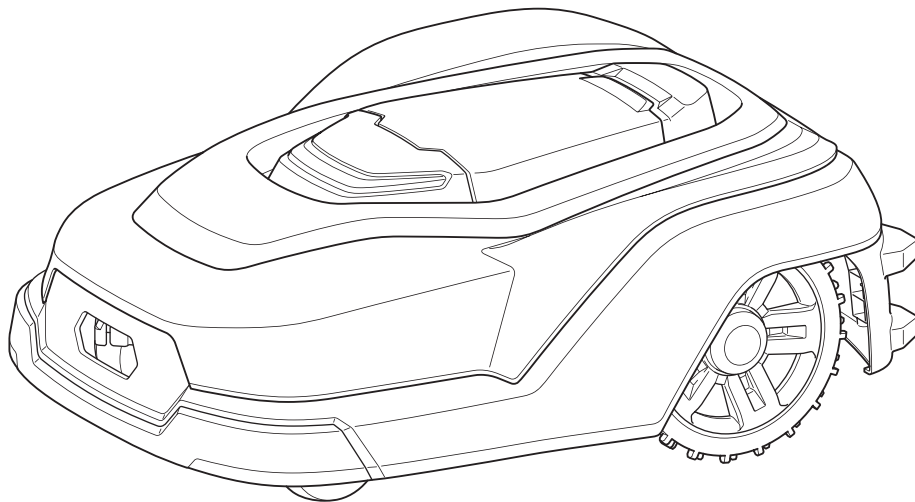




Robotic Mower INSTRUCTION MANUAL

RM350D

Original instructions




 Read before use.

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INTRODUCTION

Specifications

Model:	RM350D	
Rated voltage	D.C. 18 V	
Battery capacity	5 Ah	
Dimensions (L x W x H)	700 mm x 560 mm x 270 mm	
Weight	13.7 kg	
No load motor speed	Blade motor	2,300 min ⁻¹
Maximum mowing area	3,500 m ²	
Maximum slope climbing angle	26° (49%)	
Mower blade	Swing back blade 3 blades	
Mowing width	240 mm	
Cutting height	20 mm - 60 mm 9-step electric adjustment in 5 mm increments	
Protection degree	IPX4	
Applicable AC adapter	AAD01	
Applicable charging stations	141U84-6 / 141U85-4 / 141U86-2 / 141U87-0 / 141U88-8 / 141U89-6 / 141U90-1 / 141U91-9 / 141U92-7 / 141U93-5 / 141U94-3 / 141V19-3 / 141V20-8 / 141W32-7 / 141W33-5 / 141W34-3 / 141W35-1 / 141W36-9 / 141W37-7 / 141W38-5 / 141W39-3 / 141W40-8 / 141W41-6	
Boundary wire	Operating frequency band	3.3 kHz - 50 kHz
Guide wire	Maximum magnetic field strength (measured according to EN303 447)	38 dBµA/m

- Due to our continuing program of research and development, the specifications herein are subject to change without notice.
- Major features and AC adapter may differ from country to country.
- Weight according to EPTA-Procedure 01/2014

Symbol marks

The followings show the symbols which may be used for the equipment. Be sure that you understand their meaning before use.



WARNING – Read user instructions before operating the machine.



WARNING – Keep a safe distance from the machine when operating. The machine may throw objects and injury result.



WARNING – Set the anti-theft function and then turn off the power of the machine before working on or lifting the machine. Otherwise the mower blade may injure your hand and foot. The disabling device for this machine is a restart lock by the PIN code. You can operate the restart lock in the anti-theft function settings. If restart lock is enabled, you will be required to enter your PIN to restart the machine.



WARNING – Do not ride on the machine. Otherwise the mower blade may injure your hand and foot.



Only for EU countries
Due to the presence of hazardous components in the equipment, waste electrical and electronic equipment, accumulators and batteries may have a negative impact on the environment and human health. Do not dispose of electrical and electronic appliances or batteries with household waste! In accordance with the European Directive on waste electrical and electronic equipment and on accumulators and batteries and waste accumulators and batteries, as well as their adaptation to national law, waste electrical equipment, batteries and accumulators should be stored separately and delivered to a separate collection point for municipal waste, operating in accordance with the regulations on environmental protection. This is indicated by the symbol of the crossed-out wheeled bin placed on the equipment.

Intended use

This machine is intended for automatic mowing and charging.

Safety precautions

- Warning – Do not touch rotating blades.**
Doing so may cause injury.
- Never allow children, persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge or people unfamiliar with the instructions to use the machine, local regulations may restrict the age of the operator.**
- Do not allow children to be in the vicinity or play with the machine when it is operating.**
- Do not touch the mower blades or wheels until they have come to a complete stop.**
- Do not charge the machine with other than the supplied charging station. Do not use an AC adapter other than one specified in this Instruction Manual.**
- When disposing of the internal battery at the end of its service life, follow your local regulations relating to battery disposal. For how to remove the battery, refer to the chapter "When disposing of this product" hereafter.**
- Turn off the power switch of the Robotic Mower in the following cases.**
 - When removing foreign matter jammed in the machine.
 - Before inspecting, cleaning, or working on the machine or the charging station.
Also unplug the power cable of the AC adapter before inspecting, cleaning, or working on the charging station.
 - When inspecting the machine for damage after striking a foreign object.
 - If the machine starts to vibrate abnormally. In this case, check that the machine is not damaged before restarting it.
- Inspect the machine, peripheral devices, power cable, and extension cable before use to make sure there is no damage or signs of aging deterioration.**

- Never operate the machine or peripheral devices with defective guards or shields, without safety devices, or with damaged or worn cables.**
- Do not connect a damaged cable to a power supply. If a cable connected to a power supply is damaged, do not touch the cable before disconnecting from the power supply. Otherwise, electric shock may result.**
- Install the AC adapter and cable outside the mowing area. Otherwise, cable damage or electric shock may result.**
- Stop using the machine immediately if an accident or breakdown occurs.**
- Stop using the machine immediately if the electrolyte leaks.**
- Unplug the power plug from the power outlet if the cable becomes damaged during use.**
- It is recommended to connect the power plug of the cable only to a power supply circuit that is protected by a residual current device (RCD) with a trip current of 30 mA or less.**
- Avoid using this machine or peripheral devices in bad weather and especially when there is a risk of lightning.**
- Stop using the machine immediately if abnormal vibration occurs.**
- When using the machine in a public space, it is necessary to post warning signs around the work area. The warning signs should display the following text contents. "Warning! Automatic lawnmower! Keep away from the machine! Supervise children!"**

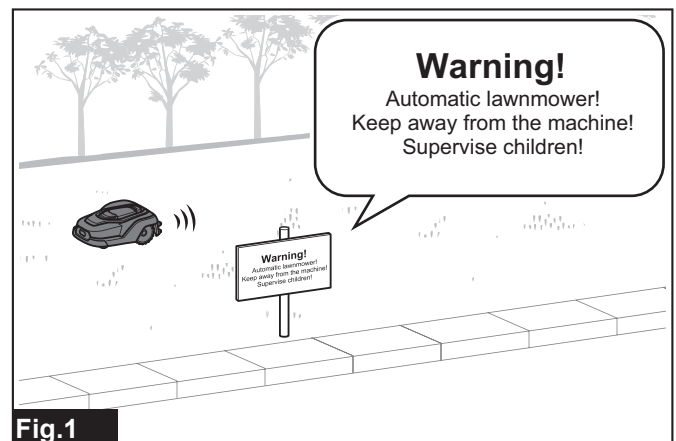


Fig.1

- The power cable of the AC adapter cannot be replaced. If the power cable becomes damaged, it is necessary to dispose of the AC adapter.**
- If the work area adjoins a public road, establish a border between the work area and the public road. Otherwise, the machine may reach over into the public road and cause an accident.**
- Make sure that there are no people, pets, or small animals in the work area before use. They may get caught in the machine, resulting in injury.**
- Do not use the AC adapter in a location that is exposed to rain, damp, or wet. Otherwise, electric shock may result.**
- Do not touch the AC plug of the AC adapter with wet hands. Otherwise, electric shock may result.**
- Connect the AC plug of the AC adapter to an outdoor power outlet.**
- Wear gloves when installing and removing wires. Otherwise, the wires may cause an injury.**
- Be careful not to hit your fingers or hand with the hammer when driving the pegs.**
- Install the wires so that they do not float from the ground. Otherwise, your foot may get caught, resulting in injury.**
- Be careful not to pinch your fingers when opening and closing the terminal cover.**
- Do not touch the mower blades while they are rising or lowering. Your fingers may get caught, resulting in injury.**
- Be careful not to pinch your fingers when opening and closing the display cover.**
- Keep your face away from rotating tires and mower blades. Your clothing may become caught, resulting in suffocation.**
- Do not look into the mower blades during operation. Flying objects may get into your eyes.**
- Do not touch rotating wheels. Your fingers may get caught, resulting in injury.**
- Be sure to install the mower blades properly according to this Instruction Manual. Otherwise, the mower blades may come loose unexpectedly, resulting in injury.**

35. **Carry this machine with the mower blade side facing away from you.** Otherwise, you may come into contact with the wheels and mower blades, resulting in injury.
36. **Carry this machine by holding the grip.** If carried by holding other than the grip, the machine will be unstable and may be dropped, resulting in injury.

Important safety instructions for battery

1. **Before using the Robotic Mower, read all instructions and warning markings.**
2. **If operating time has become excessively shorter, stop operating immediately.** It may result in a risk of overheating, possible burns and even an explosion.
3. **Do not store and use the machine in locations where the temperature may reach or exceed 50 °C (122 °F).**
4. **Do not incinerate the battery even if it is completely worn out. The battery can explode due to heating.**
5. **The contained lithium-ion batteries are subject to the Dangerous Goods Legislation requirements.**
For commercial transports e.g. by third parties or forwarding agents, special requirement on packaging and labeling must be observed.
For preparation of the item being shipped, consulting an expert for hazardous material is required. Please also observe possible more detailed national regulations.
6. **Do not use the machine near high-voltage electrical power transmission lines.** Doing so may result in a malfunction or breakdown of the machine or battery.
7. **Store the product in a safe place out of the reach of children.**
8. **Never service damaged battery packs.** Service of battery packs should only be performed by the manufacturer or authorized service providers.

SAVE THESE INSTRUCTIONS.

⚠CAUTION: Only use genuine Makita batteries. Use of non-genuine Makita batteries, or batteries that have been altered, may result in the battery bursting causing fires, personal injury and damage. It will also void the Makita warranty for the Makita tool and charger.

Tips for maintaining maximum battery life

1. **Never recharge a fully charged battery. Overcharging shortens the battery service life.**
2. **Charge the battery with ambient temperature at 10 °C - 40 °C (50 °F - 104 °F). Let a hot battery cool down before charging it.**
3. **Charge the battery if you do not use it for a long period (more than six months).**

Noise

The typical A-weighted noise level determined according to EN50636-2-107:

Sound pressure level (L_{pA}) : 70 dB(A) or less

Sound power level (L_{WA}) : 59 dB (A)

Uncertainty (K) : 3.1 dB (A)

The noise level under working may exceed 80 dB (A).

NOTE: The declared noise emission value(s) are measured by the standard test method, and may be used for mutual comparison between machines.

NOTE: The declared noise emission value(s) may also be used in a preliminary assessment of exposure.

⚠WARNING: The noise actually emitted in use of the machine may differ from the declared value(s) depending on the usage of the machine, and especially the type of material to be processed.

⚠WARNING: Be sure to take safety measures to protect workers based on estimates of exposure under the actual conditions of use (consider the entire operating cycle including the time the machine is switched off and the idling time in addition to the operating time).

Declarations of Conformity

For European countries only

The Declarations of conformity are included in Annex A to this instruction manual.

Names of parts

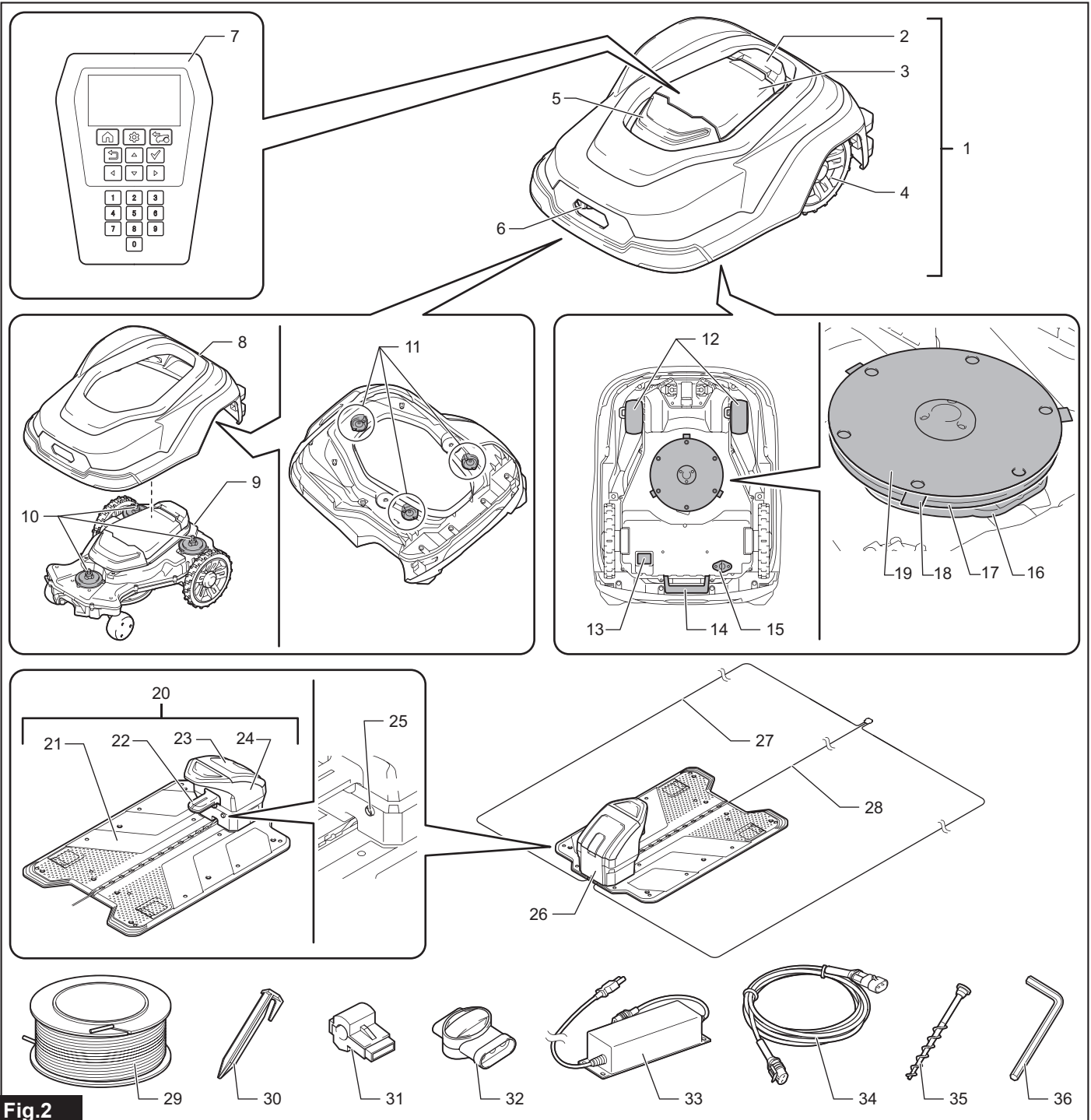


Fig.2

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Robotic Mower 2. "STOP" button 3. Display cover 4. Rear wheel 5. LED 6. Charging socket 7. Control panel 8. Top cover 9. Chassis 10. Slider shaft 11. Rubber retainer 12. Front wheel 13. Power switch 14. Grip 15. USB cap
(Do not open. This is for maintenance servicing.) 16. Blade cover 17. Blade base 18. Mower blade 19. Skid plate 20. Charging station 21. Station base | <ol style="list-style-type: none"> 22. Charging terminal 23. Terminal cover 24. Station housing 25. Station indicator 26. Wire cover 27. Boundary wire 28. Guide wire 29. Wire 30. Peg 31. Connector 32. Coupler 33. AC adapter
(The plug shape will differ from region to region.) 34. Cabtire cable 35. Screw peg
(For fixing the charging station) 36. Hex wrench 6 |
|--|---|

Introduction of separately sold items

CAUTION: These accessories or attachments are recommended for use with your Makita products specified in this manual. The use of any other accessories or attachments might present a risk of injury to persons. Only use accessory or attachment for its stated purpose.

For details of separately sold items, refer to the catalog or contact the dealer or our sales office.

- Blade set
 - Set of mower blades and fixing screws
- Wire
- Wire repair kit
 - Set of wire, couplers, and pegs
- Peg
- Coupler

NOTE: Some separately sold items in the list may be supplied with the machine as standard accessories at the time of purchase. Standard accessories may differ depending on the country of purchase.

PREPARATION

The following preparations are needed to use this product.

1. Preparing the work area

Determine the range to be mowed by the Robotic Mower. Enclose the work area with the boundary wire, and connect the power supply to the charging station. Install a guide wire as necessary. For the detailed procedure, refer to the enclosed Setup Guide.



2. Initial setting of the Robotic Mower

When using the Robotic Mower for the first time, it is necessary to set the language, date and time, mowing area, and PIN code. For the detailed procedure, refer to the enclosed Setup Guide.

3. Charging the Robotic Mower

The battery of the Robotic Mower is not charged sufficiently when factory-shipped. Charge the battery before use. For the charging procedure, refer to the section "Charging the Robotic Mower" (Page 6) in this manual.

Turning the power on/off

The power switch is located on the underside of the Robotic Mower. Press the  side of the power switch to turn on the power, or the  side to turn off the power.

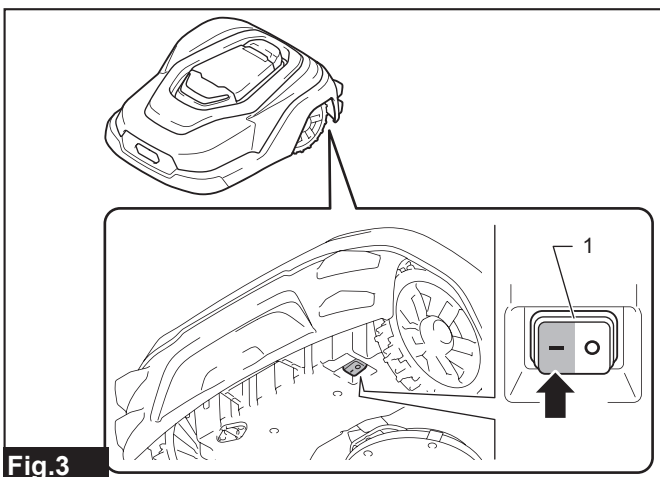


Fig.3

- ▶ 1. Power switch

Charging the Robotic Mower

Checking the remaining battery capacity

1. Press the "STOP" button.

The display cover opens.

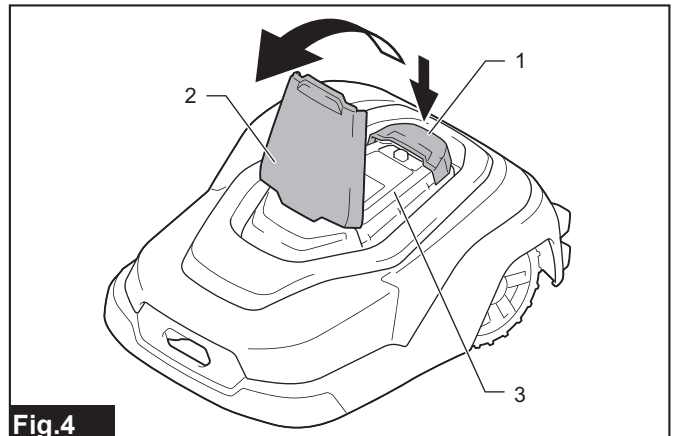



Fig.4

- ▶ 1. "STOP" button 2. Display cover 3. Control panel

2. Turn on the power switch of the Robotic Mower.
3. Press the  button on the control panel.

The [Main menu] appears. You can check the remaining battery capacity at the upper right of the screen.

Main menu

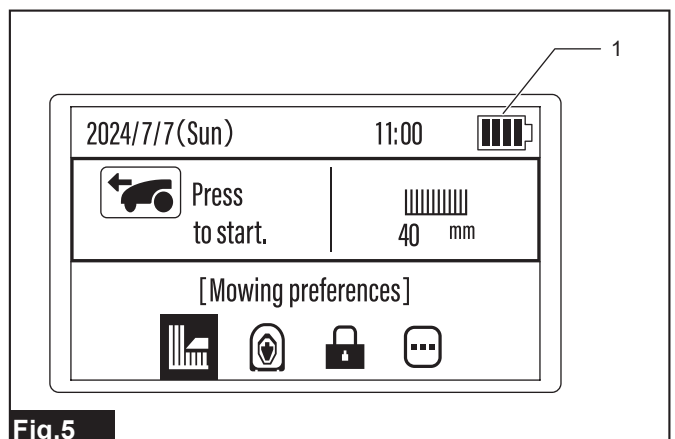






Fig.5

- ▶ 1. Remaining battery capacity indication

LCD screen indication	Remaining battery capacity
	80 - 100 %
	60 - 80 %
	20 - 60 %
	0 - 20 %

Charging

1. Turn on the power switch of the Robotic Mower.

NOTE: Charging is performed only when the power switch of the Robotic Mower is turned on.

