



WHILL Model F series

Maintenance Manual



REF 34-14027-1-2022-02
February 2022

Table of Contents

1	Introduction.....	4
2	Conventions Used in This Manual	5
2.1	Contents of This Manual	5
3	Product Specifications	6
4	Maintenance Tools and Parts	7
5	Maintenance	8
5.1	Cleaning Procedure	8
5.2	How to Replace Components	8
6	Li-Ion Battery Handling and Maintenance	9
7	Inspecting the Front and Rear Wheels.....	10
8	Inspection, Maintenance, and Maintenance Items	11
9	Daily Maintenance	12
9.1	Replacing the Battery.....	12
9.2	Replacing the Seat Base Fabric.....	13
9.3	Replacing the Back Support Assembly	16
9.4	Replacing the Seat Cushion.....	18
9.5	Replacing the Color Plate	19
9.6	Replacing the Wheel Cover	22
10	Maintenance with Parts Replacement.....	24
10.1	Replacing the Front Wheel	24
10.2	Replacing the Front Fork	26
10.3	Replacing the Rear Wheel.....	28
10.4	Replacing the Controller	30
10.5	Replacing the Controller Upper Case	39
10.6	Replacing the Controller Mouse / Boot	45
10.7	Replacing the Arm Rest Frame.....	47
10.8	Replacing the Main Body Upper Cover.....	48
10.9	Replacing the Arm Inner / Outer Cover.....	51
10.10	Replacing the Arm Frame Assembly	54
10.11	Replacing the Lock Release Button.....	62
10.12	Replacing the Seat Frame.....	65
10.13	Replacing the Back Support Frame.....	68
10.14	Replacing the Motor Unit.....	70
10.15	Replacing the Brake Release Lever	74

	Maintenance Manual	WHILL Model F series : 32-14027-1 Version 1.0.1 [EN] Page 3 / 99
--	---------------------------	---

10.16	Replacing the Stand Wheel	77
10.17	Replacing the Footrest.....	78
10.18	Replacing the Footrest Frame	8
10.19	Replacing the Anti-tip Roller	83
10.20	Calibration Adjustment.....	85
11	Device Adjustments	89
11.1	Adjusting the Arm Height	89
11.2	How to Change the Controller Width and Position	91
12	Model F series Parts List	95
	Periodic Inspection Sheet.....	98



1 Introduction

This is the Maintenance Manual for the WHILL Model F series. This Maintenance Manual provides instructions and guidelines on how to maintain and service the device and is intended for use by sales personnel and distributors. Please read the WHILL Model F series' User Manual along with this document to become familiar with the important functions of this device. This manual also describes how to replace and adjust parts that are also given in the User Manual.

If the Model F series is maintained or serviced with methods or procedures not in accordance with those described in this manual, there is the risk of injury or damage to this device. Servicing the Model F series device in ways not consistent with the methods and procedures outlined in this Maintenance Manual violates the Warranty of the device.



This manual contains information that is protected by patent rights and copyrights. It may not be reproduced in part or in whole without explicit written permission from WHILL, Inc.



	Maintenance Manual	WHILL Model F series : 32-14027-1 Version 1.0.1 [EN] Page 5 / 99
--	---------------------------	---


2 Conventions Used in This Manual

This manual explains the various parts of this device by means of text, illustrations, photographs, and standard terms.

Graphic symbols used in this manual

Symbol	Description
 WARNING	Indicates critical instructions to prevent an imminently hazardous situation that may result in death or serious injury.
 CAUTION	Indicates instructions to prevent a potentially hazardous situation that may result in minor injury, property damage or both.

	Indicates a required act.
	Indicates a prohibited act.

	Indicates precautions or reference information that must be read to prevent device malfunctions or failures, and to ensure comfortable device use.
---	--

2.1 Contents of This Manual

2.1.1 Figures (photographs)

This manual uses photographs to simplify explanations of how to perform maintenance and how to handle this device. Photographs may differ from the actual product in use depending on when it was manufactured, its specifications, software version, and the country of purchase. Be sure to read the User Manual to understand important functions of this device and other details.

2.1.2 Device specifications

All specifications and explanations given in this manual have been checked to be free of mistakes when this manual was made.

2.1.3 Errors and omissions

Every effort has been made to ensure the contents of this manual. Please contact your distributor or customer support if you notice any inaccuracies or omissions in this manual.

URL: <https://whill.inc/us>



3 Product Specifications

Item	Use/Dimensions
Device name	WHILL Model F/Fi
Name and address of the manufacturer	WHILL, Inc. Zip code 140-0002 2-1-11 Higashishinagawa, Shinagawa-ku, Tokyo, Japan 140-0002
Maximum weight limitation	115 kg (253.5 lbs.) including occupant and luggage
Drive type	2-wheel drive
Speed changes	4 stages
Brake type	Electromagnetic brakes
Type of front tires	Outside diameter 194 mm
Type of rear tires	Standard: Air tire: Outside diameter 10 1/8 inches (207 mm)
Maximum allowable inclination	10°
Cruising distance	20 km
Maximum load capacity	115 kg
Charging time	5 hours
Operating temperature	-15 to 40°C (5 to 104 °F)
Pivot width	1,080 mm
Force needed operate controller	1N
Noise produced by device and level thereof	65 dB or lower except audible warning device
Name and address of the battery manufacturer	WHILL, Inc. Zip code 140-0002 2-1-11 Higashishinagawa, Shinagawa-ku, Tokyo, Japan 140-0002
Battery type	Lithium-ion battery
Nominal voltage	25.3 V
Rated capacity (5-hour rate)	10.6 Ah

4 Maintenance Tools and Parts

Use the following tools and parts when performing adjustment and replacement.

■ Hex Wrench Set

■ Hex Bit Socket Set

■ Ratchet

■ Drive Ratchet



Hex wrenches and hex bit sockets are used for tightening and loosening the attached screws of each component. The required sockets sizes are as follows: **3 mm, 5 mm, 6 mm, 7 mm, and 8 mm** tools.

■ Socket set

■ Extension bar

■ Bit (for cross recesses) ■ Phillips Screwdrivers (#1, #2)



If sockets are difficult to reach, use a 200 mm length extension bar.

The required sockets sizes are as follows: **8 mm, 10 mm, 12 mm, and 18 mm** tools.

■ Torque wrench

■ Torque driver

■ E-ring pliers

■ Depth gauge



All nuts and bolts must be tightened at the specified optimum torque - **an analog or digital torque wrench capable of accurately measuring torque is required.**

To ensure that work is performed properly, be sure to perform all adjustment or replacement of parts in a location where sufficient lighting is available.



CAUTION

Some cables that are located inside the device require bundling bands to prevent the cable from coming loose. Before cutting the bundling bands during replacement of parts, be sure to check the locations where the bundling bands are attached and secure the cables with the bundling bands at the same locations after adjustments. When using tools, be careful not to scratch the device or components.

5 Maintenance

5.1 Cleaning Procedure

- If there is a significant amount of dirt on the exterior or wheels, wipe it away with a wet towel. Pay attention when washing the wheels off with water to prevent water from splashing the motor, connectors, and other electrical parts.
- If the dirt is tough to remove, use a neutral detergent. Avoid the use of petroleum-based solvents. Prevent solvent from splashing parts not specified for cleaning.



CAUTION

Be sure to observe the following as they might cause discoloring, stains, deformation and deterioration or might cause scratches.

- Do not use strong acidic or alkaline solvents.
- When cleaning tires, use solvent when the tires have cooled down. (As a rule, to below body temperature)
- Thoroughly wash off solvent immediately after use.
- Do not use hard brushes or solvents containing abrasive compounds.
- Do not use inflammable petroleum-based solvents (e.g., gasoline, benzene, or paint thinner), organic solvents (e.g., Acetone), acidic or alkaline solvents, and dyeing agent.
- Do not use a high-pressure washer.
- Wash only the wheels of the device with water and not the device or its other parts.

5.2 How to Replace Components

- When a part must be replaced, be sure to read this manual before starting work.



WARNING

- Do not perform any adjustment, repair, or modification that is not listed in this manual. There is a risk of injury and product safety risk due to damage to the device or its parts. Performing repair or modification which is not listed in this manual will invalidate the warranty.
- Replace the anti-tip roller if it is damaged.
- After installation, make sure that bolts and screws have not fallen off.
- Be sure to use only genuine parts sold by WHILL, Inc. Use of non-genuine parts might cause the device to malfunction or lead to an accident.
- Remove the battery before performing work.



CAUTION

- If a component becomes worn, damaged, or broken and requires replacement, contact your distributor. If a faulty part is still used in a faulty state, there is a risk of damage to the device that renders it inoperable.

6 Li-Ion Battery Handling and Maintenance

It is important to fully charge the battery before using WHILL Model F series for the first time. Ensure the battery is charged before use if the device has not been used for a long period of time. The maximum driving range of this device (11 miles (20 km)) was measured under ideal conditions; however, the actual range may vary depending on the driving conditions such as hills, curves, steps, terrain, driving habits, load, and temperature. If the device is going to be driven for an extended period or for longer distances, please follow the suggested recommendation below:

- Ensure the battery is fully charged before use.
- Keep the weight of storage items to a minimum.
- Plan your route to avoid hills and obstacles.
- Maintain consistent speed and avoid sudden and frequent stops.
- Take care not to drop the battery when removing from the device or installing it in the device.



CAUTION

- Be sure to use only genuine rechargeable batteries exclusively for the WHILL Model F series .
- Be sure to use only a genuine charger exclusively for the WHILL Model Fseries.
- Be sure to read the User Manual before using the battery to prevent malfunctions or accidents.
- Be sure to install the cap when the battery charging port is not in use. There is a risk of a short circuit caused by foreign objects if they enter the port.
- Unplug the DC connector of the charger from the battery after charging. There is a risk of battery deterioration if the DC connector of the charger is left plugged in the battery for several days.
- If the device does not start properly, remove the battery, and then re-insert it after 10 seconds have elapsed.
- The charger is for indoor use only. Do not charge the battery outdoors.
- It is recommended that the battery be charged regularly at the end of the day of usage. Insufficient battery power can be prevented by using a fully charged battery the next time the device is operated.
- If you have any questions about the battery, please contact your distributor or customer support.

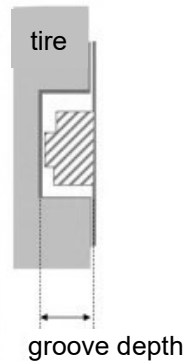
7 Inspecting the Front and Rear Wheels

- Are the tires ruptured or damaged?
- Is the groove depth sufficient?
Using a depth gauge, measure the depth of the tire grooves. If the depth is the specified value 0.5 mm or less, replace the tire.
- Check the rear wheels to see that they are at the appropriate air pressure [specified air pressure: 40 psi].

depth gauge



measuring point



WARNING

Be sure to observe the following.

Failure to observe the following will lead to damage to parts or unstable steering which might result in serious injury, and, in the worst instance, a fatal accident.

- Use tires for the left and right tires that are equally worn
- Check that parts are tightened to the specified torque.
- Use the same specified screws that are not damaged.
- Do not attach the rear wheels with their front and rear sides reversed.

Use of tires with abnormalities is forbidden

Use of tires with abnormalities still attached to the device is dangerous as this might result in the following situations and lead to unexpected accidents.

- Abnormal vibration.
- Unstable direction of forward travel on uneven road surfaces.
- Device slipping sideways.
- Failure to demonstrate the intrinsic performance of the device (cruising distance, stability and braking distance)

Cautions when replacing tires

- Never remove the center nut when replacing the rear wheels.
- Do not apply a coating of oil or grease to screw and nut sections.
- Remove oil or grease from screw and nut sections if oil or grease is found on these sections.
- Tighten screws at the specified torque. When tightening does not conform to the specified torque, nuts will be tightened beyond the required torque. This might break or damage the screws or nuts might loosen which will cause wheels to fall off and lead to serious accidents.
- Take care to attach screws and nuts at the correct locations.
- Do not use damaged screws and nuts.
- Do not use rear wheels that are ruptured, deformed or abnormal in other ways.
- After installing tires, check that screws and nuts have not fallen off.

8 Inspection, Maintenance, and Maintenance Items

(1) Inspection and Maintenance

Inspection and maintenance must be performed before driving to ensure safe use of the device. Inspection and maintenance items specified by WHILL must be thoroughly understood to perform inspection and maintenance.

(2) Inspection and maintenance items and details of inspection items (see page 95)

The Periodic Inspection Sheet summarizes the inspection and maintenance items and the details of the inspection procedure. Inspection items must be standardized based on this Periodic Inspection Sheet as it is important to prevent variations (i.e., differences in quality) from occurring when inspections are performed by different personnel.

- When an abnormality is found, be sure to perform an inspection and maintenance on the device.
- When the inspection has been performed, the results of the inspection must be entered in the Periodic Inspection Sheet. Also, keep an accurate record of inspections, replacement of parts, and maintenance performed provisionally.

These are inspections specified by WHILL, Inc. to ensure safe use of the device. Perform checks in accordance with inspection items. If device standards are not complied with, parts must be adjusted, repaired, or replaced, for example, to restore them to their normal state.

9 Daily Maintenance

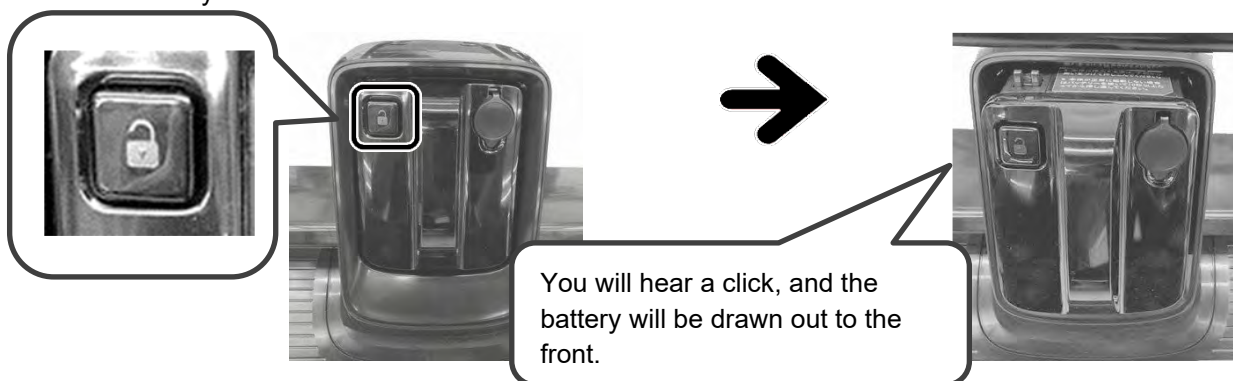
9.1 Replacing the Battery

Tool used: None

Replacement part: 23-00006-0 Battery

■ Removing the battery

- (1) Press the battery lock release button.

