



Husqvarna  
Group



# Workshop manual

**Husqvarna Automower® 405X, 415X**

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# 1 Introduction

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## 1.1 Document description

The Workshop manual is intended for dealers and service personnel, and is a supplement to the Operator's manual. The following system is used in Workshop manual to make it easier to use:

- Text written in *italics* is a text that is shown on the display or in the menus in the Autocheck service program.
- Text written in **bold** is one of the buttons on the keypad of the product or a button on Autocheck service program.

## 1.2 Servicing tools

Always use original tools recommended by the manufacturer.

## 1.3 Technical data

For the technical data, refer to Operator's manual and the manufacturer's website.

## 2 Safety

### 2.1 Safety definitions

Warnings, cautions and notes are used to point out specially important parts of the manual.



**WARNING:** Used if there is a risk of injury or death for the operator or bystanders if the instructions in the manual are not obeyed.



**CAUTION:** Used if there is a risk of damage to the product, other materials or the adjacent area if the instructions in the manual are not obeyed.

**Note:** Used to give more information that is necessary in a given situation.

### 2.2 General safety instructions



**WARNING:** Keep your hands and feet away from the rotating blades. Never put your hands or feet close to or under the machine when the motor is running.



**WARNING:** Apply a new warning label if a warning symbol on the product is damaged or missing.



**WARNING:** The original design of the product must not be modified without the expressed permission of the manufacturer.

Unauthorized modifications and/or components can result in serious disruptions and the risk of personal injuries.

Only use original spare parts.

### 2.3 Special safety instructions

#### 2.3.1 Maintenance



**WARNING:** The product must be switched off before any maintenance is done.



**CAUTION:** Never use a high-pressure washer to clean the product. Never use solvents for cleaning.

#### 2.3.2 In the event of a thunderstorm

If there is a risk of a thunderstorm, all connections to the charging station must be disconnected. This is done to avoid damage to the circuit board in the charging station.

#### 2.3.3 Battery safety



**WARNING:** Lithium-ion batteries can explode or cause fire if disassembled, short-circuited, exposed to water, fire, or high temperatures. Handle carefully, do not dismantle, open the battery or use any type of electrical/mechanical abuse. Avoid storage in direct sunlight.

For more information about the battery, refer to Technical data in the Operator's manual.

### 2.4 Symbols on the product

These symbols can be found on the product. Study them carefully.



**WARNING:** Read the user instructions before operating the product.



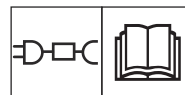
**WARNING:** Disable the product before working on or lifting the product.



**WARNING:** Keep a safe distance from the product when operating. Keep your hands and feet away from the rotating blades.



**WARNING:** Do not ride on the product. Never put your hands or feet close to or under the product.



Use a detachable power supply as defined on the rating label next to the symbol.



Lock function.



This product conforms to the applicable EC Directives.



It is not permitted to dispose this product as normal household waste. Ensure that the product is recycled in accordance with local legal requirements.



The chassis contains components which are sensitive to electrostatic discharge (ESD). The chassis must also be resealed in a professional manner. For these reasons the chassis shall only be opened by authorized service technicians. A broken seal can result in the entire or parts of the guarantee no longer being valid.



The low-voltage cable must not be shortened, extended or spliced.

Do not use a trimmer nearby the low voltage cable. Be careful when trimming edges where the cables are placed.

## 3 Product and installation

### 3.1 Main components for installation

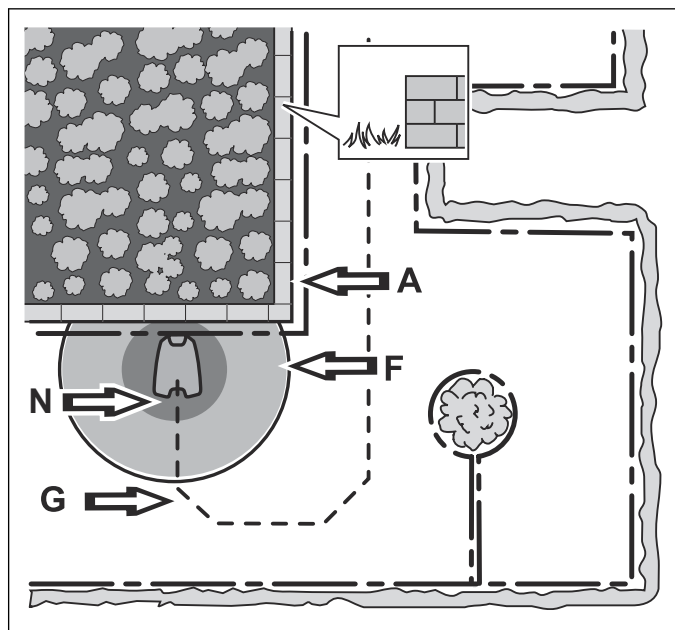
The robotic system involves 4 main components:

- Robotic lawn mower
- Charging station
- Power supply
- Loop wire

Go to the manufacturer's website or read the Operator's manual for further descriptions about the product and the installation.

### 3.2 The loop system's control signals

The loop system includes the boundary wire and the guide wire which are connected to the charging station. The loop system transmits the signals that follow:



- A signal, sets the boundary for the work area.
- F signal, is supplied by a loop in the charging station. The product then knows that it is near the charging station.
- N signal, is supplied by a loop in the charging station baseplate to guide the product correctly into the charging station.
- Guide signal, G, guides the product to the charging station, but can also be used to guide the product from the charging station to a remote area.

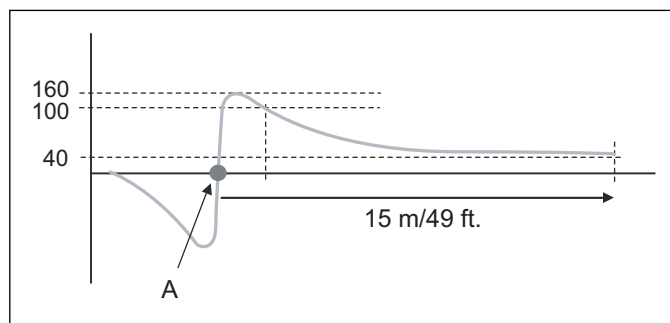
To do a check of the A, F, N and Guide signals, refer to the *Loop signal* on page 49.

### 3.3 LED indicator lamp on the charging station

The loop system's status is easily checked using the LED indicator lamp on the charging station. Refer to *Loop signal* on page 49.

### 3.4 Boundary loop

The strength of the A signal varies depending on the distance. The strength of the signal is high close to the wire. The strength subsequently diminishes the farther away from the wire you get. Outside the work area the signal is negative and its strength diminishes more rapidly. Signal quality should always be 100% for satisfactory function.



The strength of the signal is affected by the size of the work area, islands, headlands, passages and corners. The signal can also be affected by magnetic objects in the ground or in nearby walls and buildings. Examples of magnetic objects are iron fences, iron girders and reinforcement bars. Grass areas laid on concrete roofs can therefore lead to a weaker signal.

The A signal's reception and amplification can vary by +/- 10% from one product to another. This means that at the same point in an installation, one product can display A=90 and another one A=100. The charging station's circuit board and the product's loop sensor can also give certain variations between different products.

#### 3.4.1 To test the boundary loop

The product displays the *No loop signal* message if an attempt is made to start the product before the installation is complete.

However, it is possible to test the product before the installation is completed by doing one of the following:

- Connect a short, temporary loop around the product.
- Temporarily deactivate the product's loop detection. Refer to *Tools - Special settings* on page 13.

#### 3.4.2 Obstacles

To demarcate an obstacle, you can put the boundary wire from the edge of the work area to the obstacle, around it and then back.



**CAUTION:** The boundary wire must not be crossed on its way to and from an island.

### 3.5 Guide loop

The guide wire, together with the part of the boundary loop that comprises the return to the charging station, is called the guide loop. The current in the guide loop

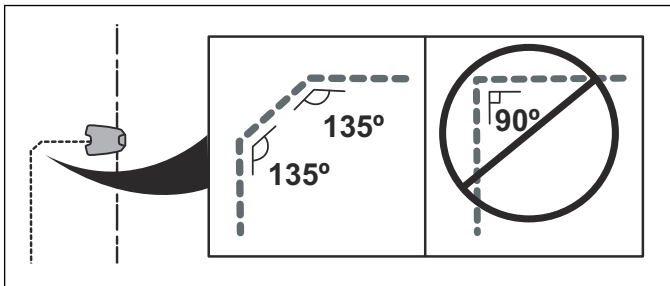
always goes from the guide wire to the left in the connection between guide wire and boundary loop.

The strength of the guide signal varies like the A signal depending on the distance to the guide loop. Inside the guide loop the signal is positive and the strength subsequently diminishes the farther away from the wire you get. Outside the guide loop, the signal is negative and the strength of the signal diminishes more rapidly.

**Note:** The product always tracks the left side of the guide wire when facing the charging station, i.e. the product follows the negative values on the guide signal.



**CAUTION:** Do not lay the guide wire at 90° angles or less. Lay the wire in two 135° angles.



### 3.6 Charging station

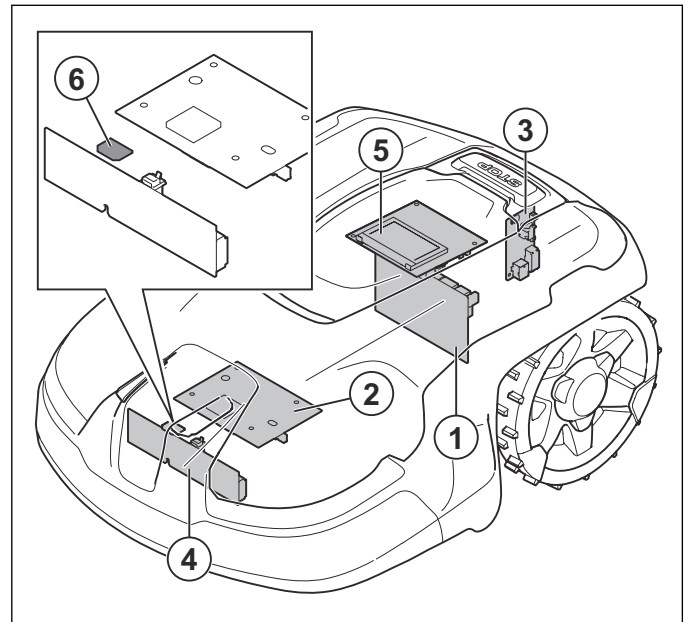
The placement of the charging station must be well planned in order to give the best installation and operation of the product. Refer to *To examine where to put the charging station* in the Operator's Manual.

**Note:** The battery is spared if charged in low ambient temperature, but not below freezing. Consequently, it is beneficial if the charging station is placed where it is shaded, especially during the warmest parts of the day.

When the battery level has dropped to 600 mAh or the battery voltage has dropped to 17.25 V, the product shuts down the cutting motor and starts searching for the charging station.

### 3.7 Circuit boards and sensors

The circuit boards and sensors in the product:



1. Motor control circuit board (tilt sensor)
2. Communication circuit board
3. Rear loop sensor circuit board (rear loop sensor and stop sensor)
4. Front loop sensor circuit board (front loop sensors)
5. Application circuit board
6. Front lift sensor / magnetic sensor circuit board (lift sensor)



**CAUTION:** Some sensors contain a hall sensor and a magnet. Because of the magnets south and north pole, it is important that the magnet is correctly installed.

#### 3.7.1 Tilt sensor

The tilt sensor is a sensor on the motor control circuit board that detects the product's inclination in relation to the horizontal plane. The X-angle indicates front to rear inclination, and the Y-angle indicates left to right inclination. The value from the tilt sensor is used, among other things, to correct the speed of the drive wheels when mowing in steep slopes.

#### 3.7.2 Lift sensors

The lift sensors detect if the product is being lifted off the ground. This is done with the help of the mechanical design and magnets. If a lift signal is indicated, the blade disc stops immediately. The product tries extrication maneuvers by reversing and turning several times.

#### 3.7.3 Loop sensors

The loop sensors measure the signals that the charging station sends through the boundary loop (A signal), the guide loop (Guide signal) and the baseplate (F signal). The signals are used to control the product and keep the product inside the work area. The product can only

detect the signals if it has been paired with the charging station. Refer to *Loop signal on page 49*.

### 3.7.4 STOP sensor

There is a magnet and a Hall sensor that detects if the **STOP** button is pushed down. If the STOP signal is indicated, the product and the blade disc stop immediately and the hatch is released.

### 3.7.5 Collision sensors

There is no collision sensor in this product. The product measures the wheel motor current to sense collision.

## 3.8 To do a test of the installation

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**Note:** Turn off *ECO mode* before you do the tests.

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With the *Lawn coverage* test you can do a test of the selected installation settings.

### 3.8.1 Test: Lawn coverage

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**Note:** The *Test: Lawn coverage* can only be used once the product has calibrated the guide wire. In other words, the product must have left the charging station on at least one occasion, either in *Auto* mode or in connection with the start-up sequence.

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The *Test: Lawn coverage* function is used to test if the product can follow the guide wire or the boundary loop at the selected corridor width out from the charging station.

The *Test: Lawn coverage* can also be used to measure the distance from the charging station to a remote area. The distance, stated in meters, is shown in the product display when STOP is pressed. How to do the test is described in the Operator's manual.

## 3.9 Weather timer

If *Weather timer* is activated, the product automatically adjust its mowing times based on how fast the grass grows. This is decided by continuously measuring the blade disc resistance and comparing that to a mean value. If the resistance is higher than the mean value, the product is allowed to work for a longer time, and the other way around. The mean value is continuously updated and when the mower has collected sufficient data, it will start to change the cut time.

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**Note:** The mean value will be reset if the settings are reset, or if the cutting height is lowered.

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The *Weather timer* does not make the product work more than the timer settings, only less. The product will always perform at least one mowing cycle per day, only after that the mowing time is reduced by the *Weather timer*.

## 3.10 Safe operation in slopes

The product adjusts its operation automatically based on factors such as the slope angle and travel direction.

If the slope is too steep, the product moves rearwards and turns to try to find a less steep slope. If after 2 attempts the product cannot find a less steep slope, it stops and the display indicates that the stop is caused by a steep incline.

Slopes that exceed the specified maximum inclination can normally only be reached in very favourable conditions. Accessibility on steeper slopes than specified cannot be guaranteed.

## 3.11 New loop signal

In rare cases, there may be a reason to change the loop signal. For example, if two nearby installations have the same loop signal they can interfere with each other.

1. Select a new loop signal via the menu in the display.

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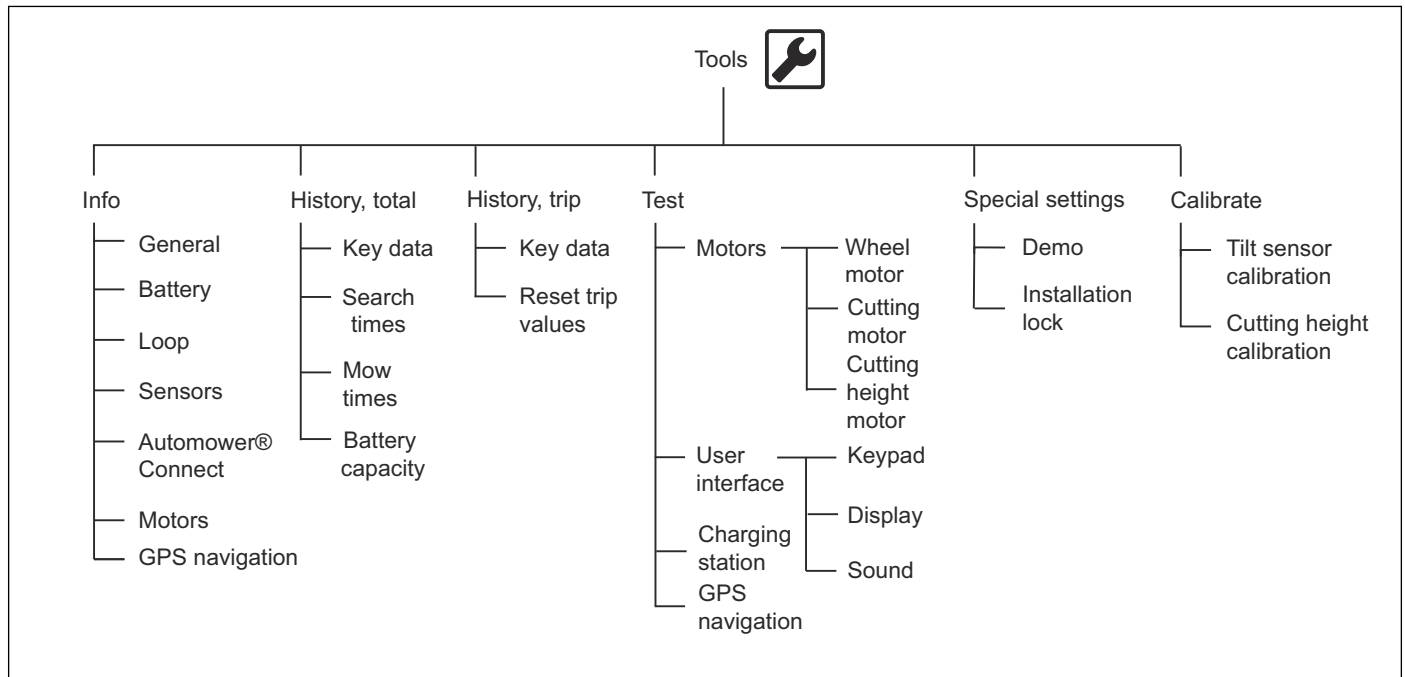
**Note:** A new loop signal has to be generated when the product returns to its ordinary charging station, for example after service if a charging station other than the customer's has been used. Refer to *Actions on page 16*.

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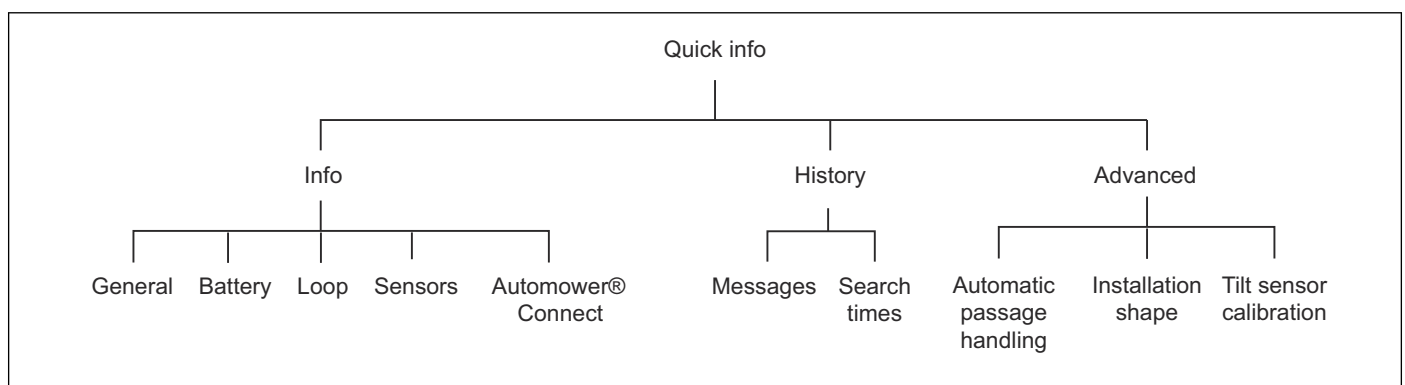


## 4 Special menus

### 4.1 Tools menu overview



### 4.2 Quick info overview

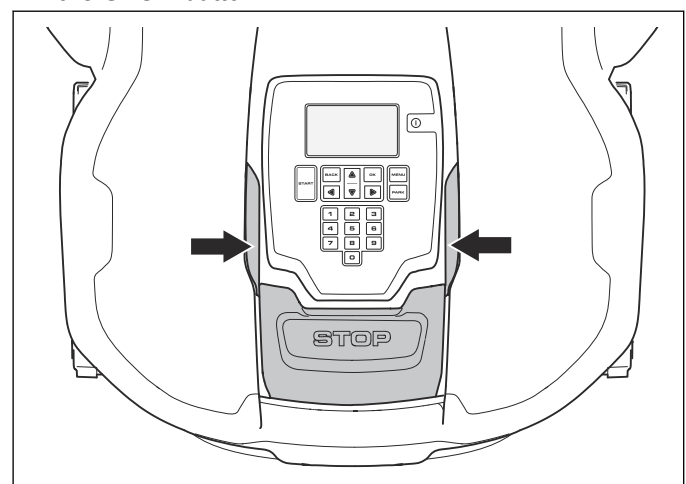


### 4.3 To operate the product with the hatch opened

For some of the functions in the special menu, for example *Info - Loop*, it is necessary to see the values on the display while the product operates. To keep the hatch open during operation:

1. Select the menu.
2. Push the **START** button to start the product.

3. Keep the hatch open and push the part of the STOP button that is on the side of the keypad to deactivate the STOP button.



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**Note:** The product will operate as usual with the hatch open.

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4. Push the **STOP** button to stop the product.

## 4.4 Tools menu (Expert mode)



The *Tools* menu is an expert view, where additional information and special settings are available.

When the main menu is displayed:

1. Push and hold down the **7** key and **9** key for 2 seconds to access the *Tools menu*.

For more information about the product's display menus, refer to the chapter about the Menu structure in the Operator's manual.



**WARNING:** Do not return the product to the customer with an activated *Tools menu*. Always switch off the product so that the main menu is reset to normal mode.

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### 4.4.1 Tools - Info

The *Info* menu shows the status of the product's subsystems.

#### 4.4.1.1 Tools - Info - General

The *Tools - Info - General* menu has 2 sections: *SW* and *Prod*.

The *Info - General - SW* menu shows:

- *Article number* for software/firmware package.
- *Main* : The version of the MSW (Main Software) program (also called the main program).
- *HMI* : The version of the HMI (Human Machine Interface) program.
- *SUB* : The version of the SSW (Subdevice Software) program.
- *COM* : The version of the communication circuit board program (Automower® Connect).

