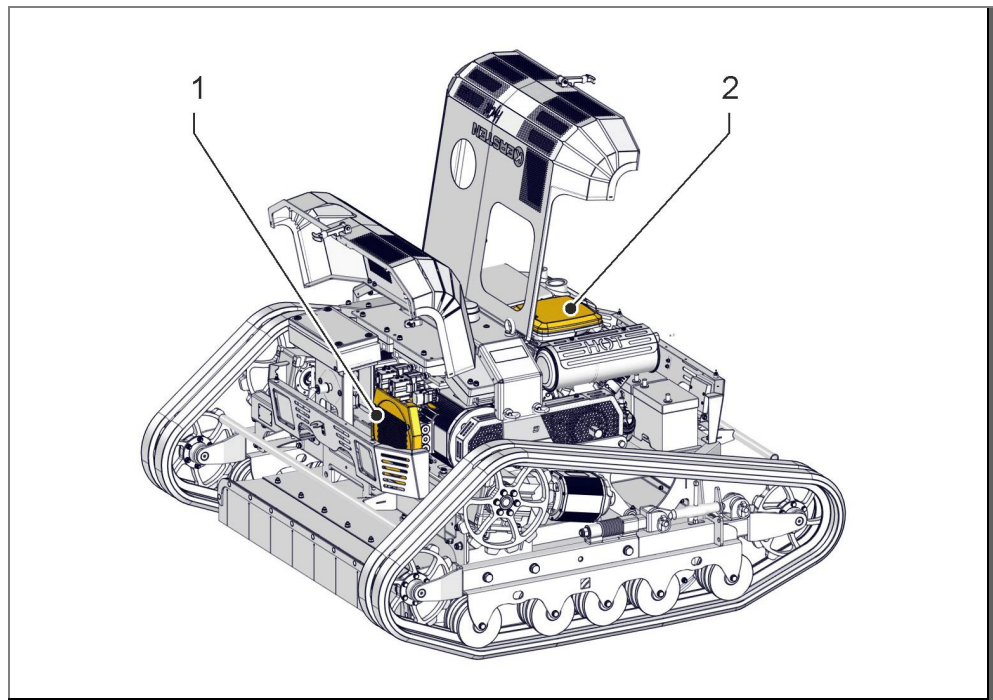


Fig. 16: Air filter

- 1 Perforated fan cover
- 2 Engine air filter

Care must be taken to ensure that both the perforated fan cover (1) and the engine air filter (2) are always free from foreign objects. To check the condition of the engine air filter, the engine air filter cover (2) must be opened at the two quick release fasteners. Once the cover has been removed, the engine air filter (2) can be removed from the housing and cleaned or replaced.

Details about the air filter and about how to clean / change it can be found in the combustion engine manual.

7.6 Lifting up the chain

If the rubber drive chain has fallen out of place or if a new one needs to be installed, then the drive chain needs to be lifted up.