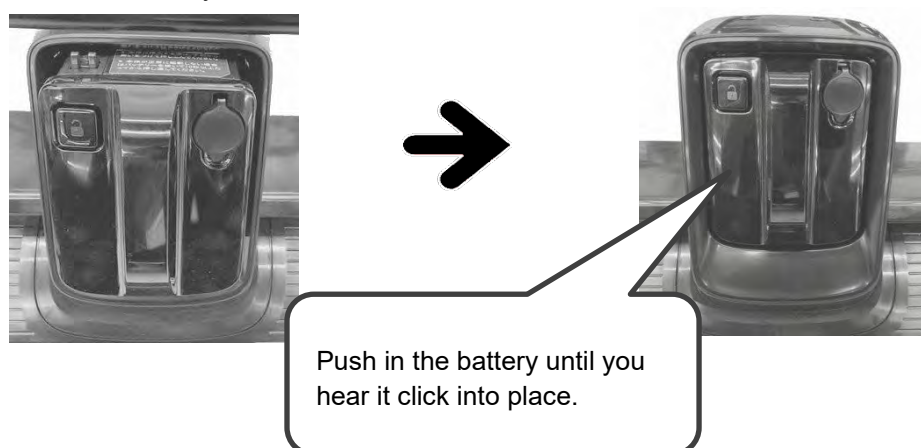


- (2) Pull out the battery by holding its handle.



■ Installing the battery

- (1) Install the battery.



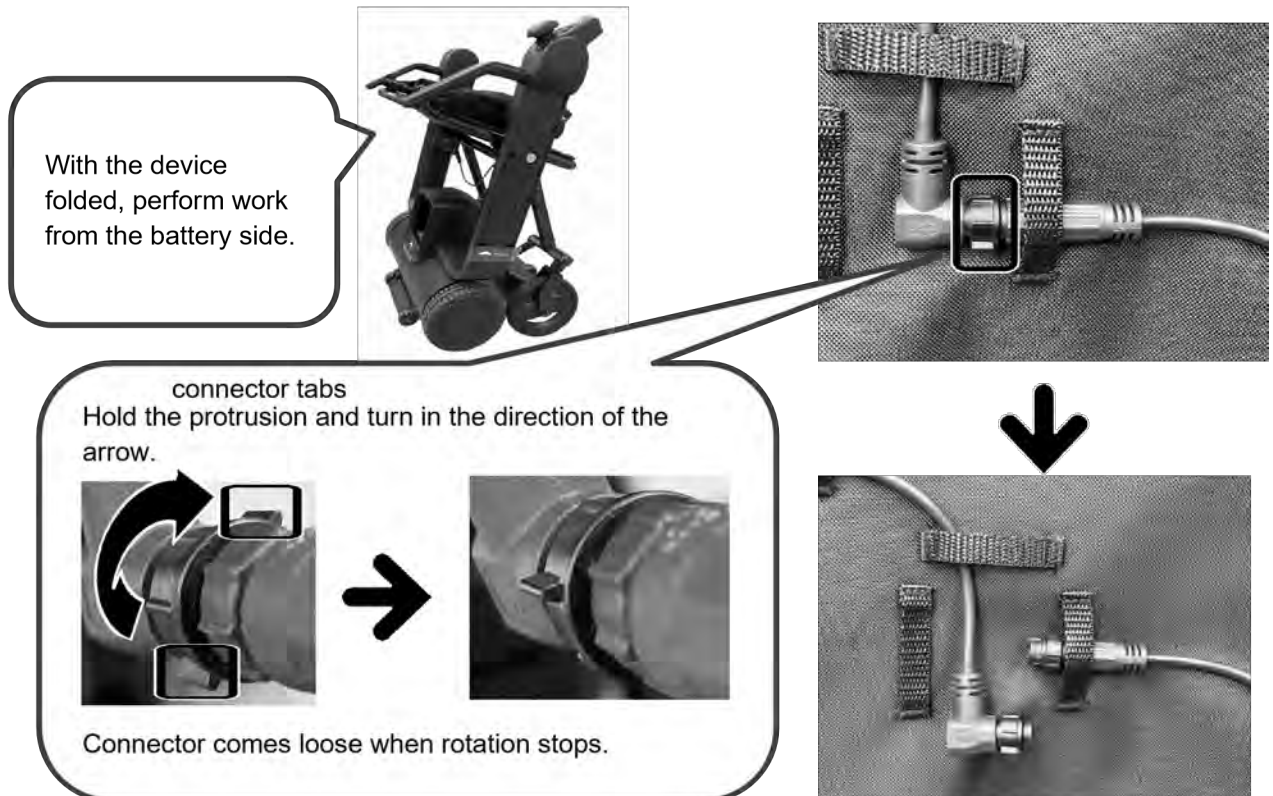
9.2 Replacing the Seat Base Fabric

Tool used: Hex wrench/hex torque wrench

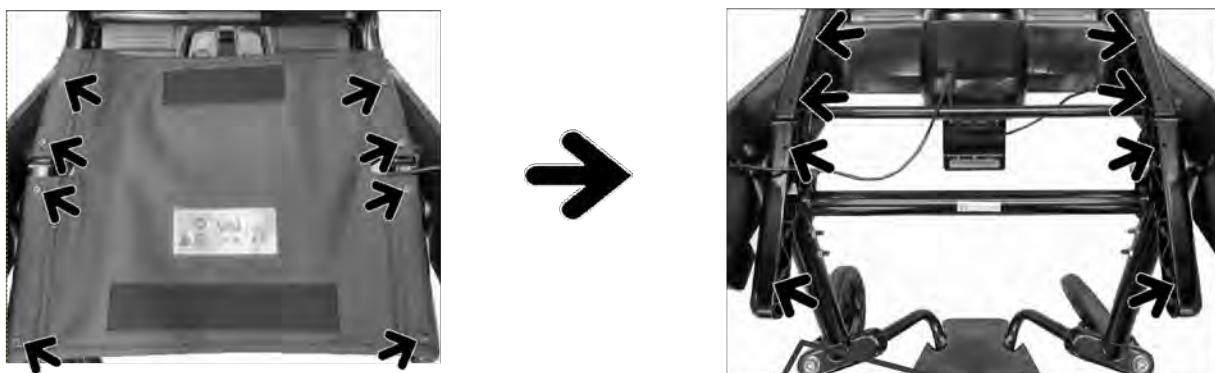
Replacement part: 24-14025-0 Seat Fabric Kit [F] (screws x 8/nuts x 8)

■ Removing the seat assembly

(1) Disconnect the cable from the rear side of the seat. Secure the removed cable to prevent it from contacting the ground (e.g., hook it onto the frame).



(2) With the device unfolded, remove the screws (8 pcs), and remove the seat base fabric.



When removing the screws, take care to prevent the nuts (8 pcs) from falling inside the frame.



■ Installing the Seat Assembly

- (1) Lay the seat base fabric on the seat and install the screws (8 pcs).



Check that the nuts (8 pcs) are inserted into the frame.



Torque value: 3 Nm

- (2) Connect the cable to the rear side of the seat base fabric.

Wiring on top side of seat base fabric



When passing the cable under the seat base fabric, pass it through the holes on the left and right.

OK



NG

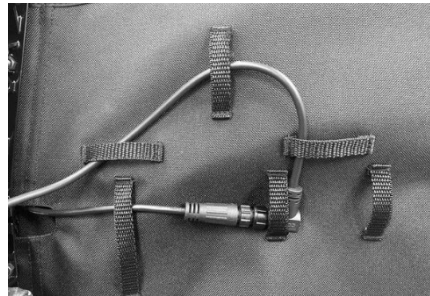


Wiring on the underside of seat base fabric

Controller right side



Controller left side



Route the wiring by referring to the photographs.

If the cable is passed through the wrong locations, the cable might become damaged, for example, when the device is folded.

9.3 Replacing the Back Support Assembly

Tool used: None

Replacement part: 31-14036-0 Back Support Fabric [F]

■ Removing the Back Support Fabric

- (1) Remove the base section of the back support fabric from the hooks on the left and right of the back support frame.



- (2) Remove the back support fabric by lifting upwards.



■ Installing the Back Support Fabric

(1) Install the back support fabric.



(2) Install the back support fabric by placing the fabric over the back support frame and hooking the rings of the back support fabric onto the hooks on the left and right side of the back support frame.



9.4 Replacing the Seat Cushion

Tool used: None

Replacement part: 22-14001-0 Seat Cushion [F]

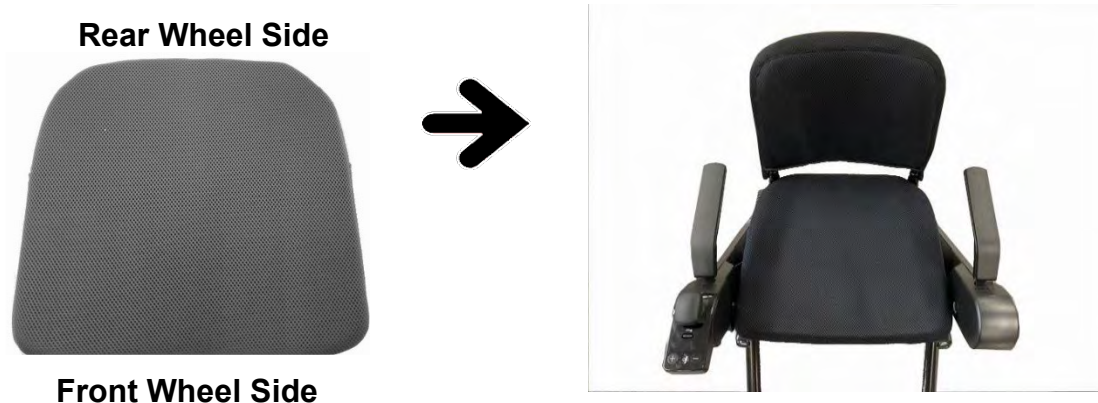
■ Removing the Seat Cushion

- (1) Grab the rear of the Seat Cushion and lift up and forward to remove.



■ Installing the Seat Cushion

- (1) Install the seat cushion with its round end towards the rear wheel.



9.5 Replacing the Color Plate

Tool used: None

Replacement part: 31-14049-0 Arm Outer Cover Color Plate White [F]

■ Removing the Color Plate

- (1) Referring to the controller replacement method, remove the controller / arm rest.



- (2) Slide the color plate upwards.

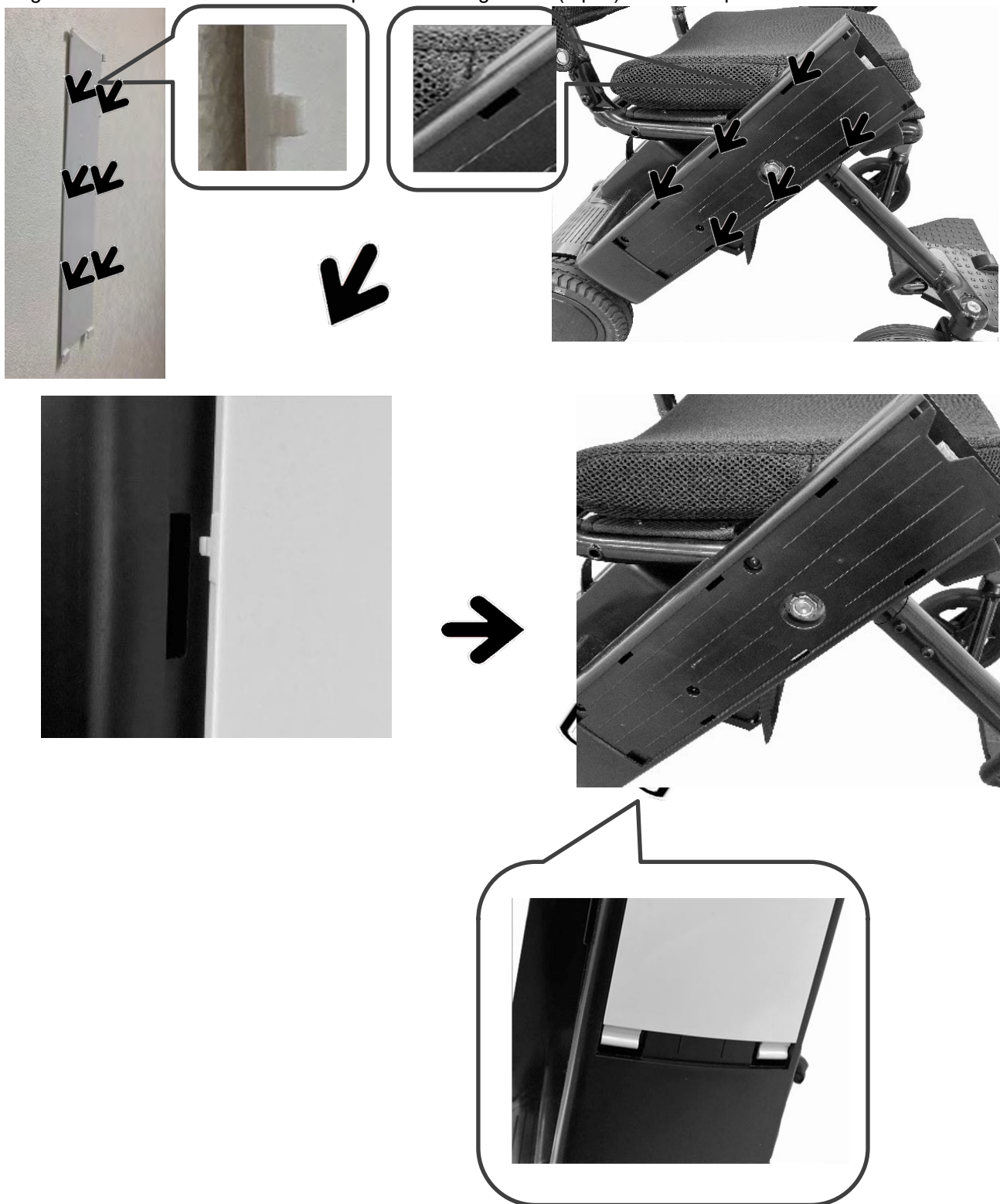


- (3) Remove the color plate.