The *Info - General - Prod* menu shows:

- *Total running* : The total hours the product has used the wheel motors (cutting and searching).
- *Mower s/n* : The product's serial number. This number must correspond with the serial number on the inside of the hatch.
- *Prod. date* : The product's date of manufacture.
- *MCB s/n* : The application circuit board's serial number. This is not linked to the product's serial number.
- *MCB prod* : The application circuit board's date of manufacture.
- *COM s/n* : The communication circuit board's serial number. This is not linked to the product's serial number.

### 4.4.1.2 Tools - Info - Battery

The *Tools - Info - Battery* menu shows:

- *Voltage* : The voltage level of the battery. About 20.5 V indicates a fully charged battery and about 17 V indicates a flat battery.
- *Charges* : The accumulated number of charge cycles since date of manufacture, or since the counter was reset.
- *Charge level* : The state of charge of the battery. When the battery is fully charged, the charge is approximately 1 700 mAh. When the charge has dropped to approximately 1 000 mAh the product returns to the charging station.
- *Current* : The nominal regulated charge current to and from the battery. A positive value indicates that the battery is charging and a negative value indicates that the product is using current from the battery.
- *Temp* : The temperature in the battery.
- *Capacity* : The maximum capacity of the battery.

### 4.4.1.3 Tools - Info - Loop

The *Tools - Info - Loop* menu has 3 sections:

- *A-loop* shows the loop signal from the boundary loop measured by the loop sensors in the product. The value should lie between approximately 40 and 320 to ensure good functionality. The closer to the loop the product is, the higher the value. When the product is directly over the loop, the value is 0 and when the product is outside of the loop, the value is negative.
- *G/F/N* shows the loop signals from the Guide and the field for F and N. To ensure good functionality, the value for the Guide signal should be (-) 70-120 beside each guide wire.
- *Quality* shows the loop system's signal quality. The loop signals can only be correct interpreted if the value is 100%. If the value is lower, the loop system does not function correctly and thus none of the displayed signals are correct.

### 4.4.1.4 Tools - Info - Sensors

The *Tools - Info - Sensors* menu has 2 sections:

- *Status*
- *Temperature*

The *Info - Sensors - Status* menu shows:

- *Lifted*: When the body is lifted up the lift sensor is activated and the product display shows *Yes*.
- *Tilted*: When the product is standing horizontally the value should be max  $\pm 3$ . Inclination up and to the left is shown as negative values.
- *Normal position*: *Yes* indicates that the product is standing in a normal position and *No* indicates that the product is upside down.

The *Info - Sensors - Temperature* menu shows:

- *Product temperature*: Measured by a temperature sensor on the motor control circuit board.

- *LCD temperature*: Measured by a temperature sensor on the application circuit board.

#### 4.4.1.5 Tools - Info - Automower® Connect

The *Automower® Connect* menu shows:

- *COM*: the version of the program on the communication circuit board.
- *SIM card*:
  - *OK*: Connected.
  - *PIN*: SIM PIN is required.
  - *PUK*: SIM PUK is required. To enter the PUK code, insert the SIM card into a cell phone.

---

**Note:** You have to enter the PUK code when an incorrect PIN code is entered too many times. You can not enter the PUK code in the product.

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- *Locked*: The SIM card is locked. The SIM card is permanently locked and must be replaced.

---

**Note:** The SIM card is locked when an incorrect PUK code is entered too many times.

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- *Error*: Other fault.
- -: Automower® Connect is not active or no SIM card is inserted.
- *GPRS*:
  - *Ok*: The communication status with the app.

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**Note:** The communication status must be *Ok* or there is no communication with the app.

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- *Error*: Not connected, no GPRS link.
- *Search*: Not connected, GPRS link ok.
- *Blocked*: The communication circuit board is blocked. The serial number of the communication circuit board is not registered on Husqvarna server. Replace the communication circuit board.
- *SIMs*: Data is not transmitted. Automower® Connect is attempting to transmit data but the Husqvarna server is not receiving.

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**Note:** If the SIM card is a cash SIM card and there is no money left, this can cause the *SIMs* code.

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- *PIN*: SIM PIN is required.
- *PUK*: SIM PUK is required. To enter the PUK code, insert the SIM card into a cell phone.

---

**Note:** You have to enter the PUK code when an incorrect PIN code is entered too many times. You can not enter the PUK code in the product.

---

- *Locked*: The SIM card is locked. The SIM card is permanently locked and must be replaced.

---

**Note:** The SIM card is locked when an incorrect PUK code is entered too many times.

---

- *Error*: Other fault.
- -: Automower® Connect is not active or no SIM card is inserted.

- *Data*: Data transmission *On/Off*.
- *SMS*: SMS function *On/Off*.
- *RSSI*: The signal strength of GPRS reception, between 0-98. A higher the value means a better reception. The value must be more than 10 for a stable connection.
- *Carrier*: The name of the operator.
- *APN*: The APN used for the operator.
- *APN user*: User name for APN.
- *APN pwd*: Password for APN.
- *Geofence*: GPS coordinates for the center point for the geofence
- *GPS signal*: The strength of the GPS reception. In order to set the center position of the Geofence, the GPS signal must be *Strong*.

#### 4.4.1.6 Tools - Info - Motors

The *Tools - Info - Motors* menu has these sections:

- *Wheel motor*
- *Cutting motor*
- *Cut height*

The *Info - Motors - Wheel motor* menu shows:

- *Speed* for the left/right wheel motor.
- *Current (mA)* for the left/right wheel motor.
- *Power (%)* for the left/right wheel motor.

The *Info - Motors - Cutting motor* menu shows:

- *Speed* of the cutting motor.
- *Current (mA)* for the cutting motor.
- *Average current (mA)* for the cutting motor.

The *Info - Motors - Cut height* menu shows:

- *Cutting height*. The blade disc height setting measured in steps.
- *Current (mA)* for the cutting height motor.

#### 4.4.1.7 Tools - Info - GPS navigation

The *Tools - Info - GPS navigation* shows:

- *Satellites*: The number of satellites the GPS receiver is currently in contact with.
- *Position*: The products position in longitude and latitude.

#### 4.4.2 Tools - History, total

##### 4.4.2.1 Tools - History, total - Key data

The *Tools - History, total - Key data* menu shows:

- *Total running*: The total time in hours that the wheel motors have been running.

---

**Note:** *Total running* also includes the time when the product is running without mowing.

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- *Total mowing* : The total time in hours that the cutting motor has been running.
- *Total search time* : The total time in hours that the product has been in search mode. This means the time from starting to search for the charging station, until the product has docked. Depending on the installation and work area, it is normal with 10-20% search time of the total running time.
- *Total charge time* : The total time in hours when the product has been charging.
- *Complete chargings* : The total number of complete chargings. A complete charging is defined as a charging that proceeds for more than 20 minutes, and is terminated when the charge current is less than 300 mA.
- *Efficiency* : How much of the total operating time that the product has mowed the lawn. *Efficiency* is the mowing time divided by the charging time + running time.
- *Run time/Fault* : The average time the product has run for each fault message displayed. *Run time/fault* is the total running time divided by the number of occurring faults.

#### 4.4.2.2 Tools - History, total - Search times

The *History, total - Search times* menu has 2 sections:

- *Overview* : Shows the average, max and min search time of the last 12 searches.
- *Search times* : Shows each of the last 12 searches.

#### 4.4.2.3 Tools - History, total - Mow times

The *History, total - Mow times* menu has 2 sections:

**Note:** The mow time is defined as the time that the cutting motor has been running.

- *Overview* : Shows the average, max and min mow time of the last 12 mowing operations. The menu shows each of the last 12 mowing operations.
- *Mow times* : Shows each of the last 12 mowing operations.

#### 4.4.2.4 Tools - History, total - Battery capacity

The *History, total - Battery capacity* menu has 4 sections: Test 1, 2, 3 and 4. Each of the 4 most recent battery tests are saved in *Battery capacity*. For each of the tests the following is shown:

- *Date* : The date of the test
- *Time* : The time of the test
- *Chargings* : The number of complete chargings at the time of the test.
- *Capacity* : Measured battery capacity (mAh) during the test.

#### 4.4.3 Tools - History, trip

The *History, trip - Key data* has the same information as in *History, total - Key data*. However, in *History, trip - Reset trip values* it is possible to reset all values, just like for a trip meter in a car.

### 4.4.4 Tools - Test

**Note:** The battery voltage should be at least 18 V when testing the wheel and cutting motors.

#### 4.4.4.1 Tools - Test - Motors

**Note:** The **STOP** button needs to be enabled to enter this menu. Refer to *To operate the product with the hatch opened on page 9*.

The *Tools - Test - Motors* has 3 sections: *Wheel motor*, *Cutting motor* and *Cutting height motor*.

- *Wheel motor*:
  1. Lift the product until the drive wheels are off the ground.
  2. Increase (**Arrow up** button) the power to 80% and block each drive wheel in different positions. Check that the motor starts again when the blocking is released.
  3. Increase the power to 100% and check that the speed in each wheel is at least 50 cm/s / 20 in./s.
  4. Block each wheel and check that the gearboxes of the motors are not slipping. When blocking, the speed should be 0 cm/s. Also listen for abnormal sounds from the gearbox.
  5. Decrease (**Arrow down** button) the power to 0%.
  6. Push the **Back** button to exit the test.

**Note:** If a wheel motor fails to start and is difficult to rotate by hand, the fault is most likely in the motor control circuit board or in the wheel motor.

**Note:** If the wheel motor needs help by hand to start, and the wheel motor stops when the wheel is blocked, the fault is in the motor control circuit board and not in the wheel motor.

- *Cutting motor*:



**WARNING:** The blade disc rotates during the cutting motor test. Keep your hands and feet at a safe distance.

- 1. Push the **OK** button to start the cutting motor test.
  2. Check the displayed values of *Speed* and *Current*. The speed is normally 2300 rpm. The current is normally 350 mA +/- 100 mA.
  3. Push the **Back** button to exit the test.
- *Cutting height motor*
  1. Push the **OK** button to start the cutting height motor test. The blade disc will move up and down.
  2. Push the **Back** button to exit the test.

#### 4.4.4.2 Tools - Test - User interface

The *Tools - Test - User interface* menu shows:

- *Keypad*:
  1. Push the **OK** button to start the keypad test.
  2. Push a button. The display shows the button that is pushed.
  3. Push the **Back** button to exit the test.
- *Display*:
  1. Push the **OK** button to start the display test. The display flashes.
  2. Push the **Back** button to exit the test.
- *Sound*:
  1. Push the **OK** button to start the sound test. The buzzer emits a short sound signal at the same time as a note is shown in the display.
  2. Push the **Back** button to exit the test.

#### 4.4.4.3 Tools - Test - Charging station

This function is used to check if there is a signal for A, F, N and the guide wires.

1. Place the product in the charging station.  
**Note:** The product and the charging station must be paired.
2. Push the **OK** button to start the test.

#### 4.4.4.4 Tools - Test - GPS navigation

The *Tools - Test - GPS navigation* menu shows:

- *Enabled (Yes/No)*: GPS navigation can be activated via *Installation - Lawn coverage - GPS supported navigation*.
- *Installed (Yes/No)*: If *NO* is shown, make sure that the GPS module or the Automower® Connect module is correctly installed and that the products firmware has been updated.
- *Signal quality*: Signal quality shows the strength of the GPS signal reception. To get a satisfactory function, signal quality should be *Good*.
- *Map (BUILDING/COMPLETE)*: *BUILDING* is displayed the first time the product is used or after the GPS map has been reset. Once the map is completed, *COMPLETED* will be displayed, which takes 2 to 5 days.

#### 4.4.5 Tools - Special settings

**Note:** The *Tools - Special settings* contains settings that are only available for service personnel.

The *Tools - Special settings* menu shows:

- *Demo*: The setting is used for installations in shops or exhibitions. The product alternates between short periods of operation, docking and charging.
- *Installation lock*: If the installation settings lock is activated, it is not possible to change any settings in the *Installation* menu.

---

**Note:** The installation settings lock must be deactivated to change any of the installation settings in the main menu.

---

#### 4.4.6 Tools - Calibrate

The *Tools - Calibrate* menu shows:

- *Tilt sensor calibration*: If the product does not operates as expected in slopes it might help to calibrate the tilt sensor. Place the product on a horizontal surface and start the calibration.
- *Cutting height calibration*: The cutting height calibration can be enabled and the calibration set to start the next time the product starts.

#### 4.5 Quick info (Limited Tools menu)

The *Quick info* menu is a limited *Tools menu*.

When the start page or the main menu is displayed:

1. Push and hold down the **0** key for 2 seconds to access the *Quick info* menu.

##### 4.5.1 Quick info - Info

The *Quick info - Info* menu has the same sub-menus as in *Tools*, except for the sub-menu *Motors*. Refer to *Tools - Info on page 10*.

##### 4.5.2 Quick info - History

The *Quick info - History* menu has 2 sections: *Messages* and *Search times*.

The *History - Messages* menu shows:

- *Fault messages*: The 50 last fault messages
- *Info messages*: The 50 last information messages.

The *History - Search times* menu show the same sub-menus as in *Tools - History, total - Search times*. Refer to *Tools - History, total - Search times on page 12*.

##### 4.5.3 Quick info - Advanced

The *Quick info - Advanced* menu shows:

- *Automatic passage handling*: The guide corridor width is adjusted automatically. If *Auto passage handling* is disabled, the corridor width settings must be made manually. To disable the *Auto passage handling*: Unselect *Auto passage handling* and push the **OK** button.
- *Installation shape*:
  - *Open*: Applicable in a large open work area with a small number of obstacles and no passages, or when the mowing result is uneven in steep slopes.
  - *Normal*: Applicable in a work area with a moderate number of obstacles and/or passages. Applicable for most work areas.
  - *Complex*: Applicable in work areas with many obstacles and/or passages.

- *Calibrate* : It has the same submenus as in *Tools - Calibrate*. Refer to *Tools - Calibrate on page 13*.

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## 5 Autocheck service tool

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Autocheck 3 is a PC tool developed for the service of the robotic lawn mowers from Husqvarna Group. It is a tool for troubleshooting as well as a database of sold products and service history. Autocheck also includes technical documentation and service bulletins. Autocheck 3 supports all G3 (Generation 3) and G4 (Generation 4) products. Autocheck EXP is still applicable for G2 (Generation 2). Autocheck 3 is regularly updated with new functions and appearance.

The product is connected to the computer using short-range Bluetooth® or a USB service cable.

### 5.1 Installation and login

Autocheck 3 supports Windows OS 7 and later. Compatibility with other operating systems cannot be guaranteed.

#### 5.1.1 Getting log in credentials

The log-in credentials determine the set of capabilities available within Autocheck 3.

To get Autocheck log-in credentials, either contact your local sales support, or order Autocheck through the Dealer Portal (requires access).

**Note:** Distributors can request access to Autocheck through the Husqvarna IT service portal. Access to Husqvarna IT service portal can be ordered through the Husqvarna sales representative.

#### 5.1.2 Installing Autocheck 3

Autocheck 3 is available for downloading from the manufacturer's support site.

1. Select *AFTER SALES – Autocheck 3* follow link to *SW installation*.
2. Download Autocheck 3 according to the instructions on the Support site.
3. Run the installation file.

#### 5.1.3 Log in to Autocheck 3

1. Start Autocheck.
2. Enter your username and password, refer to *Getting log in credentials on page 15*.

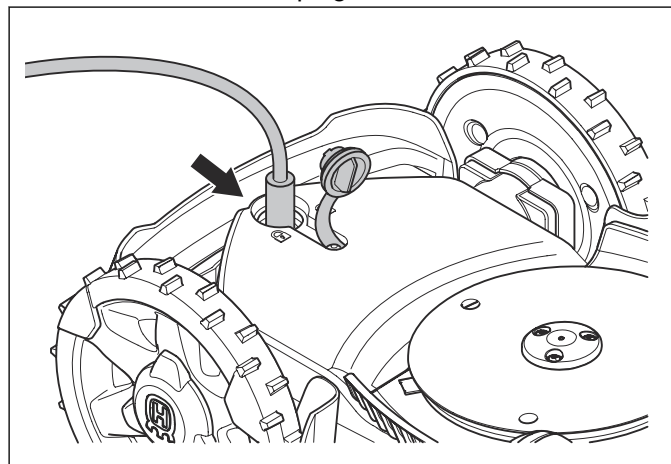
**Note:** At the first log-in after installation, Autocheck requires access to internet for user and password validation.

### 5.2 Product connections

The product is connected to Autocheck with both Bluetooth® and USB service cable. Tests and firmware updates are available with both connection methods. USB service cable connection is faster and recommended to use.

#### 5.2.1 To connect the product with USB service cable

1. Remove the service plug.



2. Connect the service cable between your computer and the product.
3. Start Autocheck on your computer.
4. Switch on the product with the **ON/OFF** button.
5. When the work in Autocheck is complete, disconnect the cable.
6. Install the service plug and make sure it seals correctly.

The connection between Autocheck and the product is usually set up automatically. The product is identified through the product's identification number.

If the text *Mower status: Not connected* is shown in Autocheck, there is no connection with the product:

- Check that the cable is correctly connected in the computer and in the product.
- Make sure that the product is switched on.

#### 5.2.2 To connect to the product with Bluetooth®

1. Start Autocheck on your computer.
2. Switch on the product with the **ON/OFF** button. The product is now pairable through for 3 minutes.
3. The product automatically appears in the list of devices found.
4. Press the **Connect** button for the intended device.

The connection between Autocheck and the product is established automatically. The connection is confirmed on the Autocheck Home screen.

If the text *Mower status: Not connected* is displayed in Autocheck, contact with the product has not been established:

- Make sure that is enabled on your tablet/device.
- Switch the product OFF and ON and try again. Refer to number 1-4 above.



## 5.3 How to use Autocheck 3

The program's main functions are grouped in a number of menus:

- *Home*
- *Auto test*
- *Manual test*
- *Firmware*
- *Actions*
- *Log book*
- *Documents*
- *Customers*
- *Help*
- *Settings*

### 5.3.1 Home

When the product is connected to Autocheck an overview is presented in the *Home* menu. Recommended actions are also shown, for example recommended firmware updates.

### 5.3.2 Auto test

*Auto test* is suitable to use for a fast and overall status of the product. In the *Auto test* menu you can select or deselect tests. All tests run in a sequence after you push *Start Auto test*. During the tests there are animations guiding you what to do.

After the *Auto test* the results are presented in a list. When clicking on a test there is more information presented on the screen. It is also possible to print a report of the test result.

### 5.3.3 Manual test

When using the *Manual test* you select, start and stop the different tests by yourself. The result is shown live on the screen and there are no test reports available. *Manual test* is appropriate to use when you want to test a specific component and allow it to work for a certain period.

### 5.3.4 Firmware

In the *Firmware* menu Autocheck updates the product firmware if necessary.



**CAUTION:** Always let Autocheck complete a started programming process. An interrupted programming can block the application circuit board.

### 5.3.5 Actions

The *Actions* menu shows:

- *Reset*: Contains reset functions, for example *Reset charge cycles counter* and *Reset period time*. *Reset charge cycles counter* should be done when the product has a new battery. *Reset period time* should be done before the product is returned to the customer (if there is a need to create a new loop

signal between the product and the charging station).

- *Unit replacement*: Has the functionality to set the product serial number if the application circuit board is exchanged.
- *Advanced mower settings*: Contains additional functions like *Demo mode* and *Override loop detection*. It is also possible to get the *Security code* from the product.

### 5.3.6 Log book

The *Log book* contains the *Fault memory* where, for example, the product's error codes can be found.

### 5.3.7 Documents

When a product is connected to Autocheck, only the relevant technical documentation for that model is shown. It is however possible to uncheck the box for the connected product and search for all available documents in Autocheck, for example spare parts lists, service bulletins, workshop manuals and operator's manuals.

### 5.3.8 Customers

In the customer's menu a list of all the customers and their products is available. The list is only saved locally. It is possible to import, export and merge customer lists. This can be used if you have a number of computers in your organization.

### 5.3.9 Help

Here you can find more information about how to use Autocheck. There are also Frequently Asked Questions (FAQ), instructional videos and release notes.

### 5.3.10 Settings

Here you can enter dealer information, change language, set date format and unit format. To apply the new language or time format Autocheck must be restarted.

## 5.4 Programming a new application circuit board

If the application circuit board is replaced, the new application circuit board must be programmed. The application circuit board includes information about the product's serial number.

**Note:** A new application circuit board may for safety reasons only be assigned one serial number which is never changed. It is therefore very important that the new application board gets the correct serial number.

There are 3 options when programming a new application circuit board:

- **Select product from the Log book**



Select product from the Log book and the serial number and operating data is transferred automatically to the new application circuit board. This requires that the product previously has been connected to Autocheck.

- **Enter the serial number manually in Autocheck**

If the product never was connected to Autocheck, the serial number must be entered manually in the *Actions - Unit replacement* menu. It is then very important to enter the correct serial number.

- **Use Service mode**

If the application circuit board is replaced when troubleshooting, and you are not sure if the application circuit board will be kept in the product, it is possible to temporarily skip to enter the serial number and use the application circuit board in a so-called *Service mode*. As long as the product is in the *Service mode*, the *Service mode* text flashes in the display. Only Autocheck can be used to control the product in service mode.



**WARNING:** Do not return the product to the customer in *Service mode*.

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## 5.5 Demo mode

Demo mode is used for installations in shops or exhibitions. The blade disc does not rotate and the product alternates between short periods of operation, docking and charging. Demo mode can be enabled and disabled in Autocheck or in the Tools menu.



**WARNING:** Do not have blades installed when the product operates for demonstration in public areas such as shops and exhibitions.

---

## 5.6 To recover the PIN code

1. In Autocheck, select *Actions - Advanced mower settings - Get security code to upload the security code to the cloud*.
2. Speak to the local sales support and tell them the serial number. They can identify the correct PIN code.