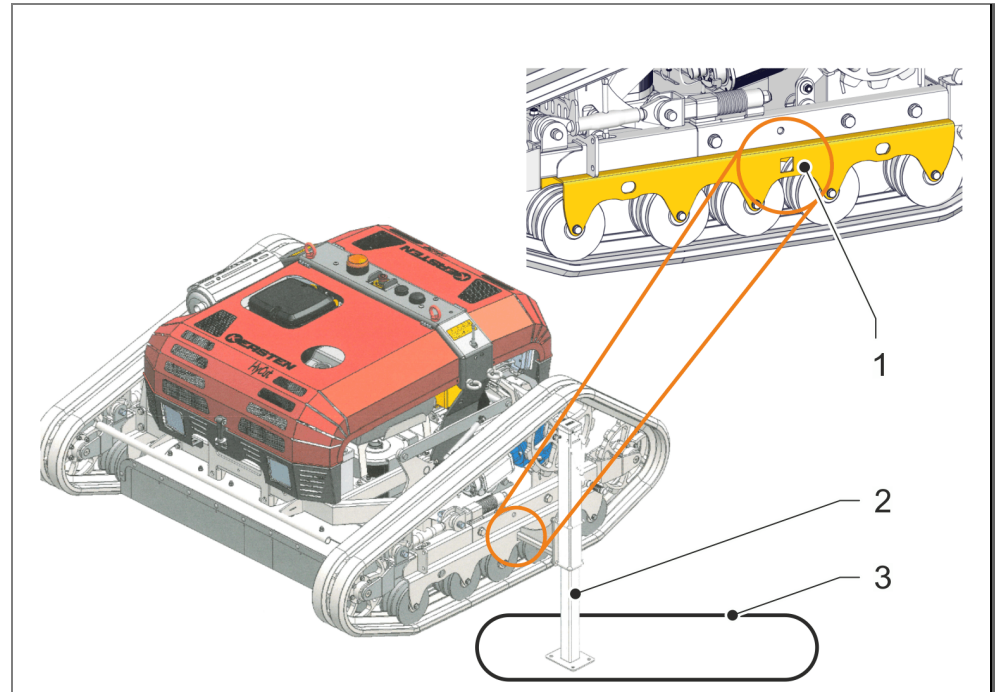


Fig. 17: Lift the mower up on the side

- 1 Rectangular receptacle for the bolt of the lifting element
- 2 Lifting element (jack; available as an option)
- 3 Rubber drive chain

1. Before using the lifting element (2), the new rubber drive chain (3) must be positioned so that the foot of the lifting element (2) is standing within the closed drive chain (3) lying on the floor.
2. The bolt of the lifting element (2) must be plugged into the rectangular receptacle (1) of the roller carrier.
3. Use the crank of the lifting element (2) to raise the mower on one side.

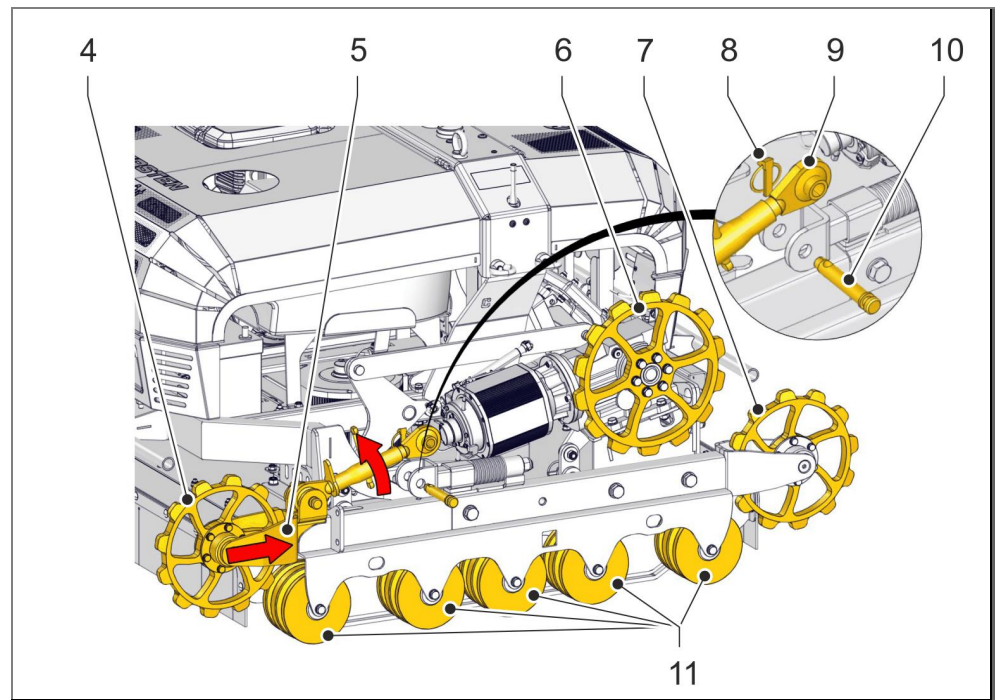


Fig. 18: Lifting up the drive chain

- 4 Front diverting wheel
- 5 Sliding element
- 6 Drive wheel
- 7 Rear diverting wheel
- 8 Locking pin
- 9 Manual clamping mechanism
- 10 Connecting bolt
- 11 Rollers

4. Twist the manual clamping mechanism (9) together and push the sliding element (5) in fully.
5. Open the locking pin (8) of the connecting bolt (10) and pull it out of the connecting bolt (10).
6. Pull the connecting bolt (10) out of the manual clamping mechanism (9).
7. Swivel the manual clamping mechanism (9) upwards on one side and push the sliding element (5) as far into the roller carrier (11) as you can.
8. Place the drive chain on the rollers (11) from below.
9. Guide the drive chain over both the front (4) and rear (7) diverting wheels.
10. Place the drive chain on the drive wheel (6).
11. Slide out the sliding element (5) as far as possible using your hand.
12. Swivel the manual clamping mechanism (9) back into place and connect it to the frame with the connecting bolt (10).
13. Insert and close the locking pin (8).

14. Use the manual clamping mechanism (9) to tighten the drive chain to the necessary chain tension (see Chapter 7.7 Setting the chain tension on Page 49).