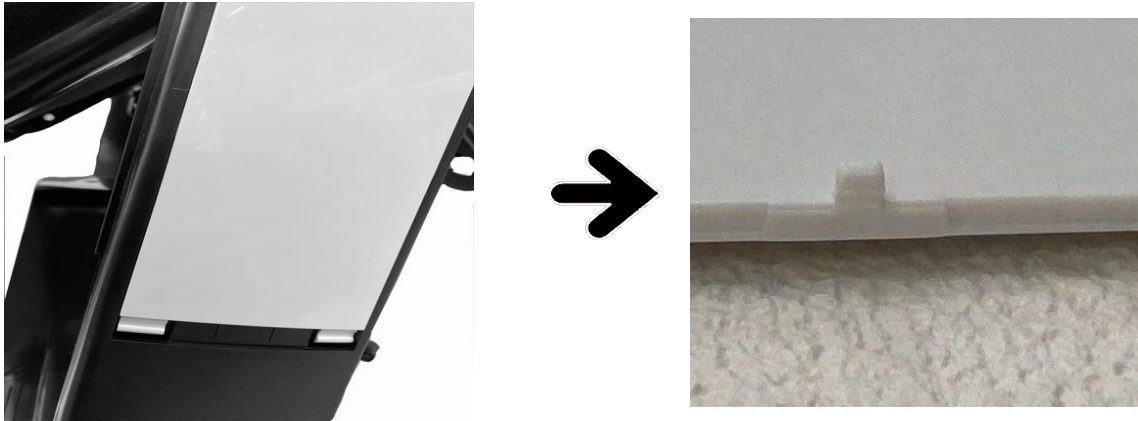


■ Installing the Color Plate

- (1) Align the tabs on the rear of the color plate with the grooves (6 pcs) of the arm plate.



- (2) Slide the color plate downwards while pressing near the center of the bottom section.



- (3) Referring to the controller replacement method, install the controller/hand rest.



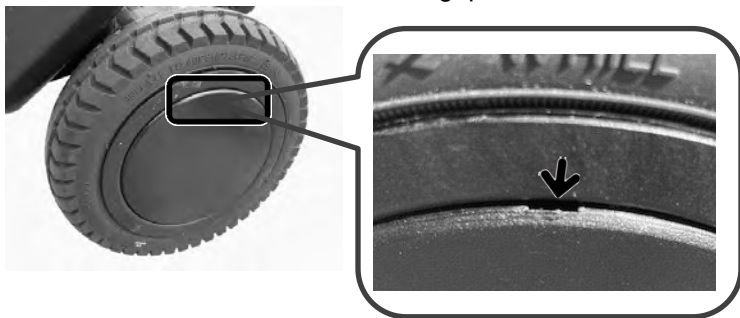
9.6 Replacing the Wheel Cover

Tool used: Flathead screwdriver (material: plastic recommended)

Replacement part: 31-14032-0 Rear Wheel Cover Assy [F]

■ Removing the Wheel Cover

(1) Insert a flathead screwdriver into the gap between the rear tire and rear wheel cover.

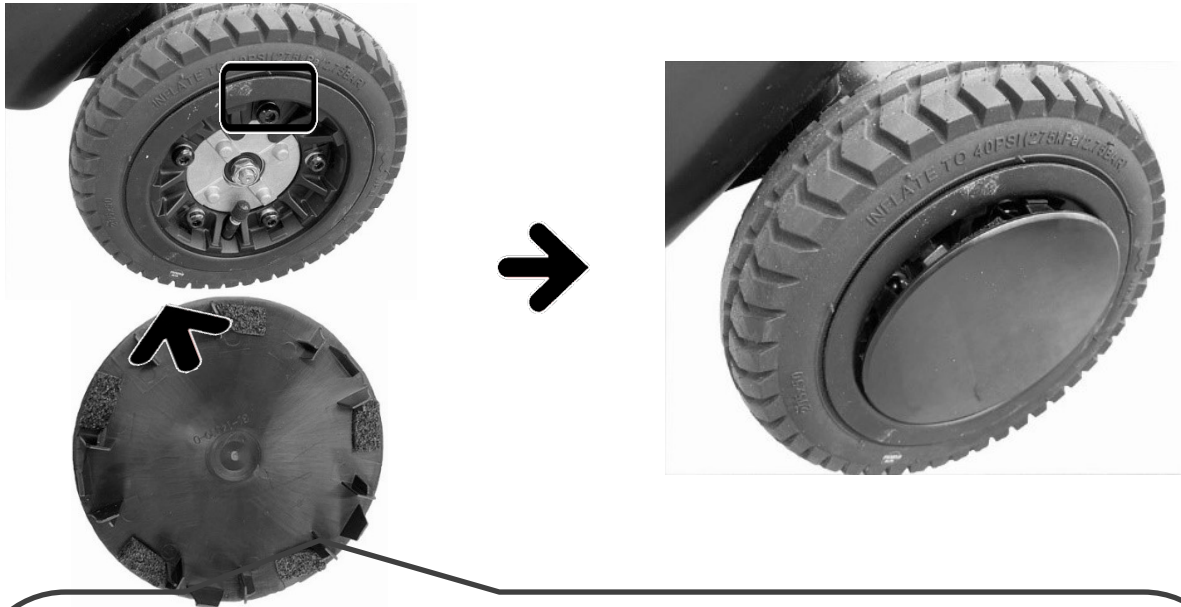


(2) Remove the rear wheel cover.



■ Installing the Rear Wheel Cover

(1) Install the rear wheel cover.



When installing the wheel cover, align the tabs on the cover with the indentation at the part where the screw comes to a stop as shown by the frame in the photograph above. In all, the five tabs must be aligned to install the rear wheel cover.



10 Maintenance with Parts Replacement

10.1 Replacing the Front Wheel

Tool used: Hex wrench/hex bit socket set/hex torque wrench

Replacement part: 24-14012-0 Front Wheel Kit [F] (screws x 1/nuts x 1)

■ Removing the Front Wheel

- (1) Install a stand under the footrest frame and raise the front wheel.



- (2) Remove the front wheel screw/nut.



- (3) Remove the front wheel from the fork.



Installing the Front Wheel

- (1) Install the front wheel on the fork and install the screw/nut.



- (2) Remove the stand.



10.2 Replacing the Front Fork

Tool used: Hex wrench/hex bit socket set/hex torque wrench

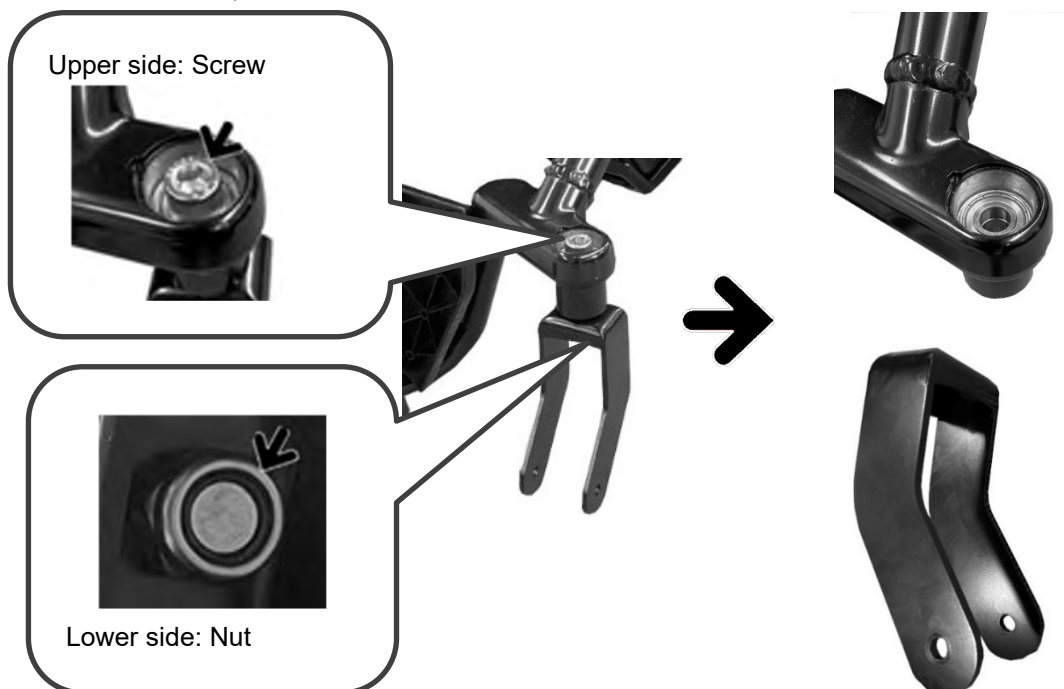
Replacement part: 24-14011-0 Front Wheel Fork Kit [F] (screws x 1/nuts x 1)

■ Removing the Fork

- (1) Refer to Section 10.1 to remove the front wheel.

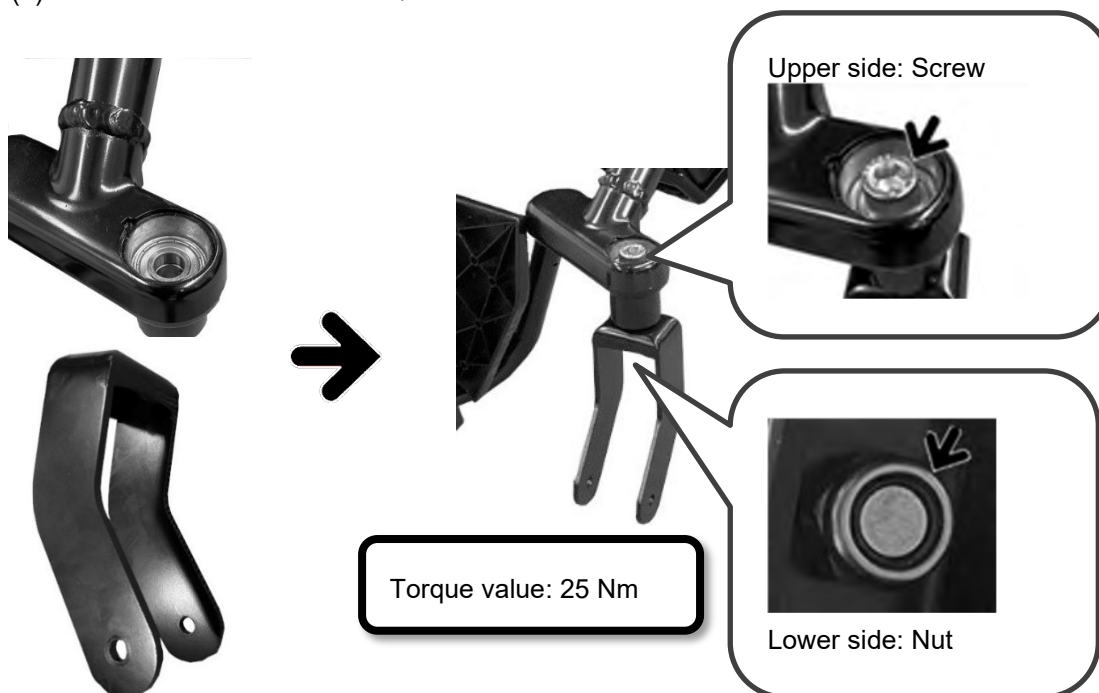


- (2) Remove the screw/nut and fork.



■ Installing the Fork

(1) Install the fork with the screw/nut



(2) Referring to 10.1, install the front wheel.



10.3 Replacing the Rear Wheel

Tool used: Hex wrench/hex torque wrench

Replacement part: 24-14017-0 Rear wheel Assy kit [F] (screws x 5)

■ Removing the Rear Wheel

- (1) Referring to Section 9.6, remove the wheel cap.
- (2) Install a stand under the foot pedal and lift the rear wheel up.



- (3) Remove the screws (5 pcs) securing the rear wheel.



- (4) Remove the rear wheel.



■ Installing the Rear Wheel

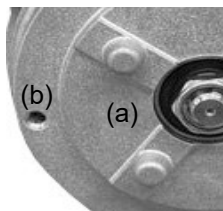
(1) Install the rear wheel



The installation positions of both the rear wheel and motor are already determined.



Rear wheel: Locate the area of the wheel where the two tabs extend out.



Motor: (a) Between the part where the two tabs extend out/(b) Part with screw hole is in center of lines (a).



(2) Install the screws (5 pcs) and secure the rear wheel.



Torque value: 12 Nm

(3) Refer to Section 9.6 to install the wheel cap.

10.4 Replacing the Controller

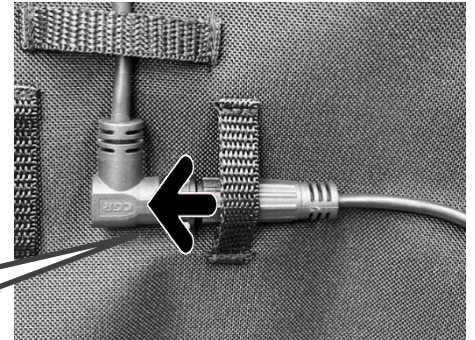
Tool used: Phillips Screwdriver

Replacement part: 21-00005-0 Controller [F]

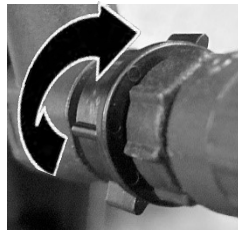
■ Removing the Controller

- (1) Disconnect the cable connector from the controller.

With the device folded, perform work from the battery side.



Hold the connector tabs and turn in the direction of the arrow.



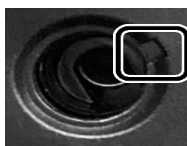
Connector comes loose when rotation stops.



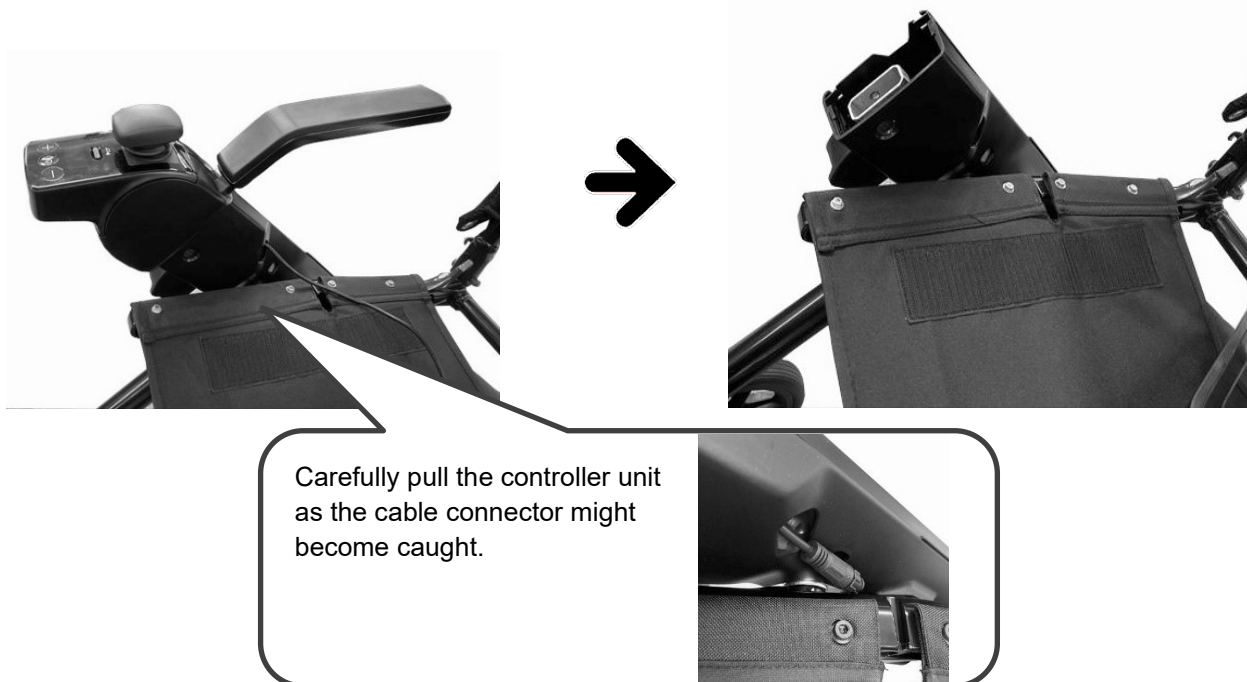
- (Ju) Remove the arm rest adjustment screw.