## 6 Repair instructions

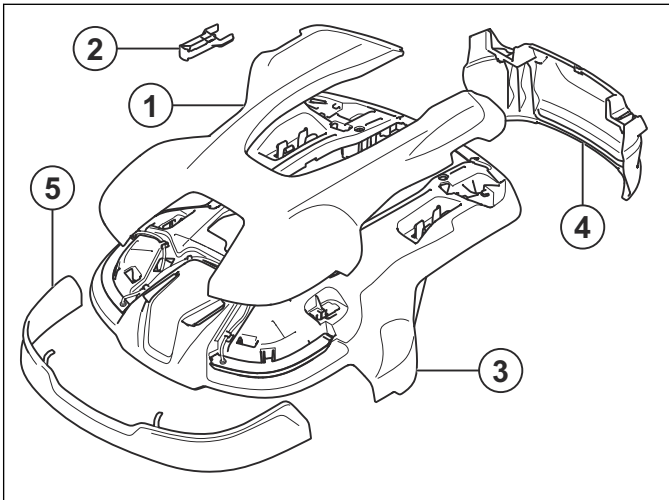
This chapter describes how to repair and change spare parts. Refer to the Illustrated parts list (IPL) at the manufacturer's support website.

### 6.1 Product overview

#### 6.1.1 The body system

The body system is structured mechanically around the modules that follow:

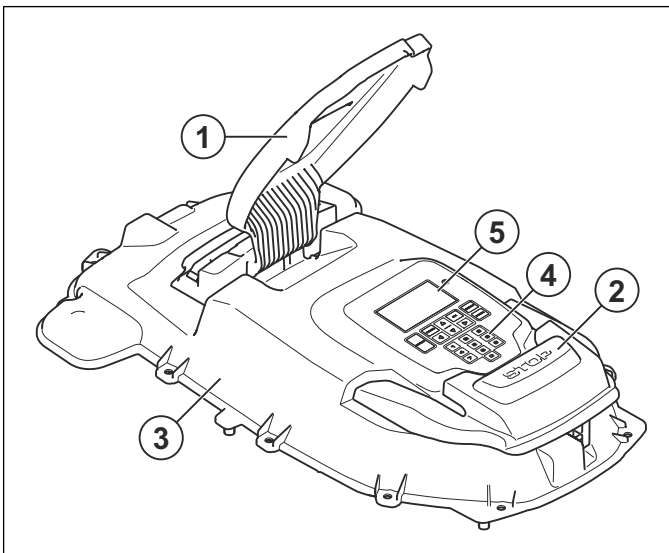
1. Top cover
2. Maintenance tool
3. Body
4. Rear bumper
5. Front bumper



#### 6.1.2 The upper chassis

The upper chassis is structured mechanically around the modules that follow:

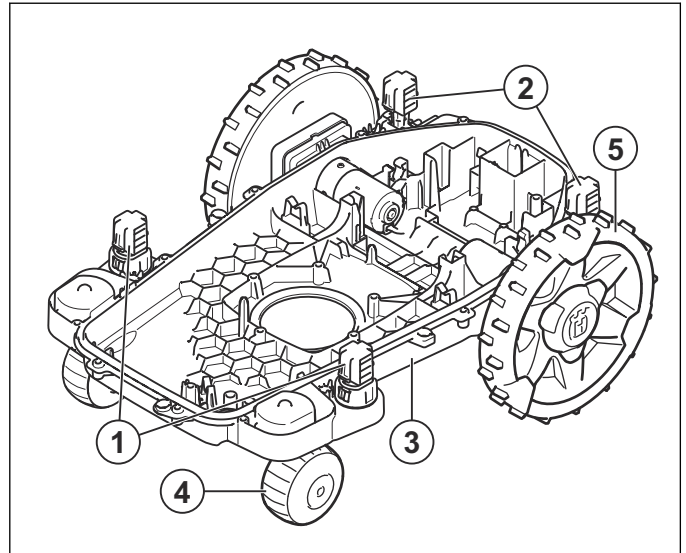
1. Hatch to display and keypad
2. STOP button
3. Upper chassis
4. Keypad
5. Display



#### 6.1.3 The lower chassis

The lower chassis is structured mechanically around the modules that follow:

1. Front body suspension parts
2. Rear body suspension parts
3. Lower chassis
4. Front wheels
5. Rear wheels

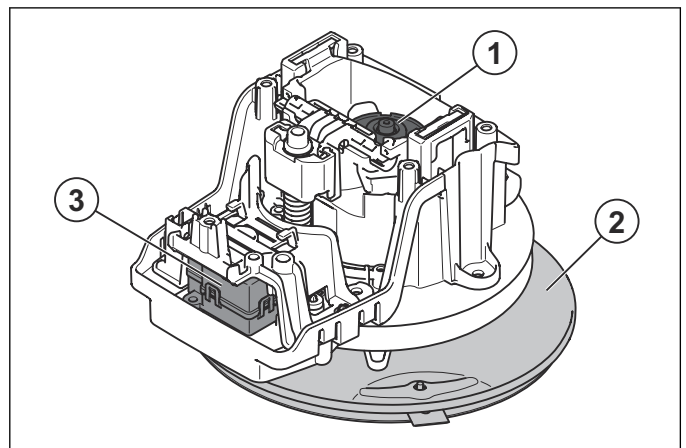


**Note:** There are one sealing strip between the upper and lower chassis. Always replace the sealing strip when the product is opened.

#### 6.1.4 The cutting system

The cutting system is structured mechanically around the modules that follow:

1. Cutting motor
2. Blade disc
3. Height adjustment motor



### 6.2 To mount screws

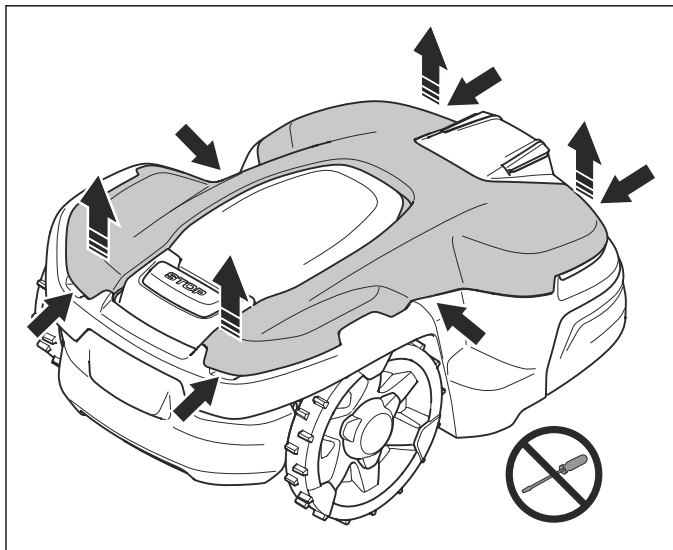
It is important to mount the screws correctly. Incorrect mounted screws may harm the product. The screw dimension is Torx 20 when there is no other information.

**Note:** Read the section about how to mount screws in plastic before starting any maintenance. Refer to *To mount screws in plastic on page 34*.

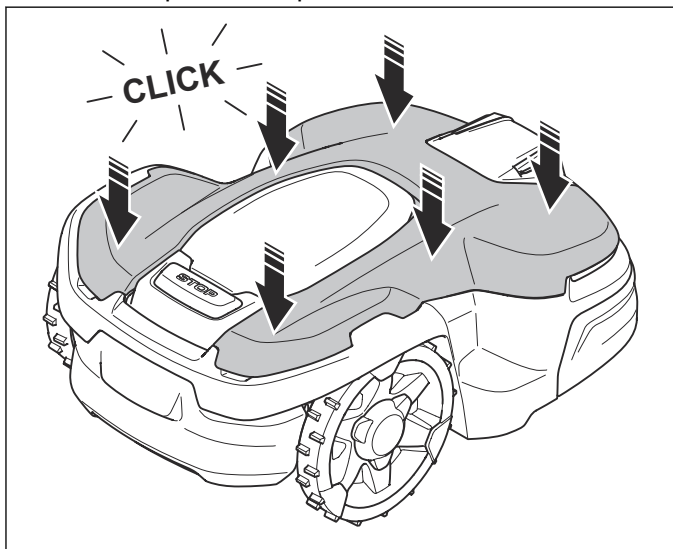
**Note:** Always use the recommended torque to mount the screws. Refer to *Screw fasteners on page 37*.

### 6.3 To remove and install the top cover

1. Push the ON/OFF button to switch off the product. The product is disabled when the indicator lamp is not lit.
2. Gently pull the top cover at the rear, the middle and the front.



3. Lift up the top cover to remove it.
4. To install push the top cover.



### 6.4 To remove and install the body

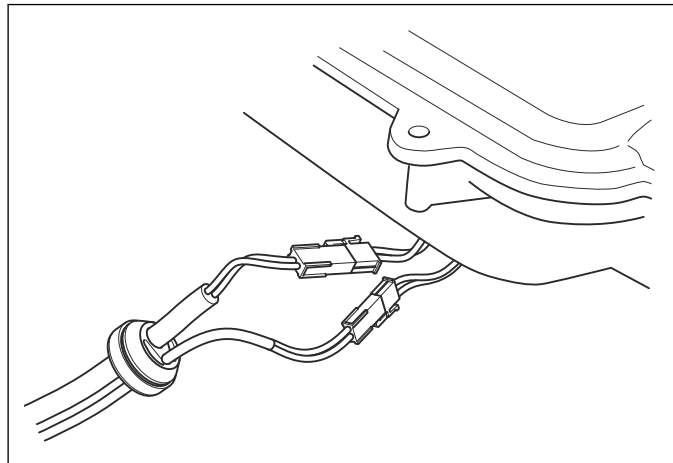


**CAUTION:** Pull the connector. Do not pull the cable.

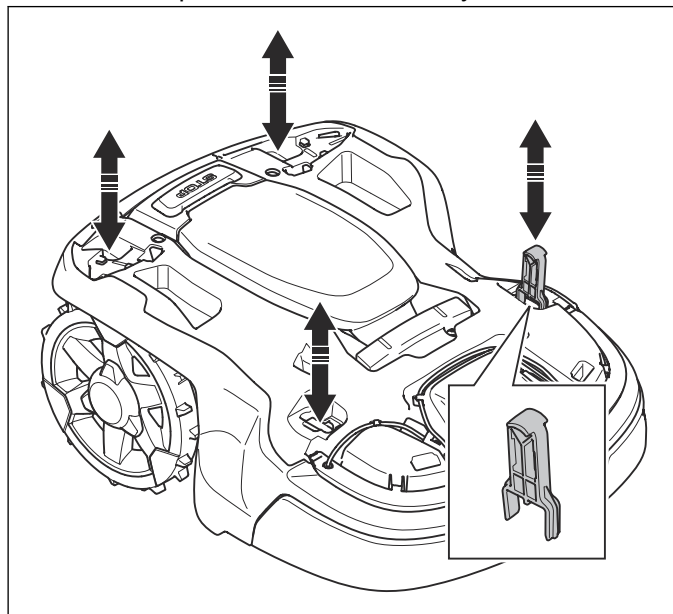


**CAUTION:** Clean dirt and grass from the product before you remove the parts.

1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Clean the area around the grommets.
3. Pull out the rubber grommet and disconnect the charge cable and the headlight cable.



4. Find the 4 positions where the body is attached.

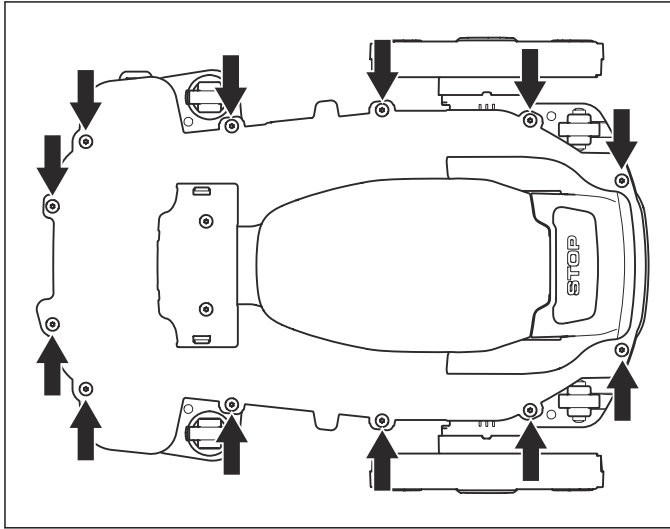


5. Push the maintenance tool down in 1 of the 4 positions, and pull the body up.
6. Continue with the remaining positions while holding the body up.
7. Lift up and remove the body.
8. Install in opposite sequence.

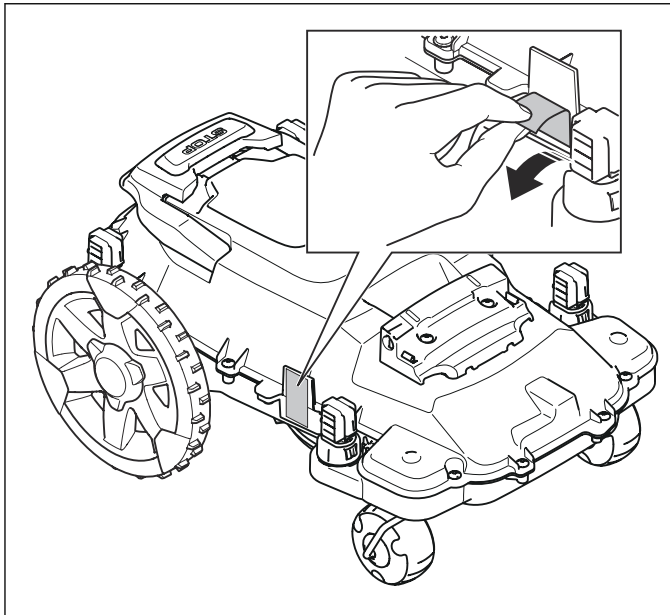
**Note:** Make sure the that the grommets are correctly installed to seal against moisture.

## 6.5 To remove and install the upper chassis

1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the body. Refer to *To remove and install the body on page 19*.
3. Remove the 12 screws.

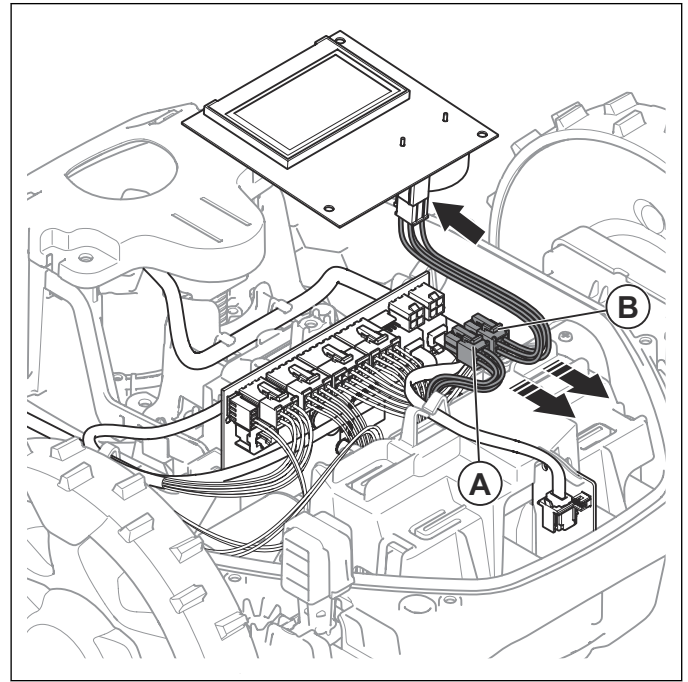


4. Remove the warranty seal at the point of separation between the chassis halves on the right side.



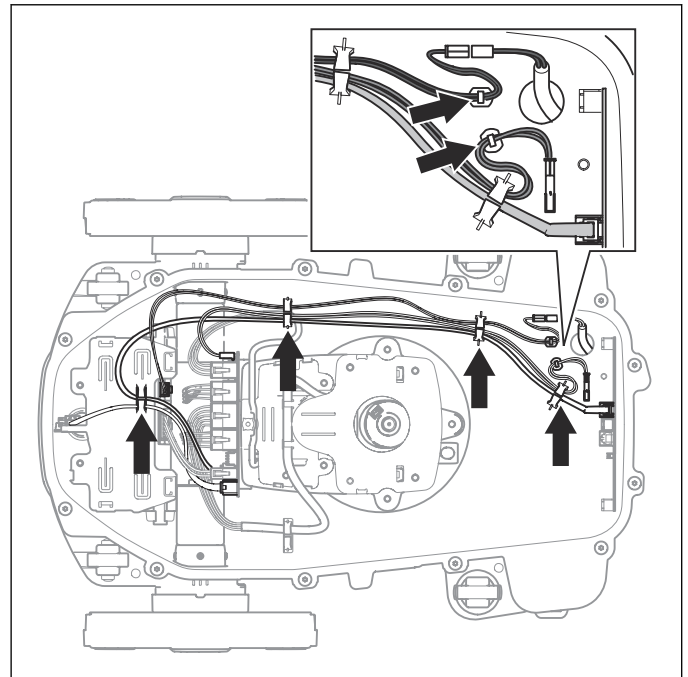
5. Lift the front end of the upper chassis.

6. Disconnect the power cable (A) from the motor control circuit board.



**CAUTION:** Always disconnect the power cable first to prevent current spikes that may harm the circuit boards or the battery.

7. Disconnect the application circuit board cable (B) from the motor control circuit board.
8. Remove the upper chassis.
9. Install in opposite sequence.
10. When you connect the cables make sure to put the cables in the cable holders. To put the cables into position in the lower chassis:



**Note:** Attach a new warranty seal. The warranty seal must be included and unbroken for the warranty to be valid.



**CAUTION:** The cable routing is important to avoid disturbance of the loop sensor board.



**CAUTION:** Always connect the cable to the application circuit board before the power cable to avoid current spikes that may harm the circuit boards or the battery.



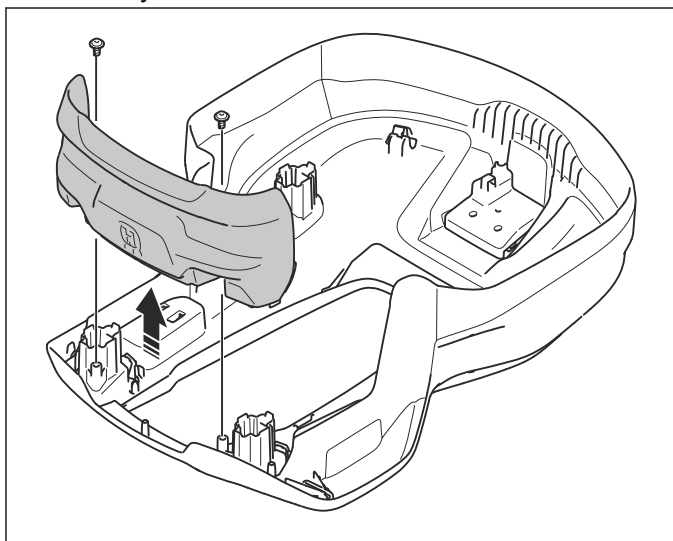
**CAUTION:** Make sure that no cables are pinched.



**CAUTION:** Replace the sealing strip each time you install the upper chassis.

## 6.6 To replace the rear bumper

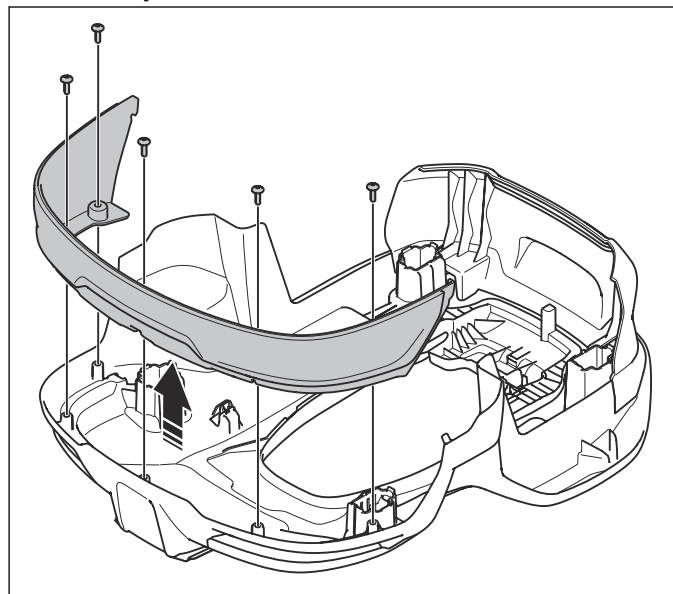
1. Remove the body. Refer to *To remove and install the body on page 19*.
2. Remove the 2 screws that hold the rear bumper to the body.



3. Remove the rear bumper.
4. Install in the opposite sequence.

## 6.7 To replace the front bumper

1. Remove the body. Refer to *To remove and install the body on page 19*.
2. Remove the 5 screws that hold the front bumper to the body.

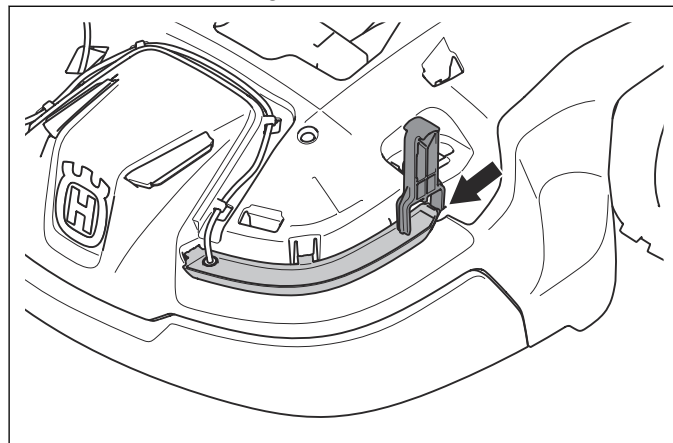


3. Remove the front bumper.
4. Install in opposite sequence.

## 6.8 To replace the headlights and the charging plates

The headlights and the charging plates are included in the same spare part. If the battery of the product does not recharge this may be because of worn or damaged charging plates. Also do a check of the contact plates on the charging station. Refer to *To replace the contact plates in the charging station on page 34*.