Caution - component damage!

Check the chain tension after lifting up the drive chain after 1, 2, 5, 10 and 20 operating hours. Correct it if necessary.

7.7 Setting the chain tension

⚠ WARNING



Risk of injury / risk of environmental damage if the chain tension is too low or too high!

If the chain tension is too low or too high, there is a risk of injury and environmental and material damage (on the machine)!

- If the chain tension is too low, there is a risk of the rubber drive chain jumping off the guide rollers!
- If the chain tension is too high, there is a risk of the rubber drive chain or parts of the guide and diverting rollers being damaged.

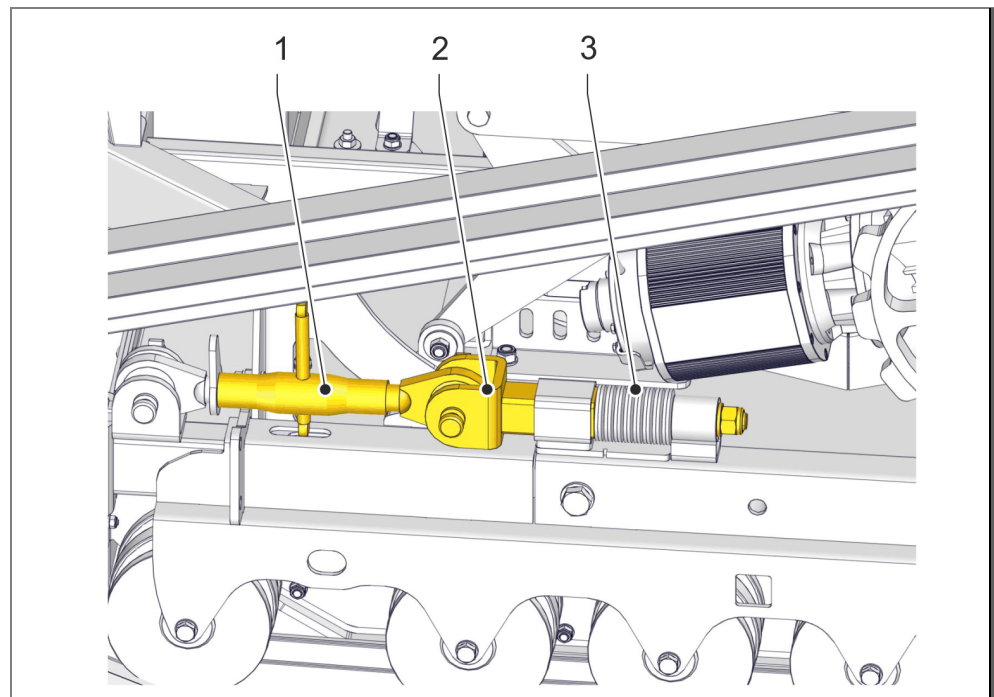


Fig. 19: Chain when not tensioned

- 1 Manual clamping mechanism
- 2 Sliding unit
- 3 Disc springs

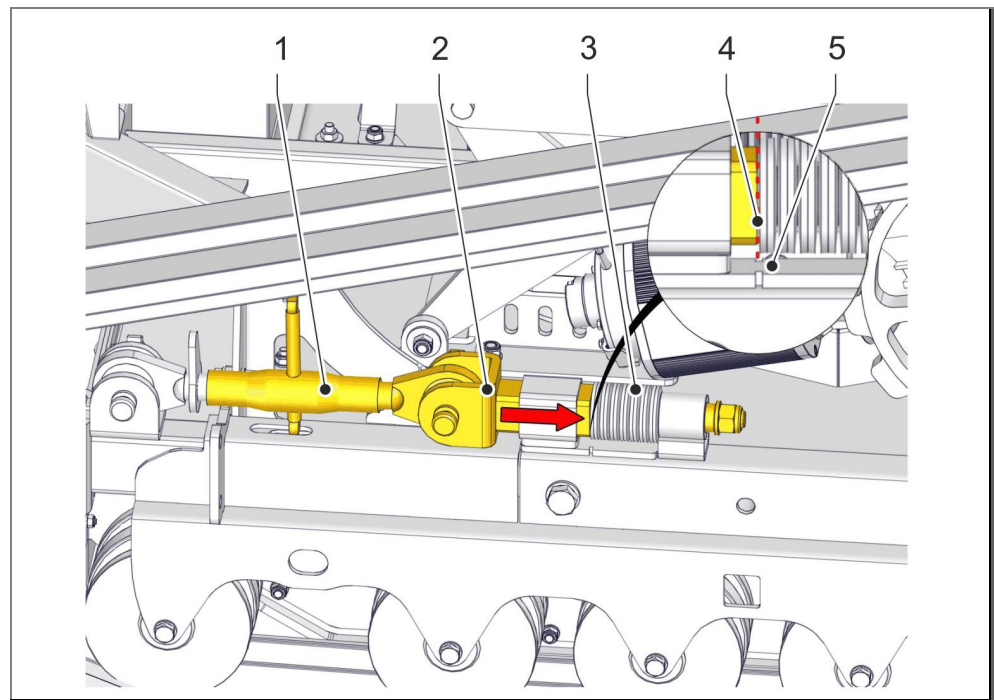


Fig. 20: Chain when tensioned

- 1 Manual clamping mechanism
- 2 Sliding unit
- 3 Disc springs
- 4 Edge of the sliding unit
- 5 Notch in the welded plate

When the manual clamping mechanism (1) is turned, the sliding unit (2) is moved in the direction of the disc springs (3).

The correct chain tension is reached once the edge of the sliding unit (4) is flush with the notch in the welded plate (5)!

7.8 Charging the batteries

DANGER



Risk of death and injury due to batteries charging!

There is a risk of death and injury, as well as a risk of material damage to the machine and system due to batteries charging!

Never charge a battery before reading the operating manual for the charging device used. In addition to the instructions provided by the charging device manufacturer, the following safety instructions must be observed.