When installing the arm rest adjustment screw, remove the screw after aligning it with the key groove indicated by the rectangle frame below.



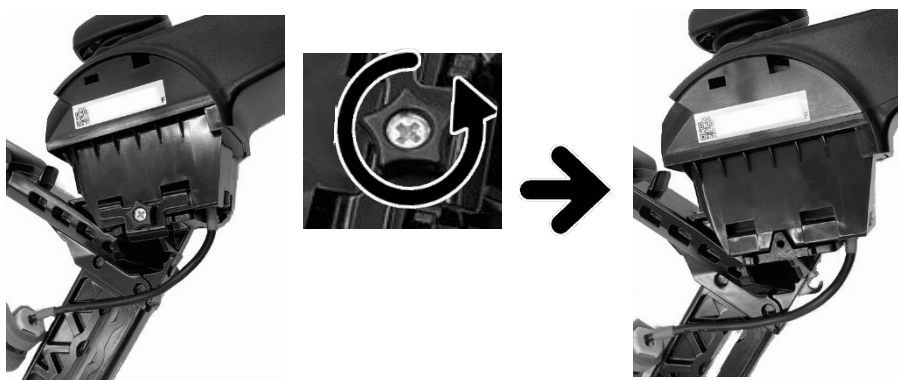
- (3) Pull the controller unit in the direction of the arrow to remove the unit.



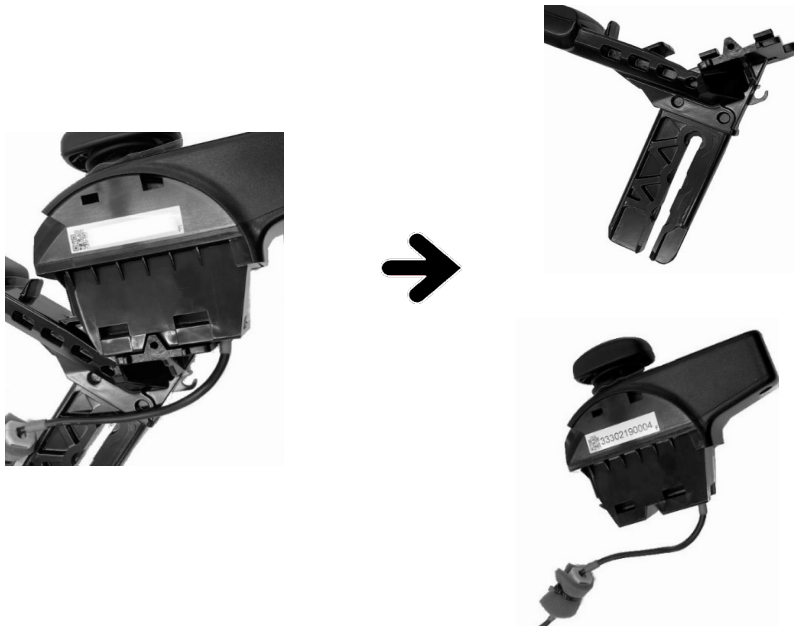
- (4) Press the tabs of controller covers A and B to remove the covers.



- (5) Remove the controller screws and the fastener.

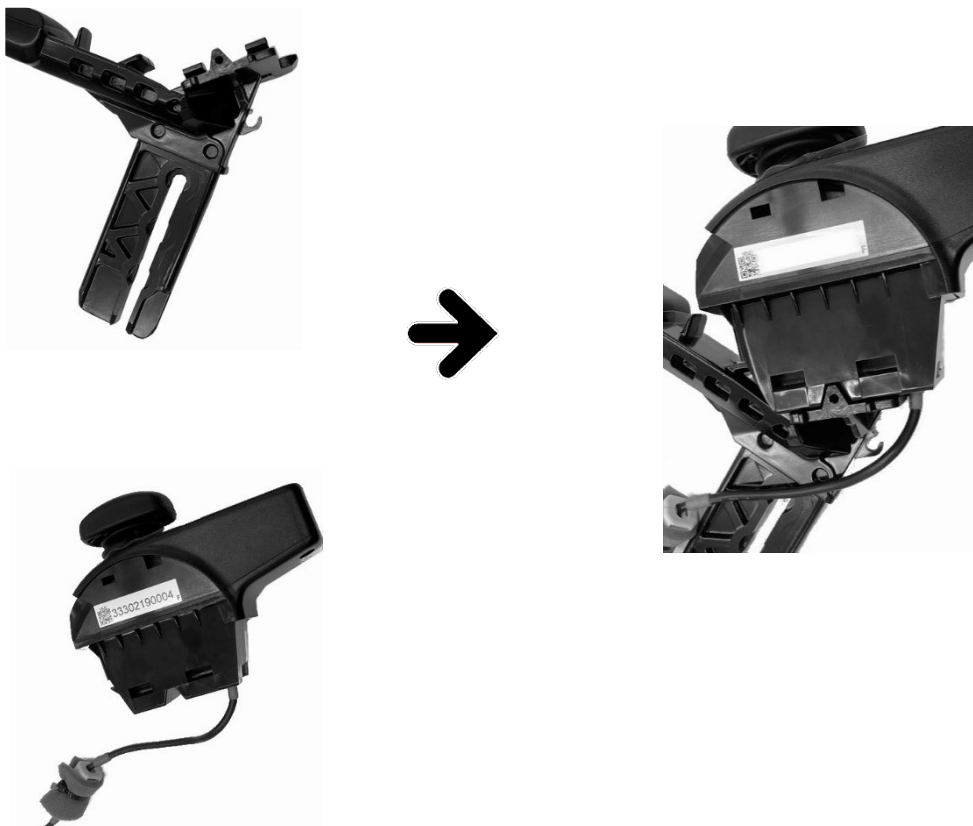


(6) Remove the controller.

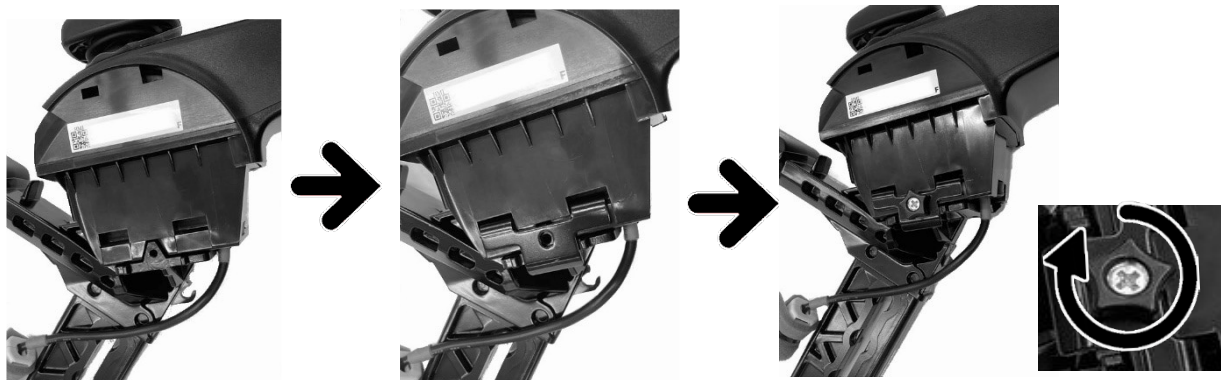


■ Installing the Controller

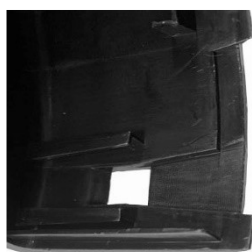
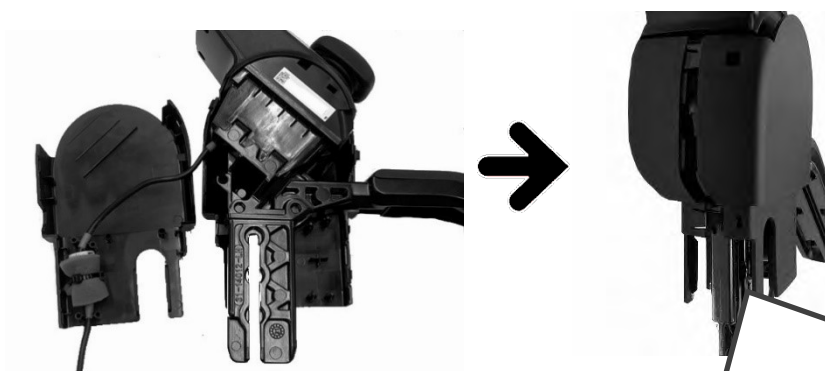
(1) Install the controller.



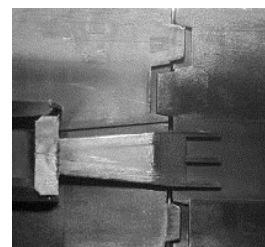
(2) Install the controller's fastener and screw.



(3) Install controller covers A and B.

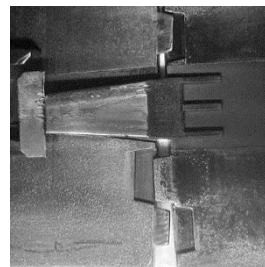


OK

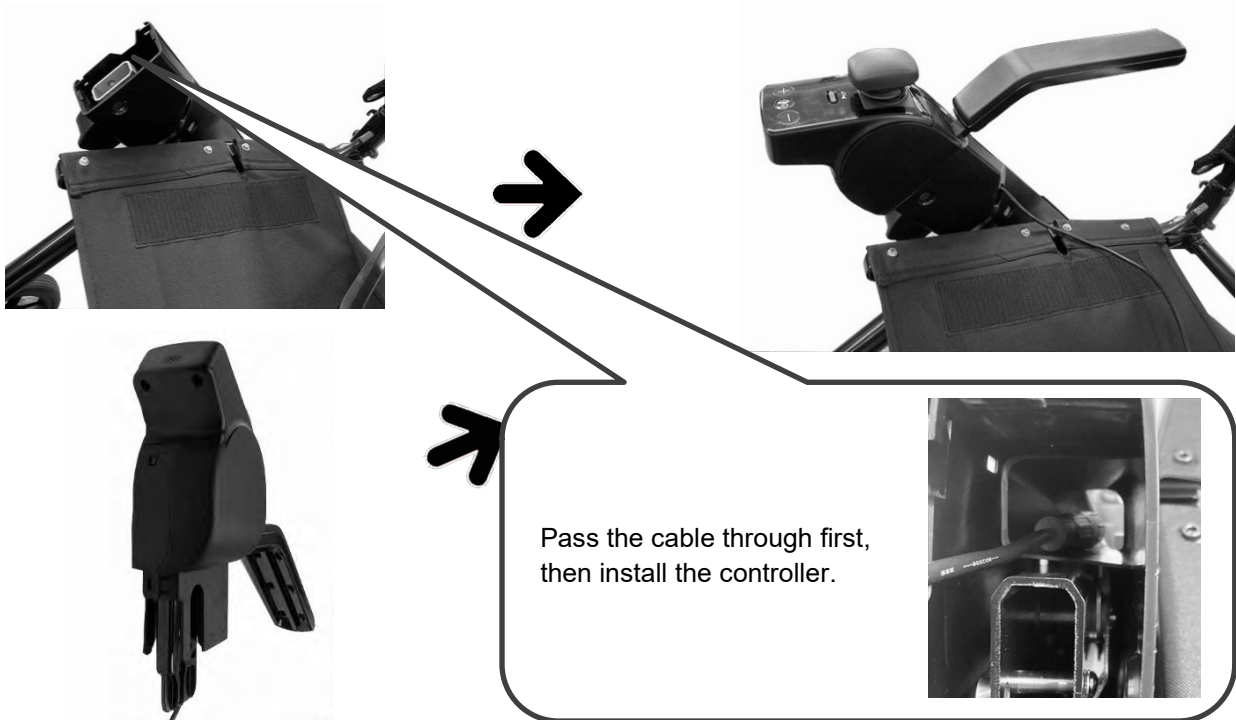


When installing the covers, the grooves and tabs of the covers must be as shown in the OK figure on the right.

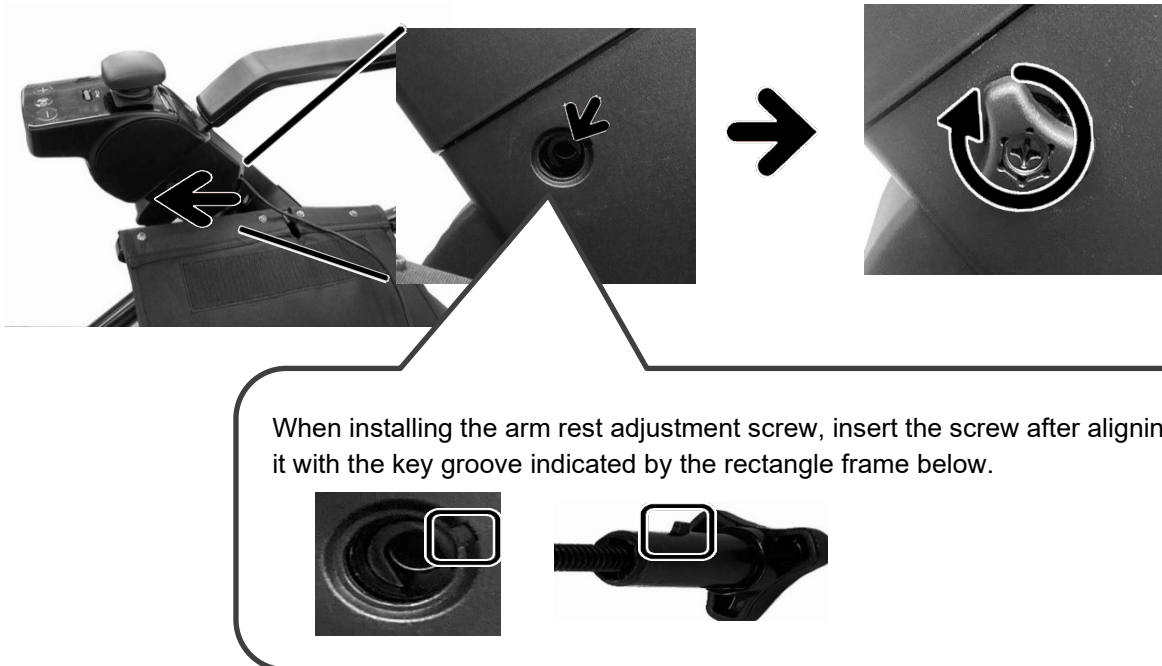
NG



(4) Install the controller unit.