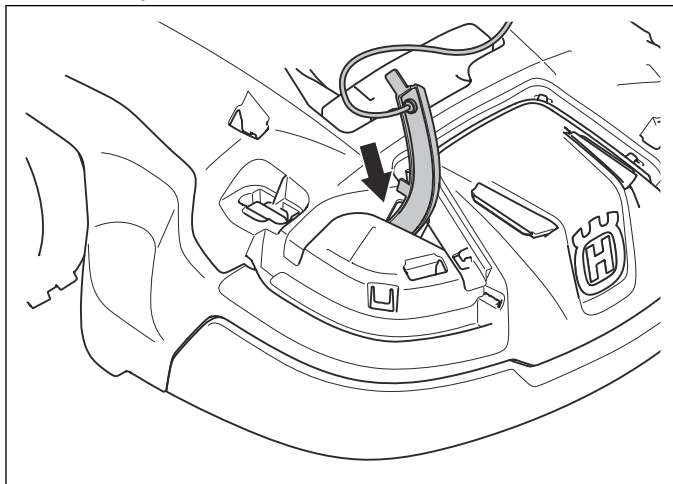
1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the body. Refer to *To remove and install the body on page 19*.
3. Use the maintenance tool to push the clips to remove the headlights.



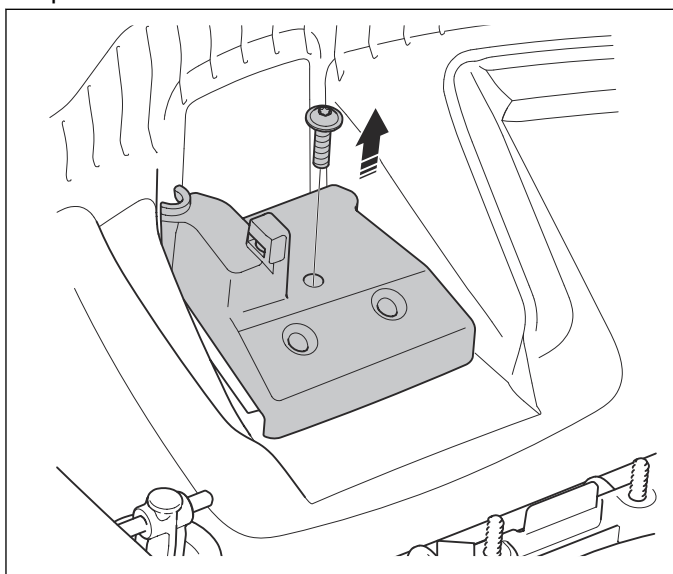
4. Remove the cable to the headlights from the cable holders.



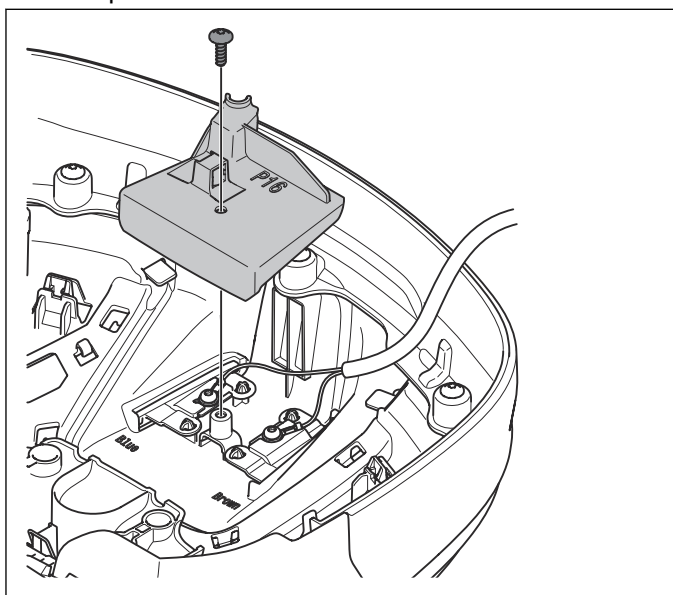
5. Pull the cable and the headlights through the hole in the body.



6. Remove the screw for the holder of the charging plates.

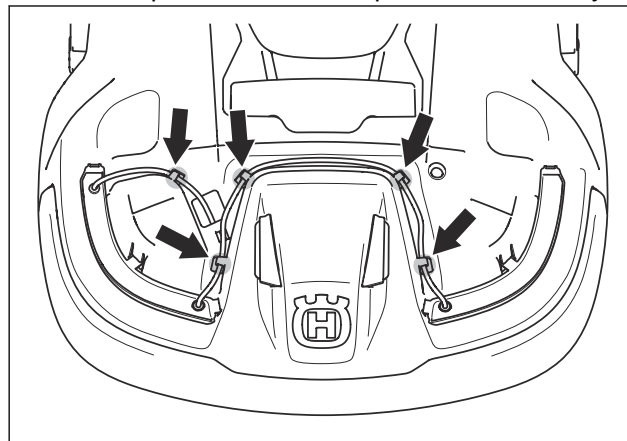


7. Lift up and remove the holder.



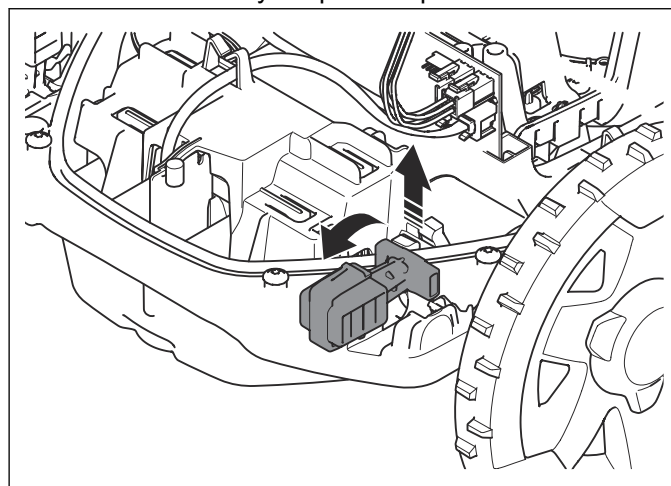
8. Remove the charging plates from the body.
9. Install in opposite sequence.

**Note:** Make sure to put the cables in the cable holders. To put the cables into position in the body:



## 6.9 To replace the rear body suspension parts

1. Remove the top cover. Refer to *To remove and install the top cover on page 19.*
2. Remove the body. Refer to *To remove and install the body on page 19.*
3. Fold the rear body suspension part.

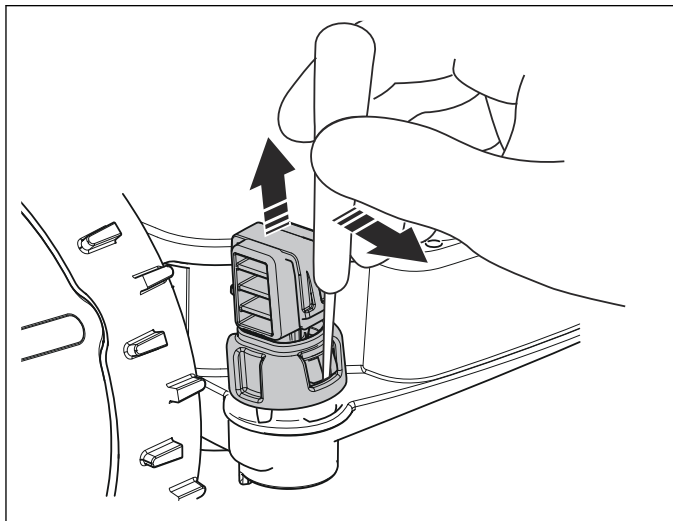


4. Lift up to remove.
5. Install in the opposite sequence.

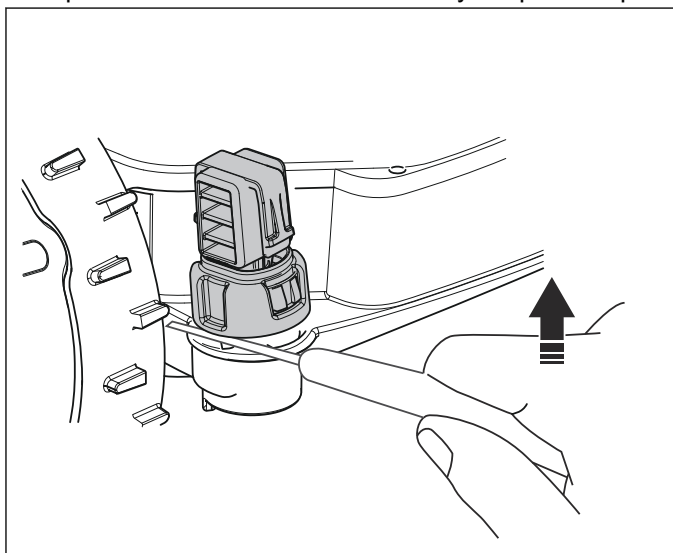
## 6.10 To replace the front body suspension parts

1. Remove the top cover. Refer to *To remove and install the top cover on page 19.*
2. Remove the body. Refer to *To remove and install the body on page 19.*

3. Lift up the front body suspension parts by using a small flat screwdriver. Pull the screwdriver gently backwards.



4. Put the screwdriver between the suspension system and the lower chassis. Push the screwdriver upwards and remove the front body suspension part.



5. To assemble the front body suspension parts, refit the pin into the slot and refit the ring into the correct position.
6. Push the front body suspension part into the hole in the lower chassis.

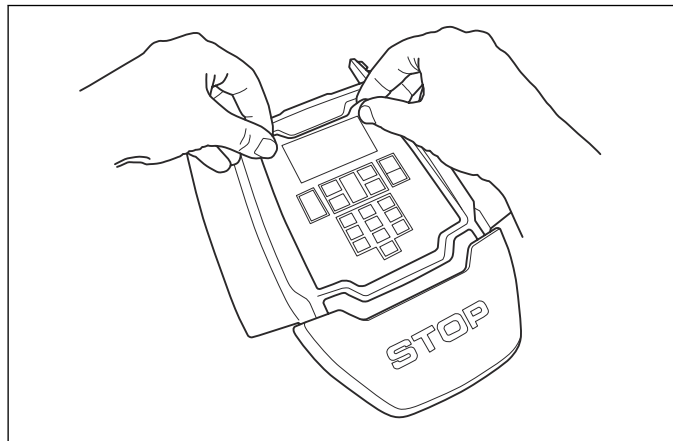
### 6.11 To replace the keypad

1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the body. Refer to *To remove and install the body on page 19*.
3. Remove the upper chassis. Refer to *To remove and install the upper chassis on page 20*.



**CAUTION:** Always disconnect the power cable first to prevent current spikes that may harm the circuit boards or the battery.

4. Disconnect all cables from the application circuit board.
5. Push the 2 clips to release the application circuit board. Refer to *To replace the application circuit board on page 26*.
6. Peel off the keypad from the display cover.



7. Remove the keypad and thread the cable out through the hole.
8. Clean the chassis from glue residue.
9. Remove the protective liner from the new keypad and press the keypad into position.



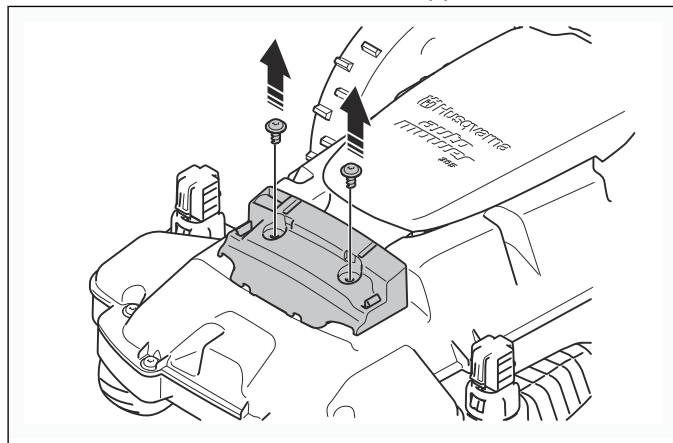
**CAUTION:** There must not be any loose corners or air bubbles as this can cause dirt and moisture to get in under the keypad.

10. Install in opposite sequence.

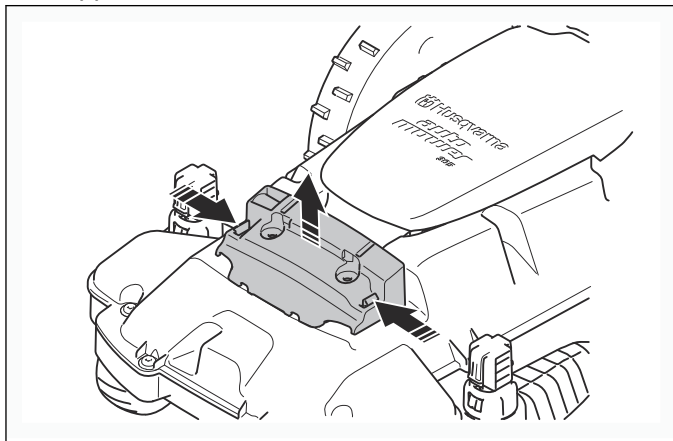
### 6.12 To clean and replace the ventilation filter

**Note:** The ventilation filter needs to be cleaned regularly and must be replaced if damaged.

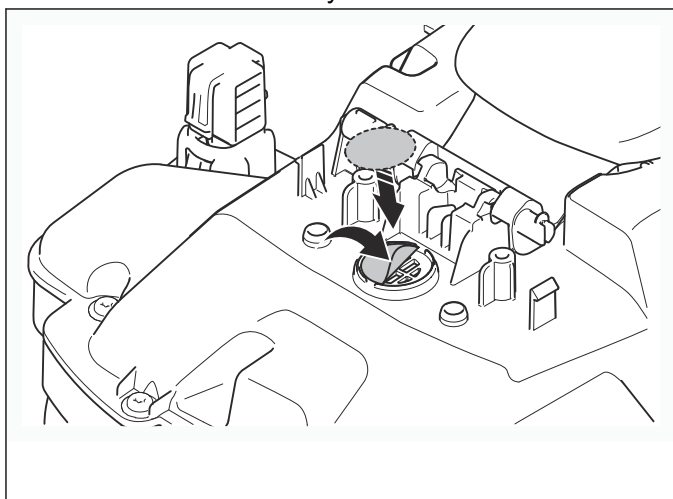
1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the body. Refer to *To remove and install the body on page 19*.
3. Remove the 2 screws for the support.



4. Push the clips inwards and lift up to remove the support.



5. Remove the damaged ventilation filter.
6. Clean fully around the mounting surfaces.
7. Attach the new filter. Make sure that the adhesive surfaces attach correctly to the chassis.



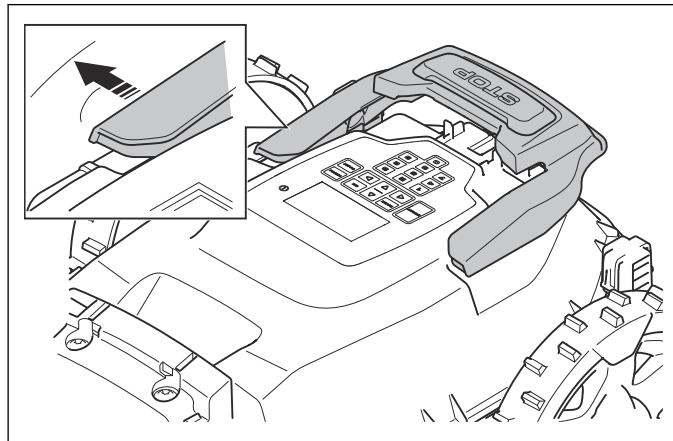
8. Install in the opposite sequence.

### 6.13 To replace the STOP button

**Note:** The magnet in the STOP button must be installed correctly for the correct operation of the STOP button. If this is not the condition, it is necessary to replace the STOP button.

1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the body. Refer to *To remove and install the body on page 19*.

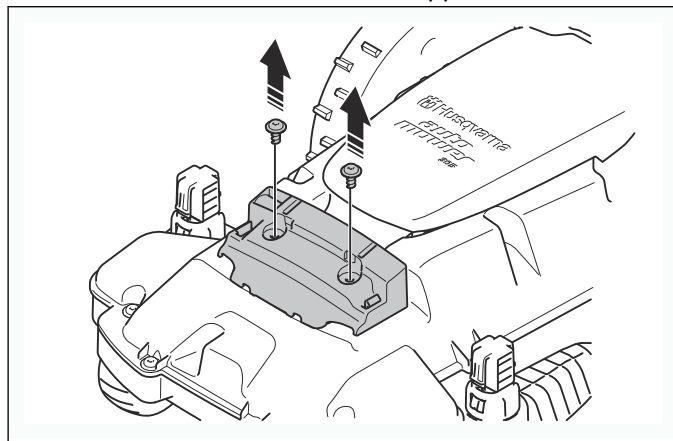
3. Pull out one side of the stop button.



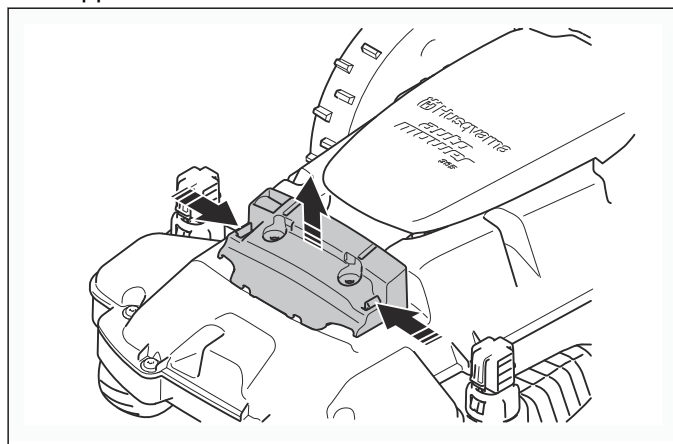
4. Pull the STOP rearward to remove it.
5. Install in the opposite sequence.

### 6.14 To replace the hatch

1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the body. Refer to *To remove and install the body on page 19*.
3. Remove the 2 screws for the support.

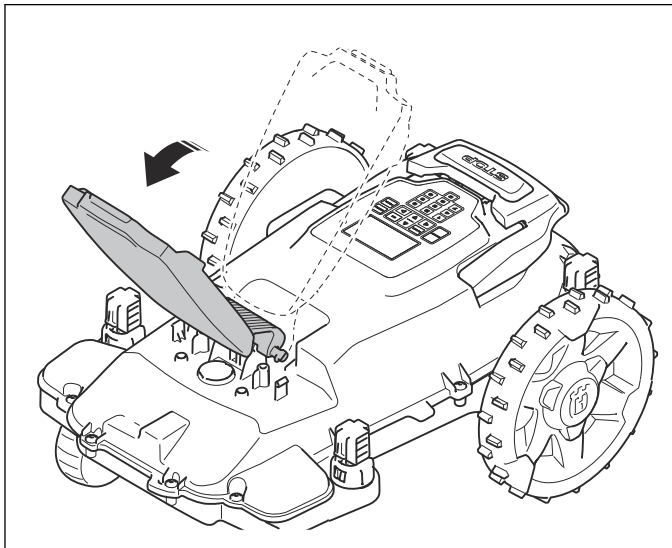


4. Push the clips inwards and lift up to remove the support.

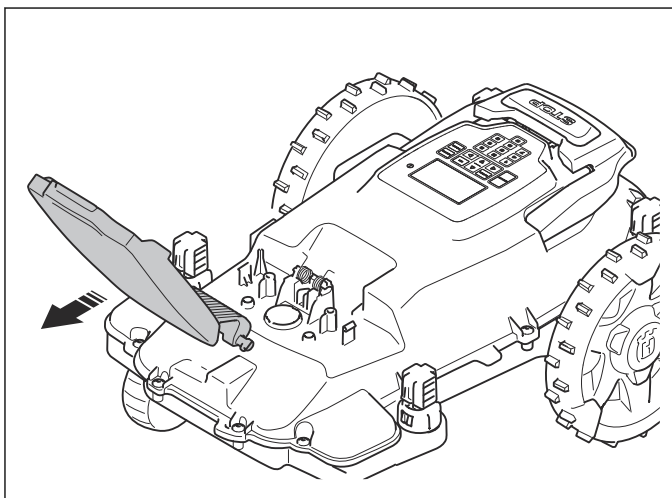




5. Open the hatch and bend it over.



6. Remove the hatch.



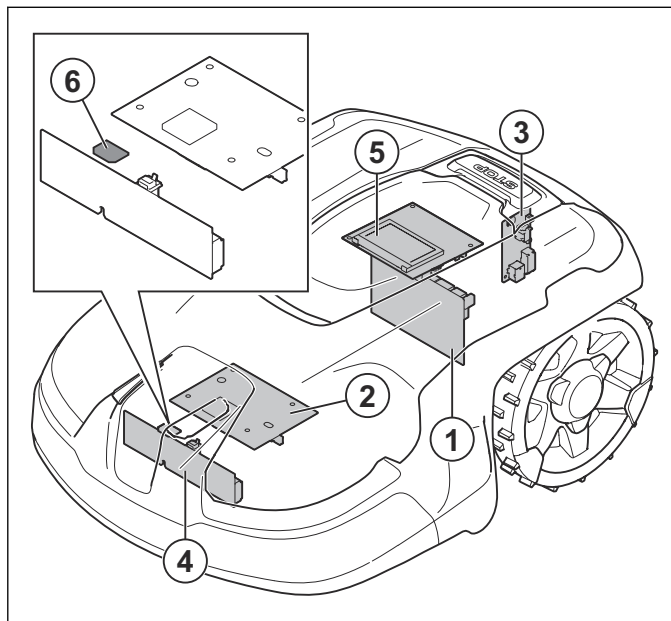
7. Remove the spring.