2. Dock the Robotic Mower with the charging station.

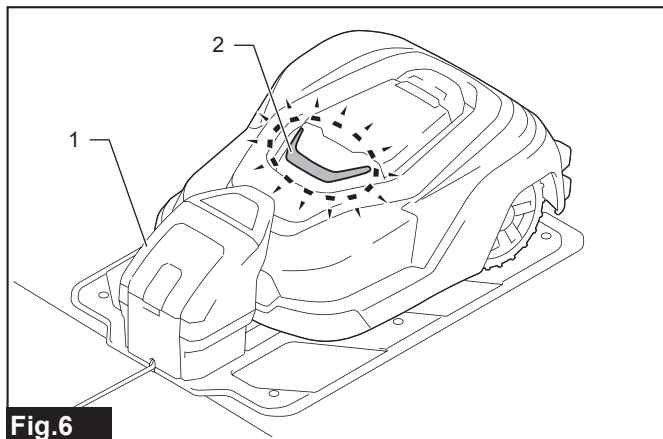


Fig.6

- 1. Charging station 2. LED

When charging starts, the LED blinks green. When charging is complete, the LED turns off.

Things that should be understood before use

Work environment

Check that the area to be mowed by the Robotic Mower conforms to the following items.

- The grass height is 100 mm or less.
If the grass is too long, cut it down in advance.
- There are no obstacles such as stones, sticks, or tools.
The Robotic Mower may fling or catch obstacles, resulting in an accident.
- There are no puddles.
The Robotic Mower can mow lawns in the rain, but wet grass tends to stick to the Robotic Mower, and the possibility of slipping on steep slopes increases.
- There is no snow accumulation.
The Robotic Mower may slip and not operate correctly.

Charging station

The charging station charges the Robotic Mower and flows signals in the boundary wire and guide wire.

Check that the location to install the charging station conforms to the following items.

- It is close to the power supply.
- It is a level location.
The installation location has a slope within $\pm 5^\circ$ of level.
- The location should be protected from the sun.
- When installing the charging station on the lawn directly, keep the lawn short.
- There is space of 3 m or more to the front.

NOTICE: Do not bend the station base.

Boundary wire

The boundary wire defines the area where the Robotic Mower is to perform mowing work.
Install the boundary wire around the boundary of the area where the Robotic Mower is to perform mowing work.
For the installation method, refer to the chapter "Installing the Boundary Wire" in the Setup Guide.

Guide wire

This wire guides the Robotic Mower when it returns to the charging station. This wire also guides the lawn mower to areas that the lawn mower works less frequently due to topographical reasons, etc.
For the installation method, refer to the chapter "Installing the Guide Wire" in the Setup Guide.

Lamp lighting

The Robotic Mower and the charging station indicate various states by the lighting patterns of their lamps.

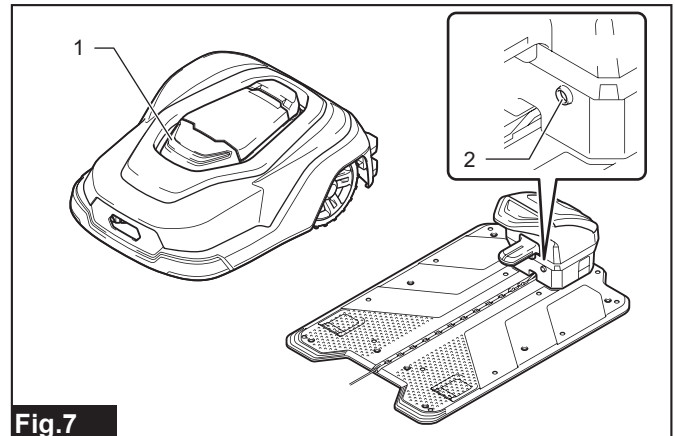


Fig.7

- 1. LED 2. Station indicator

Robotic Mower

LED	State
Green/blinking	Charging (Turns off when charging is complete)
White/blinking	Operating (Blinks for the time specified by the [LED] setting)
Red/blinking	Error occurrence
Off	Standby/Power off or other than the above

Charging station

Station indicator	State
Red/lighted	Error occurrence
Red/blinking	There is an abnormality in the boundary wire connection
Green/lighted	The boundary wire are properly connected

HOW TO USE

Control panel operations

When the "STOP" button is pressed, the display cover opens and the control panel can be operated.

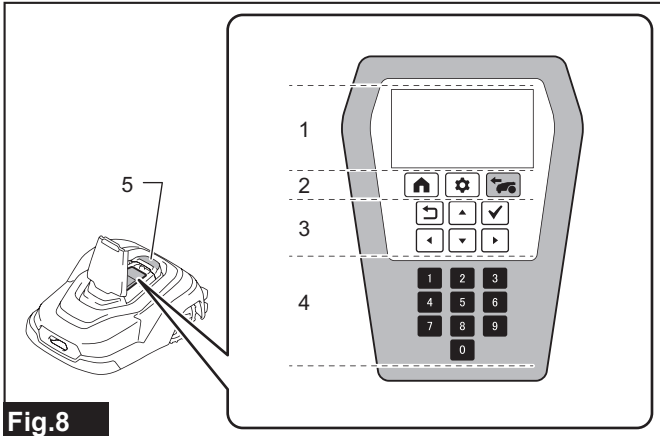


Fig.8

- ▶ 1. LCD screen 2. Menu buttons 3. Operation keys 4. Numeric keys 5. "STOP" button

Button/key	Function
Menu buttons	
	Returns the Robotic Mower to the charging station. After pressing this button, select the desired return method.
	Displays the [Main menu].
	Starts mowing. After pressing this button, select the desired mowing method.
Operation keys	
	Select items on the screen. The selected item is highlighted (white-black inverted display).
	Returns to the previous screen/operation.
	Executes the selected item.
Numeric keys	
	Enter numbers. They can be operated only when numeric entry is possible.

Selecting and executing items on the LCD screen

LCD screen operations are performed mainly with the Main menu. Press the button to display the Main menu.

Main menu

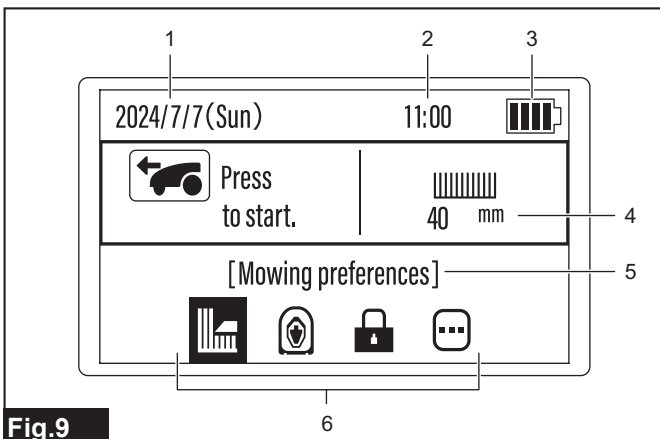


Fig.9

- ▶ 1. Date 2. Time 3. Remaining battery capacity 4. Cutting height 5. Currently selected setting menu 6. Setting menu icons

Operations within the LCD screen use the operation keys and numeric keys. The available buttons/keys differ according to the items displayed on the screen.

When selection items are arranged side by side

When items are arranged side by side, select with the / keys and execute with the key.

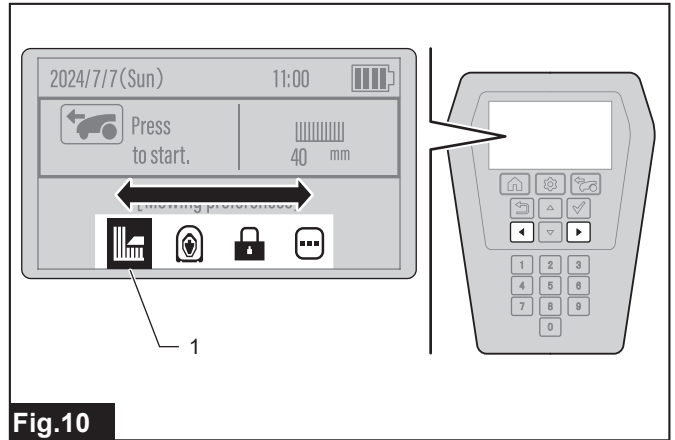


Fig.10

- ▶ 1. Selected item

When selection items are arranged vertically

When items are arranged vertically, select with the / keys and execute with the key.

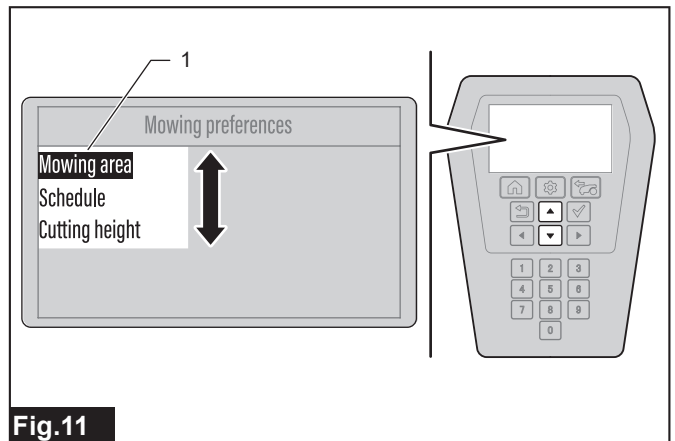


Fig.11

- ▶ 1. Selected item

When further options are available

When triangular arrow marks appear next to the selected item, further options are available. Select the item with the direction key(s) (/ / /) indicated by the triangular arrow marks, and finalize the selection with the key.

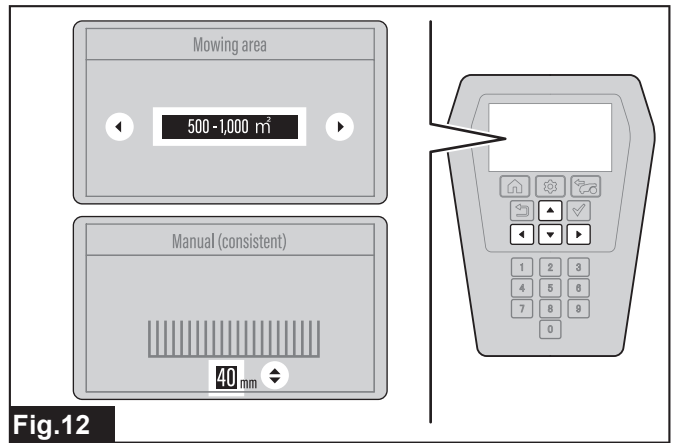


Fig.12

When entering numbers

On the PIN code entry screen and for selection items where values are entered, enter with the **0** - **9** keys and finalize the entry with the **✓** key.

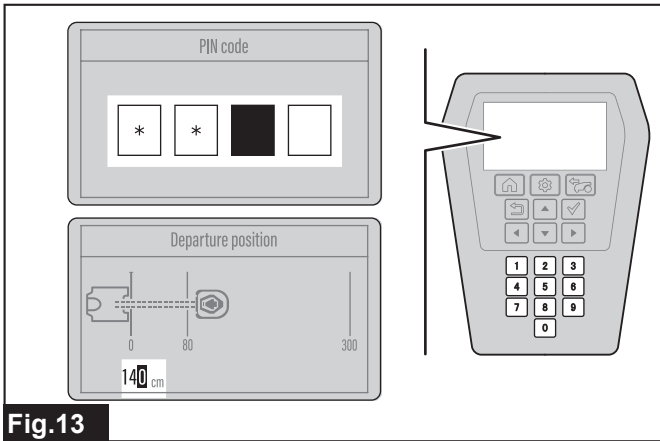


Fig.13

NOTE: When entering a value with two or more digits, enter in order from the upper digits (or the first number). If you make a mistake, enter arbitrary numbers to all digits and then enter the correct numbers again.

Starting mowing

⚠WARNING: Be sure to observe the following items when the Robotic Mower is in operation.

- Do not put your hands and feet under or look under the chassis.
- Keep your face and hands away from rotating wheels.
- Do not let children or pets enter the work area.

NOTICE: The Robotic Mower is intended only for mowing lawns. Clear away any weeds from the work area in advance.

NOTICE: Clear away objects such as small stones and sticks that may hinder Robotic Mower operation from the work area in advance.

NOTICE: Mowing will be unable to start if the station indicator is off or if it is lighted or blinking red.

A charging station error or a boundary wire open circuit may have occurred. Check the following points.

- Is the AC adapter connected to a power outlet?
- Is the cable connected correctly to the AC adapter and the charging station?
- Are the charging station and the boundary wire connected correctly?
- Is there an open circuit in the boundary wire?
- Are the connectors and couplers on the boundary wire connected correctly?

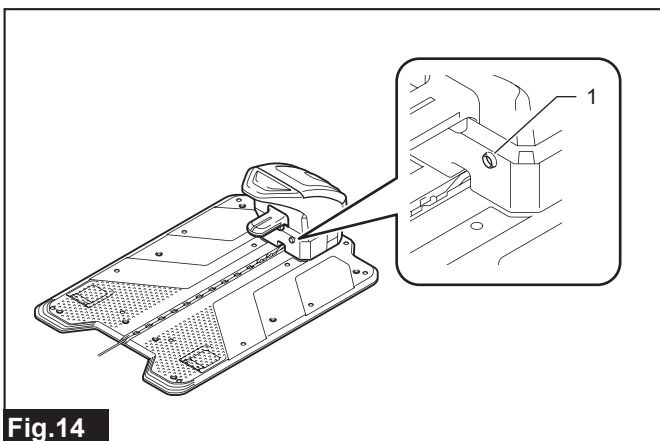


Fig.14

► 1. Station indicator

The factory default settings are defined as follows. To change the default settings, refer to the instructions on the major setting items listed under "SETTING MENUS" (Page 11).

Major setting item	Initial value
Mowing area	Area set by the initial setting
Cutting height	Consistent (60 mm)
Boundary overreach	32 cm
Spiral cutting	Enable

To start mowing at once

To start mowing at once, perform the mowing start operation on the control panel.

1. Press the "STOP" button.

The display cover opens.

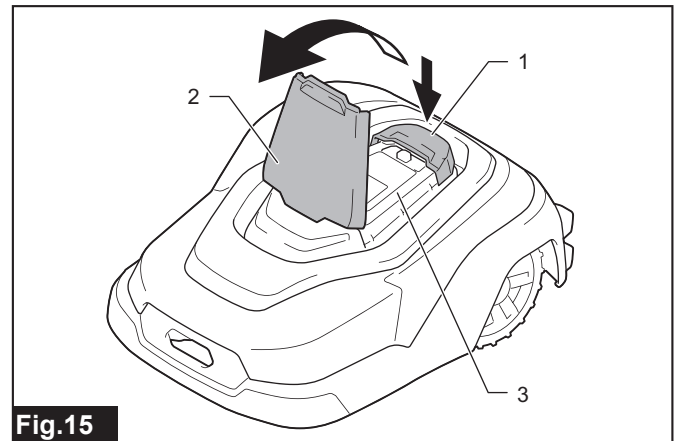



Fig.15

► 1. "STOP" button 2. Display cover 3. Control panel

2. Press the  button on the control panel.
3. Select the desired option.

Option	Details
Auto mowing	Mows by automatic operation and charging. When the remaining battery capacity becomes low, the Robotic Mower automatically returns to the charging station and charges. When charging is complete, mowing restarts. The operation is performed within the scheduled mowing period that you configured
Mowing without charging	Mows without charging. If the remaining battery capacity runs out partway, the machine stops at that point. You can select the duration time for mowing without charging. (Until battery empty / For 30 min / For 90 min) <ul style="list-style-type: none"> • The scheduled mowing will be disabled during this option. • Select this option in a sub area.
Deactivate schedules	Disables the scheduled mowing and starts mowing at once. You can select the period to disable the schedules. (For 24 hours / For 3 days)
Mowing - With spiral cutting	Starts mowing in a spiral pattern from an arbitrary location. Select [Auto mowing] in the main area and [Mowing without charging] in a sub area.

NOTE: Main area refers to the work area where the charging station is installed and the Robotic Mower can return automatically. In contrast, sub area refers to a work area where there is no path wide enough for the Robotic Mower to return to the charging station and it is necessary to move the Robotic Mower by carrying it by hand. For details, refer to "Start Mowing Menu" (Page 12) in this manual.

4. Close the display cover.

Mowing starts. The LED blinks white during operation.

NOTE: The LED will blink for the time set in advance by the [LED] setting.

NOTICE: When closing the display cover, press down firmly until it clicks.

Specifying the date and time to start mowing

Specify the date and time to perform mowing from the following setting item, and put the Robotic Mower into the stand-by state.

[Top menu] > [Main menu] > [Mowing preferences] > [Schedule]
For the detailed setting method, refer to the section "Start Mowing Menu" (Page 15).

Stopping mowing

There are two methods for stopping mowing as follows.

Stop mowing and remain in place (Pause)

When the "STOP" button is pressed during operation, the display cover opens and mowing will pause.

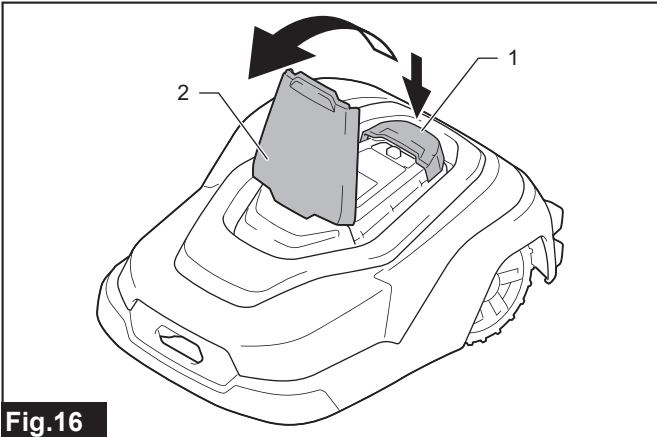



Fig.16

► 1. "STOP" button 2. Display cover

Stop mowing and return to the charging station (End)

1. Press the "STOP" button during operation, and then press the  button on the control panel.

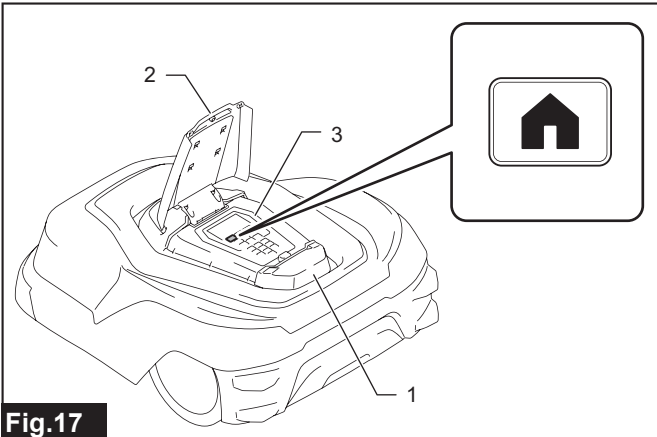


Fig.17

► 1. "STOP" button 2. Display cover 3. Control panel

2. Select the desired option.

Option	Details
Stay at charging station	The Robotic Mower returns to and stays at the charging station.
Schedule restart time	The Robotic Mower returns once to the charging station, and then restarts mowing after the set time.
Restart on schedule	The Robotic Mower returns to the charging station, and then starts mowing at the scheduled date and time.

3. Close the display cover.

NOTICE: When closing the display cover, press down firmly until it clicks.

SETTING MENUS

Operate the three menu buttons and the keypad on the control panel to set the Robotic Mower in accordance with the application and purpose. This chapter introduces the setting contents in the six menus and their multiple sub menus.