(5) Install the arm rest adjustment screw.



(6) Check the position of the controller wiring.

Wiring on top side of seat



When passing the cable under the seat base fabric, pass it through the holes on the left and right.

OK



NG

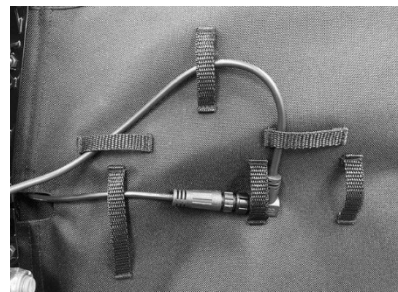


Wiring on underside of seat.

Controller right side



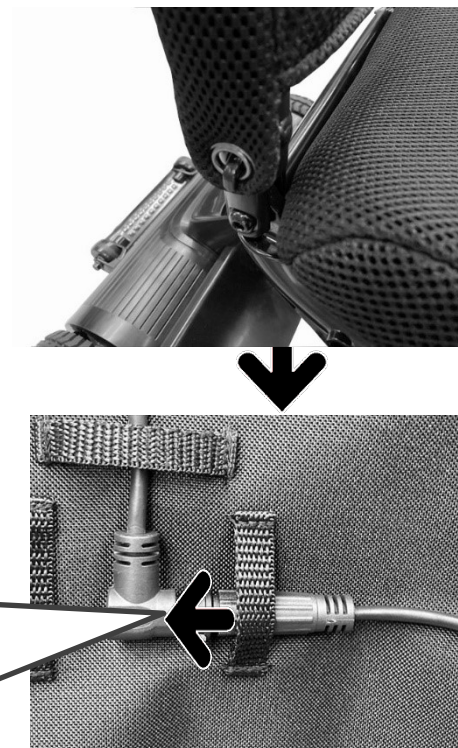
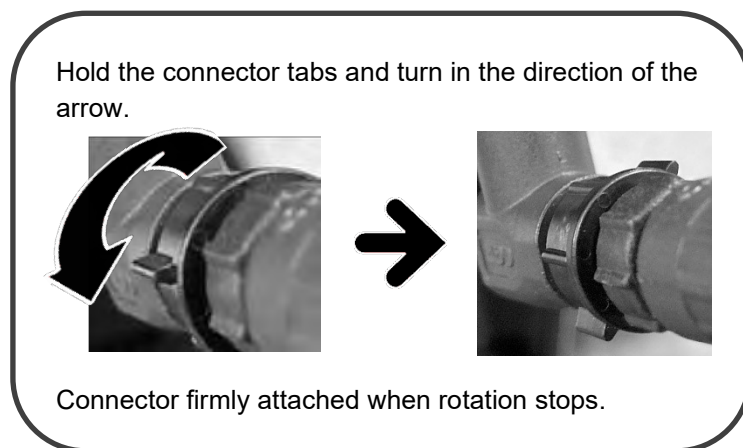
Controller left side



Route the wiring by referring to the photographs.

If the cable is passed through the wrong locations, the cable might become damaged, for example, when the device is folded.

(7) Connect the cable connector from the controller



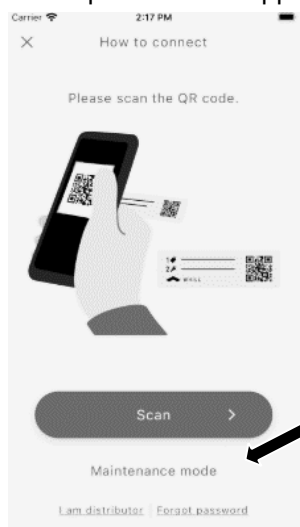
(8) Install the battery, and check that power can be started up.



(9) Prepare a smartphone installed with the WHILL app and start up the app.

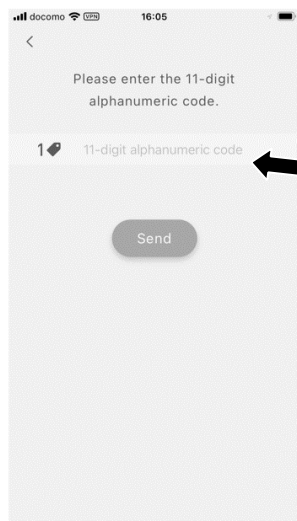


(10) Start up the WHILL App in the maintenance mode.

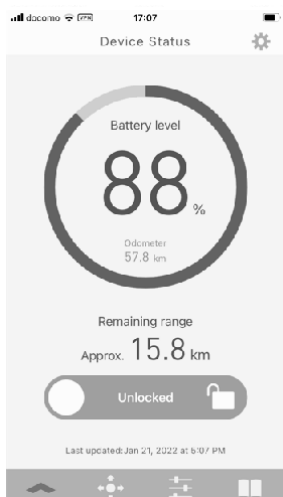


You can only start up the maintenance mode by clicking here. QR code does not guide the user to the maintenance mode.

(11) Enter the serial number that is attached to the white sticker on the controller and click the OK button.



(12) When the connection between the controller and the app is established, the information of the controller and motor controller is automatically sent to the server.

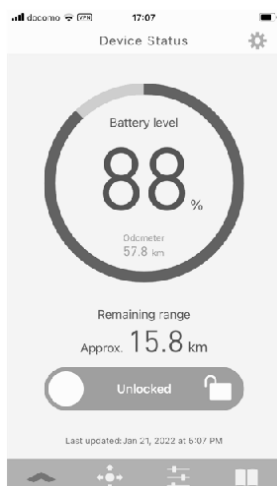


Linking of the following three items of information is performed on the server:

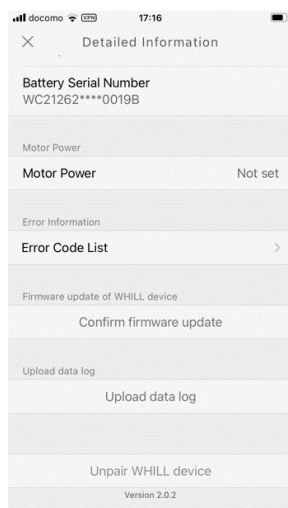
1. Device serial number
2. Controller serial number
3. Motor controller serial number

	<p style="text-align: center;">Maintenance Manual</p>	<p>WHILL Model F series : 32-14027-1 Version 1.0.1 [EN] Page 38/99</p>
--	--	--

(13) Press the gear icon at the top right of the screen to move to the "Advanced" screen.



(14) Press the "Unpair WHILL device" button to disconnect the smartphone and the device.



App information is subject to change without notice.

10.5 Replacing the Controller Upper Case

Tool used: Phillips head screwdriver, hex torque wrench, gloves for preventing static electricity

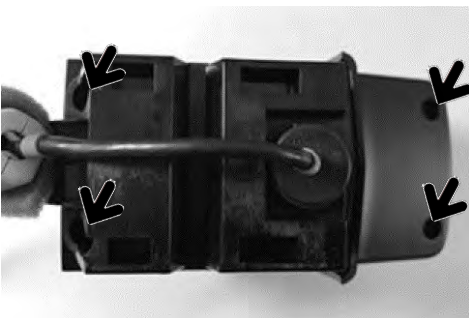
Replacement part: 22-00048-0 HMI Controller upper case [C2 / F]

■ Remove the Controller Upper Case.

Refer to Section 10.4, Remove the Controller.

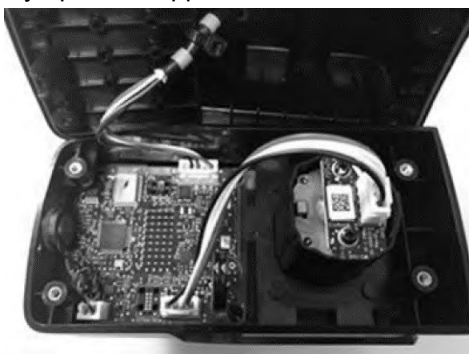


- (1) Remove the screws (4 pcs) from the rear side of the controller.



- (2) Remove the upper side cover.

*Carefully open the upper side cover as there are cables connected inside by connectors.



(3) Disconnect the two connectors from the board.



I. Disconnect the connector from the square board



I. Draw the cable out straight by holding the connector.
II. Do not hold and pull out the cable.

II. Disconnect the connector from the board of the joystick.



I. Draw the cable out straight by holding the connector.
II. Do not hold and pull out the cable.

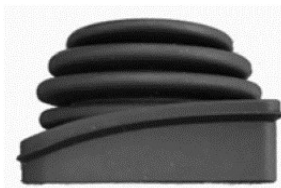
Store the packing so as not to lose it.

*Storage in an installed state is recommended

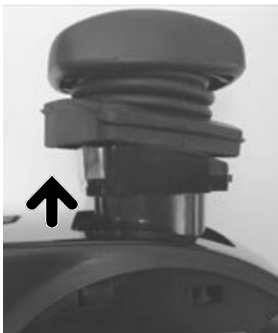
(4) Set the boot to a raised state and remove the frame screws (4 pcs).



Boot

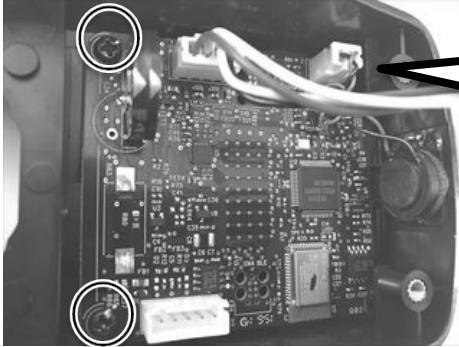


(5) Remove the joystick.



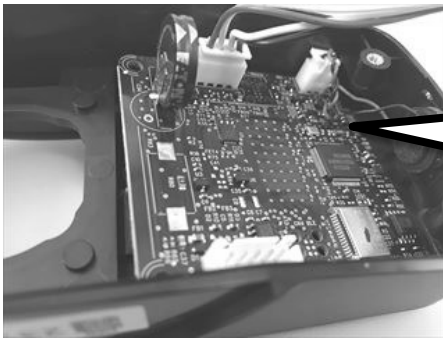
When storing the removed joystick, pay attention to the board as the joystick is re-used.

- (6) Turn the upper case over and remove the screws (2 pcs) securing the board.



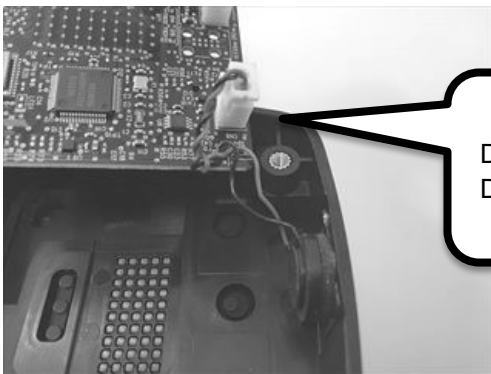
At this stage, the speaker connector is located at a difficult to remove location. For this reason, remove the board before disconnecting the speaker.

- (7) Lightly lift the edges of the board secured by screws and pull out the board.



The removed board will be re-used. For this reason, store it while taking care not to damage it.

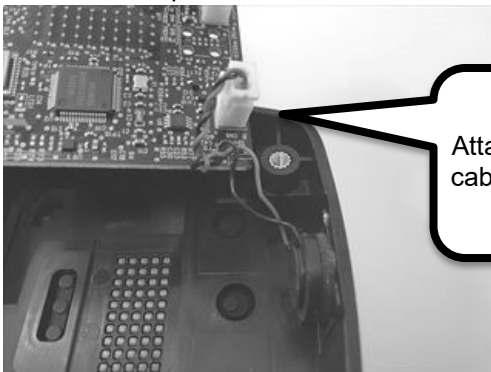
- (8) Disconnect the speaker connector.



Draw the cable out straight by holding the connector. Do not hold and pull out the cable.

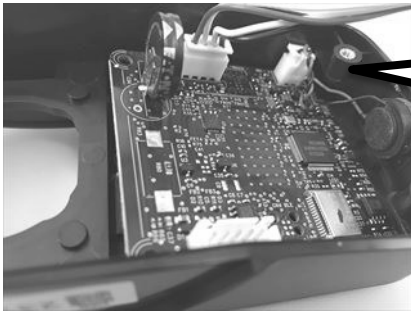
■ Installing the Controller Upper Case

- (1) Connect the speaker connector to the board.



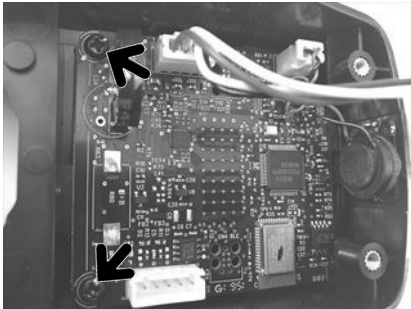
Attach the connector so that a load is not placed on the cable.

- (2) Install the board removed from the old controller on the new controller upper case.



Insert the board at an angle as far as it can go and then lower it.
Pay attention to the orientation of the board.

- (3) Secure the board with the screws (2 pcs).

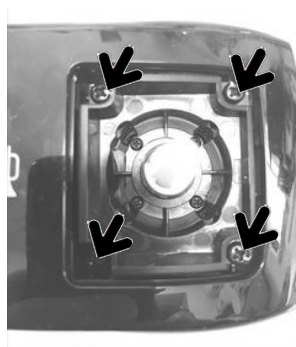


Torque value: 0.4 Nm

- (4) Install the joystick of the controller on the new controller upper case.