- Always wear suitable protective glasses and ensure that your face and hands are also suitably protected.
- Only charge the batteries in well-ventilated rooms.
- Keep ventilation caps tightly closed and horizontal.
- Always use the right charging device for each of the two voltage systems.
- Ensure that the battery disconnect switch is turned off and has been pulled out.
- Set the charging device to OFF before connecting the connection cable to the battery to avoid any dangerous sparks.
- Never try to charge a visibly damaged or frozen battery.
- Connect the connection cable of the charging device to the battery. Connect the red cable (+) to the positive terminal (+) of the battery and the black cable (–) to the negative terminal (–) of the battery.
- Ensure that the connection cable is not broken, worn or loose.
- Turn on the timer, turn on the charging device and slowly increase the charge rate until the desired current strength (A) is reached. If the battery becomes hot, violently emits gas or sprays electrolytes, reduce the charge rate or turn off the charging device temporarily.
- Always set the charging device to OFF before disconnecting the connection cable from the battery to avoid any dangerous sparks.

There are two systems with different electrical voltages used in the HyCut tracked mower.

- Control voltage → 12 volts
- Engine voltage → 48 volts (four 12-volt batteries connected in series)

The following sub-chapters / figures show the charging processes with charging devices for 12, 24 and 48-volt batteries.

7.8.1 48-volt charging device



Warning - risk due to the electrical current!

The engine voltage system should only be charged with a 48-volt charging device!