Top menu screen that appears after the power is turned on (except when starting up for the first time)

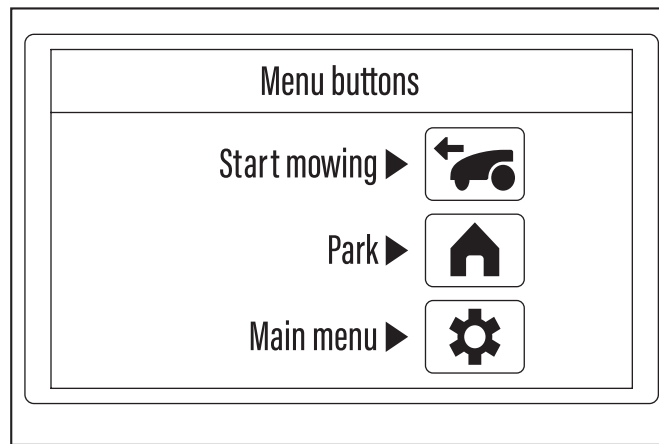





Fig.18

Button	Menu name	What can be set using the sub menu	Reference page	
	Start mowing	Mow by automatic operation and charging.	12	
		Mow without automatic charging.	12	
		Start auto mowing at the desired timing. (Scheduled mowing is put on hold.)	13	
		Mow in a spiral pattern.	13	
	Park	Return the Robotic Mower to the charging station.	13	
		Return the Robotic Mower to the charging station, and restart operation at the scheduled time.	14	
		Return the Robotic Mower to the charging station, and restart operation at the preset schedule.	14	
	Main menu	Mowing preferences	Change and register the mowing area.	14
			Schedule mowing.	15
			Determine the cutting height.	16
		Navigation preferences	Set the guide signal active search period.	16
			Cut the grass near the boundary.	17
			Set the movement distance to the mowing start point.	18
			Select the departure method from the charging station.	18
			Adjust the departure angles from the charging station.	19
			Adjust the width of offset navigation.	20
		Security	Mow unmowed grass.	21
			Set the alarm sounding time.	22
			Change the PIN code.	22
			Prevent wire signal interference.	23
		Others	Protect the Robotic Mower from theft.	23
			Save/load user preferences.	23
			Change the date and time settings.	24
Change the display language.	24			
Reset the user preferences.	24			
Browse the product information.	24			
Manage the LED on/off time.	24			
	Check the details of operation errors.	25		

Start Mowing Menu

CAUTION: When starting up the Robotic Mower for the first time after installing the wires in the work area as advance preparation, be sure to have the Robotic Mower automatically depart once from the docked state with the charging station.

When the Robotic Mower automatically departs from the charging station, it saves the magnetic field in its memory and performs autonomous control so that docking operation is performed properly thereafter. If this task is not performed, the Robotic Mower may not execute docking properly when returning, or may otherwise not function properly.

Select and execute one of the following two methods to have the Robotic Mower automatically depart from the charging station.

- Dock the fully charged Robotic Mower with the charging station within the pre-scheduled operation time (or at any time when using the [Deactivate schedules] sub menu), and then issue the start instruction using the [Start mowing] menu. For details, refer to "Start Mowing Menu" (Page 12).
- Tentatively register the departure method in the [Mower departing points] sub menu of the [Navigation preferences] menu, and perform test navigation. For details, refer to "Selecting the departure method from the charging station" (Page 18).

Mowing with automatic operation and charging

[Top menu] > [Start mowing] > [Auto mowing]

The lawn of the main area enclosed by the boundary wire is mowed automatically. When this menu is selected, the Robotic Mower is automatically controlled according to the contents set by each menu. Even if the remaining battery capacity becomes low, the Robotic Mower can automatically repeat charging and continue to neatly mow the lawn within the area.

About the main area

This is the mowing work area that has the charging station located within its boundary. The Robotic Mower continues to navigate randomly and mow the lawn within this area while repeatedly returning and departing centering on the charging station.

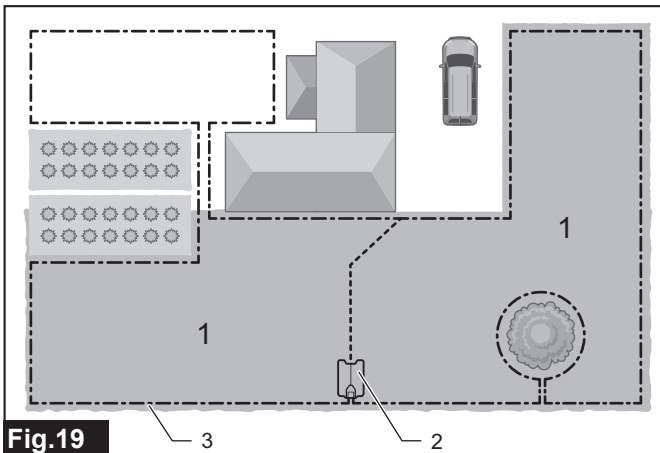


Fig.19

- 1. Main area 2. Charging station 3. Boundary wire

1. Press the button on the control panel.

The sub menu appears.

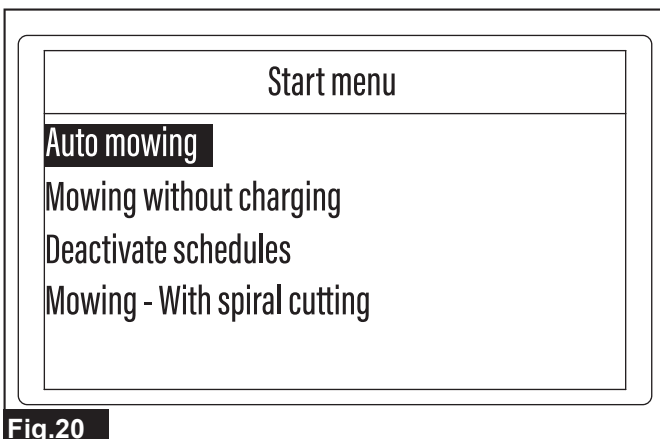


Fig.20

2. Select [Auto mowing].

Press the key, and the message [Close the display cover to start mowing.] appears.

3. Close the display cover.

The Robotic Mower starts mowing.

Mowing without automatic charging

[Top menu] > [Start mowing] > [Mowing without charging]

The lawn of a sub area established separately from the main area is mowed automatically. As there is no path for coming and going with the main area, automatic charging is not possible in a sub area, yet automatic operation can continue within the preset time or until the remaining battery capacity runs out. This setting can also be used in the main area to perform mowing work for only the selected time when return to the charging station and charging is not needed.

About the sub area

This is a separate mowing work area that is enclosed by the boundary wire but does not have a path wide enough for the Robotic Mower to pass to the main area. Mowing is performed automatically while detecting the wire signals, but automatic return to the charging station is not possible.

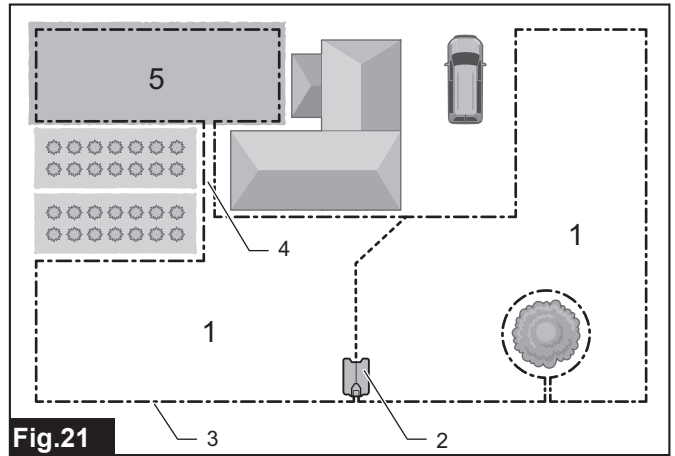


Fig.21

- 1. Main area 2. Charging station 3. Boundary wire 4. Path 5. Sub area

NOTICE: In order to operate the Robotic Mower in a sub area, move the Robotic Mower by hand from the main area to the sub area in advance.

NOTICE: To charge the Robotic Mower working in a sub area, temporarily stop the Robotic Mower and turn off the power, and then carry it to the main area. After moving the Robotic Mower, turn on the power again and manually connect it to the installed charging station.

1. Press the button on the control panel.

The sub menu appears.

2. Select [Mowing without charging].

The option menu appears.

3. Select the desired option.

Option	Details
Until battery empty	Mows automatically until the remaining battery capacity runs out.
For 30 min	Mows automatically for 30 minutes.
For 90 min	Mows automatically for 90 minutes.

Press the key, and the message [Close the display cover to start mowing.] appears.

4. Close the display cover.

The Robotic Mower starts mowing.

NOTE: When [Until battery empty] is executed, the Robotic Mower will stop at the point where the remaining battery capacity runs out. To charge the Robotic Mower, manually connect it to the charging station in the main area.

Starting auto mowing at the desired timing (Putting scheduled mowing on hold)

[Top menu] > [Start mowing] > [Deactivate schedules]

You can put pre-scheduled mowing work on hold for a certain period and have the Robotic Mower operate automatically at the necessary or convenient timing. The Robotic Mower normally executes and stops mowing according to a preset schedule, but selecting this menu lets you operate the Robotic Mower automatically even outside the scheduled times.

NOTE: Once the set period passes, the pre-registered schedule becomes enabled again and the Robotic Mower restarts work according to the preset schedule.

1. Press the  button on the control panel.

The sub menu appears.

2. Select [Deactivate schedules].

The option menu appears.

3. Select the desired option.

Option	Details
For 24 hours	Puts the mowing work scheduled in the Robotic Mower on hold for 24 hours.
For 3 days	Puts the mowing work scheduled in the Robotic Mower on hold for 3 days.

Press the key, and the message [Close the display cover to start mowing.] appears.

4. Close the display cover.

The Robotic Mower starts mowing.

NOTE: To stop the mowing work within the set period, operate the Robotic Mower manually such as by pressing the "STOP" button on the Robotic Mower or by using the [Park] menu, etc.

Mowing in a spiral pattern

[Top menu] > [Start mowing] > [Mowing - With spiral cutting]

Mowing starts in a spiral pattern from a point of concern within the area, such as a place where the grass is dense or where the grass height is uneven due to unmowed grass, etc. After navigating in a spiral pattern to mow the lawn intensively in a specific location, the Robotic Mower transitions to normal navigation and continues mowing the entire area.

Normal path and spiral path

The Robotic Mower normally calculates its path automatically and navigates randomly in straight lines within the area to achieve an even lawn finish. However, you can prioritize and intensively mow a target area of concern to achieve a good finish by starting spiral cutting from a specific location, such as a place where the grass is dense, unmowed grass remains, or the grass grows faster than other places.

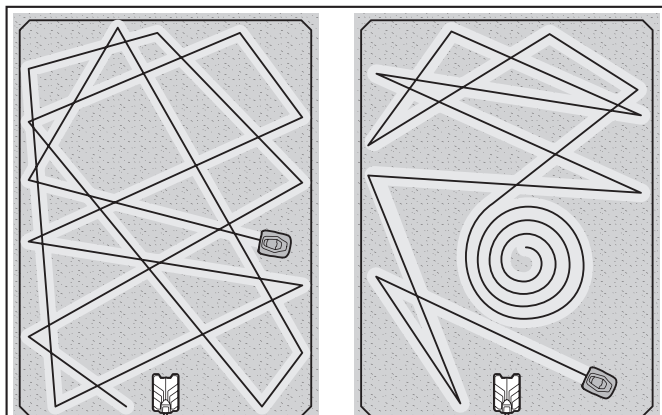


Fig.22 1

2

► 1. Normal path 2. Spiral path

NOTICE: Spiral cutting cannot be started on a slope with a gradient that exceeds 16°.

1. Turn off its power switch and place the Robotic Mower in the location to start spiral cutting. Then turn on the power switch.

2. Press the  button on the control panel.

The sub menu appears.

3. Select [Mowing - With spiral cutting].

The option menu appears.

4. Select the desired option.

Option	Details
Auto mowing	Executes spiral cutting in the main area, and when complete, continues mowing by automatic operation and charging.
Mowing without charging	Executes spiral cutting, and when complete, continues auto mowing within the specified period and without automatic charging.

Press the key, and the message [Close the display cover to start mowing.] appears.

5. Close the display cover.

The Robotic Mower starts mowing.

Park Preferences

NOTE: It is recommended to set the active search period for the guide signal to "0" (zero), if you do not install guide wires in your work area. It helps the Robotic Mower return to the charging station quickly. For details, refer to "Setting the active search period for the guide signal" (Page 16).

Returning the Robotic Mower to the charging station

[Top menu] > [Park] > [Stay at charging station]

The mowing work is stopped and the Robotic Mower is returned to the charging station.

1. Press the  button on the control panel.

The sub menu appears.

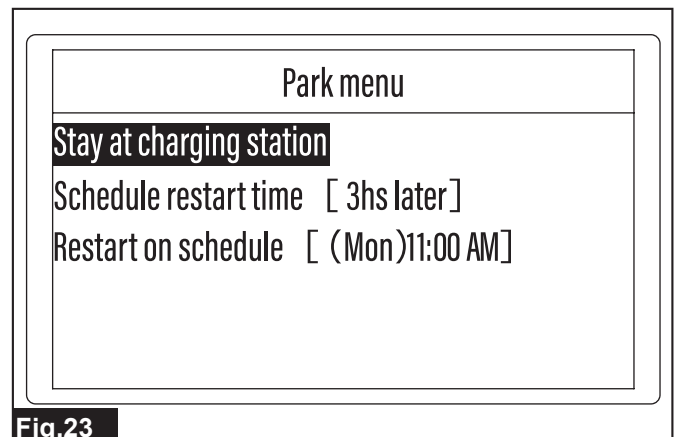


Fig.23

2. Select [Stay at charging station].

Press the key, and the message [Close the display cover to return to the charging station.] appears.

3. Close the display cover.

The Robotic Mower returns to the charging station.

Returning the Robotic Mower to the charging station and restarting operation at the scheduled time

[Top menu] > [Park] > [Schedule restart time]

The Robotic Mower is returned to the charging station, and then operation is restarted after the specified time.

1. Press the  button on the control panel.

The sub menu appears.

2. Select [Schedule restart time].

The entry screen appears.

3. Use the keypad and enter the desired time.

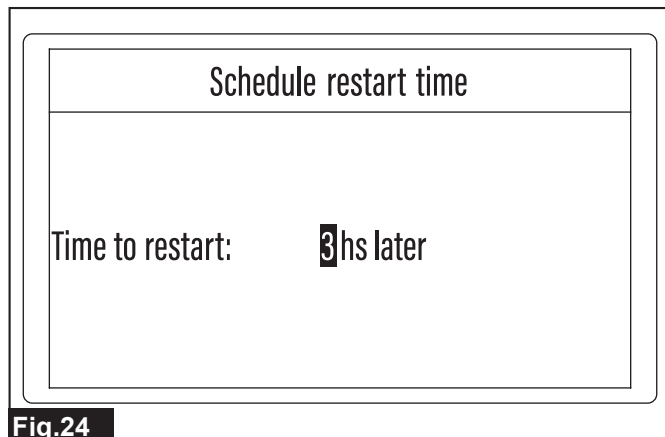


Fig.24

NOTE: You can enter a time to restart of 0 to 99 hours. The initial setting is 3 hours.

4. Press the  key to verify the entry.

The message [Close the display cover to return to the charging station.] appears.

5. Close the display cover.

The Robotic Mower returns to the charging station.

Returning the Robotic Mower to the charging station and restarting operation at the preset schedule

[Top menu] > [Park] > [Restart on schedule]

The Robotic Mower is returned to the charging station, and then operation is restarted at the preset mowing schedule. The Robotic Mower continues to stand by after returning to the charging station, and then automatically departs from the station to meet the next preset mowing schedule.

NOTE: If the Robotic Mower is not sufficiently charged, it will not start mowing even if the preset schedule approaches. Mowing will restart once charging is complete.

NOTE: The schedule displayed on the screen cannot be created, changed, or deleted from this menu. To adjust the schedule, select [Schedule] in the [Mowing preferences] menu and redo the settings.

1. Press the  button on the control panel.

The sub menu appears. The mowing schedule is displayed next to [Restart on schedule]. The displayed date and time are the next planned restart schedule after the Robotic Mower has returned to the charging station.

2. Select [Restart on schedule].

Confirm the displayed start schedule and continue with the setting.

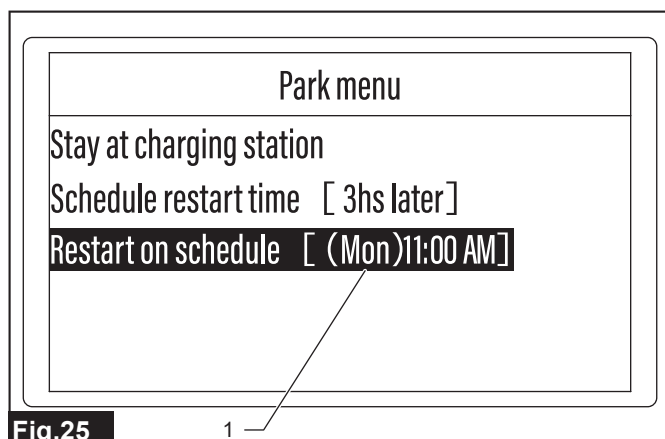



Fig.25

- ▶ 1. Next planned restart schedule

Press the  key, and the message [Close the display cover to return to the charging station.] appears.

3. Close the display cover.

The Robotic Mower returns to the charging station.

Mowing Preferences

Changing and registering the mowing area


[Top menu] > [Main menu] > [Mowing preferences] > [Mowing area]

This is used to change the mowing area size registered when the Robotic Mower was started up for the first time, or to register the size of a new mowing area. The Robotic Mower figures out the optimal mowing process and efficiently mows the lawn based on the mowing area information set here.

NOTICE: Set an appropriate mowing area. If the set value deviates greatly from the actual area, there may be unmowed places, etc.

1. Press the  button on the control panel.

The [Main menu] appears.

2. Select  displayed on the screen.

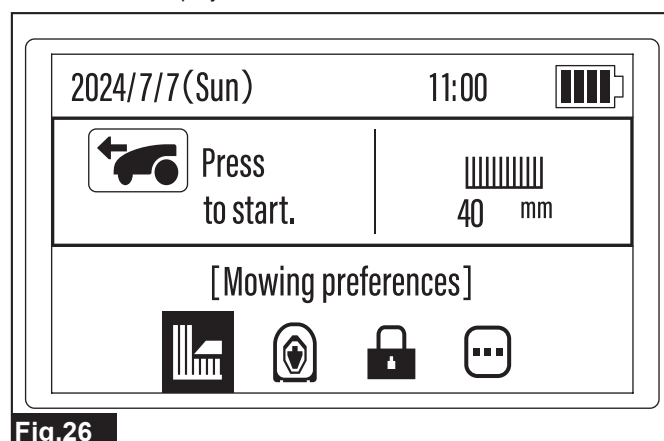


Fig.26

The sub menu appears.

3. Select [Mowing area].

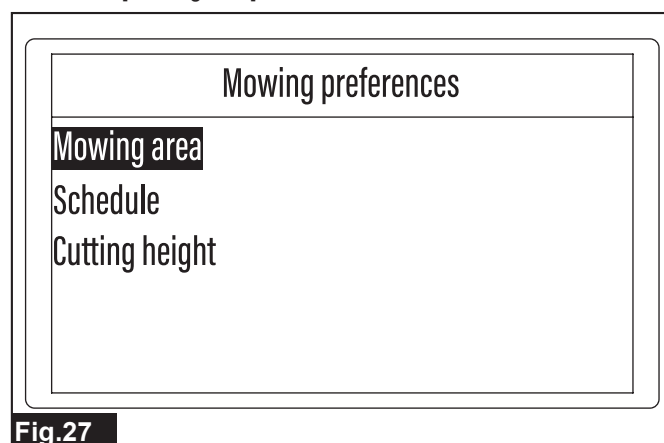


Fig.27

4. Use the keypad and select the size range of your mowing area.

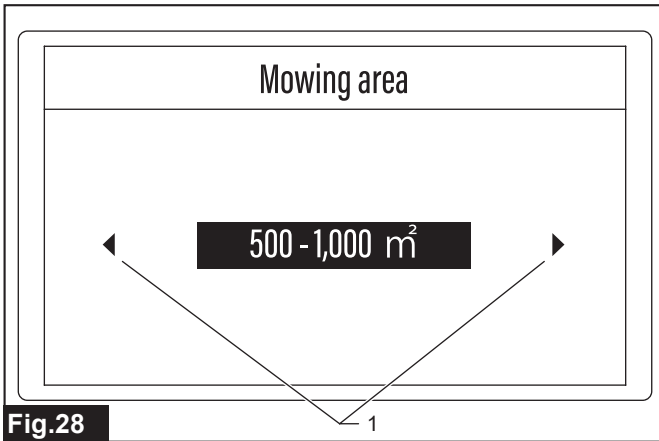


Fig.28

▶ 1. Triangular arrow marks

NOTE: When triangular arrow marks are displayed next to the option, press the keys to switch the option display. When the desired option appears, press the key to verify the selection.

5. Follow the message displayed on the screen and complete the setting.

When the message [Saved successfully.] appears, press the key.

Scheduling mowing

[Top menu] > [Main menu] > [Mowing preferences] > [Schedule]

Set a week's mowing schedule in advance to perform mowing in accordance with the weather and lifestyle patterns. An appropriate work plan will also stabilize the mowing frequency and maintain the lawn in good condition for a longer time.

CAUTION: Draw up daily and weekly work schedules during closed and unattended hours. Prepare schedules to avoid a chance to encounter nocturnal animals. Someone nearby or wild animals might be harmed by mowing operations.

NOTE: Find well-balanced schedules to avoid heavy mower traffic that causes lawn compaction. Turn long mowing hours into scheduled time blocks so the traffic can be redirected to give worn-down areas a break.

1. Press the button on the control panel.

The [Main menu] appears.

2. Select displayed on the screen.

The sub menu appears.

3. Select [Schedule].

The weekly schedule setting screen appears.

4. Use the keypad to select the day to set the schedule.

Press the keys to highlight the desired day and then press the key.

You can select multiple days at once. An underline is displayed below the selected day(s).