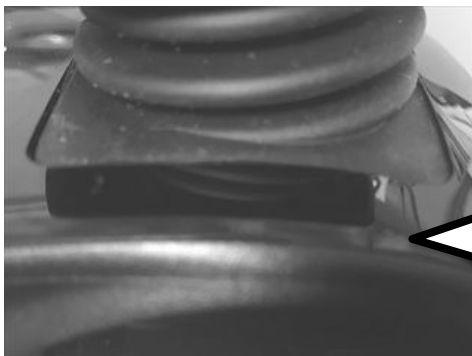


- (5) Secure the joystick with screws (4 pcs).



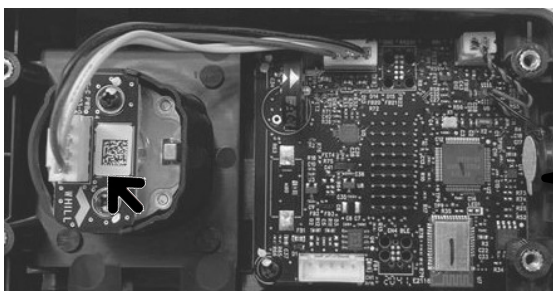
Torque value: 0.4 Nm

(6) Install the boot.



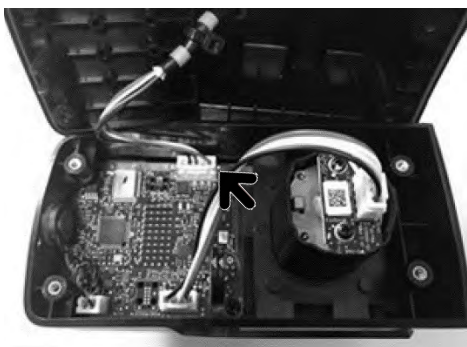
Push in the boot up to the position where there is no longer any difference in level with the upper surface of the controller.

(7) Connect the connector between the boards.

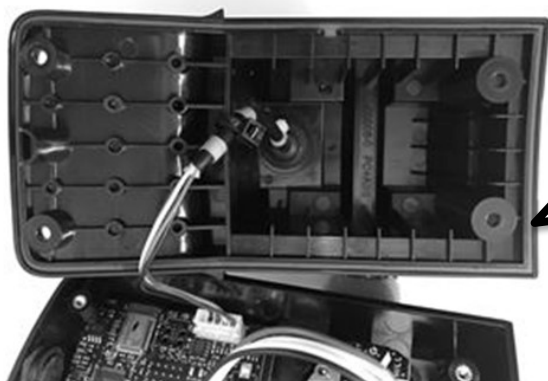


Install the cable indicated by the arrow.

(8) Install the connector under the controller to the square board.

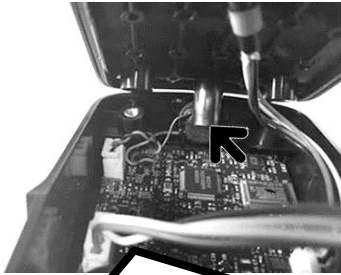


(9) Check that the packing (orange) under the controller fits properly into the groove.



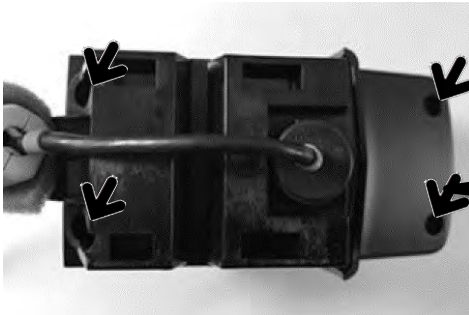
Check that the packing (orange) under the controller fits properly into the groove.
*This is because waterproofing function of the packing drops if it is not installed properly.

(10) Align the packing from the speaker side, then close the controller joystick side



*Take care to prevent the protrusions indicated by the arrow in the figure on the left from contacting the speaker.

(11) Install the screws (4 pcs).



Torque value: 0.4 Nm

(12) Referring to the installation procedure, install the controller to the device.



10.6 Replacing the Controller Mouse / Boot

Tool used: None

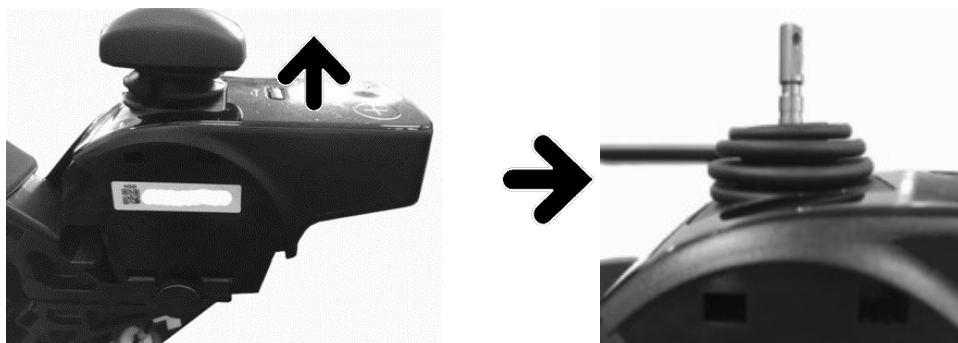
Replacement part: 22-00044-0 Joystick Knob Assy [C2/F]

■ Removing the controller mouse/boot

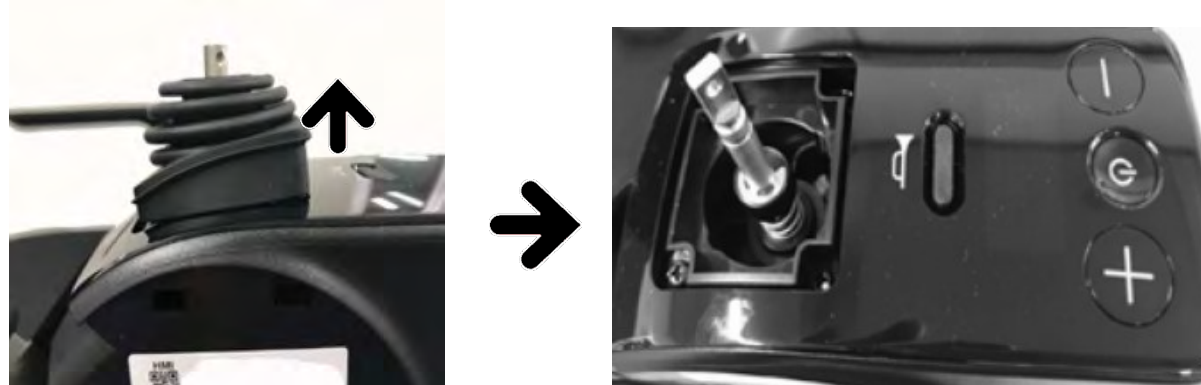
(1) Rotate the mouse 90 degrees.



(2) Pull the mouse in the direction of the arrow.

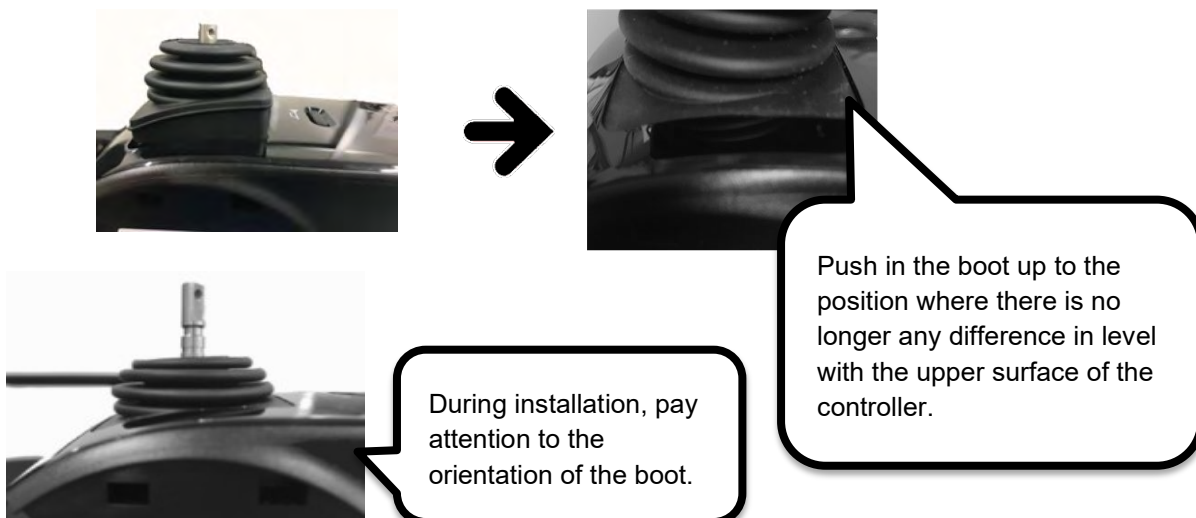


(3) Pull the boot in the direction of the arrow to remove the boot.

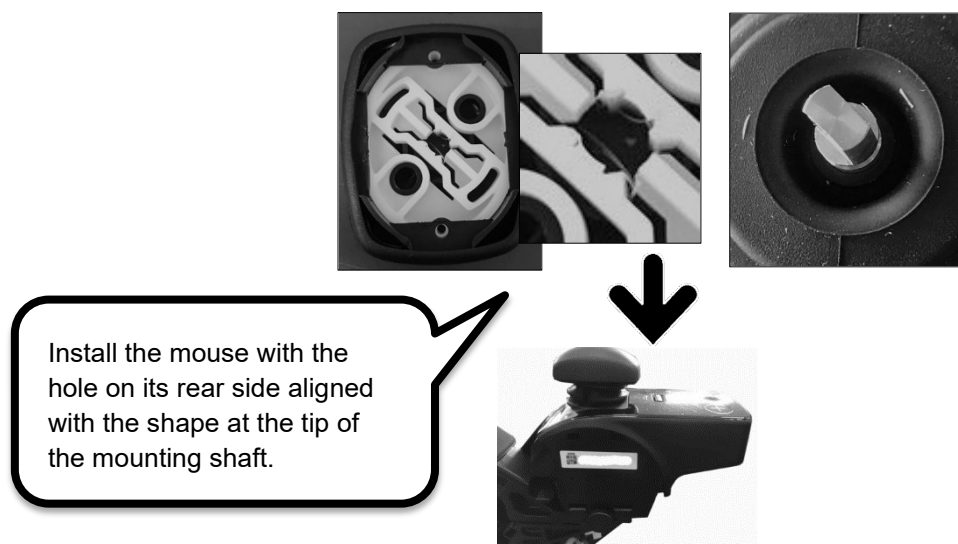


■ Installing the Controller Mouse / Boot

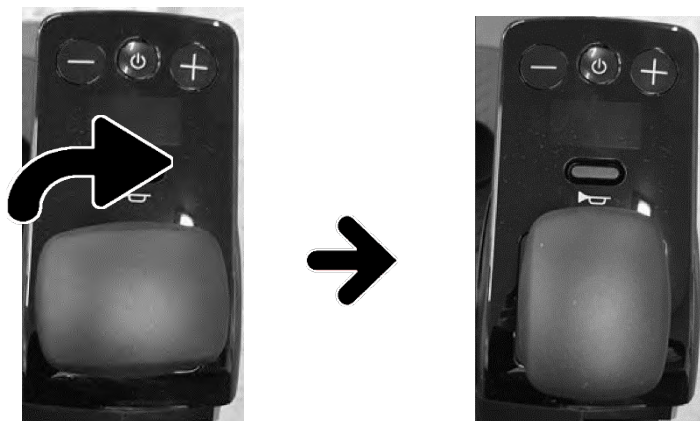
(1) Install the boot.



(2) Install the mouse.



(3) Rotate the mouse 90 degrees.



10.7 Replacing the Arm Rest Frame

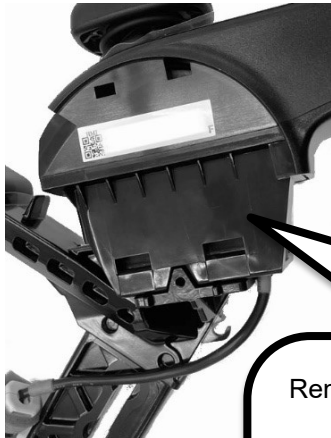
Tool used: Phillips head screwdriver

Replacement part: 31-14012-0 Arm Rest Frame (L) [F]

31-14012-1 Arm Rest Frame (R) [F]

■ Removing/installing the arm rest frame

(1) Referring to the controller replacement procedure, remove and install the arm rest frame.



Remove the controller and replace the frame unit.



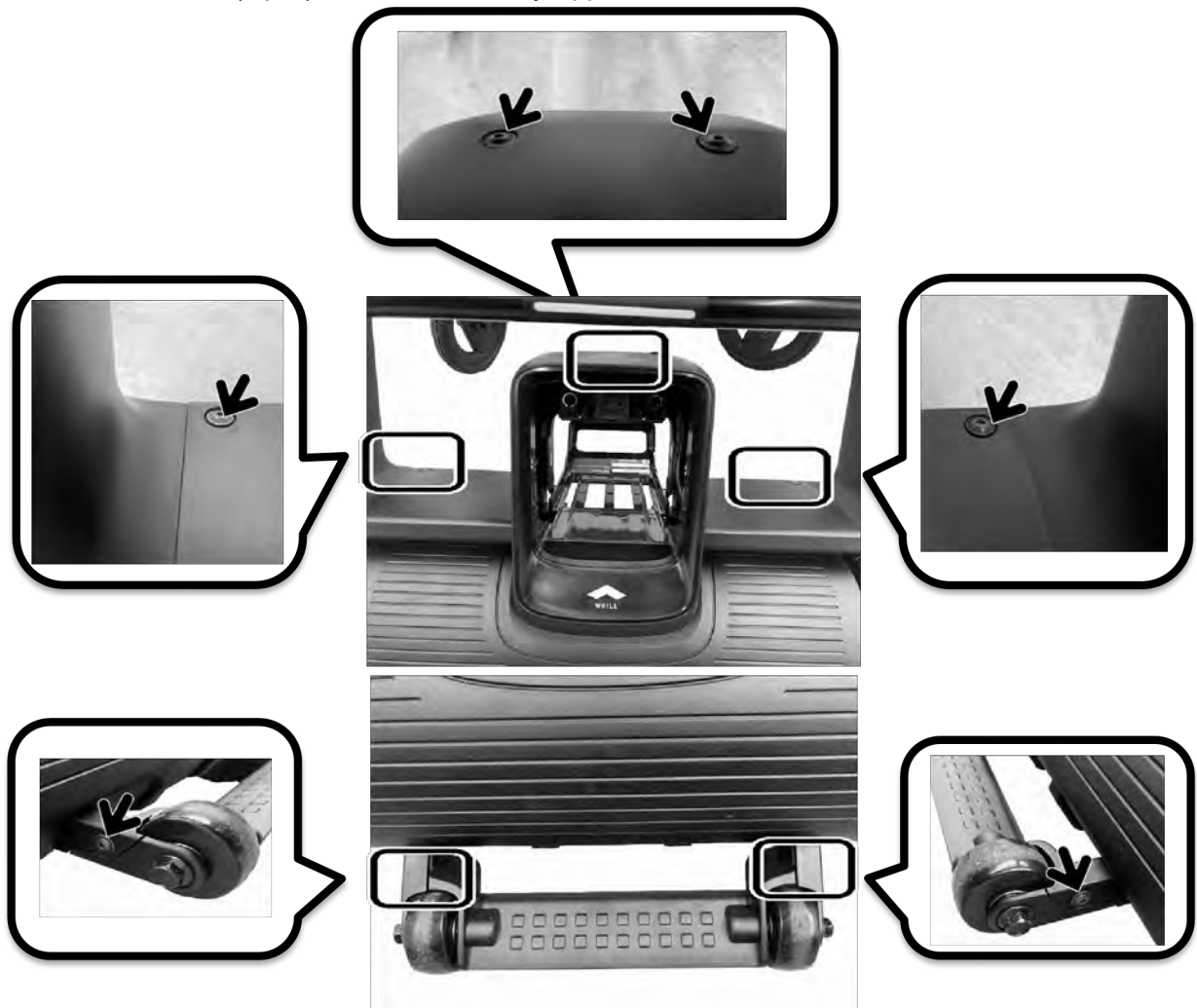
10.8 Replacing the Main Body Upper Cover