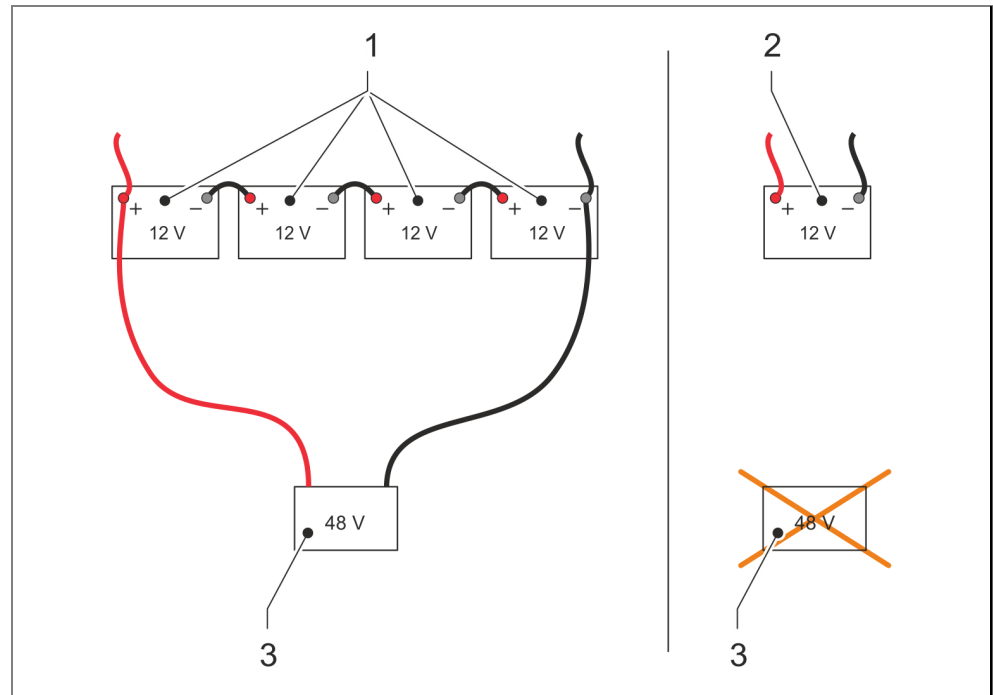


Fig. 21: 48-volt charging device

- 1 Four 12-volt batteries → Engine voltage 48 volts
- 2 One 12-volt battery → Control voltage 12 volts
- 3 48-volt charging device

The 48-volt (3) charging device must be connected to the battery terminals of the 48-volt engine voltage (1) as in the figure above.

The 48-volt charging device (3) should NOT be used to charge the control voltage (2)!

7.8.2 24-volt charging device



Warning - risk due to the electrical current!

The engine voltage system should only be charged with a 24-volt charging device!

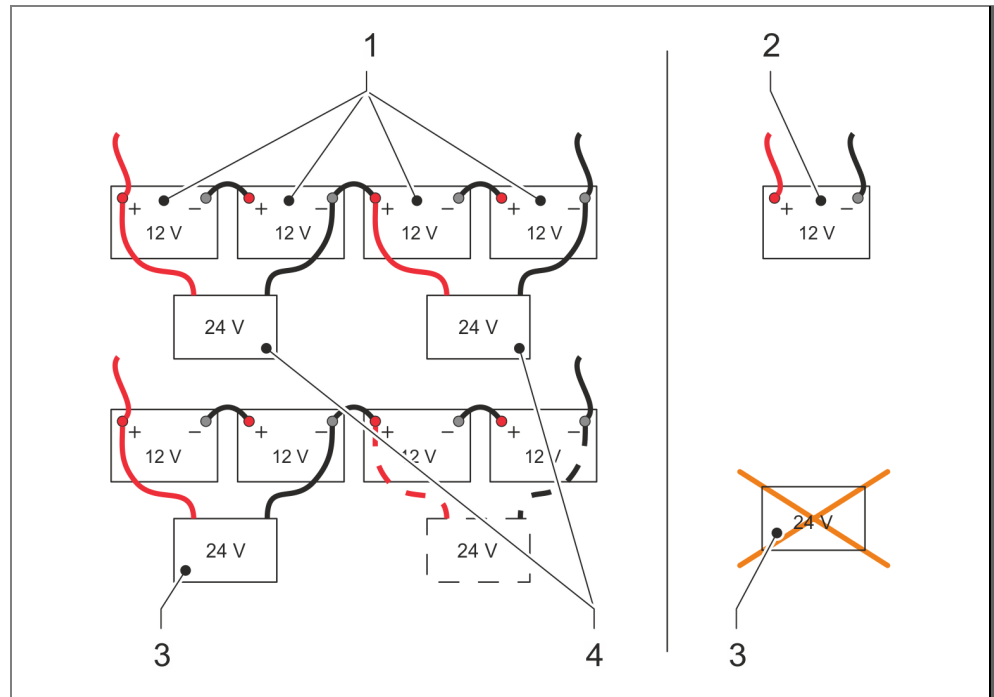


Fig. 22: 24-volt charging device

- 1 Four 12-volt batteries → Engine voltage 48 volts
- 2 One 12-volt battery → Control voltage 12 volts
- 3 One 24-volt charging device
- 4 Two charging devices, each with 24 volts

Two 24-volt (4) charging devices must be connected to the battery terminals of the 48-volt engine voltage (1) as in the figure above.

Alternatively, the network with 48-volt engine voltage (1) can be charged in two steps with a 24-volt charging device (3).

The 24-volt charging device (3) should NOT be used to charge the control voltage!