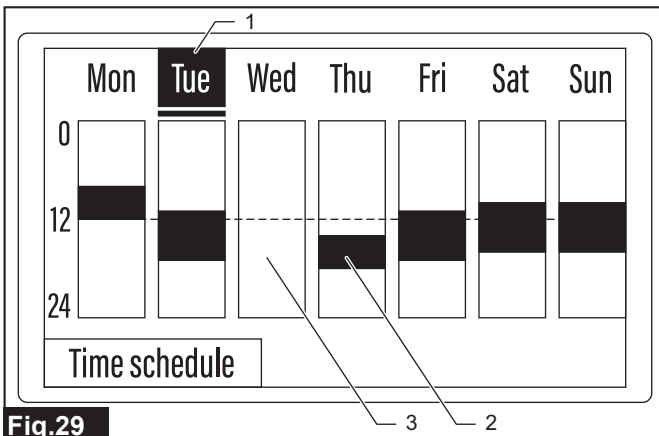


Fig.29

▶ 1. Day selection indication 2. Time period when mowing work is scheduled 3. Time period when mowing work is not scheduled

NOTE: When the days are selected and the detailed time schedule is set, the registered work timetable for each day is displayed. Time periods without a schedule set appear white.

5. Select [Time schedule].

The time schedule setting screen appears.

6. Select the desired option.

Option	Details
Work 24 hours	The Robotic Mower operates all day long. When this option is selected, a check mark appears in the [Schedule 1:] checkbox and [00:00] - [24:00] is displayed.
Park 24 hours	The Robotic Mower remains parked all day long. When this option is selected, the check marks are removed from the [Schedule 1:] and [Schedule 2:] checkboxes and [00:00] - [00:00] is displayed.
Schedule 1:	The Robotic Mower operates at the set time.
Schedule 2:	The Robotic Mower operates at the set time.

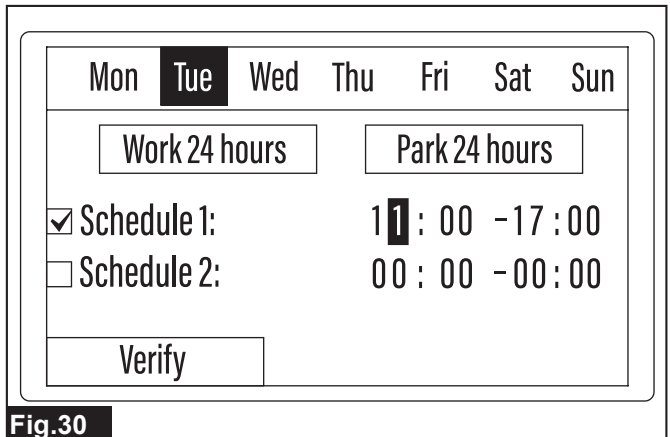


Fig.30

Setting schedules

(1) Use the keypad and place a check mark in the checkbox of the schedule option to be set.

(2) Use the keys to highlight the hour or minute entry field to be set.

(3) Use the keypad and enter the time.

(4) Repeat steps 2 and 3 to enter all the hour and minute entry fields.

NOTICE: To enable a schedule setting, be sure to place a check mark in the checkbox.

NOTICE: The times entered to [Schedule 1:] and [Schedule 2:] cannot overlap.

7. Select [Verify].

When the message [Saved successfully.] appears, press the key.

Recommended operating duration time for a selected mowing area

The table shows benchmark run time suggested for your mowing area size category. Design your own daily and weekly schedules according to your needs.

Mowing area size (m ²)	Weekly working days (days)	Daily working hours (hours)	Time table examples
500	5	5	07:00 - 12:00
	7	3.5	07:00 - 10:30
750	5	7.5	07:00 - 14:30
	7	5.5	07:00 - 12:30
1,000	5	10	07:00 - 17:00
	7	7	07:00 - 14:00
1,500	5	14.5	07:00 - 21:30
	7	10.5	07:00 - 17:30
2,000	5	19.5	04:00 - 23:30
	7	14	07:00 - 21:00
2,500	6	20	03:00 - 23:00
	7	17.5	05:00 - 22:30
3,000	7	21	02:00 - 23:00
3,500	7	24	00:00 - 24:00

Determining the cutting height

[Top menu] > [Main menu] > [Mowing preferences] > [Cutting height]

Set the cutting height manually or by using the auto function. The Robotic Mower automatically adjusts the blade height according to the set grass height.

NOTICE: Mowing long grass to a short length all at once may cause the grass to die, or the cut grass may block up inside the Robotic Mower.

NOTE: Do not try to cut long grass all at once. Instead, mow the lawn in steps, leaving a day or two between mowing sessions, until the lawn becomes evenly short. Lawn clippings would be no longer than 5 mm in a single mowing session. The damage and burden on the lawn can be reduced to maintain a beautiful lawn finish by setting an appropriate grass height and mowing frequency.

NOTE: The maximum cutting height setting value for the Robotic Mower is 60 mm. If the grass height at the start of mowing exceeds this maximum value, cut the excess grass with a Makita lawn mower or other machine before using the Robotic Mower.

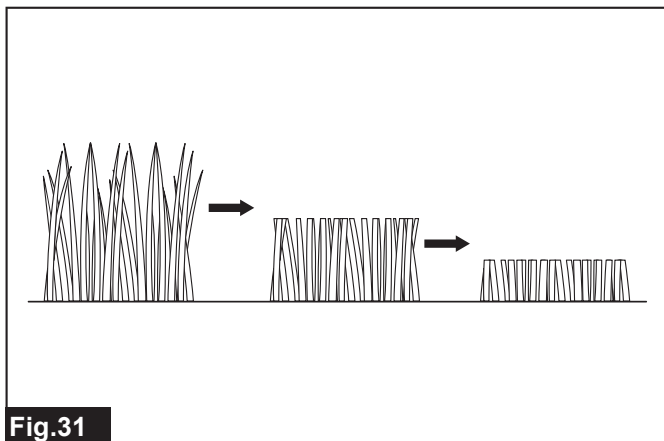


Fig.31

1. Press the button on the control panel. The [Main menu] appears.
2. Select displayed on the screen. The sub menu appears.
3. Select [Cutting height]. The menu selection screen appears.
4. Select the desired menu.

Menu	Details
Manual (consistent)	This sets a consistent cutting height.
Auto	By entering the grass heights at the start and end of mowing, the Robotic Mower automatically adjusts the blade height in steps.

The cutting height entry screen appears.

5. Use the keys to adjust the cutting height.

When the desired height is displayed on the screen, press the key to verify the setting. When there are multiple entry fields, select all the values and then press the key.

[Manual (consistent)] menu entry screen

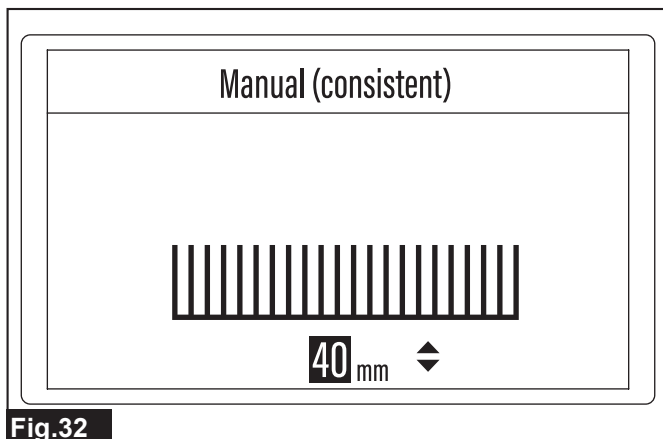


Fig.32

[Auto] menu entry screen

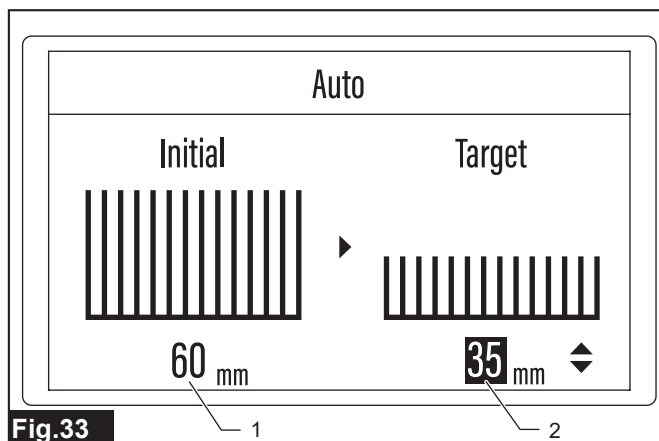


Fig.33

1. Grass height at work start
2. Target grass height

6. Follow the message displayed on the screen and complete the setting.

When the message [Saved successfully.] appears, press the key.

Navigation Preferences

CAUTION: When starting up the Robotic Mower for the first time after installing the wires in the work area as advance preparation, be sure to have the Robotic Mower automatically depart once from the docked state with the charging station.

When the Robotic Mower automatically departs from the charging station, it saves the magnetic field in its memory and performs autonomous control so that docking operation is performed properly thereafter. If this task is not performed, the Robotic Mower may not execute docking properly when returning, or may otherwise not function properly.

Select and execute one of the following two methods to have the Robotic Mower automatically depart from the charging station.

- Dock the fully charged Robotic Mower with the charging station within the pre-scheduled operation time (or at any time when using the [Deactivate schedules] sub menu), and then issue the start instruction using the [Start mowing] menu. For details, refer to "Start Mowing Menu" (Page 12).
- Tentatively register the departure method in the [Mower departing points] sub menu of the [Navigation preferences] menu, and perform test navigation. For details, refer to "Selecting the departure method from the charging station" (Page 18).

Setting the active search period for the guide signal



[Top menu] > [Main menu] > [Navigation preferences] > [Active search period for guide wire]

Set the period that the Robotic Mower actively searches for the control signal from the guide wire.

NOTE: When returning to the charging station, the Robotic Mower detects the signal transmitted from the guide wire, and follows that signal to efficiently trace the return path to the station.

NOTE: If the signal from the guide wire cannot be detected within the active search period, operation switches to search over a wide range including the signal from the boundary wire, and the Robotic Mower returns to the charging station according to the detected control signal.

NOTE: It is recommended to set the active search period for the guide signal to "0" (zero), if you do not install guide wires in your work area.

1. Press the  button on the control panel.
The [Main menu] appears.
2. Select  displayed on the screen.
The sub menu appears.
3. Select [Active search period for guide wire].

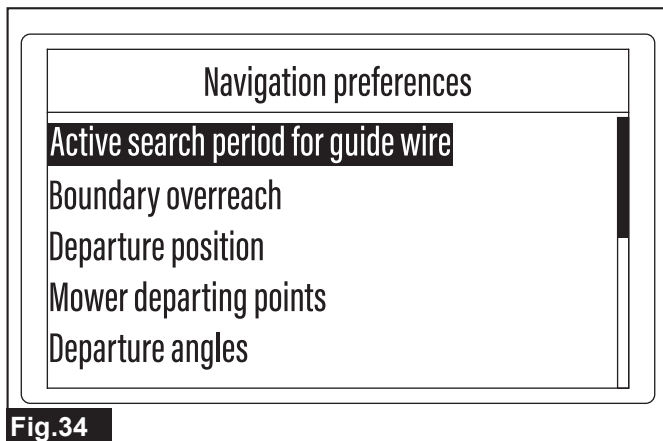


Fig.34

The entry screen appears.

4. Use the keypad and enter the desired search period.

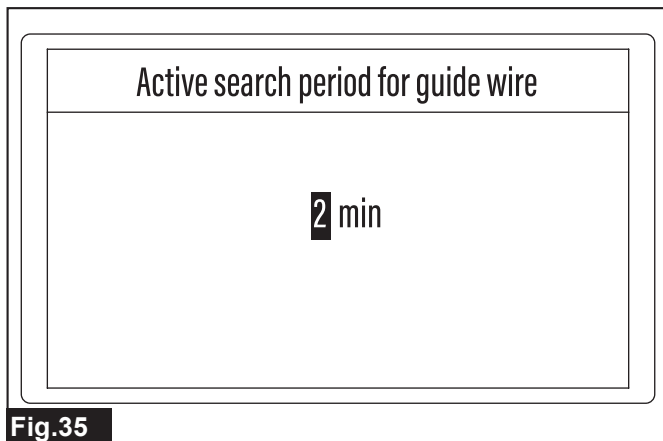




Fig.35

NOTE: You can enter an active search period of 0 to 10 min. The initial setting is 10 min. If a value that exceeds the setting range is entered, it is automatically replaced with the maximum value.

5. Press the  key to verify the entry.
When the message [Saved successfully.] appears, press the  key.

Cutting the grass near the boundary

[Top menu] > [Main menu] > [Navigation preferences] > [Boundary overreach]

Adjust the distance by which the Robotic Mower is to exceed the boundary wire in order to neatly cut the grass near the boundary.

Movement of the Robotic Mower near the boundary

When the Robotic Mower approaches the boundary wire installed around the mowing area, it detects the signal from the wire and prepares to change direction. When boundary overreach is set, the Robotic Mower mows up to a certain distance outside the wire, and then returns to within the boundary, automatically turns, and continues mowing. By setting an appropriate boundary overreach, you can achieve a good lawn finish without leaving grass unmowed near the boundary.

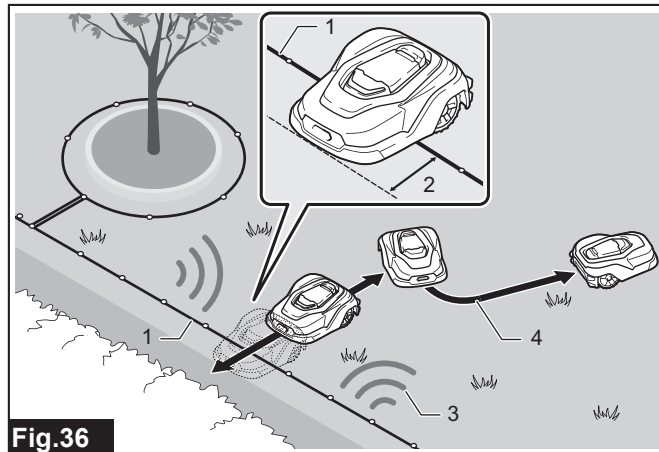




Fig.36

- 1. Boundary wire 2. Boundary overreach 3. Wire signal 4. Mowing path

1. Press the  button on the control panel.
The [Main menu] appears.
2. Select  displayed on the screen.
The sub menu appears.
3. Select [Boundary overreach].
The entry screen appears.
4. Use the keypad and enter the distance by which the Robotic Mower is to reach over the boundary wire.

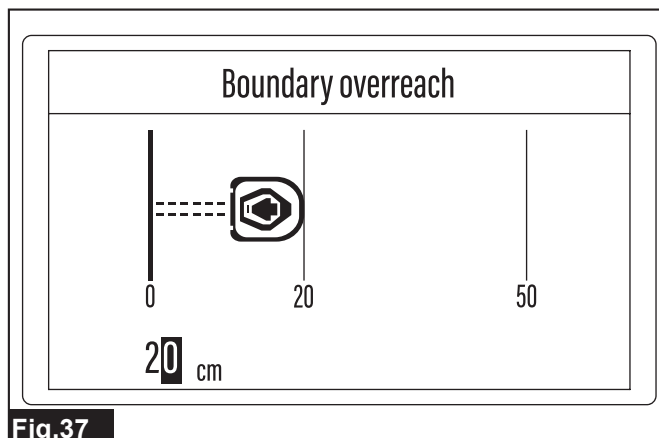





Fig.37

NOTE: You can enter an overreach distance of 20 to 50 cm.

NOTE: If a value that is below the setting range is entered, the message [Invalid input.] appears. Select [OK] and then press the  key. The entry screen appears again.

NOTE: If a value that exceeds the setting range is entered, it is automatically replaced with the maximum value.

5. Press the  key to verify the entry.
When the message [Saved successfully.] appears, press the  key.

Setting the movement distance to the mowing start point

[Top menu] > [Main menu] > [Navigation preferences] > [Departure position]

Set the movement distance until the Robotic Mower starts mowing after departing from the charging station. The Robotic Mower initially moves away from the charging station without mowing, and then starts mowing after moving for the distance set here.

Why is it necessary to move to the mowing start point?

When the Robotic Mower departs from the charging station, it does not start mowing immediately, and instead starts mowing after moving a certain distance from the station. This is because setting a slightly distant work start position enables to avoid overlapping or biased work paths, and to more efficiently reach difficult-to-access areas.

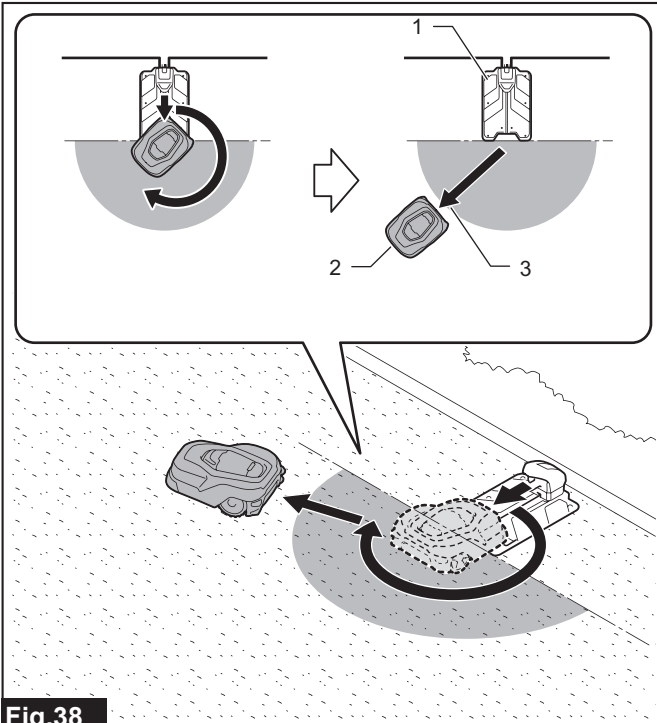


Fig.38

▶ 1. Charging station 2. Work start position 3. Movement distance

1. Press the button on the control panel. The [Main menu] appears.
2. Select displayed on the screen. The sub menu appears.
3. Select [Departure position]. The entry screen appears.
4. Use the keypad and enter the distance that the Robotic Mower is to move before starting mowing.

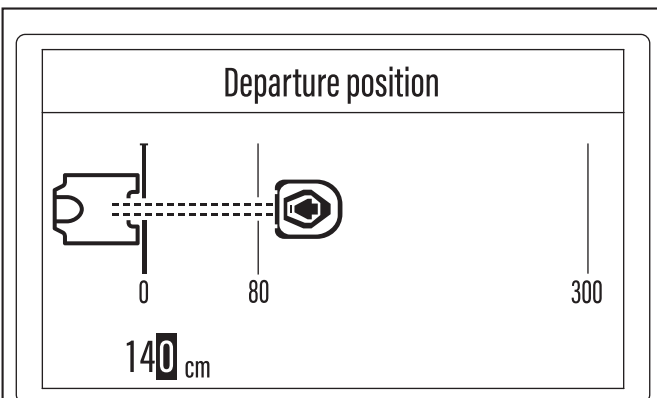


Fig.39

NOTE: You can enter a departure position of 80 to 300 cm.

NOTE: If a value that is below the setting range is entered, the message [Invalid input.] appears. Select [OK] and then press the key. The entry screen appears again.

NOTE: If a value that exceeds the setting range is entered, it is automatically replaced with the maximum value.

5. Press the key to verify the entry.

When the message [Saved successfully.] appears, press the key.

Selecting the departure method from the charging station

[Top menu] > [Main menu] > [Navigation preferences] > [Mower departing points]

Set how the Robotic Mower is to depart from the charging station and start mowing. You can register and adjust the execution priority of up to five different departure methods, including the type of wire signal to follow and the movement distance to the mower departing points when departing from the station.

Skillfully combining multiple mower departing points

In addition to starting mowing by departing directly from the charging station, the Robotic Mower can also move away from the station along the boundary wire or guide wire for a certain distance and then start work from that point. By combining multiple departure methods in accordance with the shape and layout of the work area, you can avoid overlapping or biased work paths, arrive directly to areas that are difficult to access by normal navigation, and achieve an even lawn finish over the entire area.

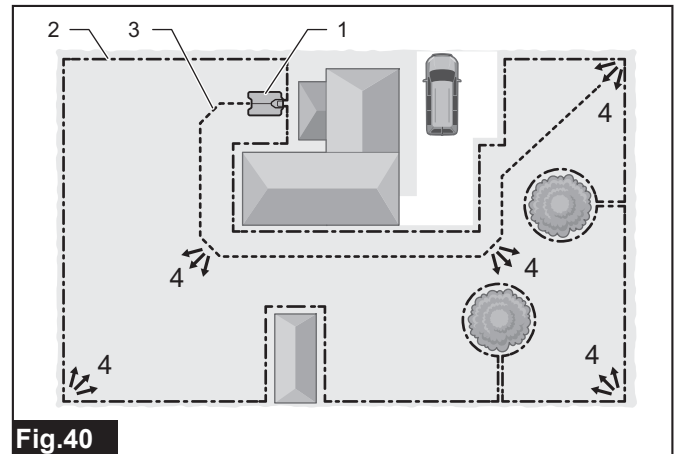


Fig.40

▶ 1. Charging station 2. Boundary wire 3. Guide wire 4. Mower departing points

NOTICE: Dock the Robotic Mower with the charging station before setting the departure methods.