8. Install in the opposite sequence.

## 6.15 The circuit boards and sensors

These are the circuit boards in the product:



1. Motor control circuit board (tilt sensor)
2. Communication circuit board
3. Rear sensor circuit board (rear loop sensor and stop sensor)
4. Front loop sensor circuit board
5. Application circuit board
6. Front lift sensor/magnetic sensor circuit board (lift sensor)

The circuit boards contain the electronics and firmware necessary to control the products functions.

The motor control circuit board, the communication circuit board and the application circuit board contain their own separate firmware. If any of these boards are replaced, they must be programmed in Autocheck.

The other circuit boards do not have any firmware, and do not need to be programmed after a replacement.



**CAUTION:** Pull the connector and not the cable.



**CAUTION:** Do not touch the components or pin terminals on the circuit board.



**CAUTION:** If the circuit board is to be checked in order to evaluate the warranty, it must be placed in a bag with protection against ESD (electrostatic discharge).



**CAUTION:** Always protect the product from electrostatic discharge, ESD, before you start to work on electrical components.

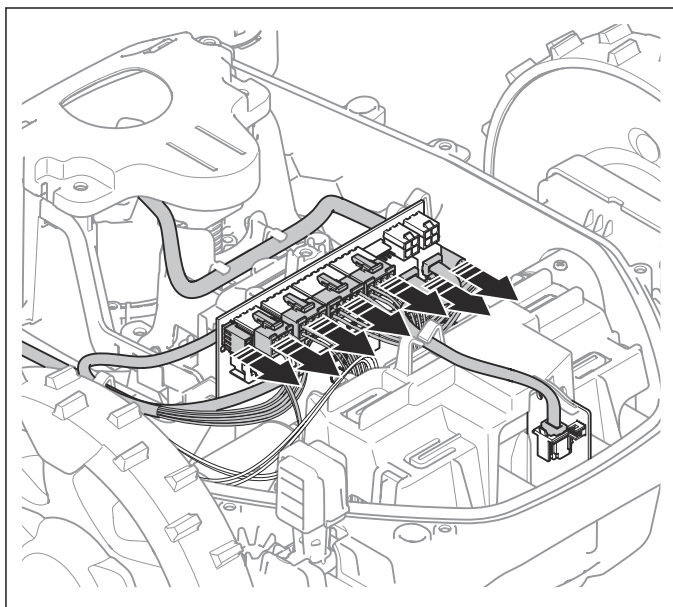
### 6.15.1 To replace the motor control circuit board

1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the body. Refer to *To remove and install the body on page 19*.
3. Remove the upper chassis. Refer to *To remove and install the upper chassis on page 20*.

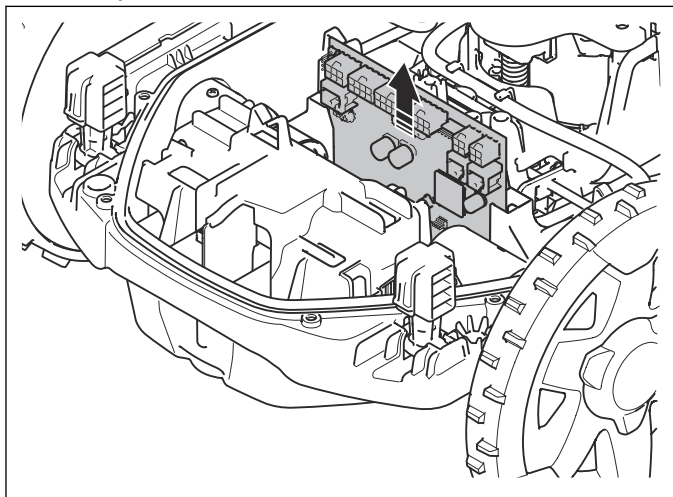


**CAUTION:** Always disconnect the power cable first to prevent current spikes that may harm the circuit boards or the battery.

4. Disconnect the power cable from the motor control circuit board.
5. Disconnect all the other cables from the motor control circuit board.



6. Pull up the motor control circuit board and remove it.



**CAUTION:** If the board is to be checked in order to evaluate the warranty, it must be placed in a bag with protection against ESD (electrostatic discharge).

7. Install in the opposite sequence

### 6.15.2 To replace the application circuit board

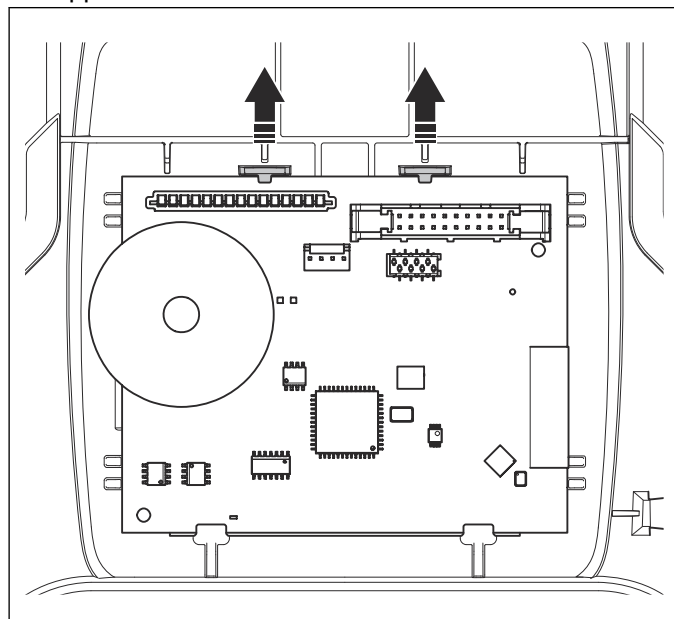
The operating information of the product is saved in the application circuit board. The Autocheck service program saves this information and then installs it in the product when the application circuit board has been replaced.

1. Connect the product to Autocheck before application circuit board is replaced. The operating data is then saved automatically.
2. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
3. Remove the body. Refer to *To remove and install the body on page 19*.
4. Remove the upper chassis. Refer to *To remove and install the upper chassis on page 20*.



**CAUTION:** Always disconnect the power cable first to prevent current spikes that may harm the circuit boards or the battery.

5. The application circuit board is held to the upper chassis by 2 clips. Push the clips and lift up the application circuit board.



6. Put a new application circuit board into position.
7. Install in the opposite sequence
8. Connect the product to Autocheck. Select the correct serial number in the log book. Autocheck automatically installs the operating information that are saved.

### 6.15.3 To install the communication circuit board

The communication circuit board contains Automower® Connect and the GPS module.

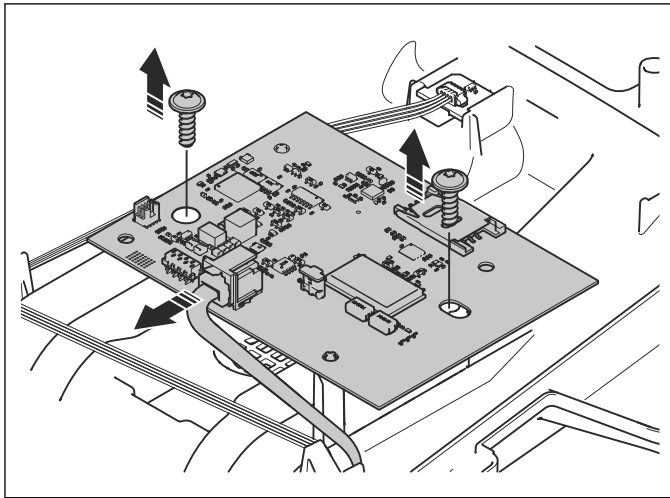
**Note:** The communication circuit board contains an e-SIM. For some markets a separate SIM card is used.

1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the body. Refer to *To remove and install the body on page 19*.
3. Remove the upper chassis. Refer to *To remove and install the upper chassis on page 20*.



**CAUTION:** Always disconnect the power cable first to prevent current spikes that may harm the circuit boards or the battery.

4. Disconnect the cable from the communication circuit board.



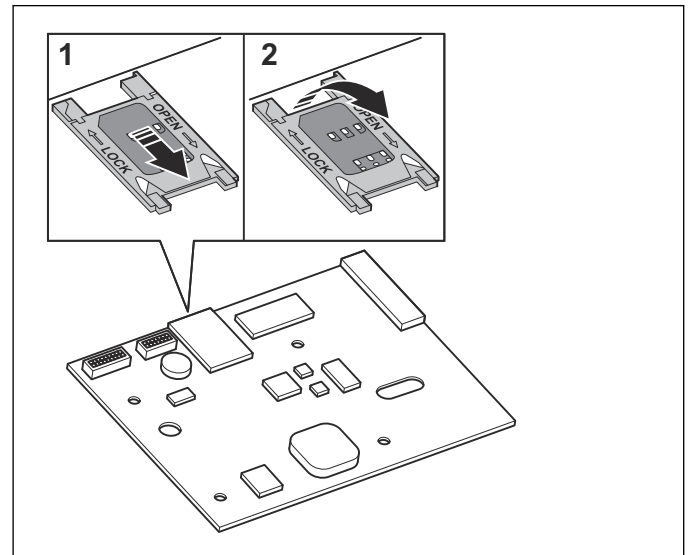
5. Remove the 2 screws and lift up the communication circuit board.
6. Install in the opposite sequence.
7. If an communication circuit board is to be installed as an accessory, you must update the product with new firmware. Connect the product to Autocheck and select *Automatic programming*. Also refer to the instructions provided with the accessory kit.

#### 6.15.4 To replace the SIM card

For communication circuit boards that have a separate SIM card and not an e-SIM.

1. Deactivate Automower® Connect in the display menu *Accessories > Automower® Connect*.
2. Remove the communication circuit board. Refer to *To install the communication circuit board on page 26*.

3. Slide the hatch to the SIM card holder and open the hatch.



4. Remove the SIM card from the holder.
5. Install a new SIM card in the holder.
6. Install in opposite sequence.
7. Switch on the product.
8. Connect to Autocheck.
9. Reset the communication circuit board in Autocheck.

**Note:** When you reset the communication circuit board, the GeoFence settings are set to default and the phone numbers are deleted.

10. Activate Automower® Connect in the display menu *Accessories > Automower® Connect*. The function is active after 5 minutes.

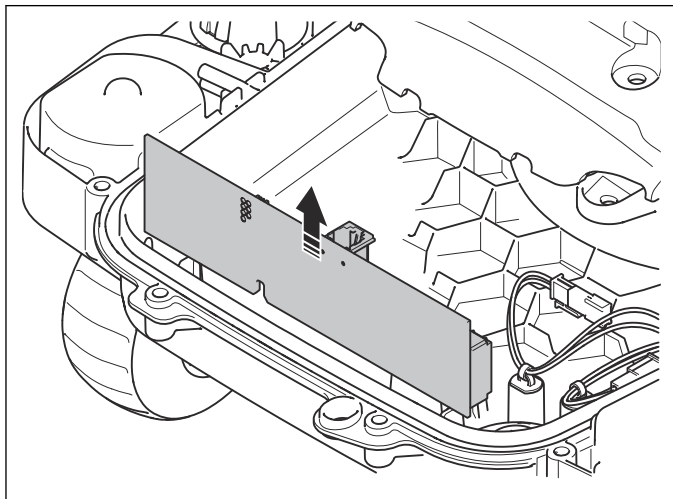
#### 6.15.5 To replace the front loop sensor circuit board

1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the body. Refer to *To remove and install the body on page 19*.
3. Remove the upper chassis. Refer to *To remove and install the upper chassis on page 20*.



**CAUTION:** Always disconnect the power cable first to prevent current spikes that may harm the circuit boards or the battery.

4. Disconnect the cable to the front loop sensor circuit board.



5. Pull up the front loop sensor circuit board.
6. Install in opposite sequence.

#### 6.15.6 To replace the front lift sensor

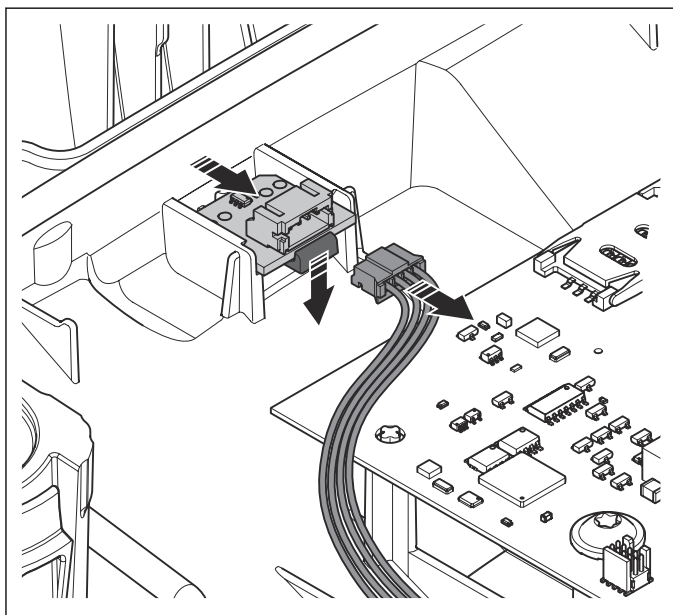
The front lift sensor circuit board must be replaced as a unit. The magnet on the front edge below the body must be installed correctly for the correct operation of the lift sensor. If this is not the condition, the magnet holder, which is part of the charging plate installation, must be replaced.

1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the body. Refer to *To remove and install the body on page 19*.
3. Remove the upper chassis. Refer to *To remove and install the upper chassis on page 20*.



**CAUTION:** Always disconnect the power cable first to prevent current spikes that may harm the circuit boards or the battery.

4. Disconnect the cable.



5. Push down the clip and remove the circuit board.
6. Install in opposite sequence.

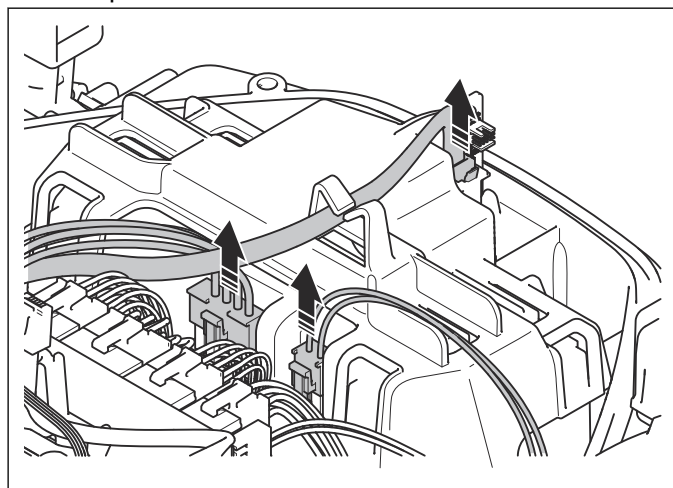
#### 6.15.7 To replace the rear loop sensor circuit board

1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the body. Refer to *To remove and install the body on page 19*.
3. Remove the upper chassis. Refer to *To remove and install the upper chassis on page 20*.

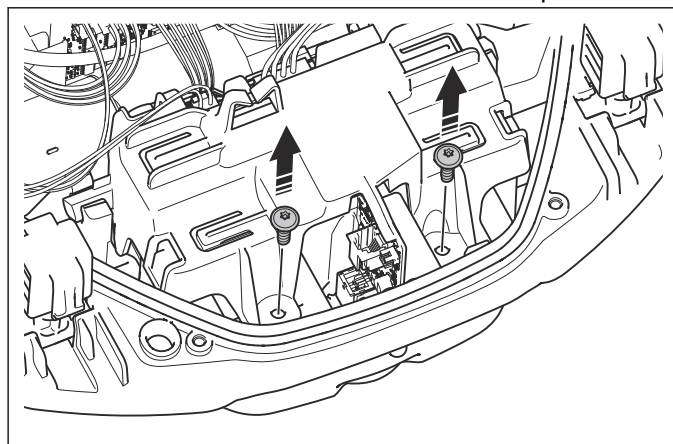


**CAUTION:** Always disconnect the power cable first to prevent current spikes that may harm the circuit boards or the battery.

4. Disconnect the cable from the rear sensor circuit board and the 2 cables connected to the battery.
5. Remove the cables from the cable holders on the clamp.

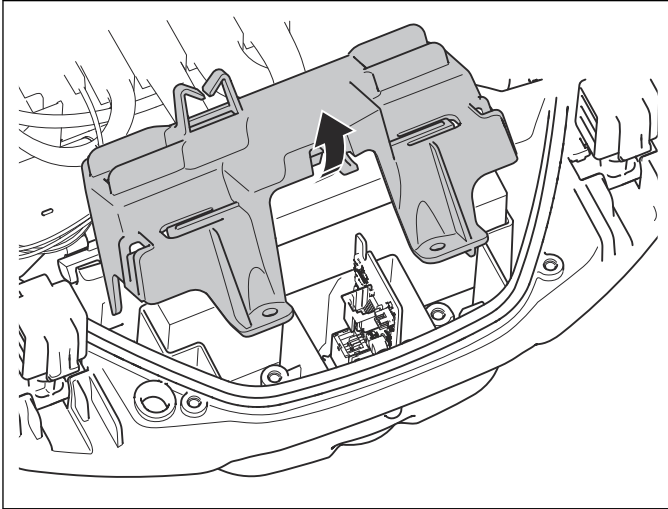


6. Remove the 2 screws that holds the clamp.

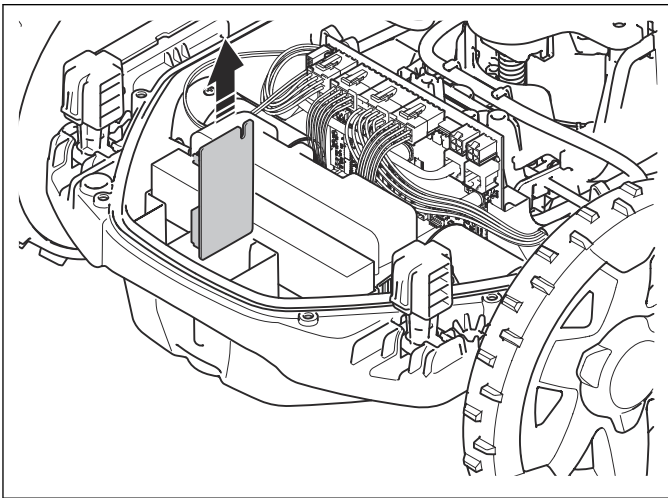




7. Push to detach the 2 clips and pull up.



8. Pull up the circuit board.



9. Install in the opposite sequence.

#### 6.15.8 To replace the tilt sensor

The tilt sensor is integrated in the motor control circuit board. The sensor cannot be replaced separately. The motor control circuit board must be replaced as one unit. Refer to *To replace the motor control circuit board on page 26*.

### 6.16 The battery system



**WARNING:** Use only original batteries recommended by the manufacturer. Product safety cannot be guaranteed with other batteries. Do not use non-rechargeable batteries.

The battery is considered to be fully charged when the battery reaches 80% of the total capacity. To charge the battery to 100% would take too long since the charging current is low. The most rational way of using Li-ion batteries is therefore to stop charging at 80%. The maximum utilised capacity is thus 80% of the battery's total capacity.

The battery is maintenance-free, but has a limited life span. The battery is expected to last for 3000 - 4000 charging cycles. The normal charging current is 1.3 A.

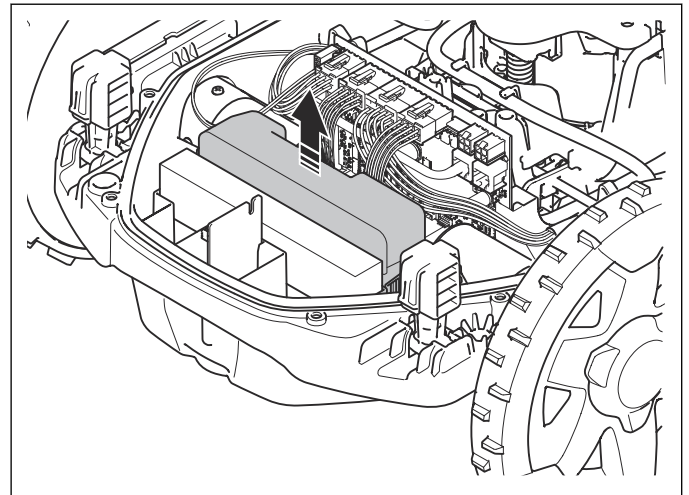
#### 6.16.1 To replace the battery

1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the body. Refer to *To remove and install the body on page 19*.
3. Remove the upper chassis. Refer to *To remove and install the upper chassis on page 20*.



**CAUTION:** Always disconnect the power cable first to prevent current spikes that may harm the circuit boards or the battery.

4. Disconnect the battery cable from the motor control circuit board.
5. Remove the clamp that holds the rear sensor loop circuit board and the battery. Refer to *To replace the rear loop sensor circuit board on page 28*.
6. Lift up and remove the battery.



7. Install a new original battery in the battery holder.
8. Install in opposite sequence.

### 6.17 The cutting system

#### 6.17.1 To replace the cutting motor



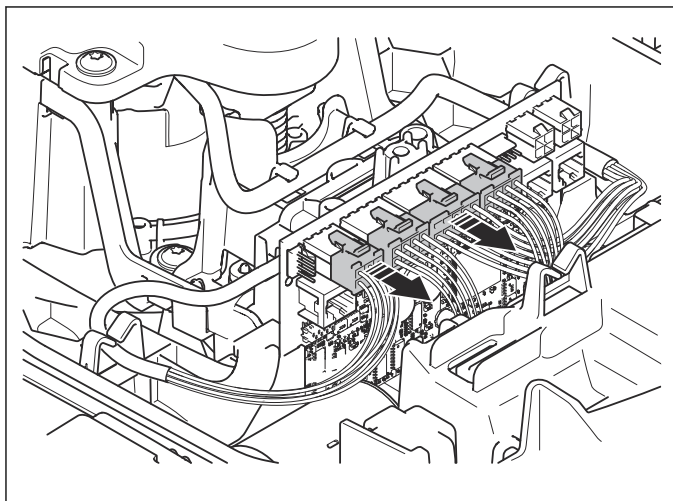
**WARNING:** Be careful when working on the blade disc when the blades are installed.