Tool used: Hex wrench/hex torque wrench

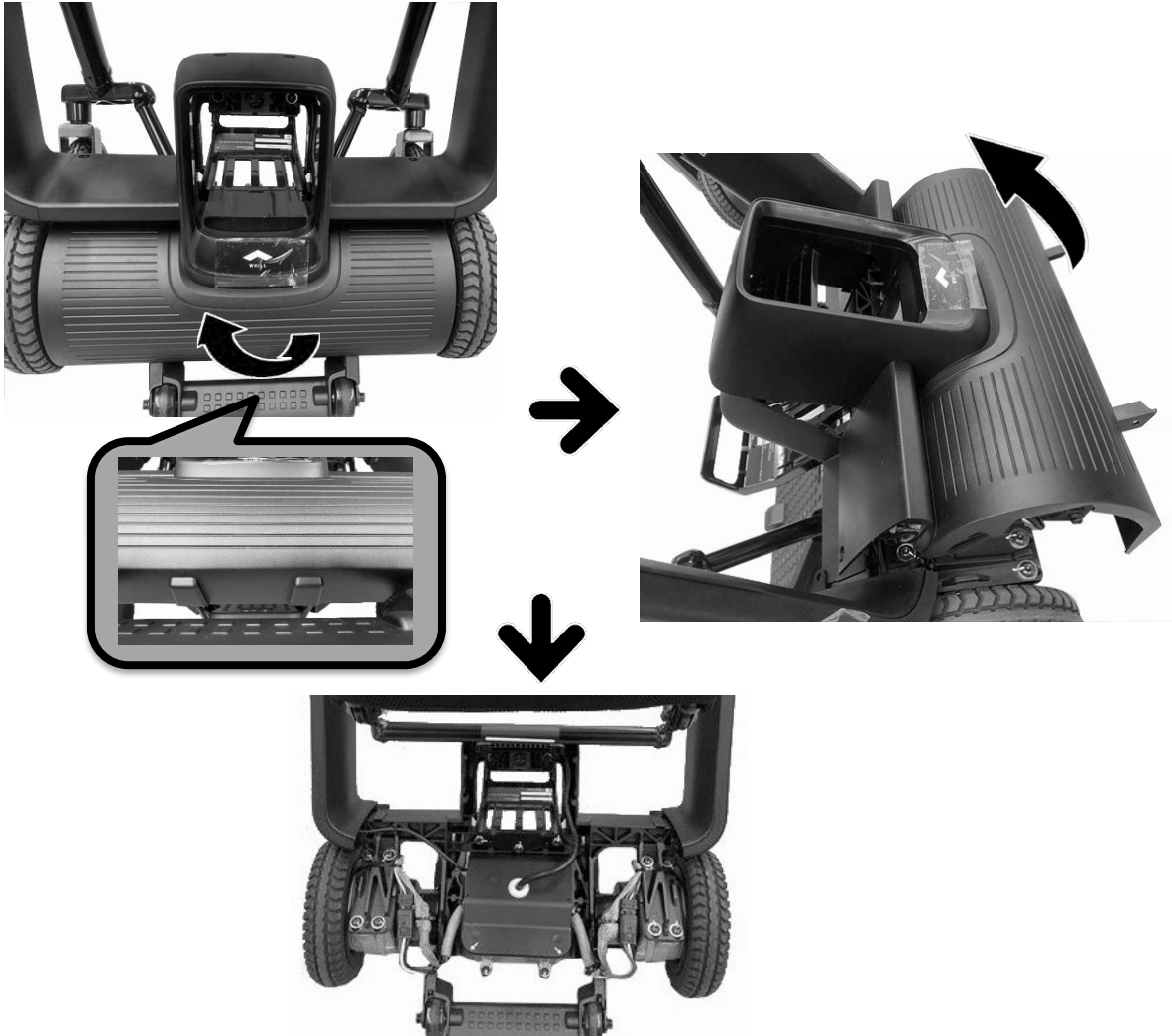
Replacement part: 31-14004-0 Main Body Upper Cover Kit [F] (screws x 6/nuts x 6)

■ Removing the Main Body Upper Cover

(1) Remove the screws (6 pcs) from the Main Body Upper Cover.



(2) Remove the Main Body Upper Cover by gripping the base side of the cover and lifting up.

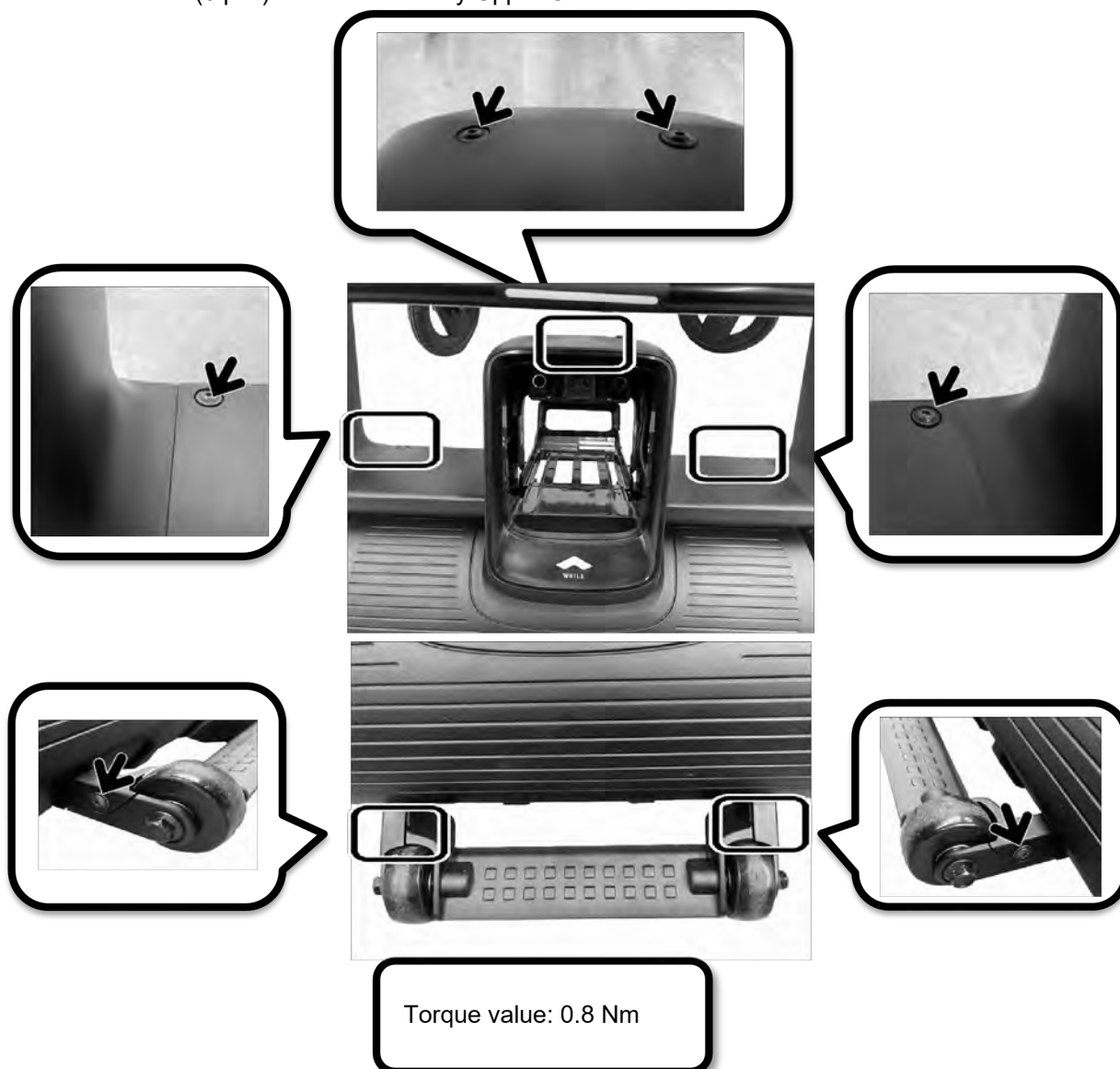


■ Installing the Main Body Upper Cover

(1) Install the Main Body Upper Cover.



(2) Install the screws (6 pcs) on the Main Body Upper Cover.



10.9 Replacing the Arm Inner / Outer Cover

Tool used: Hex wrench/hex torque wrench

Replacement part: 24-14004-0 Arm Inner Cover Kit (Left) [F] (screws x 4/nuts x 4)

24-14004-1: Arm Inner Cover Kit (Right) [F] (screws x 4/nuts x 4)

24-14005-0: Arm Outer Cover Kit (Left) [F] (screws x 4/nuts x 4)

24-14005-1: Arm Outer Cover Kit (Right) [F] (screws x 4/nuts x 4)

■ Removing the Arm Inner / Outer Cover

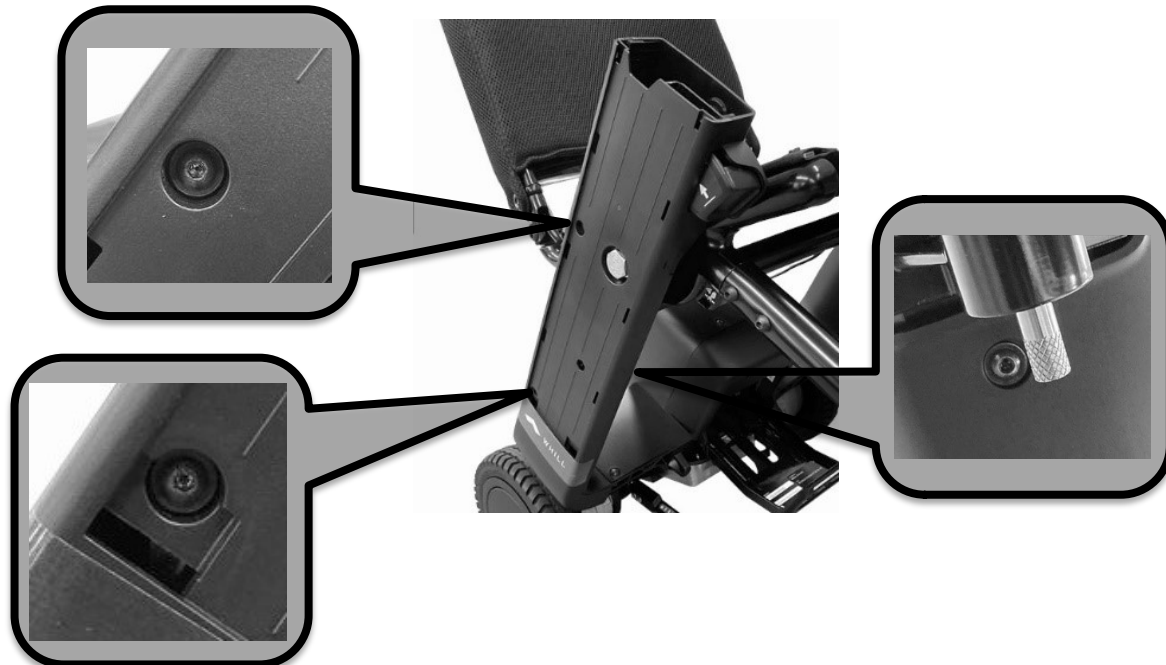
- (1) Referring to the respective replacement method, remove the Main Body Upper Cover / arm rest (both sides) including the color plate.



- (2) Remove the screws (3 pcs) from the arm inner/outer cover.

Arm outer side

Arm inner side



(3) Remove the arm outer cover.

Firmly press the round section to remove the tab.



Firmly press the round section to remove the tab.



(4) Remove the arm inner cover.

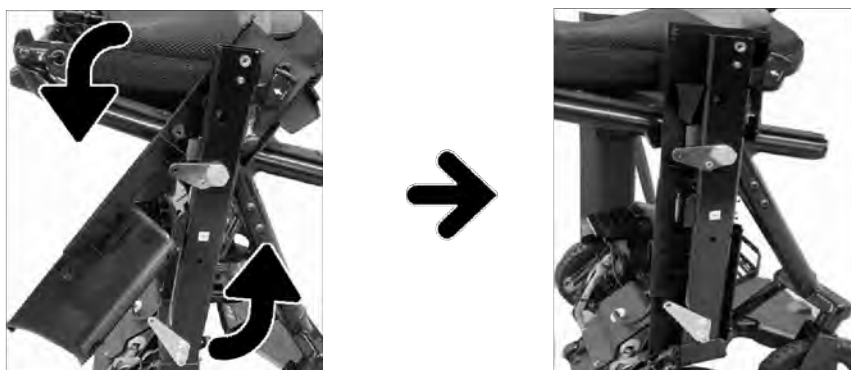


The inner cover can be removed easily by turning it 45 degrees.