1. Press the button on the control panel. The [Main menu] appears.
2. Select displayed on the screen. The sub menu appears.
3. Select [Mower departing points]. The menu selection screen appears.
4. Select the number of the profile to register the departure method.

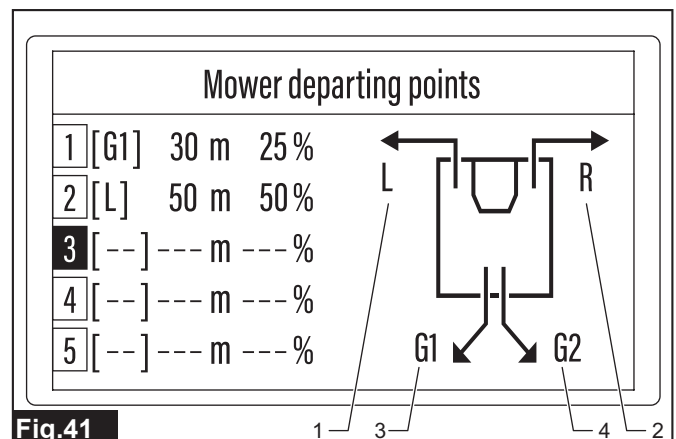


Fig.41

▶ 1. Forwards to left along boundary wire 2. Forwards to right along boundary wire 3. Forwards along guide wire 1 4. Forwards along guide wire 2

The option menu appears.

5. Use the keypad and enter the desired conditions to the option format fields displayed on the screen.

Option	Details
Wire to trace:	Select the type of wire that the Robotic Mower is to trace after departing from the charging station. Use the \leftarrow / \rightarrow keys to display the desired wire type. To depart directly from the charging station without tracing a specific wire, select [-----].
Departure position:	Enter the distance that the Robotic Mower is to move from the station before starting the mowing work. You can enter a distance of 0 to 800 m.
Probability	Enter the probability of executing the set profile as a percentage.

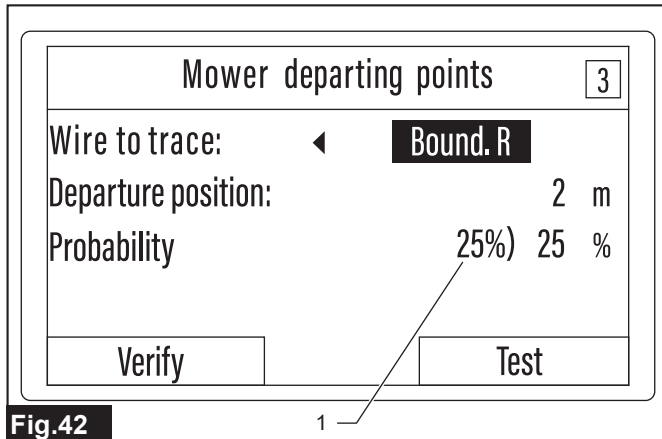


Fig.42

▶ 1. Maximum probability value that can be entered

NOTE: The maximum probability value that can be entered for each profile is displayed to the left of the probability entry field. Enter a value of the displayed maximum value or less. If a value that exceeds the range is entered, it is automatically replaced with the maximum value.

6. Select [Test] and execute test operation before registering the settings.

Follow the message displayed on the screen and complete the test operation.

If the test operation results are unsatisfactory, redo the settings.

NOTE: To register the distance setting after test navigation, save the test report by following the instructions on the screen. Then press the \checkmark key to complete the registration after the message [Saved successfully.] appears. When this registration is complete, the screen returns to the menu selection screen.

NOTE: The Robotic Mower stops automatically near the mower departing point after the test navigation. To redo the settings or register a new profile, manually dock the Robotic Mower to the charging station again.

NOTE: To skip the test navigation, select [Verify] and register the setting.

When the message [Saved successfully.] appears, press the \checkmark key.

7. Repeat steps (4) through (6) and register up to five profiles as necessary.

Adjusting the departure angles from the charging station

[Top menu] > [Main menu] > [Navigation preferences] > [Departure angles]

Set the departure angles when the Robotic Mower departs directly from the charging station. Assuming the docking contact point, facing the charging station, as 0° (12 o'clock), you can set two departure angle ranges between 90° (3 o'clock) to 270° (9 o'clock) in the clockwise direction. You can adjust the execution priority of each departure angle.

What is the "probability" that determines the execution priority?

The probability obtained when setting the departure method and departure angles from the charging station expresses the possibility of the Robotic Mower prioritizing operation based on the set contents as a percentage.

For example, if 25% and 75% are entered as the probabilities for ranges 1 and 2 when setting the departure angles, there is a 25% probability that the Robotic Mower will depart at an arbitrary angle within range 1.

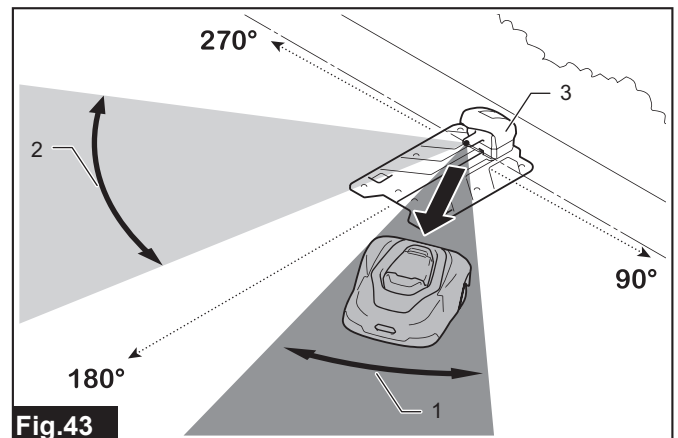


Fig.43

▶ 1. Departure angle range 1 2. Departure angle range 2 3. Charging station

The total of the "Probability" setting values is 100%

The Robotic Mower considers the total of the probabilities entered with the two sub menus [Mower departing points] and [Departure angles] to be 100%, and appropriately allocates the methods and angles for departing from the charging station.

For example, if three departure methods are registered with the sub menu [Mower departing points] and the probability for each is set to 20%, the total probability is 60%. The remaining 40% probability is allocated to the execution priority of the departure angle ranges 1 and 2 set by the sub menu [Departure angles]. Here, if 50% and 50% are input as the probabilities for the departure angle ranges 1 and 2, the remaining 40% probability is allocated 50% each for ranges 1 and 2. Therefore, in terms of total probability, the execution priority of departure angle ranges 1 and 2 are calculated as 20% and 20%, respectively.

As a result, the Robotic Mower randomly executes the three departure methods registered with the sub menu [Mower departing points] and the two departure angles registered with the sub menu [Departure angles] with a respective probability of 20% each.

1. Press the ⚙ button on the control panel.

The [Main menu] appears.

2. Select ⊙ displayed on the screen.

The sub menu appears.

3. Select [Departure angles].

The option menu appears.

4. Use the keypad and enter the desired conditions to the option format fields displayed on the screen.

Exit ranges can be set at between 90° and 270°.

Option	Details
Exit range 1:	Enter the 1st angle range for the Robotic Mower to depart from the charging station. (You can also set just one range.)
Exit range 2:	Enter the 2nd angle range for the Robotic Mower to depart from the charging station.
Probability	Enter the probability of the Robotic Mower departing within each set angle range as a percentage.

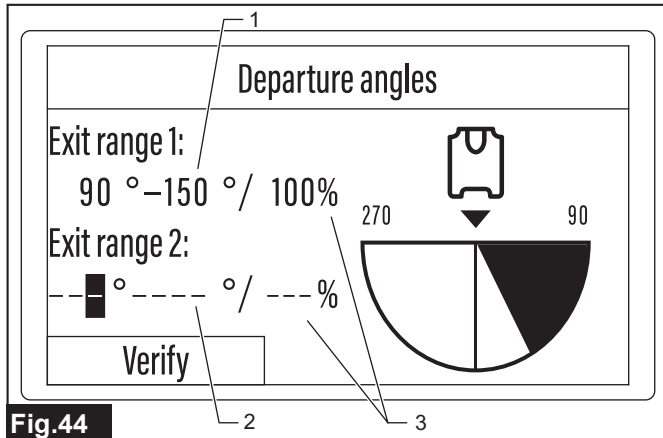


Fig.44

- ▶ 1. Exit range 1 (1st angle range) 2. Exit range 2 (2nd angle range)
- 3. Probability

Setting the departure angles

- (1) Use the keys to highlight the angle and probability entry fields to be set.
- (2) Use the keypad and enter the angles and probability.
- (3) Repeat steps 1 and 2 and enter all the entry fields.

NOTE: When entering only [Exit range 1:], the execution probability is automatically set to 100%.

NOTE: When only [Exit range 1:] is entered, the execution probability of [Exit range 1:] cannot be changed. When entry to [Exit range 2:] is started after entering [Exit range 1:], the execution probability of [Exit range 1:] can be changed.

NOTE: Finish entry to [Exit range 1:] before setting [Exit range 2:]. It is not possible to enter only [Exit range 2:].

NOTE: The execution probability of [Exit range 2:] is automatically calculated so that the total with the execution probability of [Exit range 1:] is 100%. The execution probability of [Exit range 1:] is subtracted from 100%, and the remainder probability is automatically displayed as the execution probability of [Exit range 2:].

5. Select [Verify] and register the settings.

When the message [Saved successfully.] appears, press the key.

Adjusting the width of offset navigation

[Top menu] > [Main menu] > [Navigation preferences] > [Line trace offset]

The width of the path when navigating along the boundary wire and guide wire is offset within the setting range.

What is offset navigation?

The Robotic Mower moves along the various wires while detecting the signals from the wires. Offset navigation intentionally shifts this movement path little by little from each reference wire to prevent the wheels from repeatedly passing over the same part of the lawn. The Robotic Mower moves while offsetting the path randomly within the range of the set value, enabling to reduce the burden on the lawn on specific paths.

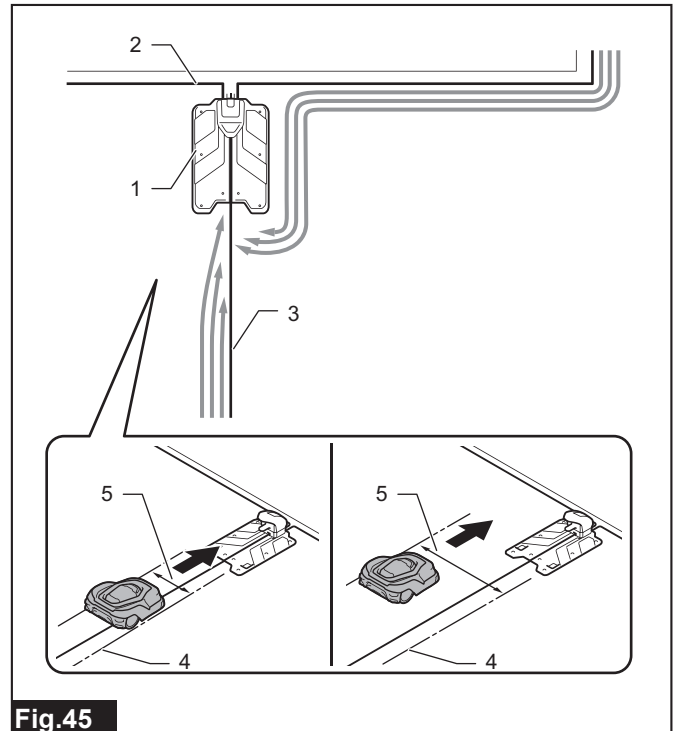


Fig.45

- ▶ 1. Charging station 2. Boundary wire 3. Guide wire 4. Outer edge reference line 5. Widths of offset navigation

NOTE: When there is a narrow path within the work area, consider the maximum offset width that will let the Robotic Mower pass.

1. Press the button on the control panel.
The [Main menu] appears.
2. Select displayed on the screen.
The sub menu appears.

NOTE: If the menu is not displayed, use the keys to scroll the screen.

3. Select [Line trace offset].
The option menu appears.

4. Select the checkbox of the wire name to set the offset path.

Option	Details
G1:	This sets the offset relative to the reference path of the 1st guide wire. The larger the offset value, the wider the offset range from the reference path.
G2:	This sets the offset relative to the reference path of the 2nd guide wire. The larger the offset value, the wider the offset range from the reference path.
Boundary:	This sets the offset relative to the reference path of the boundary wire. The larger the offset value, the wider the offset range from the reference path.

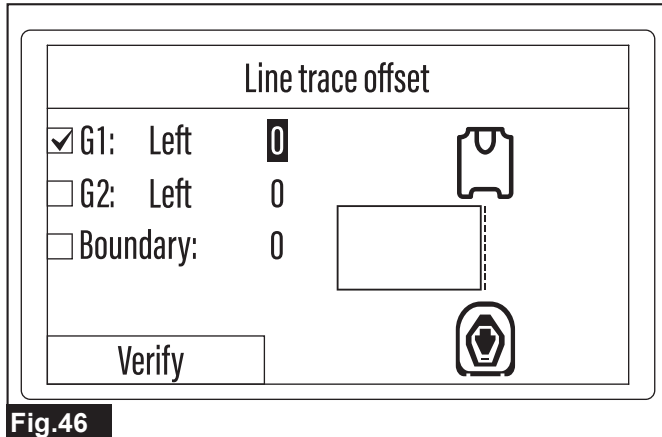


Fig.46

When a check mark is placed in the checkbox, the offset entry field is automatically highlighted.

5. Use the keypad and enter the desired conditions to the option format fields displayed on the screen.

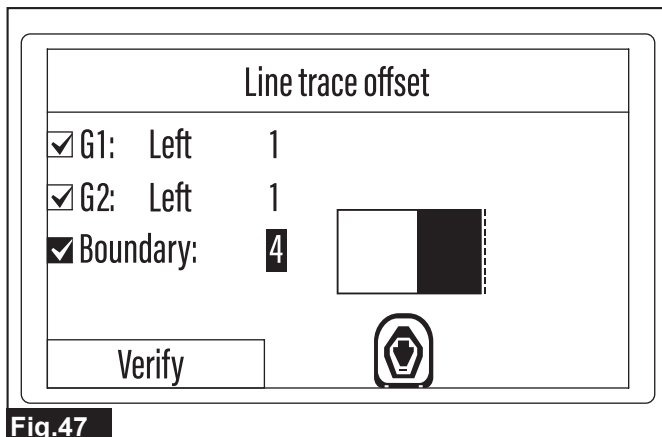


Fig.47

You can enter an offset value of 0 to 9. The following table shows the approximate range of the actual navigation widths for the offset values. The actual range of the navigation widths given in the table may differ according to the work environment and other conditions.

Offset value and navigation width correspondence table

Offset value	Navigation width	Offset value	Navigation width
0	55 cm	5	110 cm
1	90 cm	6	115 cm
2	95 cm	7	120 cm
3	100 cm	8	125 cm
4	105 cm	9	130 cm

Image of navigation width fluctuation

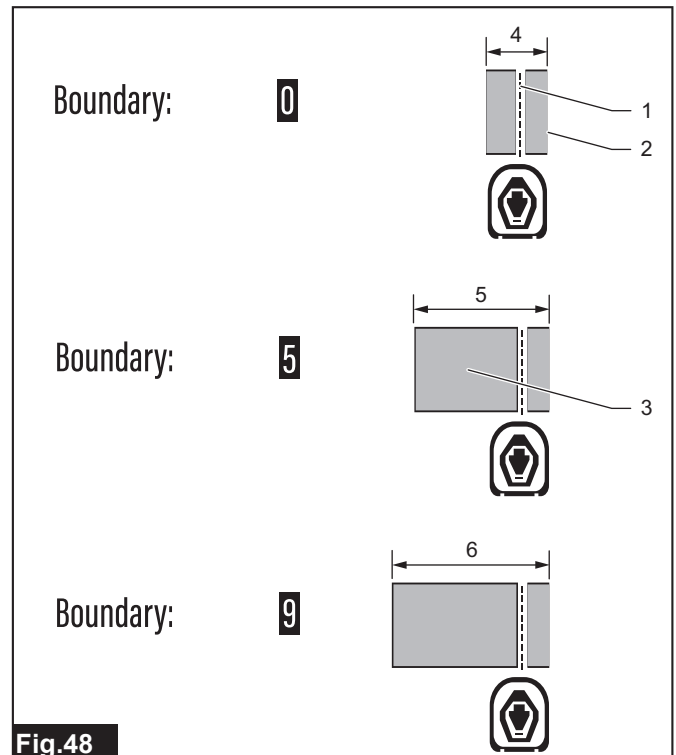


Fig.48

► 1. Boundary wire 2. Outer edge reference line 3. Navigation width fluctuation range 4. 55 cm 5. 110 cm 6. 130 cm

NOTE: The line where the right face of the Robotic Mower reaches over the boundary wire by about 20 cm to the outside is the outer edge reference line. The navigation width fluctuates toward the inside with the outer edge reference line as zero.

6. Select [Verify] and register the settings.

When the message [Saved successfully.] appears, press the key.

Mowing unmowed grass

[Top menu] > [Main menu] > [Navigation preferences] > [Spiral cutting]

When the Robotic Mower detects an area with long or dense grass, etc. during the mowing work, it navigates that area in a spiral pattern to intensively mow the grass. Mowing areas with dense grass in a spiral pattern enables to efficiently achieve a neat lawn finish.

Finding spots with dense grass

The Robotic Mower finds areas with dense grass and unmowed lawn by sensitively detecting the load when cutting the grass. When such a specific area is found, the Robotic Mower navigates in a spiral pattern from that point toward the outside and intensively mows the grass to efficiently achieve a neat and even lawn finish.

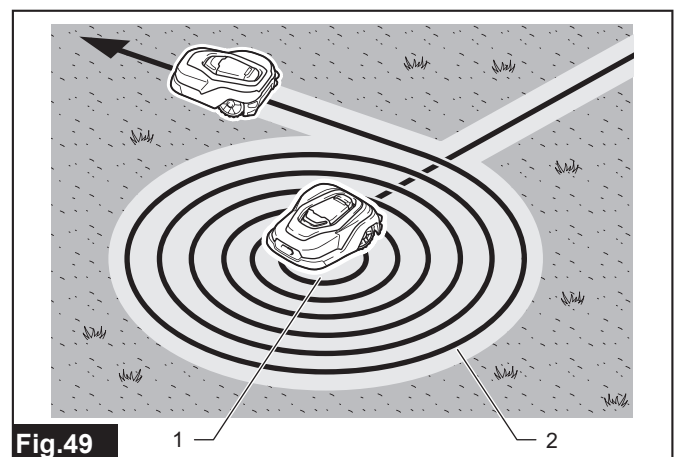





Fig.49

► 1. Area with dense grass 2. Spiral path

NOTE: The Robotic Mower executes spiral cutting one time per charge. When the Robotic Mower departs the charging station after charging is complete, it first performs normal mowing work continuously for about 30 minutes. When dense or unmowed grass, etc. is detected after that, operation switches to spiral cutting centering on that spot, and then after intensively mowing the grass, the mowing work continues with normal navigation again.

1. Press the  button on the control panel.
The [Main menu] appears.
2. Select  displayed on the screen.
The sub menu appears.

NOTE: If the menu is not displayed, use the / keys to scroll the screen.

3. Select [Spiral cutting].
The option menu appears.
4. Select the desired option.
Select the checkbox in front of the option, and then press the  key.

Option	Details
Spiral cutting	Enables the spiral cutting mode.

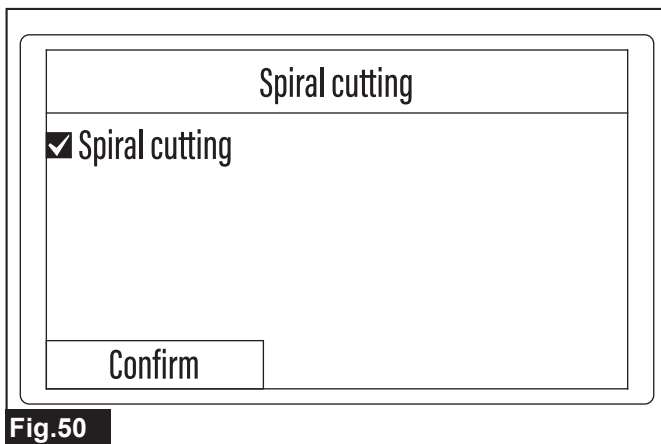



Fig.50



5. Select [Confirm] and register the setting.
When the message [Saved successfully.] appears, press the  key.

Security Preferences

Setting the alarm sounding time

[Top menu] > [Main menu] > [Security] > [Alarm duration]

Set the duration of the alarm that sounds for various notification or when an error occurs.

1. Press the  button on the control panel.
The [Main menu] appears.
2. Select  displayed on the screen.
The PIN code entry screen appears.
3. Use the keypad and enter the PIN code.