1. Set the cutting height adjustment to MAX.
2. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
3. Remove the body. Refer to *To remove and install the body on page 19*.
4. Remove the upper chassis. Refer to *To remove and install the upper chassis on page 20*.

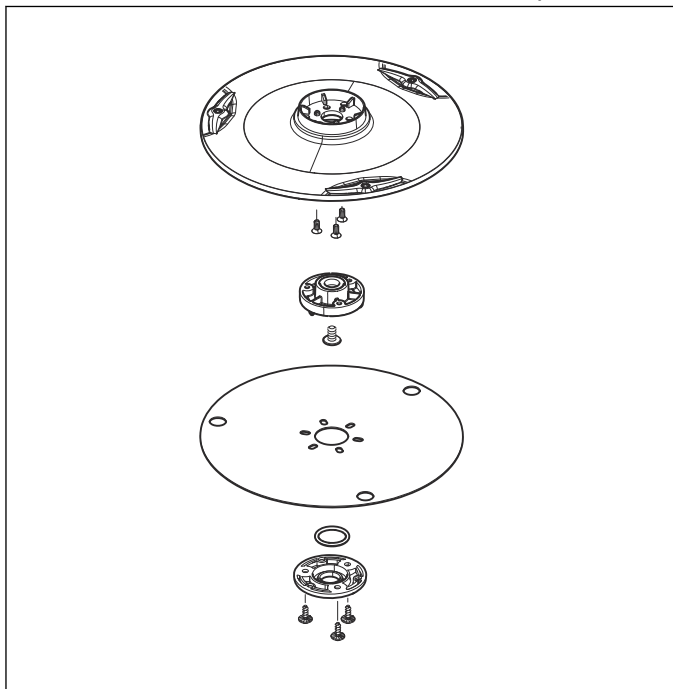


**CAUTION:** Always disconnect the power cable first to prevent current spikes that may harm the circuit boards or the battery.

5. Disconnect the cutting motor cable and the height adjustment motor cable from the motor control circuit board.

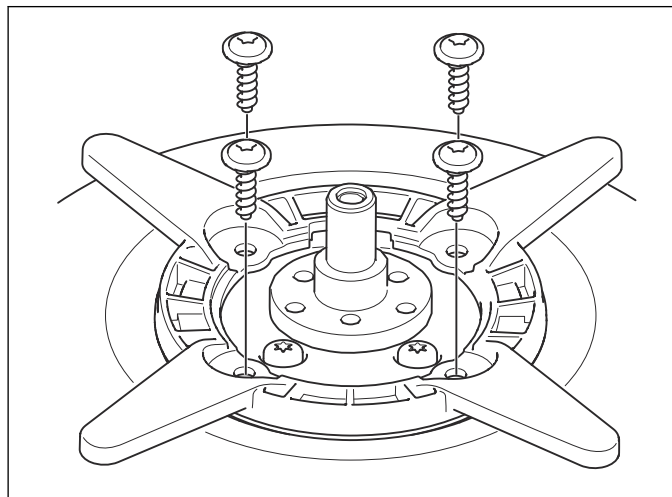


6. Remove the 3 screws that holds the skid plate.

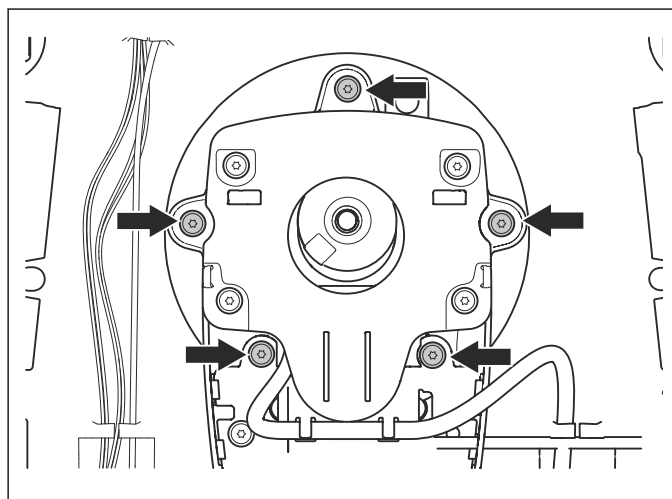


7. Remove the screw (hex key 4) that holds the bearing.
8. Remove the 3 screws that holds the blade disc.

9. Remove the 4 screws and the frame.

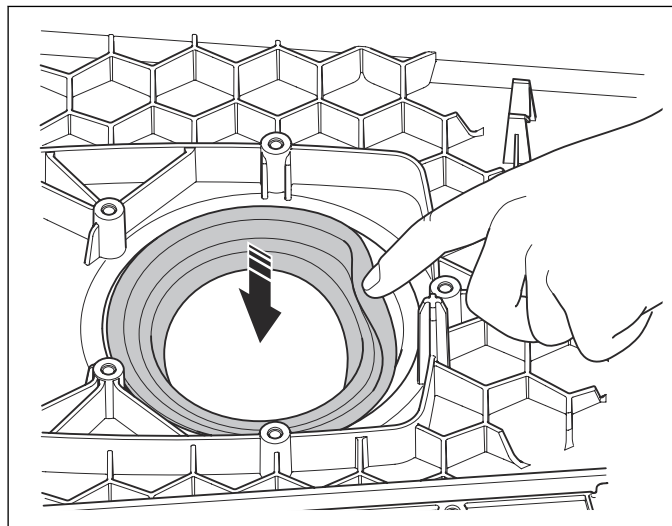


10. Remove the 5 screws that holds the cutting system to the lower chassis.

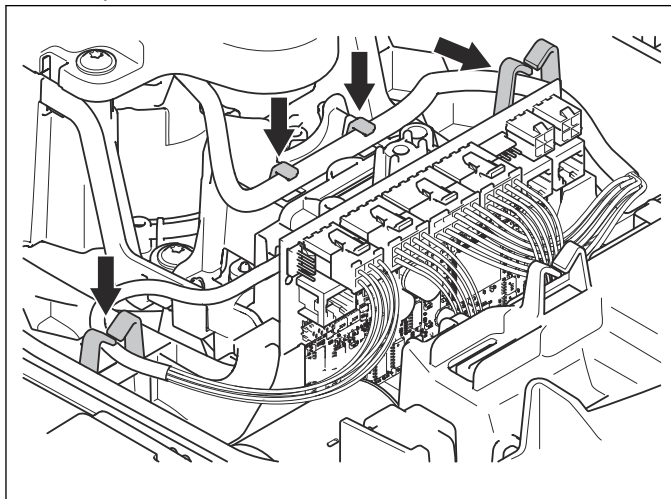


11. Lift up and remove the cutting system.

12. Push down the bellows and remove it from the rear side.



13. Install in the opposite sequence. Connect the cables and position them in the cable holders.

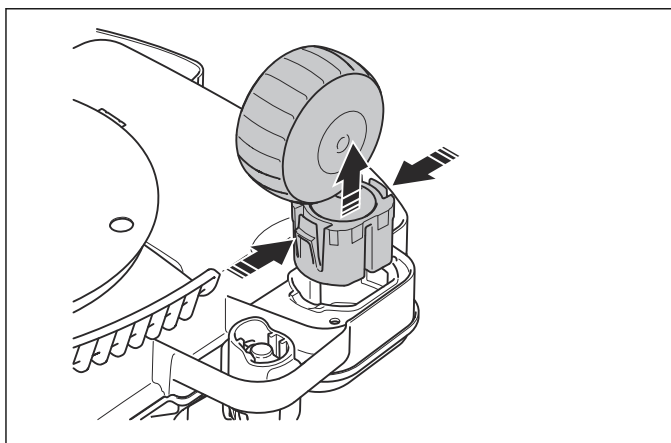


**Note:** Make sure that the bellows are installed correctly to get a sufficient seal.

## 6.18 Wheels and wheel motors

### 6.18.1 To replace the front wheels

1. Push the ON/OFF button to switch off the product. The product is disabled when the indicator lamp is not lit.
2. Turn the product upside down.
3. Push to release the clips and lift up the wheel to remove it.



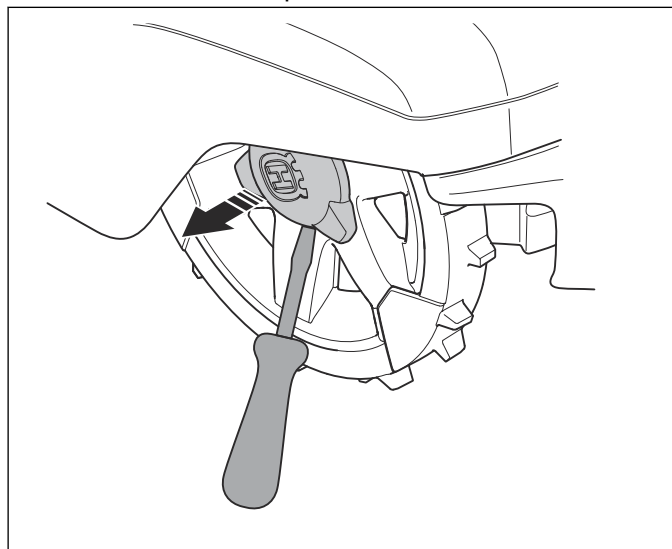
4. Install in opposite sequence.

### 6.18.2 To replace the rear wheels

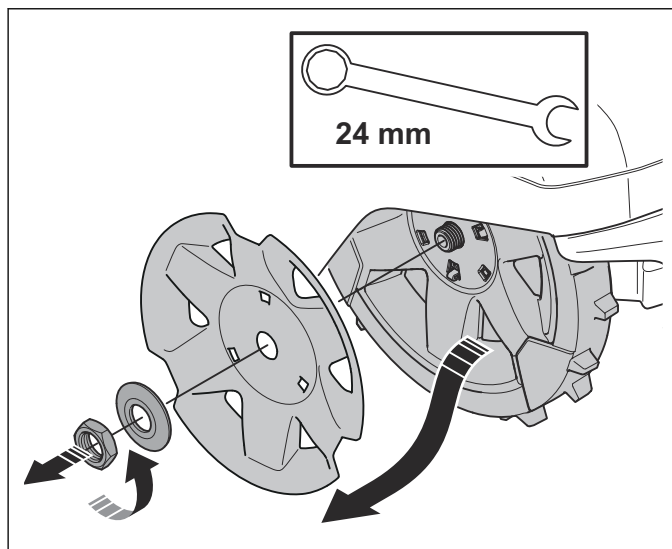
**Note:** When using the terrain wheels with weights, special settings are needed to compensate for additional weight. Collision is detected by the current in the wheel

motor. Enter the menu *Accessories > Terrain kit* and enable Terrain kit.

1. Remove the hub cap.



2. Remove the nut (24 socket wrench), the washer and the wheel cover.



3. Remove the wheel.
4. Install in the opposite sequence.

### 6.18.3 To replace the wheel motors

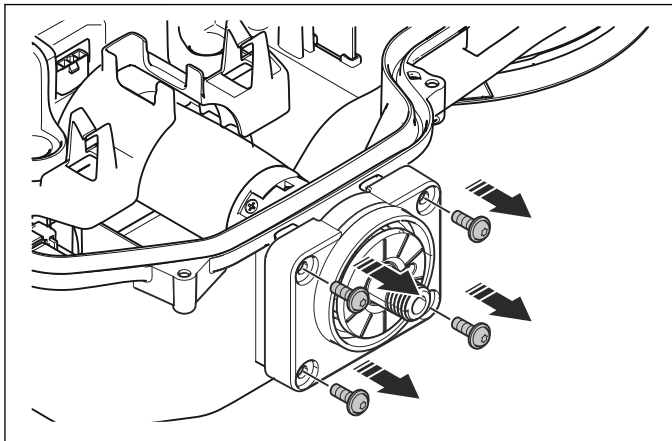
1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the body. Refer to *To remove and install the body on page 19*.
3. Remove the upper chassis. Refer to *To remove and install the upper chassis on page 20*.



**CAUTION:** Always disconnect the power cable first to prevent current spikes that may harm the circuit boards or the battery.

4. Disconnect the wheel motor cable from the motor control board.

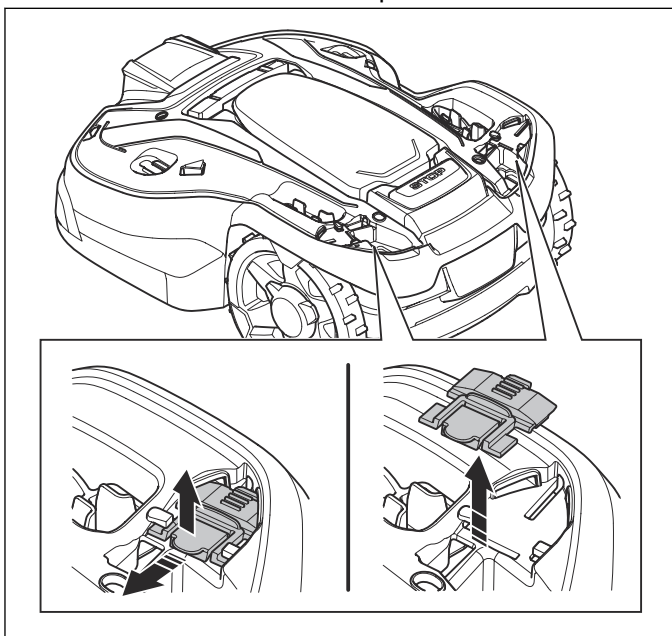
5. Remove the wheel. Refer to *To replace the rear wheels on page 31*.
6. Remove the 4 screws for the wheel motor.



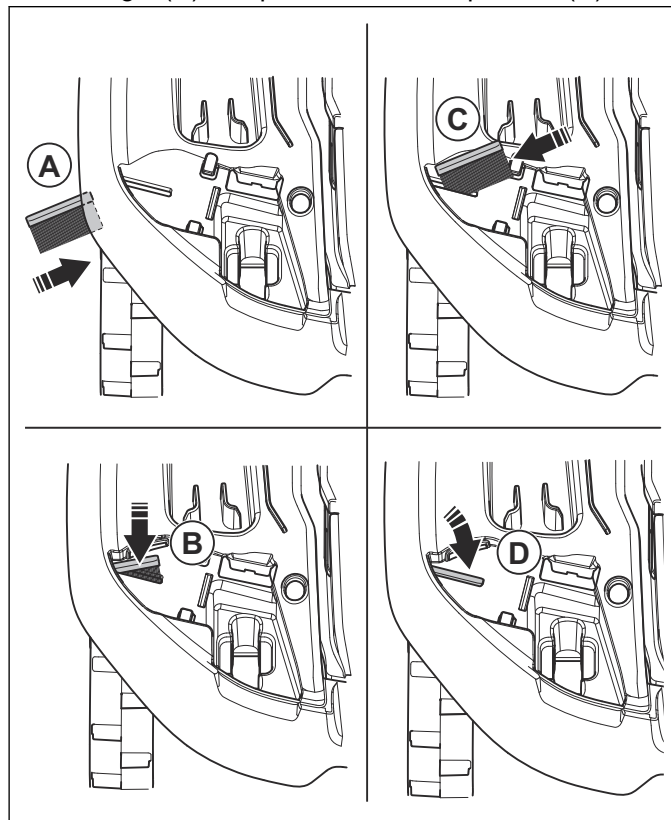
7. Remove the wheel motor.
8. Install the new wheel motor.
9. Install in opposite sequence.

#### 6.18.4 To install or replace the wheel brushes

1. Remove the top cover. Refer to *To remove and install the top cover on page 19*.
2. Remove the wheel brush holders. Lift the clips on the wheel brush holder and push forward.



3. Insert the wheel brush in the slot from below in an angle (A) and push it down into position (B). As an alternative, insert the wheel brush from the above in an angle (C) and push it down into position (D).



4. Install in the opposite sequence.

### 6.19 Charging station

The charging station consists of a baseplate and a charging tower with the charging station's circuit board and the contact plates. When the product's battery does not recharge or cannot contact the charging station this may be due to worn contact plates in the charging station. Also check the charging plates on the product.

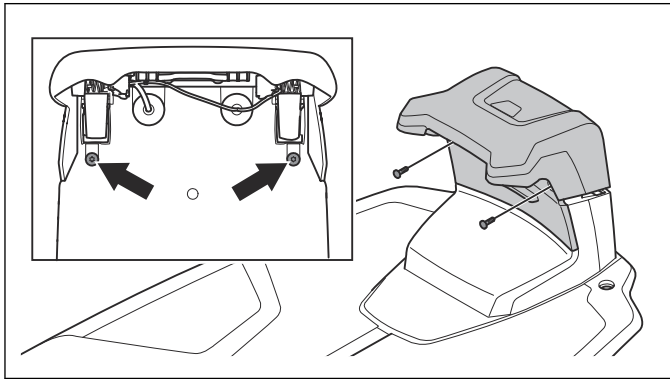
#### 6.19.1 To remove and install the charging station and the charging station cap

This section gives information on how to remove all parts of charging tower. For service or to replace spare parts all steps may not be needed.

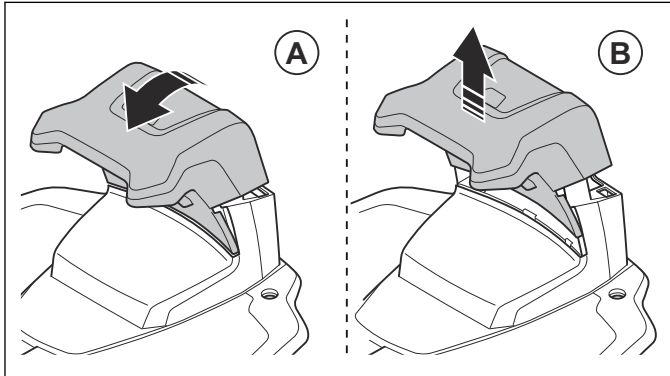
1. Disconnect the power supply.
2. Push the button and tilt the charging station cap.
3. Disconnect all cables from the charging station.



4. Remove the 2 screws on the front of the charging station.

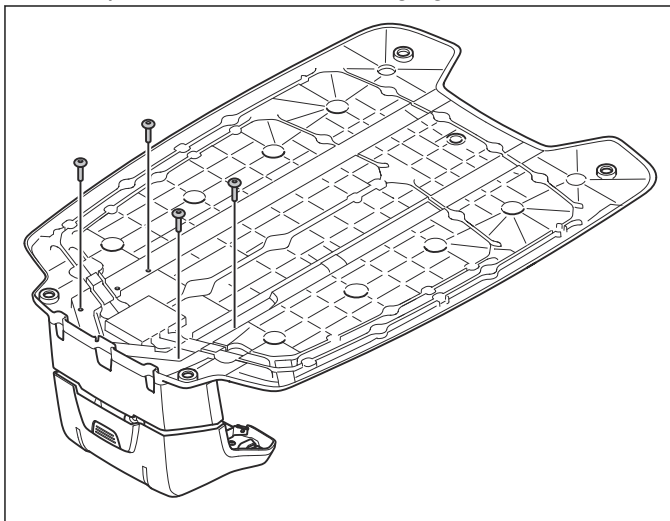


5. Carefully lift the charging cover forward and upward from the charging tower.

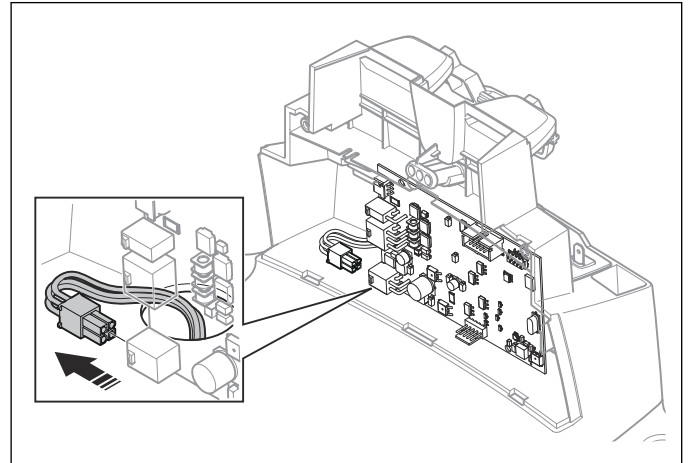


6. Disconnect the charging cable.

7. Remove the 4 screws from underneath the baseplate to remove the charging tower.



8. Disconnect the cables to the cable plate.

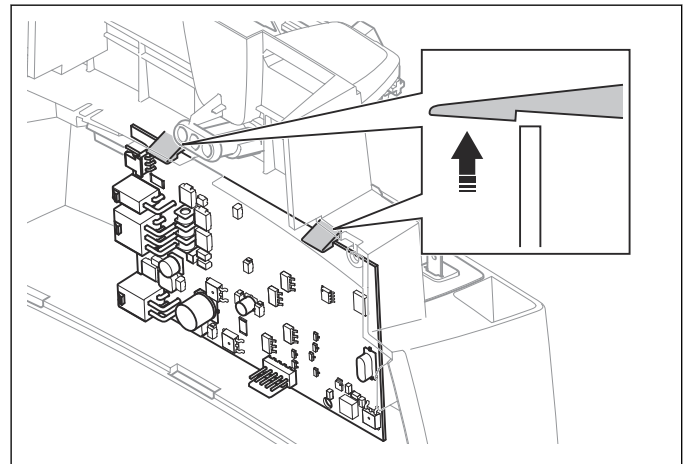


9. Remove the charging tower from the baseplate.

10. Install in opposite sequence.

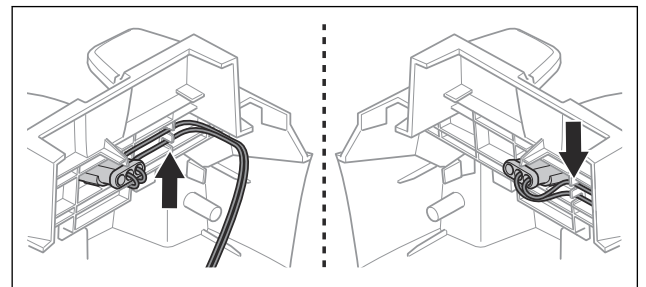
#### 6.19.2 To replace the circuit board in the charging station

1. Remove the charging tower and charging station cap. Refer to *To remove and install the charging station and the charging station cap on page 32.*
2. Disconnect the cables from the circuit board.
3. Push the 2 clips to remove the circuit board.