7.8.3 12-volt charging device

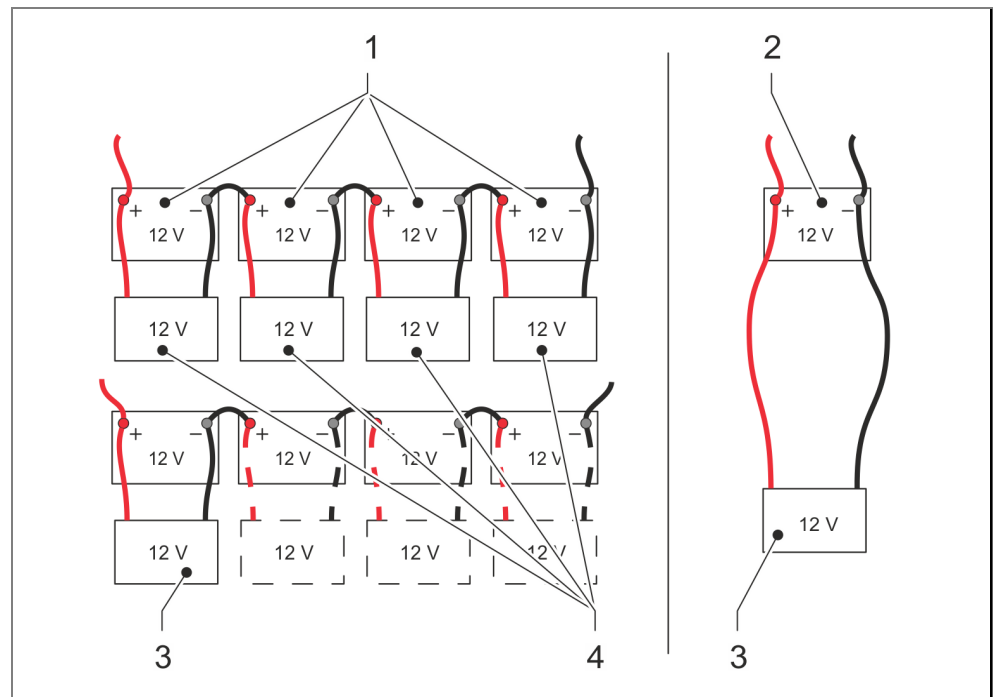


Fig. 23: 12-volt charging device

- 1 Four 12-volt batteries → Engine voltage 48 volts
- 2 One 12-volt battery → Control voltage 12 volts
- 3 One 12-volt charging device
- 4 Four charging devices, each with 12 volts

Four 12-volt (4) charging devices must be connected to the battery terminals of the 48-volt engine voltage (1) as in the figure above.

Alternatively, the network with 48-volt engine voltage (1) can be charged in four steps with a 12-volt charging device (3).

The 12-volt charging device (3) can also be used to charge the control voltage!

7.9 Cleaning the machine

When cleaning the HyCut tracked mower, the following points must be observed.

WARNING



Risk of injury / risk of environmental damage due to the transmission of electrical current during cleaning work!

There is a risk of injury and environmental and material damage (on the machine) if electrical current is transmitted during cleaning work!

- Personal protective equipment, in the form of close-fitting workwear, safety shoes, protective glasses and protective gloves, must be worn.
- High-pressure cleaners should under no circumstances be used to clean the tracked mower.
- Clean machines with flowing water (from a hose without a nozzle attachment) and brushes.
- When outside of closed areas, the machine can also be cleaned with compressed air. Protective clothing in the form of protective eyewear and respirators, if necessary, must be worn. Care must be taken to ensure that flying particles of contaminants or dirt do not injure anyone.

7.10 Measures after maintenance has been performed

Personnel:

- Private and commercial operators

Perform the following steps after the maintenance work has been completed and before the machine is turned off:

1. Check that all previously loosened screw connections have been tightened.
2. Check to ensure that all previously removed safety devices and covers have been put back into place correctly.
3. Ensure that all tools, materials and other equipment used has been removed from the work area.
4. Clean the work area and remove any substances, such as liquids, processing material or similar, that may have been produced.
5. Ensure that all of the machine's safety devices function flawlessly.

7.11 Storage

If the machine will not be used for a long time, proceed as follows:

1. Clean the machine (see Chapter 7.9 Cleaning the machine on Page 55)
2. Preserve the engine. To do so, follow the instructions provided in the engine manufacturer's manual!
3. Ensure that the machine is sheltered.
 - To avoid corrosion, protect the machine from weather exposure. Do not store the machine in a damp room, artificial fertiliser warehouse or a barn.
4. Cover the machine with a cloth, dust sheet or something similar.

8 Malfunctions / Troubleshooting

The following chapter describes possible causes for malfunctions and the steps that must be taken to remedy them.

If malfunctions occur repeatedly, shorten the maintenance intervals according to the actual load.

If you experience a malfunction that cannot be remedied by the information provided, contact the manufacturer.

8.1 Safety instructions



Observe all safety instructions provided in the Safety chapter!
(See Chapter 2 Safety on Page 7)

8.2 Warning codes

In order to alert the operator of a borderline operating situation, the lights are activated in a specific pattern (code), e.g. they will flash.