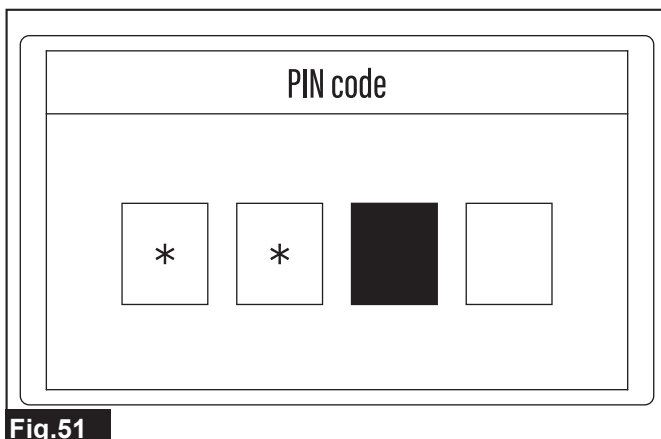


Fig.51

The sub menu appears.

4. Select [Alarm duration].

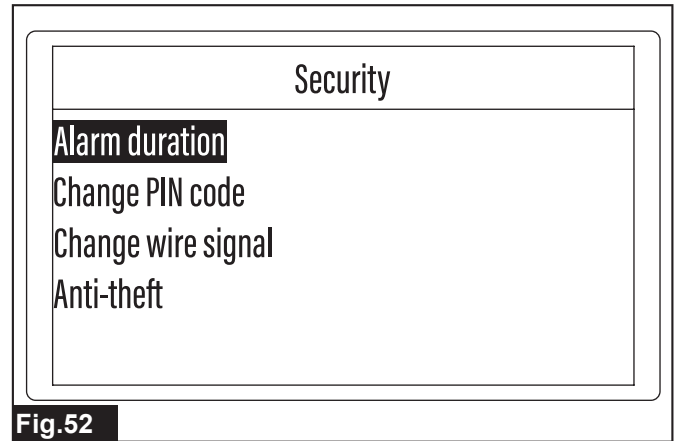


Fig.52

The entry screen appears.

5. Use the keypad and enter the desired time.

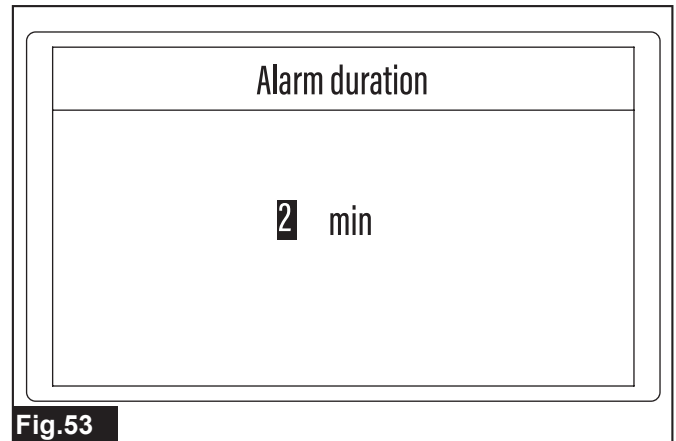




Fig.53



NOTE: You can enter an alarm duration of 1 to 99 min. The initial setting value is 10 min.

6. Press the  key to verify the entry.
When the message [Saved successfully.] appears, press the  key.

Changing the PIN code

[Top menu] > [Main menu] > [Security] > [Change PIN code]

This is used to change the currently used PIN code to a new code.

1. Press the  button on the control panel.
The [Main menu] appears.
2. Select  displayed on the screen.
The PIN code entry screen appears.
3. Use the keypad and enter the currently used PIN code.
The sub menu appears.
4. Select [Change PIN code].
The entry screen appears.
5. Use the keypad and enter the new PIN code.

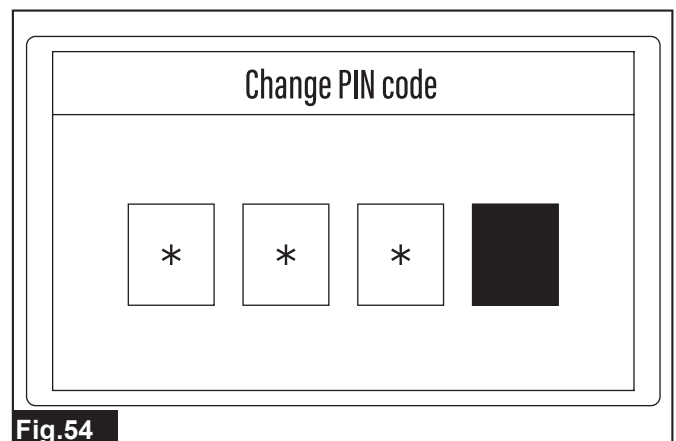


Fig.54

- Enter the new PIN code again for confirmation.



When the message [The PIN code has been changed.] appears, press the key.

Preventing wire signal interference

[Top menu] > [Main menu] > [Security] > [Change wire signal]

Change a channel for sending wire signals when it interferes with signals from adjacent work areas.

NOTICE: Dock the Robotic Mower with the charging station before changing the channel.

- Press the  button on the control panel.
The [Main menu] appears.
- Select  displayed on the screen.
The PIN code entry screen appears.
- Use the keypad and enter the PIN code.
The sub menu appears.
- Select [Change wire signal].
The option menu appears.
- Use the keypad and select a new channel code.

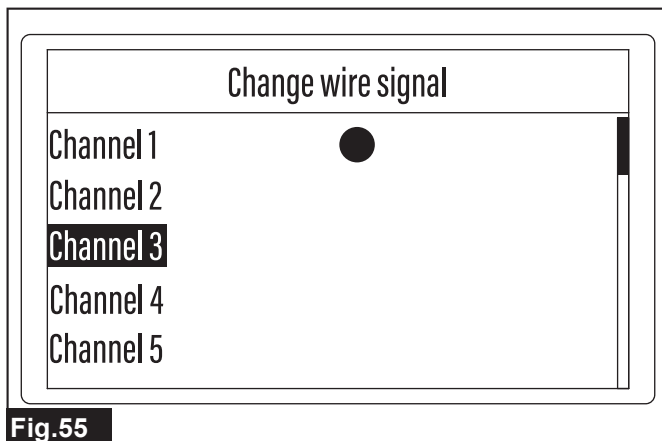


Fig.55



NOTE: A mark is displayed next to the currently used channel code. (The initial value is [Channel 1].) When changing the channel, select a channel without the mark displayed.

- Follow the message displayed on the screen and complete the setting.
When the message [Dock the mower to the charging station.] appears, select [Confirm] and press the key.
When the message [Completed.] appears, press the key.

Protecting the Robotic Mower from theft

[Top menu] > [Main menu] > [Security] > [Anti-theft]

Prevent theft and improper use of the Robotic Mower by setting the operation lock and notification function.

- Press the  button on the control panel.
The [Main menu] appears.
- Select  displayed on the screen.
The PIN code entry screen appears.
- Use the keypad and enter the PIN code.
The sub menu appears.
- Select [Anti-theft].
The option menu appears.
- Use the keypad and place a check mark in the checkbox of the desired option.
You can select multiple options.

Option	Details
Stopped: PIN	When the Robotic Mower is forcibly stopped, PIN code entry is necessary to restart operation.
Stopped: PIN & Alarm	When the Robotic Mower is forcibly stopped, the alarm sounds and PIN code entry is necessary to restart operation.
Lifted: PIN & Alarm	When the Robotic Mower is lifted up, the alarm sounds and PIN code entry is necessary to restart operation.
Tilted: PIN & Alarm	When the Robotic Mower is tilted by a certain angle or more, the alarm sounds and PIN code entry is necessary to restart operation.

- Select [Verify] and register the setting.

When the message [Saved successfully.] appears, press the key.



Other Settings

Saving/loading user preferences

[Top menu] > [Main menu] > [Others] > [Save and load preferences]

You can save up to three preferred settings you create and customize in the setting menus and load them at any time. This allows to use a range of user preferences to switch according to the work area and environment.

NOTE: A certain range of items (e.g., date and time, PIN code and so on, set on the initial setting screen) cannot be saved and loaded.

- Press the  button on the control panel.
The [Main menu] appears.
- Select  displayed on the screen.
The sub menu appears.
- Select [Save and load preferences].

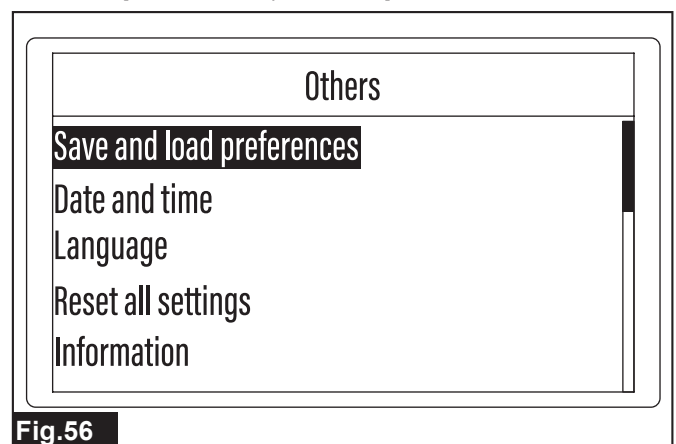


Fig.56

The menu selection screen appears.

- Select the desired menu.

Menu	Details
Load	Loads saved user preferences.
Save	Saves the user preferences currently being used.

The option menu appears.

- Select the user preference load source or the save destination option name.

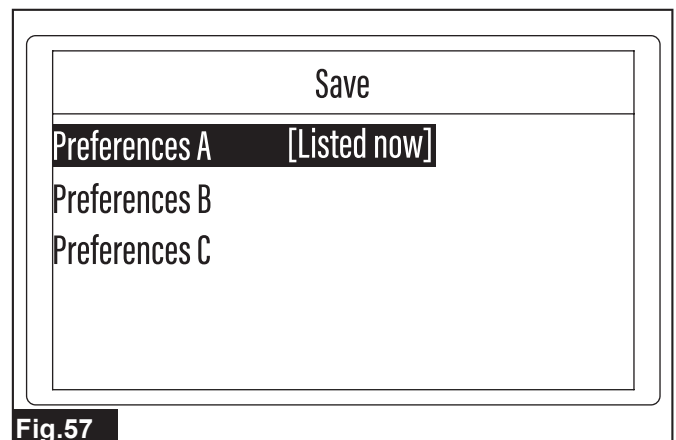


Fig.57

NOTE: [Listed now] is displayed to the right of options with user preferences already registered.

- Follow the message displayed on the screen and complete the setting.
When the message [Are you sure?] appears, select [Yes] and press the key.

Changing the date and time settings

[Top menu] > [Main menu] > [Others] > [Date and time]

This is used to adjust or change the date and time set in the Robotic Mower.

1. Press the  button on the control panel.





The [Main menu] appears.

2. Select  displayed on the screen.

The sub menu appears.

3. Select [Date and time].

The menu selection screen appears.

4. Use the , , ,  keys to select the desired menu option.

Select and display the desired format on the screen.

Menu	Option details
Date format:	Selects the date format from [Year/Month/Day], [Month/Day/Year], or [Day/Month/Year].
Time format:	Switches the time format between [12 hours] or [24 hours].

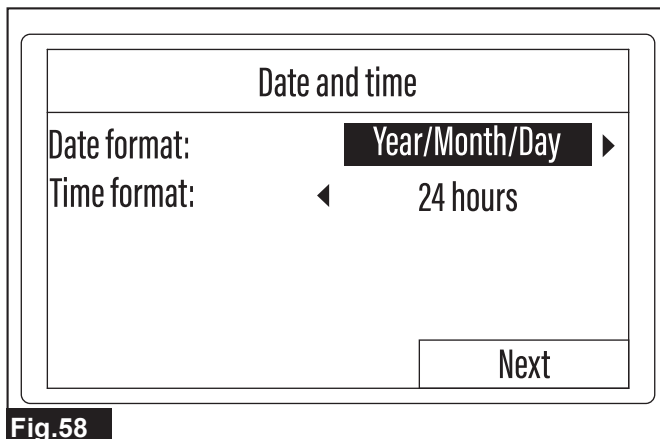


Fig.58

5. Select [Next].

The date and time entry screen appears.

6. Use the keypad and enter the desired date and time.

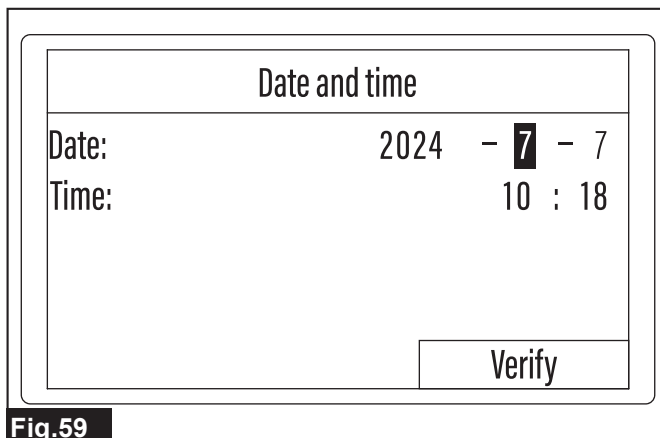







Fig.59

Entering the date and time

- (1) Use the , , ,  keys to highlight the date or time entry field to be set.
- (2) Use the keypad and enter the year, month, and day or the time.
- (3) Repeat steps 1 and 2 and enter all the entry fields to be changed.
7. Select [Verify].

When the message [Saved successfully.] appears, press the  key.

Changing the display language

[Top menu] > [Main menu] > [Others] > [Language]

This is used to change the language displayed on the LCD screen.

1. Press the  button on the control panel.

The [Main menu] appears.

2. Select  displayed on the screen.

The sub menu appears.

3. Select [Language].

The language selection screen appears.

4. Select the desired language.

The display language of the language selection screen changes.

When the message [Saved successfully.] appears, press the  key.

Resetting the user preferences

[Top menu] > [Main menu] > [Others] > [Reset all settings]

This is used to reset all saved user preferences and return them to the initial state.

NOTICE: Some information and settings entered when starting up the Robotic Mower for the first time, such as the date and time and the PIN code, are not reset.

1. Press the  button on the control panel.

The [Main menu] appears.

2. Select  displayed on the screen.


The sub menu appears.

3. Select [Reset all settings].

The PIN code entry screen appears.

4. Use the keypad and enter the PIN code.

5. Follow the message displayed on the screen and complete the setting.

When the message [Completed.] appears, press the  key.

Browsing the product information

[Top menu] > [Main menu] > [Others] > [Information]

This displays the latest product information, such as the cumulative work time and the software version information.





1. Press the  button on the control panel.

The [Main menu] appears.

2. Select  displayed on the screen.

The sub menu appears.

3. Select [Information].

NOTE: After browsing the information, you can return to an upper menu screen by pressing the  key or the  button. Press the  key to return to the [Others] sub menu screen, or the  button to return to the [Main menu] screen.

Managing the LED on/off time

[Top menu] > [Main menu] > [Others] > [LED]

This is used to control the on and off times of the LED lamp on the top of the Robotic Mower. For details on the LED lamp, refer to "Lamp lighting" (Page 7).

1. Press the  button on the control panel.

The [Main menu] appears.

2. Select  displayed on the screen.

The sub menu appears.

NOTE: If the menu is not displayed, use the ,  keys to scroll the screen.

3. Select [LED].

The on/off schedule setting screen appears.

4. Select the desired option.

Option	Details
Always ON	The LED is always on. When this option is selected, a check mark is placed in the [Schedule 1:] checkbox and [00:00] - [24:00] is displayed.
Always OFF	The LED is always off. When this option is selected, the check marks are removed from both the [Schedule 1:] and [Schedule 2:] checkboxes, and [00:00] - [00:00] is displayed.
Schedule 1:	The LED is on within the set time range.
Schedule 2:	The LED is on within the set time range.

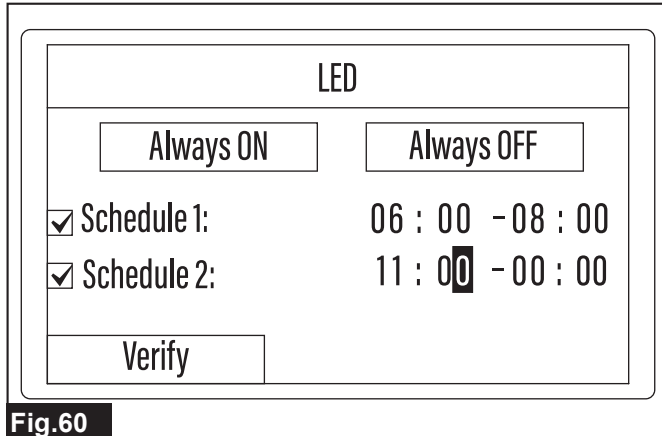


Fig.60

Setting schedules

- (1) Use the keypad and place a check mark in the checkbox of the schedule option to be set.
- (2) Use the keys to highlight the hour or minute entry field to be set.
- (3) Use the keypad and enter the time.
- (4) Repeat steps 2 and 3 to enter all the hour and minute entry fields.

NOTICE: To enable a schedule setting, be sure to place a check mark in the checkbox.

NOTICE: The times entered to [Schedule 1:] and [Schedule 2:] cannot overlap.

5. Select [Verify].

When the message [Saved successfully.] appears, press the key.

Checking the details of operation errors

[Top menu] > [Main menu] > [Others] > [Error message]

This displays the most recent error messages, including the details, reported to the Robotic Mower.

1. Press the button on the control panel.

The [Main menu] appears.

2. Select displayed on the screen.

The sub menu appears.

NOTE: If the menu is not displayed, use the keys to scroll the screen.

3. Select [Error message].

The Robotic Mower searches for the error information and displays a list of the reported error codes in order from the newest.

4. Select an error code to check the details.

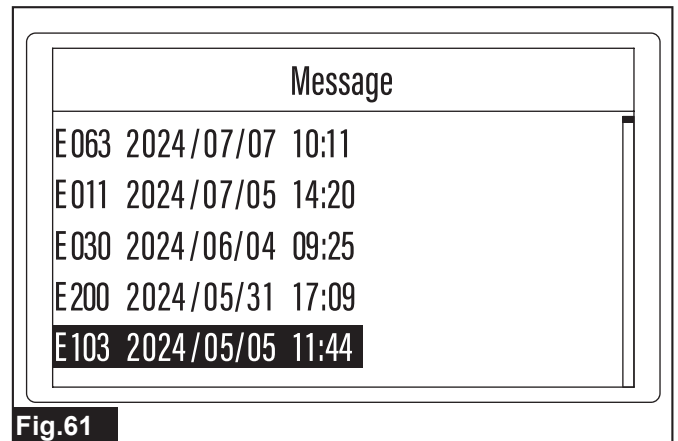


Fig.61

The error details screen appears.

5. Check the date and time that the error occurred and the error message contents.

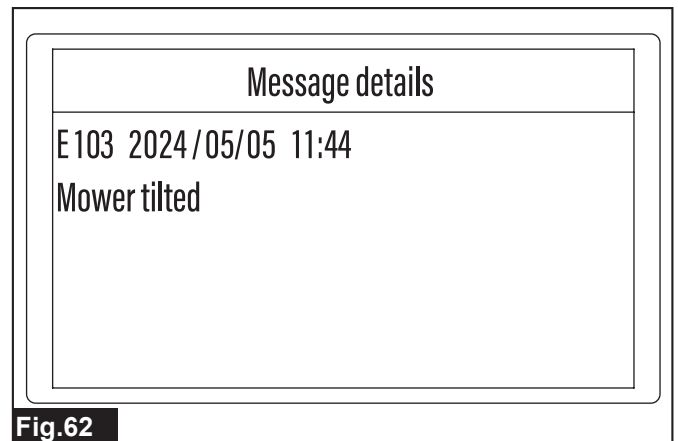


Fig.62

NOTE: After browsing the information, you can return to an upper menu screen by pressing the key or the button. Press the key to return to the [Others] sub menu screen, or the button to return to the [Main menu] screen.

MAINTENANCE

CAUTION: Always make sure that the power switch of the Robotic Mower is turned off before performing inspection or maintenance. In addition, be sure to unplug the AC adapter from the power outlet when performing maintenance on the charging station.

CAUTION: Always wear gloves and protective eyewear when performing inspection and maintenance. Otherwise, injury may result.

To maintain product SAFETY and RELIABILITY, repairs, any other maintenance or adjustment should be performed by Makita Authorized or Factory Service Centers, always using Makita replacement parts.

Cleaning

NOTICE: Never use gasoline, benzene, thinner, alcohol or the like. Discoloration, deformation or cracks may result.

NOTICE: Periodically clean the machine. Grass clippings may accumulate in the chassis or the charging station.

NOTICE: Do not wash the machine with a high pressure washer. Doing so may result in damage or breakdown.

Cleaning the Robotic Mower

CAUTION: Be careful not to injure yourself with the blades when cleaning the mower blades and surrounding areas.

CAUTION: Be careful not to get your hands or other objects caught between the top cover and chassis or to injure your hands on the edges of the top cover when attaching and removing the top cover.