4. Attach the new circuit board.

**Note:** Make sure that the cables to the power supply are in the cable holders behind the circuit board.

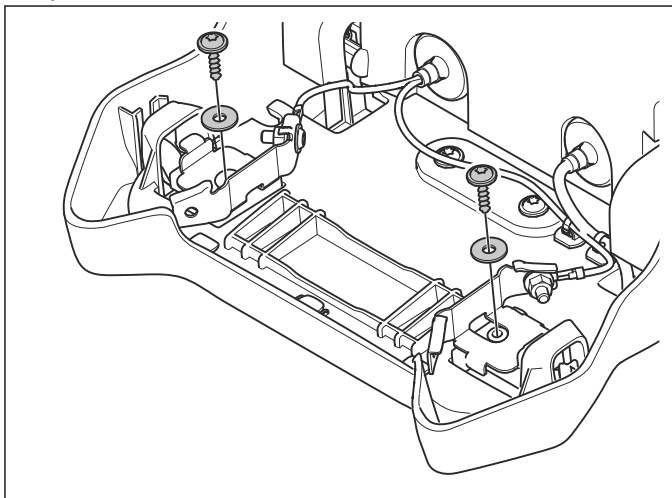


5. Reconnect the cables to the new circuit board.

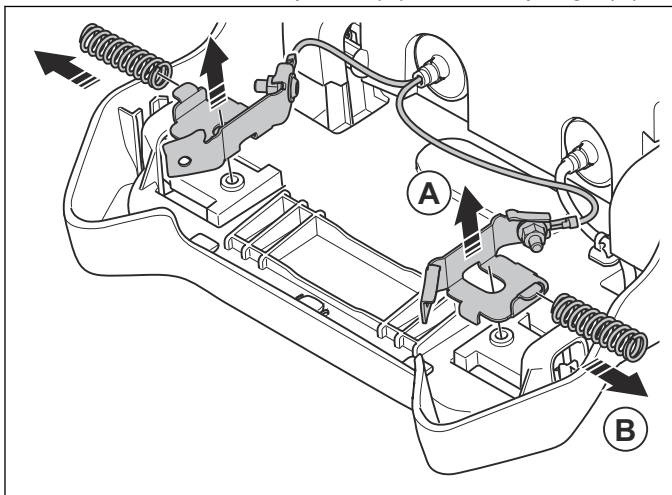
6. Install in opposite sequence.

### 6.19.3 To replace the contact plates in the charging station

1. Remove the charging tower and charging station cap. Refer to *To remove and install the charging station and the charging station cap on page 32*.
2. Remove the 2 screws and washers for the contact plates.



3. Remove the contact plates (A) and the springs (B).



4. Remove the grommet and thread the cables through the hole.
5. Install in opposite sequence.

### 6.20 To mount screws in plastic



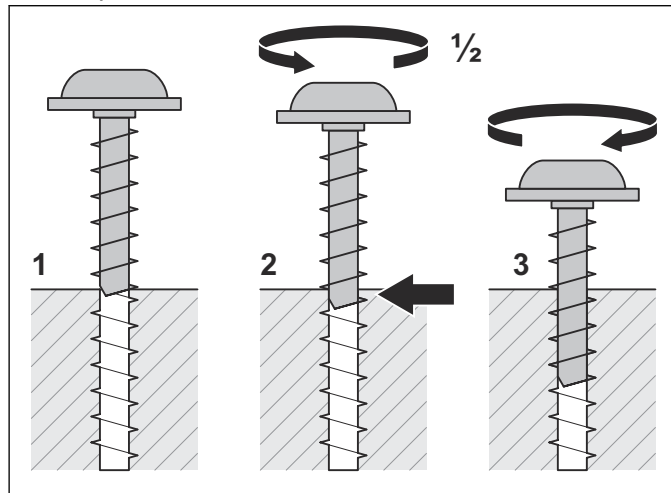
**CAUTION:** If the screws are mounted incorrectly, there is a risk of damaging the threads in the plastic and thereby shortening the service life of the plastic part. If threads are destroyed, the part must be replaced or thread plugs can be inserted. Refer to *To mount thread plugs on page 34*.



**CAUTION:** When assembling parts in plastic, always tighten the screws crosswise. This is to avoid tension in the plastic, causing malfunction or not attaining a satisfactory seal.

To ensure the threads in plastic parts are not damaged:

1. Carefully turn the screw counter-clockwise until it engages the existing threads in the plastic. The screw will fall slightly by itself when the threads are located correctly in relation to the existing threads in the plastic.



2. Screw in the screw to the correct torque as specified in *Screw fasteners on page 37*.

### 6.21 To mount thread plugs

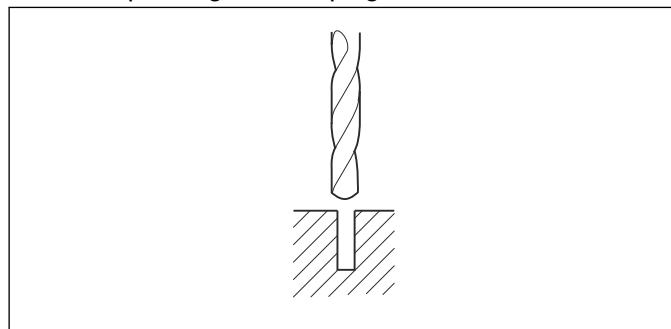
If the threads in plastic parts are worn, thread plugs can be inserted. A repair kit containing thread plugs and suitable metal screws is available to order.



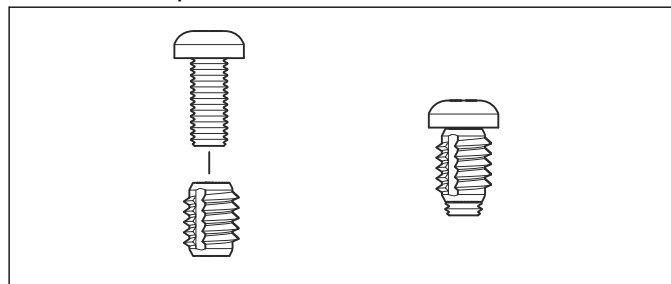
**CAUTION:** Fit the thread plug carefully since there is a risk that the screw bosses crack.

To mount a thread plug into a worn plastic thread:

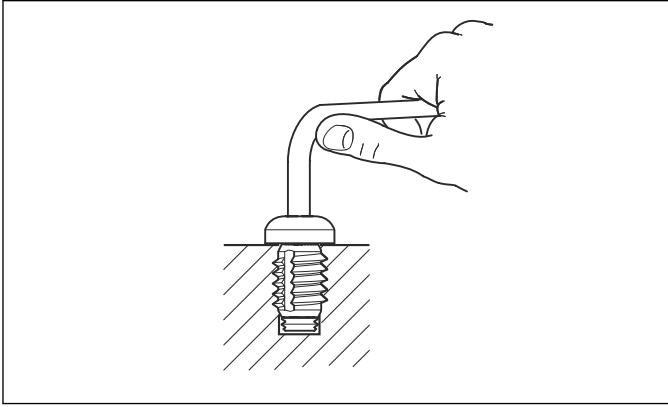
1. Make the hole bigger with a 6.6 mm drill to a depth corresponding with the plug.



2. Mount the thread plug with the screw that comes with the repair kit and screwdriver.

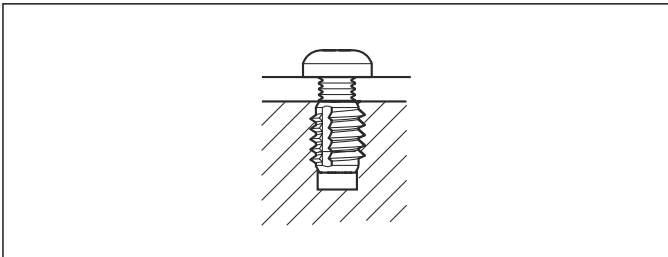


3. Make sure the plug is screwed in completely so that a good seal is obtained.



**CAUTION:** Tighten by hand so as not to damage the plastic.

4. Fit the plastic parts with the accompanying screw instead of the old plastic screw.



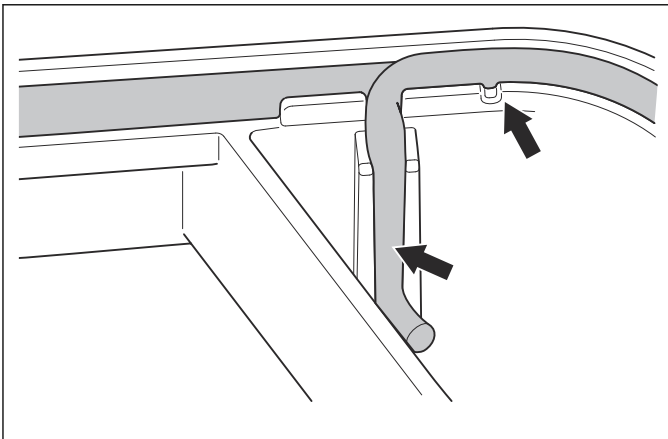
## 6.22 To replace the sealing strip

There is one sealing strip in the product between the upper and lower chassis.



**CAUTION:** A 5 mm sealing strip must be used. Sealing may be deficient if the wrong sealing strip is used.

1. Start by laying one end of the sealing strip in line with the marking on the chassis.
2. Continue laying the sealing strip clockwise around the lower chassis.
3. Lay the other end of the sealing strip above the first end and then out of the channel. Fasten the sealing strip in the retainer.



## 7 Service

### 7.1 Service schedule

The table below contains a checklist of points and actions to be taken when servicing the product.

Every year	Every 3rd year	Action	Explanation
X		Firmware update If firmware is available in Autocheck, update the product with the newest firmware.	Refer to <i>Firmware on page 16</i> .
X		Autotest Diagnostic test of all product functions.	Make a complete Autotest in Autocheck. Refer to <i>Auto test on page 16</i> .
X		Service messages Do a check of the service messages for recommended upgrades.	Updated service bulletins can be found in Autocheck.
X		Cleaning Remove the body of the product. Clean the body of the product, the chassis and the wheels.	Refer to <i>To remove and install the body on page 19</i> .
X		Charging plates Examine the cable and connector to the charging plates on the body of the product. Replace if damaged.	Refer to <i>To replace the headlights and the charging plates on page 21</i> .
X		Rubber grommets Examine the rubber grommets on the chassis to make sure that they are completely sealed. Replace if damaged.	Refer to <i>To remove and install the body on page 19</i> .
X	X	Ventilation filter Examine the ventilation filter and clean carefully with a soft brush. The ventilation filter should be replaced after three years of use.	Refer to <i>To clean and replace the ventilation filter on page 23</i> .
X		Hatch Clean the area around the display cover hinge.	
X		Bearings Examine the rear wheel bearings. Replace if damaged.	Refer to <i>To replace the rear wheels on page 31</i> .
X		Wheels Examine the front and rear wheels. Replace if damaged.	Refer to <i>To replace the front wheels on page 31</i> and <i>To replace the rear wheels on page 31</i> .
X		Body suspension parts Examine and clean the body suspension parts.	Refer to <i>To replace the front body suspension parts on page 22</i> and <i>To replace the rear body suspension parts on page 22</i> .
X		Bellows Do a check of the rubber bellow in the cutting height adjustment. Refer to <i>To replace the wheel motors on page 31</i> .	

Every year	Every 3rd year	Action	Explanation
X		Chassis screws Do a check of the tightening torque of chassis screws.	Refer to <i>Screw fasteners on page 37</i> .
X		Blades Replace blades and blade screws.	Refer to <i>Maintenance - Replace the blades in the Operator's manual</i> .
X		Skid plates Examine the skid plate and the skid plate bearing. Replace the bearing if damaged.	Make sure that the skid plate can rotate freely and that the ball bearing does not make a noise.
	X	Sealing strips Every third year, open the chassis and replace all sealing strips.	Refer to <i>To replace the sealing strip on page 35</i> .
X		Cleaning Clean the charging station by using a wet brush and/or a moist cloth.	
X		Charging plates Examine and polish the charging plates on the product and the charging plates on the charging station.	Polish contact surfaces on both the product and the charging station with a fine grade emery cloth.
X		Docking Check that docking and charging works correctly.	Refer to <i>Symptoms during docking on page 48</i> and <i>Symptoms during charging on page 49</i> .
X		Charging Fully charge the battery.	Always charge the battery fully before winter storage. If this is not done, the battery may be rendered useless due to coltage levels dropping too low.

## 7.2 Screw fasteners

All screws are made from stainless material or rustproofed with zinc plating. Article numbers are found in the spare parts list (IPL).

The tightening torque must be attained, otherwise there is not a satisfactory seal against moisture etc.

Fastener	Hardware	Tool	Tightening torque (Nm)
Upper to lower chassis	Screw, 5 x 16 mm	Torx 20	1.8
Rear bumper to body	Screw, 5 x 16 mm	Torx 20	1.8
Front bumper to body	Screw, 5 x 16 mm	Torx 20	1.8
Holder charging strips	Screw, 5 x 16 mm	Torx 20	1.8
Support for hatch	Screw, 5 x 16 mm	Torx 20	1.8
Communication circuit board	Screw, 5 x 16 mm	Torx 20	1.0
Service plug	Screw, 5 x 16 mm	Torx 20	1.0
Wheel motor to lower chassis	Screw, 5 x 16 mm	Torx 20	1.8
Rear wheel	Nut, M16	24 socket spanner	18
Blade disc	Screw, M4 x 8 mm	Cross screwdriver	1.8
Blade disc bearing	Screw, M6 x 8 mm	Allen key 4	5.5
Blades	Screw, M4 x 10 mm	Flat/cross screwdriver	1.8

Fastener	Hardware	Tool	Tightening torque (Nm)
Bearing cover, skid plate	Screw gray, 4 x 14 mm	Torx 20	1.2
Cutting motor to lower chassis	Screw, 5 x 16 mm	Torx 20	1.8
Clamp for battery, weight and rear loop sensor circuit board.	Screw, 5 x 16 mm	Torx 20	1.8
Charging station, lid	Screw gray, 4 x 14 mm	Torx 20	0.8
Charging station, frame	Screw gray, 4 x 14 mm	Torx 20	1.2
Charging station, contact strips	Screw gray, 4 x 14 mm	Torx 20	0.8
Charging station, base and housing	Screw gray, 4 x 14 mm	Torx 20	1.2

## 8 Troubleshooting

### 8.1 Messages

The table below contains fault and information messages which can appear in the product.

There are references to menus in the product, but Autocheck can also be used in many cases.

**Note:** Refer to the Operator's manual for more information about how to rectify errors.

Messages			
Number	Message	Cause	Action
0	No message	Indicates that no message is stored.	
1	Outside working area	The boundary wire connections to the charging station are crossed.	Check that the boundary wire is connected correctly to the charging station.
		The boundary wire is too close to the edge of the work area.	Check that the boundary wire has been laid according to the instructions.
		The work area slopes too much at the boundary wire.	Check that the boundary wire has been laid according to the instructions.
		The boundary wire is crossed on its way to and from an island.	Check that the boundary wire has been laid according to the instructions. Refer to <i>To examine where to put the boundary wire</i> in the Operator's manual.
		The product finds it hard to distinguish the signal because of an installation close by.	Put the product in the charging station and generate a new loop signal.
		Disturbances from magnetic objects (fences, reinforcement steel) or buried cables close by.	Try moving the boundary wire and/or creating additional islands in the work area.

Messages			
Number	Message	Cause	Action
2	No loop signal	Boundary wire broken.	Check the signal given by the LED on the charging station. If the LED indicates a break in the boundary wire, find out where the break is. Replace the damaged section of the loop with a new loop wire and splice using an original coupler.
		The boundary wire is not connected to the charging station.	Check that the boundary wire connectors are fitted properly to the charging station. Replace connectors if damaged.
		The power supply or low voltage cable are not connected.	Check the LED status on the charging station. If the LED is not lit it indicates that there is no power. Check the wall socket connection and whether an earth-fault breaker has tripped. Check that the low voltage cable is connected to the charging station.
		The power voltage cable or low voltage cable are damaged.	Replace the power supply or low voltage cable.
		The pairing between the product and the charging station is broken.	Put the product in the charging station and generate a new loop signal. Refer to <i>To create a new loop signal</i> in the Operator's manual.
		The boundary wire is crossed on its way to and from an island.	Check that the boundary wire has been laid according to the instructions. Refer to <i>To examine where to put the boundary wire</i> in the Operator's manual.
		Disturbances from metal objects (fences, reinforcement steel) or buried cables.	Try moving the boundary wire and/or creating additional islands in the work area to increase the signal strength.
		ECO mode is activated and the product has attempted to start outside the charging station.	Put the product in the charging station, start the product and close the hatch.
4	Loop sensor problem, front	The cabling to the sensor circuit board is faulty or has come loose.	Check the cabling and refit the cable or replace if necessary.
		The front loop sensor circuit board is faulty.	Check and replace the front loop circuit board if necessary. Refer to <i>To replace the front loop sensor circuit board on page 27</i> .
		Electronic or software related problem in the product.	Check the levels for the A signal. Refer to <i>Loop signal on page 49</i> .



Messages			
Number	Message	Cause	Action
5	Loop sensor problem, rear	The cabling to the sensor circuit board is faulty or has come loose.	Check the cabling and refit the cable or replace if necessary.
		Electronic or software related problem in the product.	Check the levels for the A signal. Refer to <i>Loop signal on page 49</i> .
		The rear loop sensor is faulty.	Check and replace the rear sensor circuit board if necessary. Refer to <i>To replace the rear loop sensor circuit board on page 28</i> .
8	Wrong PIN	Wrong PIN code has been entered. Five attempts are permitted, then the keypad is blocked for a period of time.	Enter the correct PIN code. If you forget the PIN code refer to <i>To recover the PIN code on page 17</i> .
9	Trapped	The product is stuck in a small area behind a number of obstacles.	Check if there are any obstacles which make it hard for the product to move on from this location.
10	Upside down	The product is leaning too much, or has turned over.	Turn the product the right way up.
11	Low battery	The product cannot find the charging station.	Change the position of the guide wire. Refer to <i>To examine where to put the guide wire</i> in the Operator's manual.
			Check the installation settings about how to find the charging station. Refer to <i>To find the charging station</i> in the Operator's manual.
		The battery is spent.	Perform a battery test. Refer to <i>Auto test on page 16</i> .
		The charging station's antenna is defective.	Check if the indicator lamp in the charging station flashes red. Check and replace the baseplate of the charging station if necessary.
12	Empty battery	Refer to number 11 above.	Check the installation settings about how to find the charging station. Refer to number 11 above.
15	Mower lifted	The lift sensor has been activated due to the product getting stuck.	Free the product and rectify the reason.
		One of the lift sensor magnets is inverted or missing.	Check the magnet. Refer to <i>To replace the front loop sensor circuit board on page 27</i> .
		The lift sensor is faulty.	Check the lift sensor. Refer to <i>To replace the front lift sensor on page 28</i> .
16	Stuck in charging station	There is an object in the way of the product preventing it from leaving the charging station.	Remove the object.
		The product slides on the baseplate.	Clean the baseplate.

Messages			
Number	Message	Cause	Action
17	Charging station blocked	There is an object in the way of the product preventing it from entering the charging station.	Remove the object.
		The baseplate is bent.	Ensure that the baseplate is placed on level ground.
		The contact between the charging plates and contact plates may be poor and the product has made a number of attempts to charge.	Put the product in the charging station and check that the charging plates and contact plates make good contact.
18/19	Collision sensor	The rear wheels of the product are blocked.	Free the product and correct the cause of the problem.
20/21	Wheel motor blocked, right/left	Grass or other object has wrapped around the drive wheel.	Check the drive wheel and remove any objects.
22/23	Wheel drive problem, right/left	The wheel motor is faulty.	Check the function of the wheel motors when idling. Replace if faulty. Refer to <i>To replace the wheel motors on page 31</i> .
		The motor control circuit board is faulty.	Replace the motor control circuit board. Refer to <i>To replace the motor control circuit board on page 26</i> .
		The cabling to the wheel motor is damaged.	Check whether the damage is repairable. Replace the wheel motor if necessary.
25	Cutting system blocked	Grass or another object may have become wrapped around the blade disc.	Check the blade disc and remove any object.
		The blade disc lies in a pool of water.	Move the product and prevent the collection of water in the work area.
		The cutting motor is defective.	Make sure the cutting motor has the right speed. Refer to <i>Tools - Test - Motors on page 12</i> .
		The motor control circuit board is defective.	Replace motor control circuit board. Refer to <i>To replace the motor control circuit board on page 26</i> .
		The cabling to the cutting motor is damaged or faulty.	Check whether the damage is repairable. Otherwise replace the cutting motor.
26	Invalid sub-device combination	Unknown combination of software versions.	Program the product with the most recent main program. Refer to <i>Firmware on page 16</i> .
		Invalid combination of circuit boards.	Replace the circuit boards to a valid combination.