Pattern	Meaning
Quick flashing	Load management active
Quick flashing	Tilting of the tracked mower in the limit area
Slow flashing and horn signal	Failure (collective error message)

8.3 Causes of malfunctions and how to remedy them

This chapter describes the most common malfunctions that can occur while the tracked mower is in operation in more detail. For malfunctions that require a major intervention, always have the repair work carried out by a specialist workshop.

8.4 Petrol engine malfunction table

Malfunction	Possible causes	Remedy
The petrol engine does not start	Spark plug connector not attached	Attach the spark plug connector
	Fuel tank empty or incorrect fuel used	Fill the fuel tank with fresh fuel
	Fuel line blocked	Clean the fuel line, change the fuel filter
	Spark plug defective	Replace the spark plug
	Too much fuel in the engine (flooded)	Dismantle the spark plug, dry/clean it, put it back in place and restart the engine

Malfunction	Possible causes	Remedy
The petrol engine cuts out	Ignition cable loose	Plug the spark plug connector firmly into the ignition cable Clamp the ignition cable fastening Connect the spark plug connector firmly to the spark plug
	Fuel line blocked or incorrect fuel used	Change the fuel filter, clean the fuel line or fill the tank with fresh fuel
	Ventilation in the fuel tank lid closed or blocked	Open the ventilation, clean and change the fuel tank lid
	Water or dirt in the fuel system	Drain all fuel and clean the system, fill with clean fuel
	Air filter dirty	Clean or replace the air filter
	Faulty spark plug	Replace the spark plug
Petrol engine becomes too hot	Not enough engine oil	Fill up the engine oil immediately
	Air filter dirty	Clean or replace the air filter
	Cool air system restricted	Clean fan grille, clean interior cooling fins
	Faulty spark plug	Replace the spark plug
Petrol engine often runs in idle	Air filter dirty	Clean or replace the air filter
	Faulty spark plug	Replace the spark plug
Petrol engine does not work in the stop position	Engine stop line defective	Interrupt the fuel supply line to stop the engine, inspect the cable harness
	Not grounded	Check ground contact
Petrol engine does not have enough power	Air filter dirty	Clean or replace the air filter
	Cylinder head gasket loose or seal damaged	Remove the cylinder head gasket and replace if necessary
	Too little compression	Check the engine
Petrol engine produces a lot of smoke when working on steep slopes	Too much oil in the engine	Check the oil level, fill up to max. 75%

8.5 Control system malfunction table

Malfunction	Possible causes	Remedy
The towed mower control system does not start	Battery disconnect switch is off	Turn on the battery disconnect switch
	12V battery empty or defective	Charge or replace the 12V battery
Remote control does not start	Remote control battery empty	Charge the battery or replace it with a charged battery
	"Turn on remote control" button pressed too long/not long enough	Hold the button down until the status LED goes green, then release
Connection between the remote control and tracked mower cannot be established, "STOPPED" displayed on the screen	The emergency stop button on the remote control or the machine is pressed	Release the emergency stop button and press the green "Signal horn" button
The machine stops, the lights flash; error code appears on the display screen	An error has occurred in the control system	To reset the machine, press "Acknowledge error". If the error occurs repeatedly, have it checked by an expert
The combustion engine's electric starter does not work	48V battery empty/voltage too low	Charge the battery or start the engine manually

8.6 Drive malfunction table

Malfunction	Possible causes	Remedy
Machine only moves to the left or the right	Check the trimming settings on the wireless remote control	Correct the trimming on the wireless remote control.
	Electric motors of the rubber chains faulty/defective	Replace the electric motors
	Rubber chains run less smoothly on one side	Check the run of the rubber chains and adjust if necessary Check the tension of the rubber chains Check the guide roller bearings and replace if necessary
Machine stops when running on electricity	48V battery empty/voltage too low	Start the combustion engine, manually if needed

8.7 Mowing unit drive malfunction table

Malfunction	Possible causes	Remedy
Mower drive V-belt slips through	V-belt tension too low	Check the spring tension
	Edges of the V-belt are hard and cracked	Replace the V-belts
	Blade spindles/pendulum blades are blocked	Check the mower for foreign objects and remove if necessary
The machine stops, the lights flash; the error code "CUTTER DRIVE CT 20.3" is displayed on the screen	Mowing unit overloaded	Raise the mowing unit, reduce the speed
	Mowing spindles/pendulum blades are blocked	Check the mower for foreign objects and remove if necessary
	Pendulum blades are in contact with the ground	Raise the mowing unit
Severe imbalance on the mower	Loss of or damage to the pendulum blades	Replace the pendulum blades and fastening elements in pairs
	Foreign object in the mowing unit	Remove the foreign object, check the pendulum blades and replace in pairs if necessary
Mowing unit produces loud noises when in rotation	Blade spindle ball bearings knocked out of place/worn	Repair the ball bearings
Mowing unit cannot be raised	Height adjustment electric cylinder overloaded	Check the gas pressure damper on the lifting link and repair if necessary
	Height adjustment electric cylinder defective	Replace the electric cylinder