Wipe clean the surface of the top cover and the underside of the chassis with a dry cloth or a cloth dampened with diluted neutral detergent. Completely wipe away any dirt and clippings that have accumulated on and around the wheels.

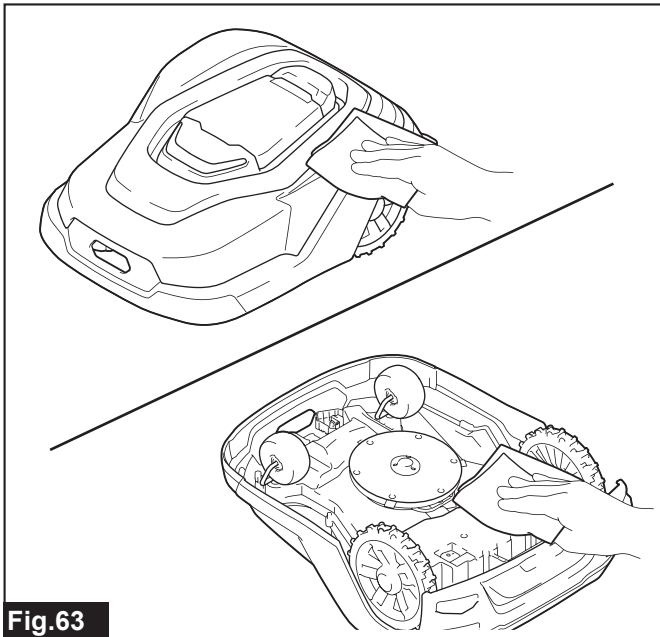


Fig.63

NOTE: Wash with water if very dirty. After washing with water, it is recommended to let the machine dry thoroughly before restarting.

Grass clippings may accumulate between the top cover and the chassis. Follow the procedure below to remove the top cover and also clean the upper part of the chassis.

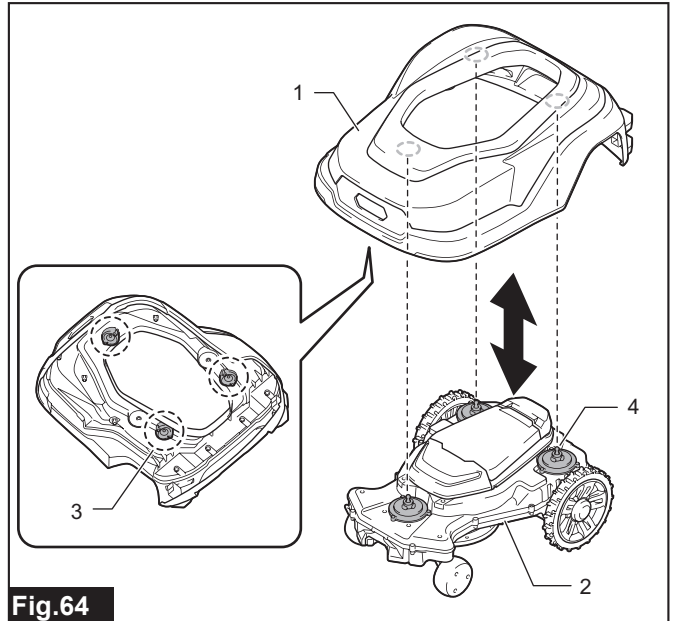


Fig.64

► 1. Top cover 2. Chassis 3. Rubber retainer 4. Slider shaft

While holding down the display cover, lift up and disengage the parts of the top cover indicated in the illustration one by one.

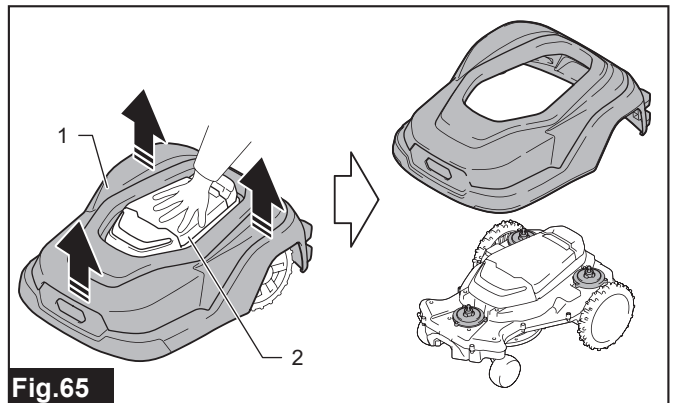


Fig.65

► 1. Top cover 2. Display cover

NOTE: Make sure that there are no obstacles around when removing the top cover.

NOTE: The top cover and chassis are firmly connected in three locations. Pull up the top cover strongly until the rubber retainers inside the top cover disengage from the slider shafts of the chassis.

When returning the top cover to its original condition, align the rubber retainers of the top cover with the slider shafts of the chassis and press down strongly.

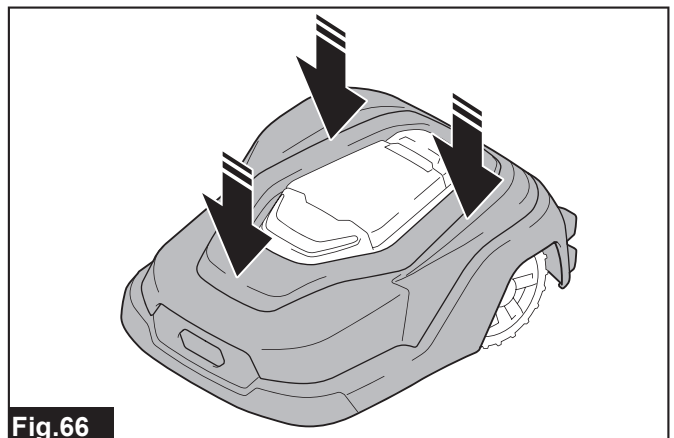


Fig.66

NOTE: Check if the top cover is correctly attached to the chassis by lifting the front and side parts of the top cover. Incorrect attachment may result in detection failure of the sensors.

Cleaning the charging station

Clean away any dirt or clippings that have accumulated on the terminal and base of the charging station.

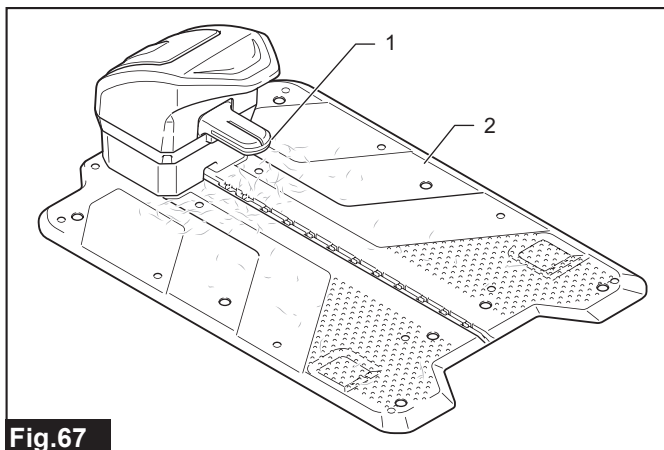


Fig.67

► 1. Charging terminal 2. Station base

Inspecting the mower blades

Follow the procedure below and inspect once per week.

1. Turn off the power switch of the Robotic Mower and turn it upside down.

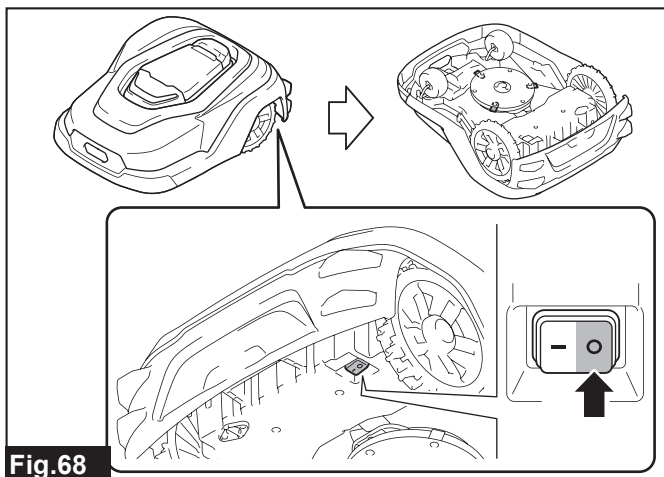


Fig.68

2. Inspect the condition of the mower blades and the rotation of the blade base.

Check the following points.

- Does the blade base rotate smoothly?
- Are the mower blades excessively worn, cracked, chipped, or bent, etc?

Blade base and mower blades

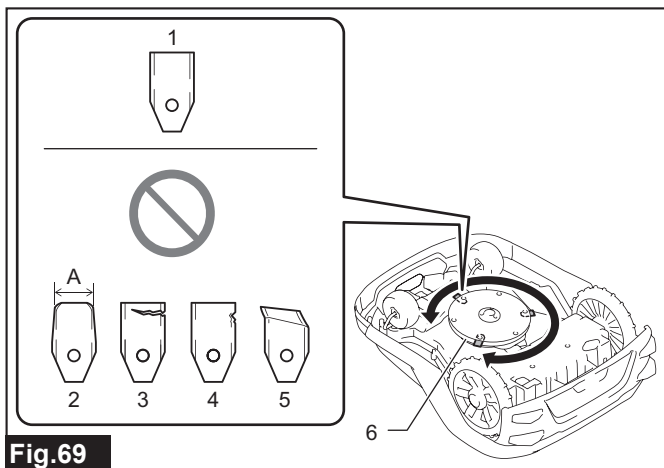


Fig.69

► 1. Normal 2. Worn (A: 17.5 mm or less) 3. Cracked 4. Chipped 5. Bent 6. Blade base

3. Inspect the condition of the mower blade fixing screws.

Follow the procedure in the section "Replacing the mower blades" (Page 27) to remove the fixing screws, and check the condition of the fixing screws.

Mower blade fixing screw

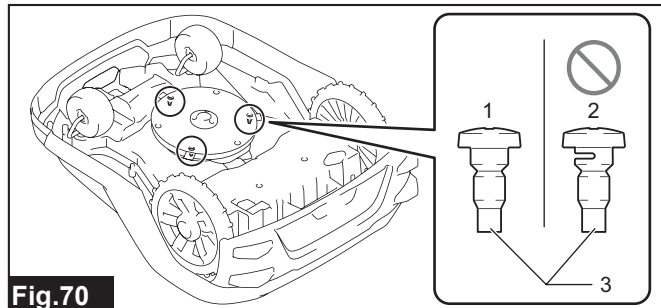


Fig.70

► 1. Normal 2. Worn 3. Fixing screw

NOTE: If no particular abnormality is observed in weekly inspections, lengthen the inspection interval.

NOTE: The mower blade life will vary according to the operating environment. In particular, conditions such as the following will shorten the life.

- Long mowing time
- Wide work area
- Grass with thick stems and leaves
- High seasons for grass growth
- Dirt, sand, or other matter adhered to the grass

Replacing the mower blades

⚠ WARNING: Replace the mower blades according to the procedure in this manual. If replacement is done by a different method, accident or injury may result.

⚠ CAUTION: Always wear protective eyewear and gloves when replacing the mower blades.

⚠ CAUTION: Perform the replacement work on a level and stable surface.

NOTICE: Replace the mower blades approximately 2 to 6 weeks. The replacement timing will vary according to the mowing frequency and the condition of the grass.

NOTICE: There are three mower blades. Replace all three blades at once. Even if only one mower blade is damaged, replace all three blades.

NOTICE: The following tools are necessary for mower blade replacement. Prepare these tools in advance.

- Screwdriver (plus) (Used to remove and attach the blades)
- $\Phi 6$ mm metal rod or screwdriver with a length of 160 mm or more (Used to fix the blade base)

If the mower blades are excessively worn, cracked, chipped, bent, etc., or the mower blade fixing screws are worn, follow the procedure below and replace them.

1. Turn off the power switch of the Robotic Mower and turn it upside down.
2. Fix the blade base.

Align the holes of the skid plate, blade base, and blade cover and then insert the metal rod. If the blade base does not rotate, the fixing is complete.

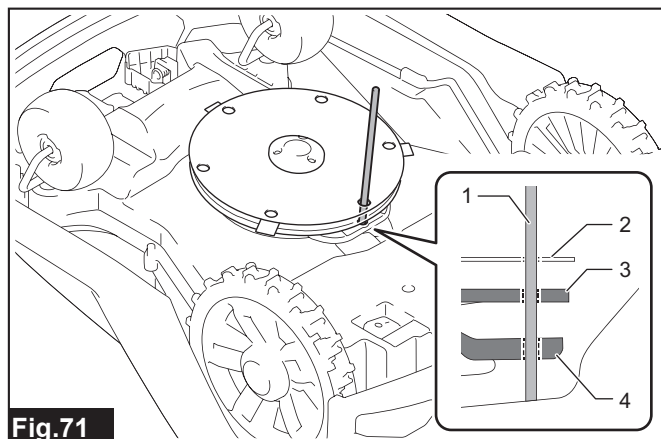


Fig.71

► 1. Metal rod 2. Skid plate 3. Blade base 4. Blade cover

3. Remove the mower blades.

Use the plus screwdriver and remove the screws fixing the mower blades.

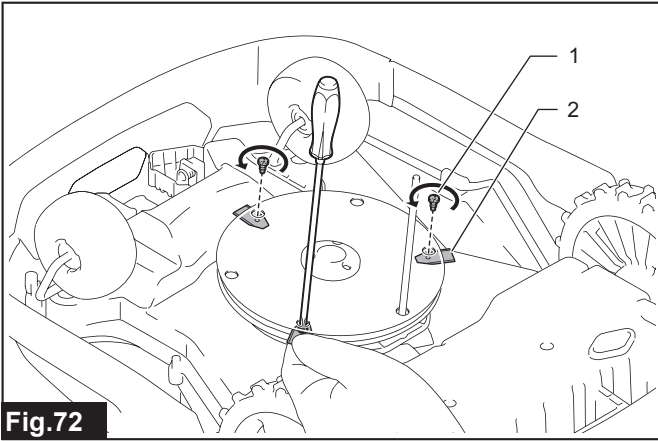


Fig.72

► 1. Screw 2. Mower blade

NOTE: Hold the mower blade with your fingers when removing the screw. Otherwise, the mower blade may fall into the gap between the top cover and the chassis.

4. Attach the new mower blades.

Use the screws supplied with the new mower blades. After attachment, check that the mower blades rotate around the screws.

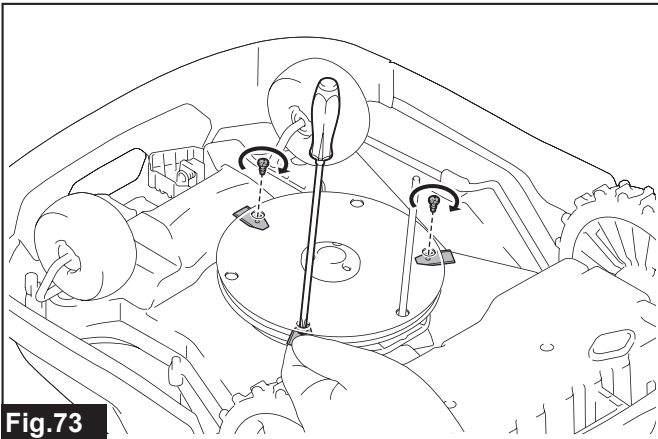


Fig.73

NOTICE: Be sure to observe the following items to prevent the mower blades from falling off.

- Use the screws supplied with the mower blades. (Do not reuse the removed screws)
- Firmly tighten the screws so that they are not loose.

5. Remove the metal rod fixing the blade base, and return the upside-down Robotic Mower to its original condition.

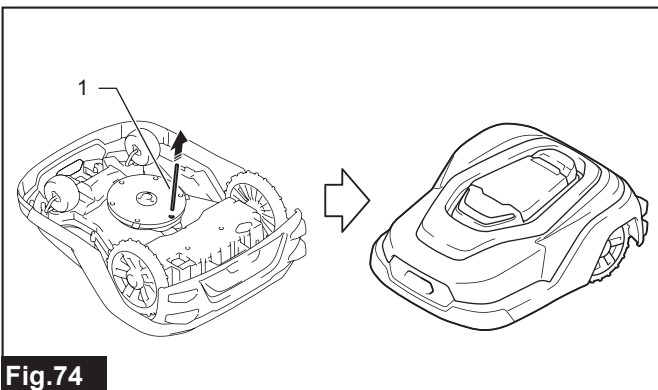


Fig.74

► 1. Metal rod

NOTE: After replacing the mower blades, remember to turn on the power switch of the Robotic Mower when restarting.

Periodic inspections

Periodically check the following points.

Inspection site	Check item	Countermeasures	Inspection frequency
Robotic Mower	Is there any abnormality with the mower blades?	If mowing cannot be performed well, turn off the power switch, check the mower blades for wear, cracks, or chips, and replace the mower blades if necessary.	Once per week
	Is the Robotic Mower traveling stable?	If the Robotic Mower travels unstable, turn off the power switch and check if there is any damage to the wheels and axles or if any foreign objects are caught or rubbish and dirt has accumulated on the wheels and axles. If the problem is not resolved, contact our sales office.	Once per month
	Is abnormal sound produced?	If abnormal sound is produced, turn off the power switch and check if there are any foreign objects caught in the rotating parts of the wheels and the mower blades. If the problem is not resolved, contact our sales office.	Once per month
	Can docking be performed correctly?	If docking cannot be performed, turn off the power switch, move the Robotic Mower by hand, and check whether proper docking with the charging station is possible. If proper docking is not possible, check the following points. - Remove any obstacles from near the wheels. - Attach the top cover correctly. (The top cover should be fixed in three places) - If the ground under the station base is uneven, smooth it.	Once per month
Charging station	Is the station indicator lighted green?	If it is lighted or blinking red or off, the Robotic Mower will be unable to execute mowing. Check the following points and take the appropriate countermeasures. - Is the AC adapter connected properly to a power outlet? - Is the cable connected properly to the AC adapter and the charging station? - Are the boundary wire connectors connected properly to the charging station? - Are couplers attached on the boundary wire connected properly? - Is the boundary wire broken partway?	When the LED of the Robotic Mower lights up or blinks red
	Is the charging station properly fixed?	If the charging station moves, retighten the screw pegs with the hex wrench 6.	Once per week
	Has foreign matter adhered to the terminals?	Some adhered matter may hinder proper communication and charging. Clean away any dirt on the charging terminal and other terminals.	Once per week
	Is the guide wire protruding from the station base?	If the guide wire protrudes from the groove of the station base, insert it again.	Once per week
AC adapter and cable	Are the power plug and connection terminals inserted firmly all the way?	If a power outlet or connection terminal insertion is loose, insert it again.	Once per month
	Are the cables damaged?	If a cable sheath is peeled or severely damaged, contact our sales office.	Once per month
Work location	Are any foreign objects present?	Clear away any objects that may damage the mower blades or get caught in the rotating parts of the Robotic Mower. (Small stones, sticks, rubbish, string-like objects, etc.)	Once per month
	Is there any change in the work environment?	Take the following countermeasures. - If the grass height exceeds 100 mm, cut it down to that height or less. - Clear away any weeds that are higher than the lawn. - Fill in any holes or depressions and smooth out local unevenness. - Refrain from use if there are deep puddles or snow accumulation.	Once per month
	Is there any abnormality with the boundary wire and guide wire installation?	If the wires float from the ground, fix them again with the pegs.	Once per month

Handling after the season ends

After mowing season ends, remove the following parts from where they are installed and store them indoors.

- Robotic Mower
- Charging station
- AC adapter
- Cabtire cable

NOTICE: Charge the Robotic Mower before storage.

NOTE: The boundary wire and guide wire(s) can be left installed.

Clean the Robotic Mower and charging station before storing them. In addition, follow the procedures below to remove each part.

Removing the AC adapter

1. Unplug the AC adapter from the power outlet.
2. Remove the cabtire cable.
3. If the AC adapter is fixed to a wall, remove it from the wall.

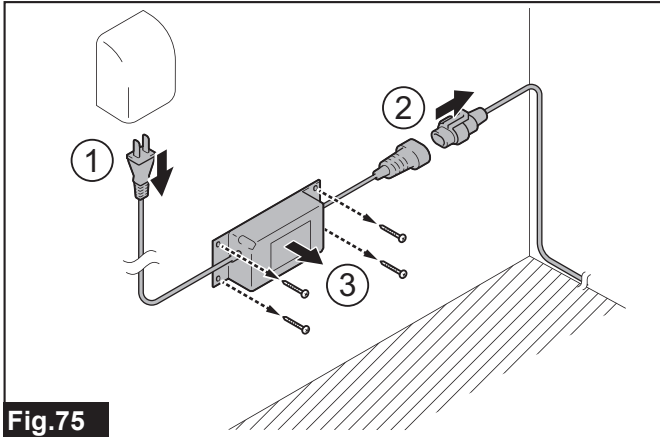


Fig.75

NOTE: Remove the AC adapter in the order of the numbers shown in the illustration.

Removing the charging station

CAUTION: Wear gloves when performing the work.