Messages			
Number	Message	Cause	Action
27	Settings restored	When restoring user settings after, e.g circuit board replacement, user settings failed to save and the product has been reset to factory settings.	If the fault occurs repeatedly, program the product with the most recent main program. Refer to <i>Firmware on page 16</i> .
			If the fault occurs repeatedly, even using the most recent main program, replace the motor control circuit board. Refer to <i>To replace the motor control circuit board on page 26</i> .
		Confirmation that Reset all user settings has been carried out.	This is normal. No action required.
28	Electronic problem	Memory data error.	Program the product with the most recent main program. Refer to <i>Firmware on page 16</i> .
			Replace the motor control circuit board. Refer to <i>To replace the motor control circuit board on page 26</i> .
29	Slope too steep	Mower stopped because the slope is too steep.	Calibrate the tilt sensor. Refer to <i>Tools - Calibrate on page 13</i> .
			Change the installation of the boundary wire to exclude this steep part of the work area. Refer to <i>To examine where to put the boundary wire</i> in the Operator's manual.
30	Charging system problem	Battery not connected properly, or faulty.	Check that the battery is properly connected. Refer to <i>The battery system on page 29</i> .
		Wrong type of battery.	Use only original batteries recommended by the manufacturer.
32	Tilt sensor problem	The tilt sensor has invalid values.	Calibrate the tilt sensor. Refer to <i>Tools - Calibrate on page 13</i> .
			Replace the motor control circuit board. Refer to <i>To replace the motor control circuit board on page 26</i> .
33	Mower tilted	The product is tilted more than the maximum angle.	Move the product to a flat area.
35/36	Wheel motor overloaded, right/left	Grass or other object has wrapped around the drive wheel.	Check the drive wheel and remove any objects.
37	Charging current too high	The battery is being charged with too high current.	Fault in the power supply, or wrong type of power supply or charging station is being used.

Messages			
Number	Message	Cause	Action
38	Electronics problem	Communication problems with the cutting system.	Restart the product.
			Replace the motor control circuit board. Refer to <i>To replace the motor control circuit board on page 26</i>
			Update the firmware via Autocheck.
40 - Limited cutting height range 41 - Unexpected cutting height adj 42 - Limited cutting height range 43 - Cutting height problem, drive 44 - Cutting height problem, current 45 - Cutting height problem, direction 46 - Cutting height blocked 47 - Cutting height problem		The cutting height adjustment cannot move.	Remove the chassis and check that the cutting height adjustment can move. Do a check on all moving parts in the cutting height system.
		The cutting height adjustment motor is not installed correctly or is defective.	Do a check on the motor cabling and make sure it is installed correctly. Replace the motor if necessary.
		The cutting height sensor circuit board is not installed correctly or is defective.	Do a check that the cutting height sensor circuit board is installed correctly. Replace the circuit board if necessary.
		The cutting height adjustment has been altered without a request from the product.	Do a cutting height calibration. Refer to <i>Tools - Calibrate on page 13</i> .
50	Guide not found	The guide wire is not connected to the charging station.	Check that the guide wire connector is tightly connected to the charging station. Refer to <i>To install the guide wire</i> in the Operator's manual.
		Break in the guide wire.	Find out where the break is. Replace the damaged section of the guide wire with a new loop wire and splice using an original coupler.
		The guide wire is not connected to the boundary loop.	Check that the guide wire is connected correctly to the boundary loop. Refer to <i>To install the guide wire</i> in the Operator's manual.
53	GPS navigation problem	The cable to the communication circuit board is defective or has come loose.	Inspect and refit the cable.
		The communication circuit board is defective.	Replace the communication circuit board.
54	Weak GPS signal	The GPS signal is blocked in large parts of the work area.	If possible, remove objects that are blocking the signal.
			Disable the GPS navigation function and use the lawn coverage function instead.
55	Difficult finding home	The product has followed the boundary wire but has not found the charging station.	Check the boundary wire's corridor width setting and location. Refer to the Operator's manual.

Messages			
Number	Message	Cause	Action
58	Temporary battery problem	Wrong type of battery.	Use only original batteries recommended by the manufacturer.
60	Temporary battery problem	Battery temperature sensor defective.	Replace the battery. Refer to <i>To replace the battery on page 29</i> .
		Wrong type of battery.	Use only original batteries recommended by the manufacturer.
62	Battery temperature outside limits	The temperature in the battery is too high or too low to enable normal operation.	No action. When the temperature is back within the allowed limits the product will revert to normal operation.
66	Battery problem	Battery not connected properly, or faulty.	Check that the battery is properly connected. Refer to <i>The battery system on page 29</i> .
		Wrong type of battery.	Use only original batteries recommended by the manufacturer.
69	Alarm! Mower shut down	Alarm has been activated as the product is shut down.	Adapt the security level of the product in the <i>Security menu</i> .
70	Alarm! Mower stopped	Alarm activated as the product has been stopped.	
71	Alarm! Mower lifted	Alarm activated as the product has been lifted.	
72	Alarm! Mower tilted	Alarm activated as the product has been tilted.	
73	Alarm! Mower was moved	Alarm activated as the product has been moved.	
74	Alarm! Mower outside Geofence	Alarm activated as the product was moved outside the Geofence area.	
75	Connection changed	New loop signal successfully changed.	No action.
76	Connection NOT changed	Failed to change loop signal.	Try several times to create a new loop signal. If the problem remains, replace the battery. Refer to <i>To replace the battery on page 29</i> .
77	Connection problems	Problem with the Automower® Connect module.	Restart the product. If the fault persists, refer to <i>To install the communication circuit board on page 26</i> .
78	No drive	The product has hit an obstacle and stopped or the wheels cannot move on the wet grass.	Free the product and rectify the reason for the lack of drive. If it is due to wet grass, wait until the lawn has dried before using the product.
		The work area includes a steep slope.	Check the maximum guaranteed slope. Steeper slopes should be isolated.
		The guide wire is not laid at an angle on a slope.	Lay the guide wire at an angle across the slope.

Messages			
Number	Message	Cause	Action
80	Cutting system imbalanced	Too few or too many blades.	Check the blades on the blade disc.
81	Safety function faulty	Status LED malfunctioning.	Restart the product. If the problem remains, replace the keypad, application circuit board or cabling. Refer to <i>To replace the keypad on page 23</i> , <i>To replace the application circuit board on page 26</i> .
89	Invalid system configuration	Wrong configuration of the circuit boards after replacing a circuit board.	Redo the configuration in Autocheck.

Messages			
Number	Message	Cause	Action
MESSAGES WITHOUT ERROR CODE			
NA	Needs manual charging	The product is set to the <i>Secondary area</i> operating mode.	Put the product in the charging station. This behavior is normal and no further action is required.
	Next start hh:mm	The timer setting prevents the product from operating.	Change the timer settings.
		The products clock is incorrect.	Set the time.

## 8.2 Symptoms

The most commonly occurring symptoms are described below. All symptoms are grouped by the situation where they occur most often.

- |                             |                  |
|-----------------------------|------------------|
| 1. Mowing                   | 5. Charging      |
| 2. Searching                | 6. Miscellaneous |
| 3. Following the guide wire |                  |
| 4. Docking                  |                  |

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**Note:** Refer to the Operator's manual for more information about how to rectify errors.

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## 8.2.1 Symptoms during mowing

Symptom	Cause	Action
Uneven mowing results	The product works too few hours per day.	Increase the working hours.
	Work area too large.	Try to limit the work area or extend the working time.
	Blunt blades.	Replace all the blades and screws so that the rotating parts are balanced.
	Long grass in relation to the set cutting height.	Increase the cutting height and then gradually lower it.
	Incorrect lawn coverage settings.	Check the lawn coverage settings and optimize them for the installation.
	Does not follow the guide wire to the areas specified.	Check the guide signal. Refer to <i>Tools - Info - Loop on page 10</i> .
	Accumulation of grass by the blade disc or around the motor shaft.	Check that the blade disc rotates freely and easily. If not, the blade disc may need to be removed and grass and foreign objects removed.
	Weather timer reduces the mowing time too much.	Check and change the settings. Refer to Operator's manual.
The product runs at the wrong time	The start and stop times for mowing are incorrect.	Adjust the start and stop time settings for mowing.
	Weather timer reduces the cutting time.	Check and change the settings. Refer to Operator's manual.
The product vibrates	Wrong number of blades creates an imbalance.	Make sure there are no blades missing or that more than one blade is mounted on the same screw.
The product mows for shorter periods than usual between charges	Grass or a foreign object is blocking the blade disc or wheels. The cause may also be lower battery capacity.	Remove and clean the blade disc. Perform a battery test to determine the battery's capacity. Refer to <i>Battery test on page 51</i> .
Both the mowing and charging times are shorter than usual	Lower battery capacity.	Perform a battery test to determine the battery's capacity. Refer to <i>Battery test on page 51</i> .
The product travels in a small circle or one wheel locks up when turning instead of rotating backwards.	The gearbox of the wheel motor is slipping.	Check the function of the wheel motors when idling. The battery voltage should be more than 18 V in this test. Check that both wheel motors start with 50% power. Then increase the power to 100%. At 100% the speed of each wheel should be at least 35 cm/second. Check that the gearboxes of the motors are not slipping by blocking each wheel. When blocking a wheel, the speed should be 0 cm/second. Replace the wheel motor if there is a fault.
The product does not react when pushing the <b>STOP</b> button  The product does not react when the hatch is closed.	An object or dirt under the <b>STOP</b> button.	Remove the object or clean under the <b>STOP</b> button.
	Faulty magnet or Hall sensor for the <b>STOP</b> button.	Make sure that the magnet is in the correct position. Replace the STOP button. Refer to <i>To replace the STOP button on page 24</i> .



### 8.2.2 Symptoms during searching

Symptom	Cause	Action
The product runs, but the blade disc does not rotate	The product is searching for the charging station. The blade disc does not rotate when the product is searching for the charging station.	This behaviour is normal and no action is required.
The product does not find the guide wire when it is searching for the charging station.	The guide loop is broken.	Check the guide signal, as well as the settings for following the guide wire. Refer to <i>Tools - Info on page 10</i> .

### 8.2.3 Symptoms during docking

Symptom	Cause	Action
The product detects the F signal, but cannot dock	Dirt/leaves/grass in the charging station is preventing the product's charging strip from making contact with the charging station's charging strip.	Clean the charging station.
	Malfunction in the charging station's circuit board or in the F-wire.	Replace the charging station's circuit board. Refer to <i>To replace the circuit board in the charging station on page 33</i> .
	N signal from the antenna plate is faulty.	Check N signals. Refer to <i>Tools - Info - Loop on page 10</i> .
	The cables for the charging strips in the product are not connected or connected incorrectly.	Check that the cable lugs for the charging strips are intact and properly connected. Make sure that the correct cable is connected to the right charging strip. Plus and minus must be correctly connected. Refer to <i>To replace the headlights and the charging plates on page 21</i> .
	The cables for the contact strips in the charging station are not connected or are connected incorrectly.	Check that the cable lugs for the contact strips are intact and properly connected. Make sure that the correct cable is connected to the right charging strip. Plus and minus must be correctly connected. Refer to <i>To replace the contact plates in the charging station on page 34</i> .
The product drives straight in to the charging station	The product cannot detect the F field and therefore does not turn in front of the charging station.	Check the LED on the charging station and the instructions about how to troubleshoot the loop signal. Refer to <i>Loop signal on page 49</i> .

### 8.2.4 Symptoms during charging

Symptom	Cause	Action
Both the mowing and charging times are shorter than usual	Low battery capacity.	Perform a <i>Battery test</i> to determine the battery's capacity. Refer to <i>Auto test on page 16</i> .
The product never leaves the charging station	The parking mode is activated.	Restart the product on main or secondary area.
	Schedule settings are preventing the product from leaving the charging station.	Check the Schedule settings. Also check that the clock shows the current time.
	The product never becomes fully charged.	Check that the product is receiving the charging power. Check that the value for the current corresponds with the guideline values. If the charging strips appear to be burnt or coated, clean them using a fine grade emery cloth. Check that the rear sensor module and the charging tower are correctly connected, and that they are not damaged.  If the problems remain, try the following: <ul style="list-style-type: none"><li>• Replace the charging tower.</li><li>• Replace the rear sensor module.</li></ul>
	The power supply is faulty.	Check that the product is receiving the charging power. Check that the value for the current corresponds with the guideline value in <i>The battery system on page 29</i> .
Charging time longer than normal	The product is not allowed to operate if the battery temperature is too high or too low.	Wait until the temperature is within the allowed charging limits. Check that the charging station is placed in an area with protection from the sun.

### 8.2.5 Miscellaneous symptoms

Symptom	Cause	Action
The display is lit but the keypad does not lead to any reaction	The application circuit board is faulty.	Reprogram the application circuit board using Autocheck.
	Faulty keypad.	Replace the keypad. Refer to <i>To replace the keypad on page 23</i> .
The display shows the Loading program text	The application circuit board is blocked.	Program the product using Autocheck.
The display flashes or shows incorrect information	The application circuit board is blocked.	Program the product using Autocheck.

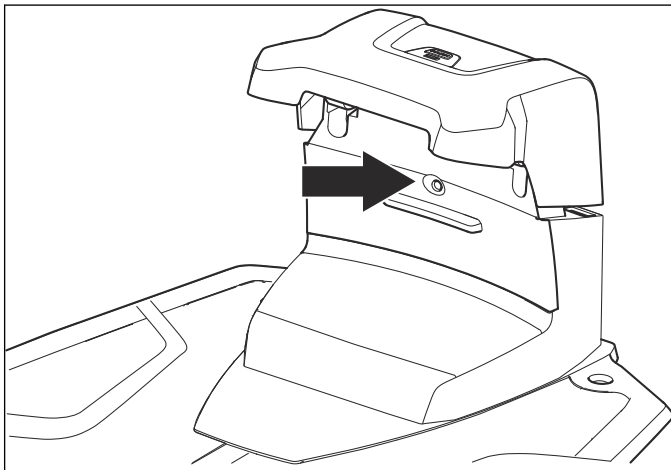
### 8.3 Loop signal

**Note:** Refer to the Operator's manual for more information about how to rectify errors.

When measuring loop signal strength the product should be placed in the charging station. Use the *Tools - Info - Loop* menu function to check that the signal strength is within the expected values. The test provides a quick answer to if the charging station generates all signals and if the product can detect these signals. Refer to *Tools - Info - Loop on page 10*.

### 8.3.1 To troubleshoot the loop signal

Always start by checking the LED in the charging station. This usually provides a good indication of where troubleshooting should begin.



Colors in the charging station's LED

Color	Status
Solid green light	All signals are OK
Green flashing light	ECO mode
Blue flashing light	Malfunction in the boundary loop
Red flashing light	Malfunction in the charging station F and N signal
Solid red light	Fault in the circuit board, or incorrect power supply in the charging station.

In the event of faults in the charging station follow the instructions in the Operator's manual and below.

#### 8.3.1.1 Green solid light

The LED in the charging station is solid green, but neither the front or rear loop sensor detects any loop signal:

1. Generate a new loop signal. Test the product and continue with step 2 if the product still cannot find the loop signal.
2. Replace the circuit board in the charging station. Refer to *To replace the circuit board in the charging station on page 33*.

#### 8.3.1.2 Green flashing light

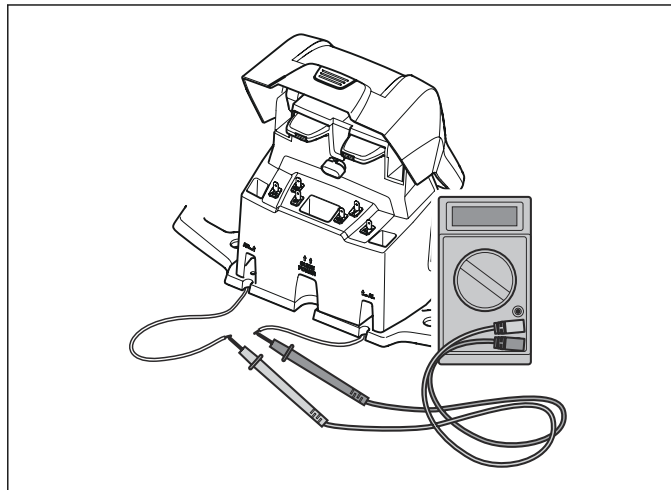
ECO mode is enabled in the product and no loop signals are therefore being transmitted in the loop wires. If the product has been removed from the charging station manually without pushing STOP before, ECO mode may still be enabled (green flashing light) so that the loop system is not transmitting any signals. To start the loop system manually:

1. Place the product in the charging station and push the **STOP** button.

#### 8.3.1.3 Blue flashing light

A blue flashing light is most likely a break in the boundary loop.

1. Check the connections to the charging station.
2. Disconnect all cables from the charging station.
3. Measure the resistance in the boundary wire using a multimeter. The resistance value for a non-faulty boundary wire should be between 0-20 Ohm.



- Value >20 Ohm: Indicates a break in the boundary loop. Identify and repair the break. Refer to *Boundary loop on page 6*.
- Value <20 Ohm: Indicates that the boundary loop is intact. Replace connectors to the charging station. Replace the circuit board in the charging station if the fault remains. Refer to *To replace the circuit board in the charging station on page 33*.

#### 8.3.1.4 Yellow flashing light

A yellow flashing light indicates malfunction in the guide wire.

1. Check that the guide wire connector is properly connected to the charging station.
2. Replace the guide connector.
3. Break in the guide wire: Find out where the break is. Replace the damaged section of the guide wire and splice the ends using an original coupler.

#### 8.3.1.5 Red flashing light

A red flashing light is most likely an interruption in the N or the F-wire in the charging station's antenna.

1. Replace the charging station circuit board, or the baseplate (including the N and F wires). Refer to *To replace the circuit board in the charging station on page 33* and *To remove and install the charging station and the charging station cap on page 32*.

#### 8.3.1.6 Red solid light

A solid red light is probably a fault in the circuit board, or an incorrect power supply in the charging station.

1. Check the power supply.
2. Replace the charging station circuit board. Refer to *To replace the circuit board in the charging station on page 33*.

## 8.4 To find a break in the boundary loop

A break in the loop wire is normally due to physical damage to the wire, e.g. using a spade while gardening. In countries with ground frost, also sharp stones that move in the ground can damage the wire. Breaks can also be due to too high a tension in the wire during installation.

Cutting the grass very short immediately after the installation can damage the wire's insulation. Certain damage to the insulation may not cause disruptions until several weeks or months later. To avoid this, always select the maximum cutting height the first week after installation and then lower the height one to two steps at a time every week until the desired cutting height has been reached.

A wire break can be found by using a break detection tool from the manufacturer or with the manual method that is described in the Operator's manual.

The procedure involves gradually halving the distance of the loop where the break may have occurred until there is only a very short section of the wire left.

## 8.5 Battery test

If the product's battery starts to perform poorly, the product mows for shorter time periods. The product can also stop and show the *Low battery* message.

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**Note:** A battery test can be run on the workbench with Autocheck, but the most reliable test result is achieved when the product is run in an installation.

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### 8.5.1 To do a battery test

1. Fully charge the battery.
2. Set the cutting height to maximum.

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**Note:** The product must have a low level of cutting resistance during the battery test.

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3. Let the product to mow in manual operation mode until the battery is empty.
4. When the battery is empty the product stops. The result of the battery test is then saved automatically and can be found in Autocheck or in the *Tools menu*.

### 8.5.2 To evaluate the battery test

A new battery has a total capacity of about 2100 mAh but is charged to a maximum of 1700 mAh. The test results from a battery test on a new battery are thus normally around 1,600 to 1700 mAh.

As the battery ages the battery capacity decreases. If the battery capacity displayed is approximately 1,000 mAh or lower, it is possible that the battery is poor and needs to be replaced. The assessment should be based on the most recently conducted test as the first test can show an incorrect value. It is therefore more practical to

perform a battery test in connection with the product's normal operation or in connection with it having recently been in operation.

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**Note:** The values are approximate and vary between different products and batteries.

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**Note:** If the product has not been in operation for more than two months, at least two and preferably three battery tests should be carried out.

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## 9 Transportation, storage and disposal

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### 9.1 Transportation

The supplied Li-ion batteries obey the Dangerous Goods Legislation requirements.

- Obey all applicable national regulations.
- Obey the special requirement on package and labels for commercial transportations, including by third parties and forwarding agents.

### 9.2 Cleaning



**CAUTION:** Never use a high-pressure washer to clean the product. Never use solvents for cleaning.



**WARNING:** The product must be switched off. Wear gloves when cleaning the underside of the body.

1. Remove the body to clean the body, center console and chassis.
2. Remove the blade disc to enable more thorough cleaning.

**Note:** It is important to remove any grass and dirt between the chassis and the blade disc, and between the blade disc and the blades.

3. Do the *Cutting motor test*. Listen for abnormal sounds when the cutting motor operates.
4. Test the different cutting height settings while the cutting motor operates.

### 9.3 Winter storage

Before the product is put away for the winter, the following should be done:

1. Switch off the product.
2. Clean the product.
3. Remove the blade disc and clean around the blades and around the motor shaft.
4. Remove the rear wheels and remove grass and other objects from the motor shafts. Clean the wheels' drive tread. Install the wheels again.
5. Fully charge the product.



**CAUTION:** The battery must be charged fully before winter storage. If the battery is not fully charged it can be damaged and in certain cases be rendered useless.

- Keep the product in a dry, frost free space.

- Keep the product with all wheels on level ground during storage, or use an original wall hanger.
- If you keep the charging station indoors, disconnect and remove the power supply and all the connectors from the charging station. Put the end of each connector wire in a container with grease.
- If you keep the charging station outdoors, do not disconnect the power supply and the connectors.

### 9.4 Environmental information



It is not permitted to dispose this product as normal household waste. Obey the local recycling requirements and applicable regulations. The battery must be removed from the product before it is scrapped.

### 9.5 Removal of battery for recycling

For removal of the battery for recycling, refer to the Operator's manual.











**Husqvarna  
Group**

**ORIGINAL INSTRUCTIONS**

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