9 Dismantling, disposal

9.1 Safety instructions



Observe all safety instructions provided in the Safety chapter!
(See Chapter 2 Safety on Page 7)

9.2 Dismantling

Before dismantling the machine:

- Turn off the machine and secure it against being turned on again.
- Physically separate all power supplies from the machine, discharge any stored residual energy.
- Remove all operating materials and supplies, as well as any remaining processing materials, and dispose of them in an environmentally-friendly way.

Finally, clean all assemblies and components correctly and dismantle the machine in accordance with all applicable, local occupational safety and environmental protection regulation.

9.3 Disposal

If no return or disposal agreement has been made, recycle the dismantled parts:

- Scrap metal
- Send plastic elements for recycling
- Sort other parts by material type and dispose of them accordingly

CAUTION



Risk to the environment if disposed of incorrectly!

If disposed of incorrectly, the parts can pose a risk to the environment.

- Have electronic scrap, electronic components, lubricant and other supplies disposed of by specialist waste disposal companies.
- If in any doubt, obtain the necessary information from the local municipal authorities or specialist waste disposal companies.

Batteries and accumulators

CAUTION



Batteries and accumulators pose a risk to the environment!

Certain components of batteries and accumulators are toxic and pose a risk to the environment.

- Never throw batteries and accumulators away with household waste and only dispose of them in accordance with the regulations applicable to the operating site.



Machine parts that bear this symbol should never be disposed of with household waste. They should only be disposed of by specialist companies that are authorised at the operating site.

Lubricants

CAUTION



Lubricants pose a risk to the environment

Lubricants such as greases and oils contain toxic substances. These should not be released into the environment.

- They must be disposed of by a specialist waste disposal company.
-

10 Technical Data

10.1 General information

		Unit
Working / Mowing width	1150	mm
Cutting height	50 – 180	mm
Width	1500	mm
Length	approx. 1600	mm
Height	890	mm
Weight	approx. 660	kg
Speed When mowing forwards	approx. 0 – 7 continuously	km/h
Sound pressure level on the ear in accordance with DIN EN 12733 (L_{pa} , L_{eq})	< 85	dB
Tracks	Rubber	
Track width	150	mm

10.2 Electric motors / batteries

		Unit
Mowing deck motor	10.0 48	kW volt
Drive	2 x 2.8 48	kW volt
Hybrid battery	35 48	Ah volt
Control unit battery	22 12	Ah volt

10.3 Wireless remote control

		Unit
Control system	On / Off Forwards / Reverse Left / Right	
Safety	2 emergency stop buttons Automatic tilt monitoring	
Engine	Start / Stop	
Mowing unit	On / Off	
Batteries	Alternating system	
Range	max. 300	metres
Radio frequency	433 / 434 and 2.4	GHz
Equipment features	Display Trimming chassis Speed control	

You can find further details in the manufacturer documents provided.

10.4 Engine type

		Unit
Net power	17.2 23	kW HP
Engine oil (recommended for general use)	approx. 1.7 Multigrade oil SAE 10W-30 API SJ (or higher)	litres
Fuel	Normal and super unleaded petrol	
Fuel tank, external	25	litres
Air filter	Dry filter element	
Starting device	Electric starter + reversing start	

You can find further details in the manufacturer documents provided.

10.5 Declaration of Conformity

We,
Kersten Arealmaschinen GmbH
Empeler Straße 95
D-46459 Rees, Germany,

hereby declare that the product

tracked mower

HyCut

complies with all applicable regulations of the EC Machinery Directive 2006/42/EC.
The machine also complies with all the applicable regulations from the following
EC directives:

Low Voltage Directive	2014/35/EU
Pressure Equipment Directive	2014/68/EU

The following standards have also been applied:

EN ISO 12100: 2011
EN 12733: 2019

Dipl. Ing. (FH) Robert Bosch, Empeler Straße 95, D-46459 Rees, Germany
Is authorised to compile technical documents.

Rees, 08.01.2021



Dipl. Ing. (FH) Robert Bosch
Managing Director