1. Open the covers of the charging station and remove the cabtire cable.

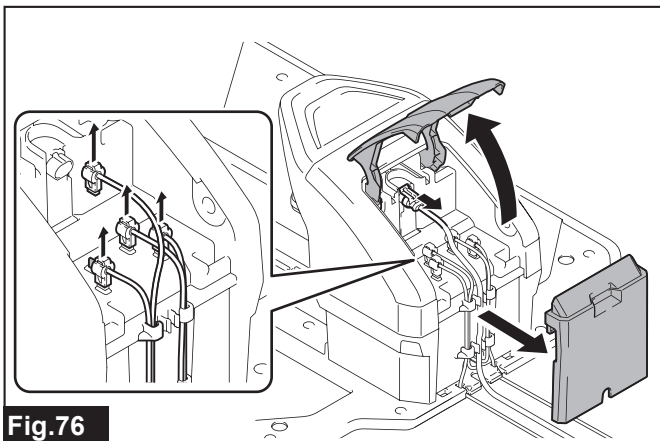


Fig.76

2. Pull off the boundary wire and guide wire terminals, and remove each wire from the charging station.

3. Remove the screw pegs from the station base using the hex wrench 6.

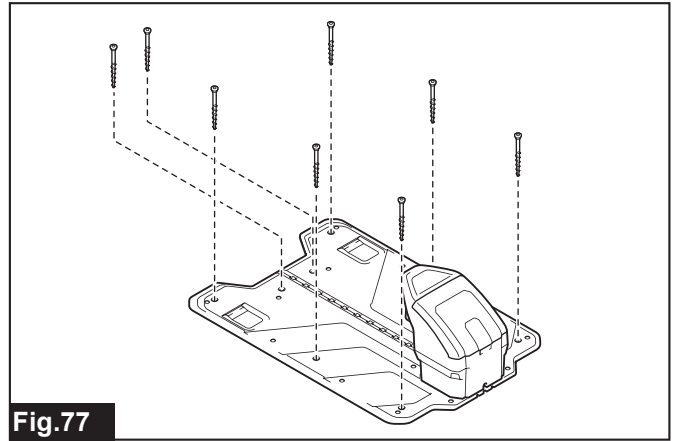


Fig.77

Storage

NOTICE: Store the Robotic Mower in the condition with the power switch turned off.

NOTICE: Wipe clean the terminal parts of the charging station, wires, and cables with a dry cloth, etc. before storing them. Storage with dirt adhered may result in rust or corrosion.

NOTICE: Place the screws used to fix the charging station and the AC adapter in a bag or other container and store them carefully so as not to lose them.

Store in a location that satisfies the following conditions.

- A flat and stable location
- A location out of direct sunlight and not exposed to rain or snow, etc.
- A location with low humidity
- A location out of the reach of children

NOTE: The Robotic Mower can be stored upright as illustrated. Also select a flat and stable location when storing upright.

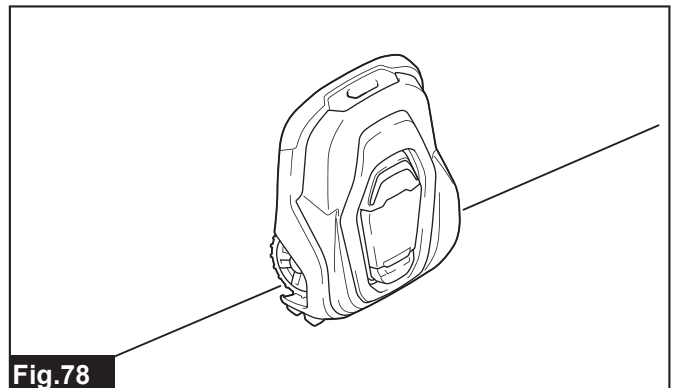


Fig.78

When disposing of this product

When disposing of this product, follow your local regulations and dispose of the separate parts correctly.

WARNING: The Robotic Mower contains a battery. When disposing of this product, remove the battery and dispose of it separately. Failure to dispose of the battery separately may result in accident or injury due to rupture, fire, or smoke.

NOTE: It is necessary to disassemble the chassis in order to remove the battery. Prepare a plus screwdriver.

Removing the battery

NOTICE: Remove the battery only when disposing of this product.

1. Turn off the power switch of the Robotic Mower.
2. Remove the top cover.

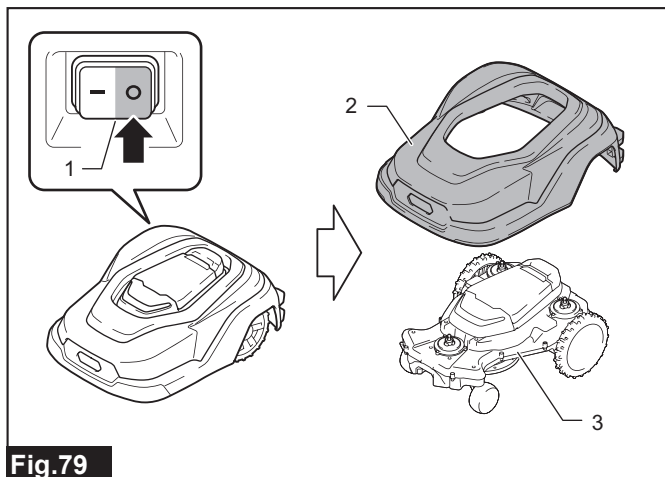


Fig.79

- 1. Power switch 2. Top cover 3. Chassis

3. Loosen the 14 screws on the upper part of the chassis and remove the upper housing.

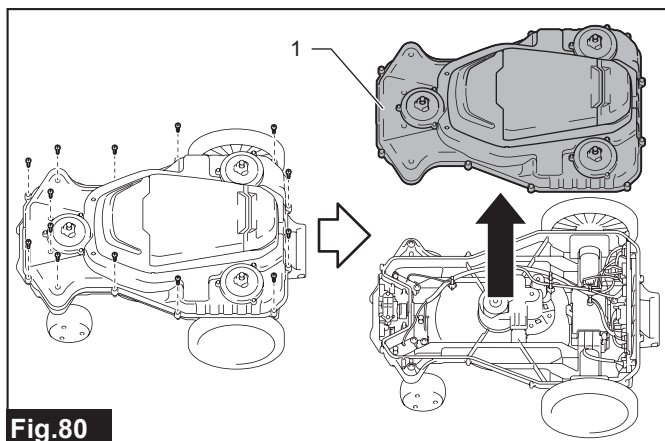


Fig.80

- 1. Upper housing

4. Disconnect the 2 connectors connected to the battery.

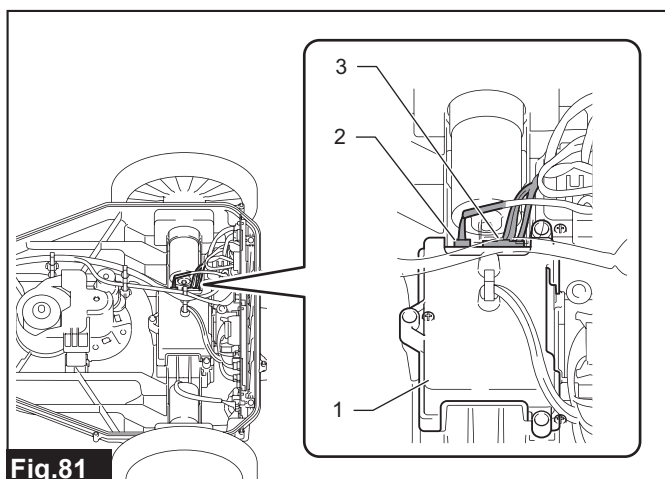


Fig.81

- 1. Battery cover 2. Connector (small) 3. Connector (large)

NOTE: If it is hard to perform the procedure, remove the connector attached to the upper housing.

5. Disconnect the 3 connectors connected to the main board.

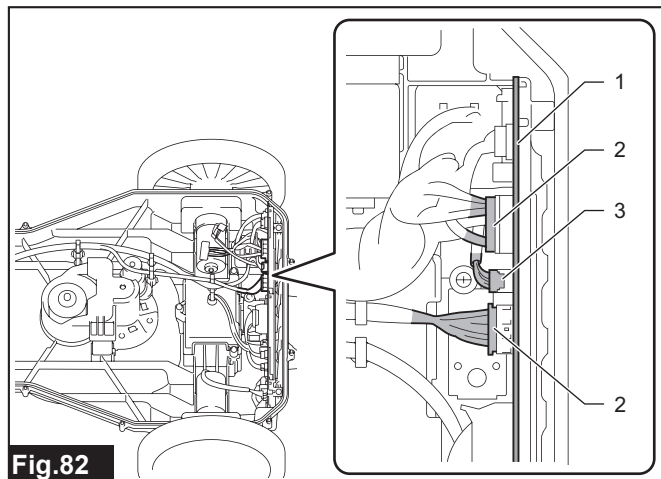


Fig.82

- 1. Main board 2. Connector (large) 3. Connector (small)

6. Remove the 3 battery cover screws.

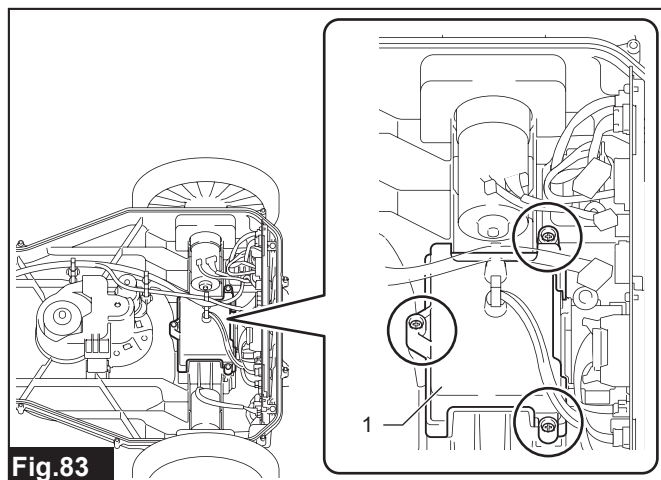


Fig.83

- 1. Battery cover

7. Remove the battery cover, and then remove the battery together with the cushion.

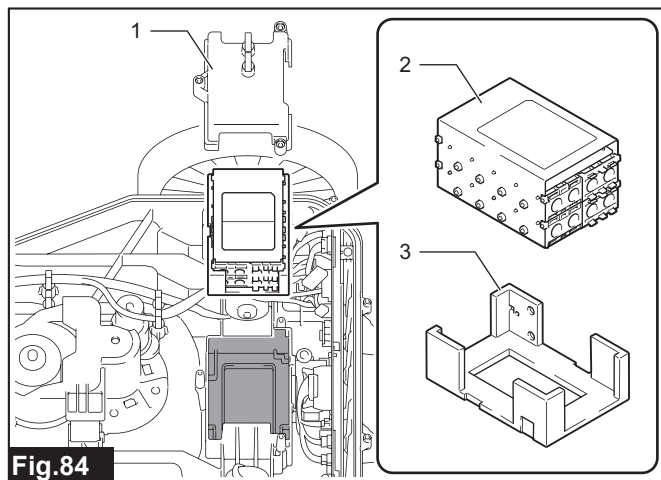


Fig.84

- 1. Battery cover 2. Battery 3. Cushion

8. Remove the battery from the cushion.

Follow your local regulations when disposing of the battery.

CAUTION: Do not disassemble the removed battery.

PROTECTION SYSTEM

Protection system and Error Indication

The Robotic Mower is equipped with a protection system. When an error occurs, the protection system is activated and all motors stop automatically. Details of the error are displayed on the LCD screen with the error code.

Code	Details of the error	Cause	Action
E012	Right wheel motor problem	Foreign objects such as grass or branches are preventing the wheels from rotating, or the driving motor is overloaded due to repeated collisions.	Inspect the wheels and remove any foreign objects. Also check the operating area is compliant with the work environment specified in the instruction manual. Restart the machine after a while.
E013	Left wheel motor problem		
E020	Blade motor overloaded	The blade motor is overloaded by some causes. For example, foreign matter such as grass or branches are interfering with the rotation of the blade base.	Inspect around the blade base and remove any foreign objects. Restart the machine after a while.
E021	Blade motor problem		
E030	Cutting height motor overloaded	The cutting height motor is overloaded by some causes. For example, foreign matter such as grass or branches are interfering with the movement of the cutting height adjustment mechanism.	Inspect the cutting height adjustment mechanism and remove any foreign objects.
E031	Cutting height motor problem		
E040	No wire signal	The AC adapter, cable, or boundary wire connection is poor or damaged.	Check the indicator on the charging station. Green/lighted: Contact the dealer or our sales office. Red/blinking: Check the boundary wire and reconnect. Replace if you find any damage. Off: Check the AC adapter and cable, and reconnect. Replace if you find any damage.
		Each channel code of the machine and the charging station are different.	Change the channel code of the wire signal appropriately in [Security] menu.
		The machine is too far from the boundary wire.	Reinstall the boundary wire so that the whole of the work area is within 35 m of the boundary wire.
		Signals are blocked by surrounding metal objects (fences, reinforcing steel) and interference from other devices.	Increase the signal strength in the work area by increasing the number of islands in the work area, reducing the work area, etc.
E041	Outside working area	Incorrect boundary wire connection or installation. For example, boundary wires are crossed or the machine goes out of the work area because of the high slope.	Check that the boundary wires are installed properly and connected to the charging station firmly. For the installation method, refer to the chapter for installing the boundary wire in the Setup Guide.
		Signals are blocked by surrounding metal objects (fences, reinforcing steel) and interference from other devices.	Increase the signal strength in the work area by increasing the number of islands in the work area, reducing the work area, etc.
		There is interference with signals from other products nearby.	Change the channel code of the wire signal appropriately in [Security] menu. And reinstall the boundary wires so that both boundary wires keep the distance more than 1 m.
E051	Temporary problem	The machine is in a high temperature, or the "STOP" button remains active after the command of mowing.	Restart the machine after a while or release the "STOP" button by closing the display cover after the command of mowing.
E060	Empty battery	The machine could not find a charging station.	Check the installation of the boundary wire and guide wire. For the installation method, refer to the chapter for installing the boundary wire and guide wire in the Setup Guide.
		The mowing option is set to [Auto mowing] when operating in the sub area.	Set the mowing option to [Mowing without charging] when operating in the sub area. While working in the sub-area, the machine cannot return to the charging station.
		The battery is exhausted.	Dock the machine to the charging station to charge. If the problem persists, contact the dealer or our sales office.
E064	Low battery	The battery is over-discharged. The battery is exhausted.	Restart the machine. If the problem persists, contact the dealer or our sales office.
E080	Electronic problem	There is a temporary problem relating electronic or firmware in the product.	
E100	Stucked	The rear wheels are spinning due to muddy conditions.	Avoid spinning the rear wheels by leveling the ground or limiting the operating area with boundary wire.
E101	Docking problem	The machine has failed to dock with the charging station, or the charging station has an error.	Clean each terminal. If the charging station is tilted or skewed, lay it flat. If the indicator of the charging station is lit red, pull out the plug, wait a while, and then restart the charging station.
E102	Upside down	The machine is tilted massively or rolled over.	Correct the posture of the machine.
E103	Mower tilted	The machine is tilted beyond the acceptable range.	Move the machine to a flat area. Reinstall the boundary wire so that large slopes are out of the work area.
E104	Lifted	The lift sensor is activated because the machine hits or rides on the obstacle.	Keep the distance between the obstacle and the work area, and restart the machine.
E105	Collision sensor problem	The top cover cannot return to the standard position.	If the machine contacts an obstacle, release the machine from the obstacle. Remove any dirt or foreign objects between the top cover and chassis, and make sure the top cover moves freely around the slider shafts.
E200	Loop sensor problem	The wire sensor has poor contact or has failed.	Contact the dealer or our sales office.
E201	Tilt sensor problem	Failed to communicate with tilt sensor.	
E202	Stop switch problem	The reliability of the "STOP" button is declining.	
E203	IMU sensor problem	Failed to communicate with the IMU sensor.	
E204	Cutting height sensor problem	The sensor of the lifting mechanism has a poor contact or has failed, there is an error in the connection.	
E206	Lift sensor problem	The reliability of the lift sensor is declining.	

If you think there is a malfunction

TROUBLESHOOTING

Before asking for repair or making an inquiry, check whether the following apply.

State of abnormality	Probable cause (malfunction)	Remedy
LCD screen does not display.	Is the power of the Robotic Mower turned off?	Turn on the power of the Robotic Mower. (Refer the section for "Turning the power on/off".)
Robotic Mower does not run.	Does an error occur? (Is the LED blinking in red?)	The Robotic Mower does not run during an error. (Refer the section for "PROTECTION SYSTEM".)
Robotic Mower cannot dock to the charging station.	The charging station is deformed.	Place the charging station firmly on a level surface. Refer to the chapter "Locating the charging station" in the Setup Guide for how to install the charging station.
	The guidewire is not laid straight from the charging station or the distance is incorrect.	Install the guidewire at least 2 meters straight from the charging station. Refer to the chapter "Guide wire installation conditions" in the Setup Guide for how to install guide wires.
	The guidewire is not properly secured to the charge charging station.	Secure the guidewire to the groove in the center of the station base of the charging station. Refer to the chapter "Installing the guide wire" in of the Setup Guide for how to install the guide wire.
Robotic Mower does not return to the charging station.	Since Robotic Mower is in the active search period of the guide signal, it does not return with the boundary signal.	If the guide wire is not installed, set the active search period of the guide signal to 0 minutes. Refer to the chapter "Setting the active search period for the guide signal" for the setting procedure.
	Robotic Mower does not depart from the charging station after the work area has been changed.	Have the Robotic Mower depart from the charging station and let it save the surrounding magnetic field in its memory. Refer to the chapter "Navigation Preferences" for the setting procedure.
	Robotic Mower cannot return by the boundary signal because the boundary wire installed near the charging station is incorrect.	Install the boundary wire 1.5 m straight on both sides of the charging station. Refer to the chapter "Installing the boundary wire" in the Setup Guide for how to install boundary wires.
The battery is empty but not charged when docked in the charging station.	If the battery is fully discharged, it may take some time for the battery to start charging.	Dock the Robotic Mower to the charging station with the main power ON, and wait for a while until the charging starts. If the problem persists, contact our sales office or local dealer.
Robotic Mower stays at the charging station for a long time and will not start mowing.	The display cover is closed, but the mowing start button is not pressed.	Close the display cover after pressing the mowing start button. Refer to the chapter "Starting mowing" for instructions.
	Robotic Mower is in standby state after returning to the charging station.	Check the operation options after charging. Refer to the chapter "Park Preferences" for instructions.
	Robotic Mower does not work if battery temperature is too high or too low.	Restart the Robotic Mower after a while.
Abnormal vibration / noise	The mower blade is damaged.	Check the condition of the mower blades and replace them with new blades and screws. Refer to the chapter "Replacing the mower blades" for how to replace.
	Foreign matter is stuck in the mower blade.	Check the part around the mower blade and remove any foreign matter.
Robotic Mower operates unintended time / date.	Unintended setting of scheduled mowing.	Check the date and time for scheduled mowing. Refer to the chapter "Changing the date and time settings" for how to set the schedule.
		Please change the mowing schedule. Refer to the chapter "Scheduling mowing" for instructions.
Robotic Mower travels, but the cutting blade motor does not rotate.	The robotic mower has just started driving or it is returning to the charging station.	The blade motor does not rotate when the Robotic Mower has just started driving or when it is returning to the charging station.
Short mowing time	The mower blades have worn out and the load on the cutting blade motor has increased.	Replace the mower blade. Refer to the chapter "Replacing the mower blades" for how to replace.
	The end of battery life is approaching.	Contact our sales office or local dealer.
Short mowing time and charging time	The end of battery life is approaching.	Contact our sales office or local dealer.
Uneven lawn mowing	The mowing schedule is too short to mow whole work area.	Reduce the size of the work area or extend the schedule. Refer to the chapter "Scheduling mowing" for instructions.
	The mower blades have worn out and the load on the cutting blade motor has increased.	Replace the mower blade. Refer to the chapter "Replacing the mower blades" for how to replace.
	The lawn is too long for the set cutting height.	Change the cutting height or cut the lawn to 100 mm or less beforehand. Refer to the chapter "Determining the cutting height" for how to configure.
	Grass, branches, or other foreign matter prevents the blade base or wheels from rotating.	Inspect the blade base or wheels and remove any foreign matter.
Ruts are formed on the lawn.	Robotic Mower travels on a particular path repeatedly.	Adjust the width of offset navigation. Refer to the chapter "Adjusting the width of offset navigation" for how to configure.
Unable to travel along a path.	The width of the path is narrow.	The width of the path must be at least 150 cm. Refer to the chapter "Boundary wire installation conditions" in the Setup Guide for how to install boundary wires.
Robotic Mower cannot go over two boundary wires to and from the island.	The two boundary wires to and from the island are not close together.	Close (0 cm) the two boundary wires to and from the island. Refer to the chapter "Installing the boundary wire" in the Setup Guide for how to install boundary wires.
Spiral cut does not work.	The normal mowing operation has not elapsed 30 minutes.	Spiral cutting works when it detects dense grass after about 30 minutes of normal lawn mowing. For more information, refer to the chapter "Mowing unmowed grass"

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