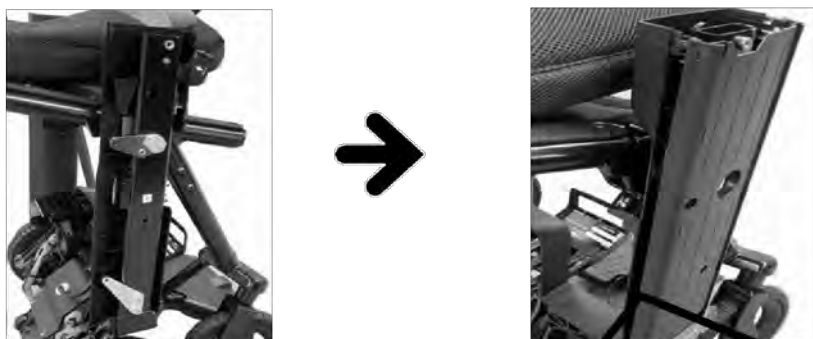


■ Installing the Arm Inner / Outer Cover

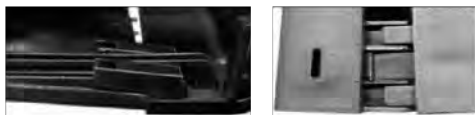
(1) Install the arm inner cover.



(2) Install the arm outer cover.



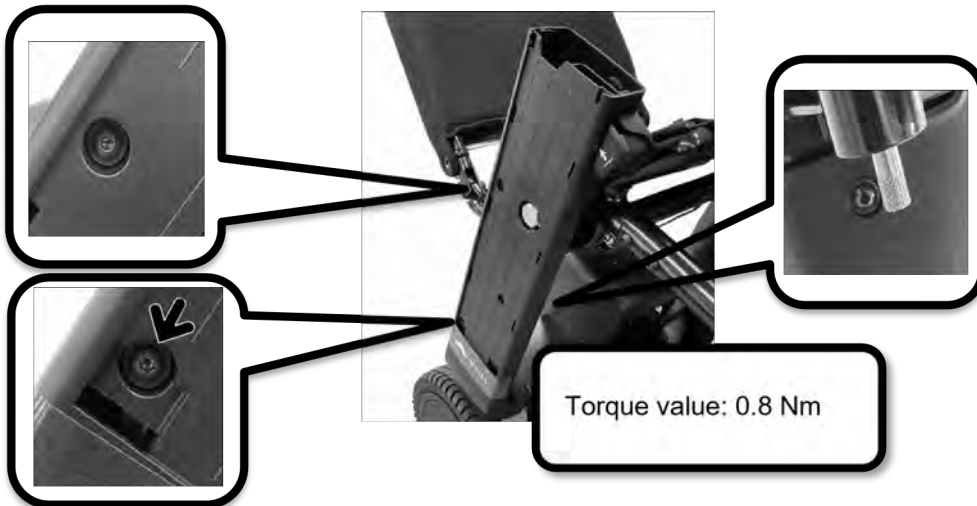
Align the positions of the tabs when installing.



(3) Install the screws (3 pcs) on the arm inner/outer cover.

Arm outer side

Arm inner side



Torque value: 0.8 Nm

- (4) Referring to the respective replacement method, remove the rear cover/arm rest (both sides) and color plate.



10.10 Replacing the Arm Frame Assembly

Tool used: Hex wrench/hex torque wrench

Replacement part: 24-14007-0 Arm Frame Kit (Left) [F] (screws x 3/nuts x 3/washers x 2)

24-14007-1 Arm Frame Assy Kit (Right) [F] (screws x 3/nuts x 3/washers x 2)

■ Removing the Arm Frame Assembly (common)

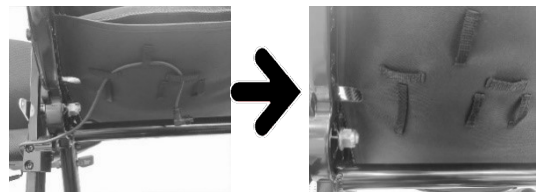
- (1) Referring to the respective replacement method, remove the arm inner/outer frame.



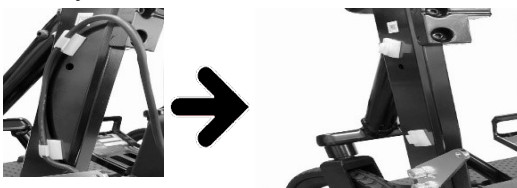
- (2) Remove the wiring to the motor controller from the arm frame.

Take care to prevent the removed cable from becoming caught or stepped on.

1. Disconnect the cable from the under side of the seat.

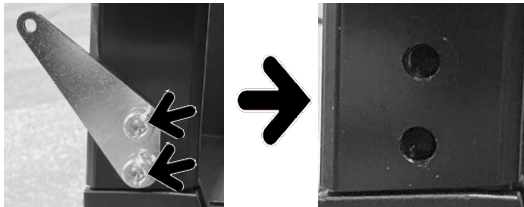


2. Disconnect the cable from the arm frame assembly.



- (3) Remove the screws (4 pcs) from the underside of the arm frame. (2 each on left and right)

Remove the screws (2 pcs).
Likewise, remove the screws on the opposite side.



- (4) Remove the front/seat unit from the main body frame.



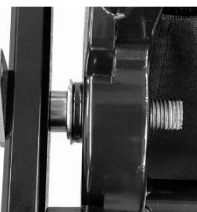
■ Removing the Arm Frame Assembly

- (5) Remove the nut/washer from the screw.

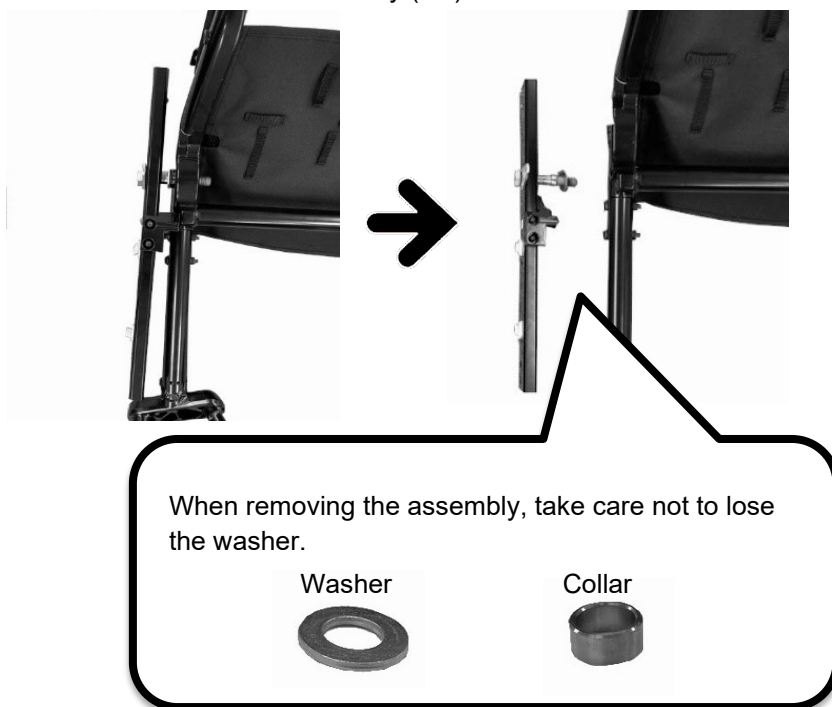
1. Loosen the nut.



2. Remove the nut/washer.
*Take care not to lose the washer.

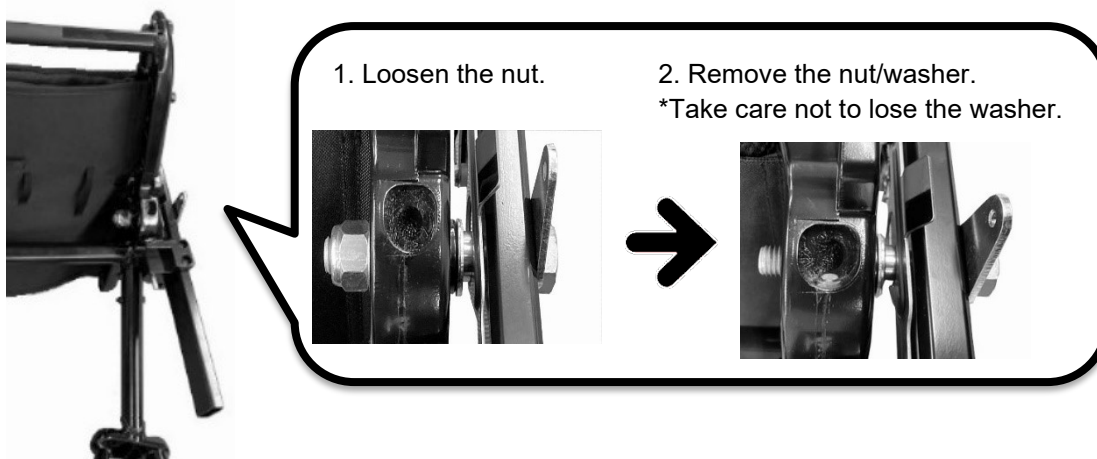


(6) Remove the arm frame assembly (left).

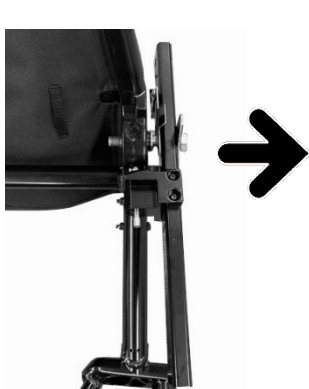


■ Removing the Arm Frame Assembly (right)

(7) Remove the nut/washer from the screw.



(8) Remove the arm frame assembly (right).



When removing the assembly,
take care not to lose the washer.

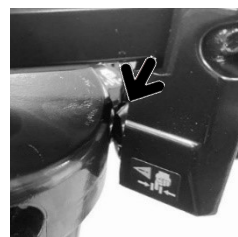
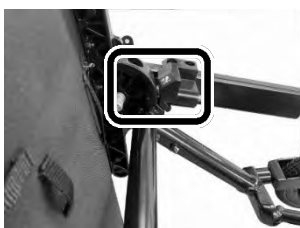
Washer



Collar

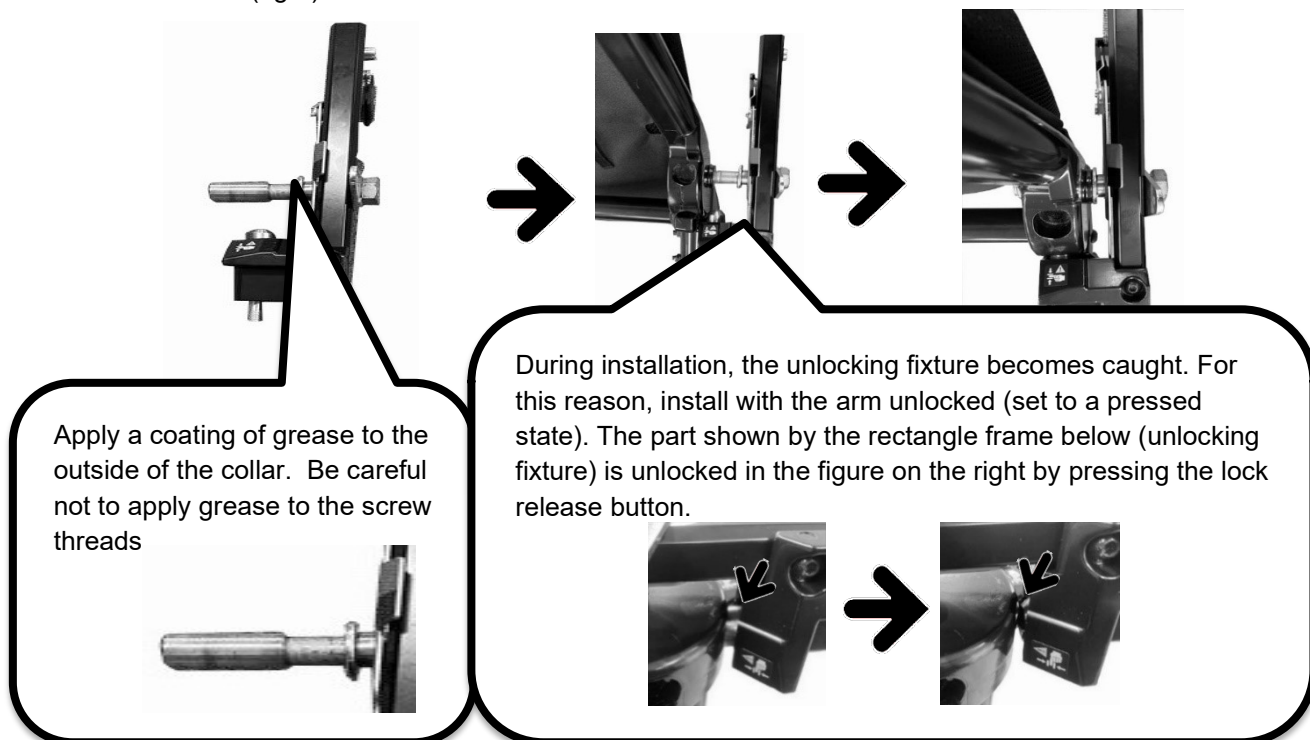


Before removing the arm frame assembly, unlock the arm (set to a pressed state).
The part shown by the rectangle frame below is unlocked in the figure on the right by pressing the lock release button.

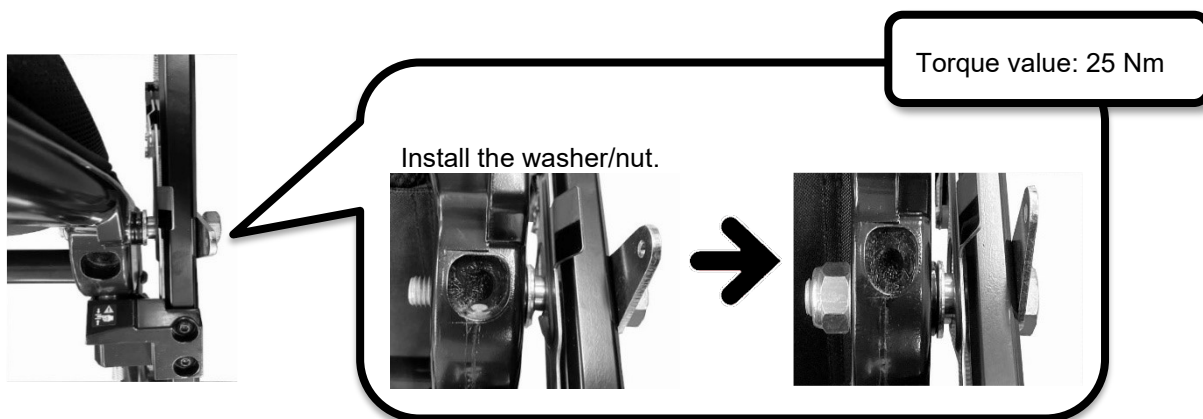


■ Installing the Arm Frame Assembly (right)

(1) Install the arm frame (right) on the seat frame.

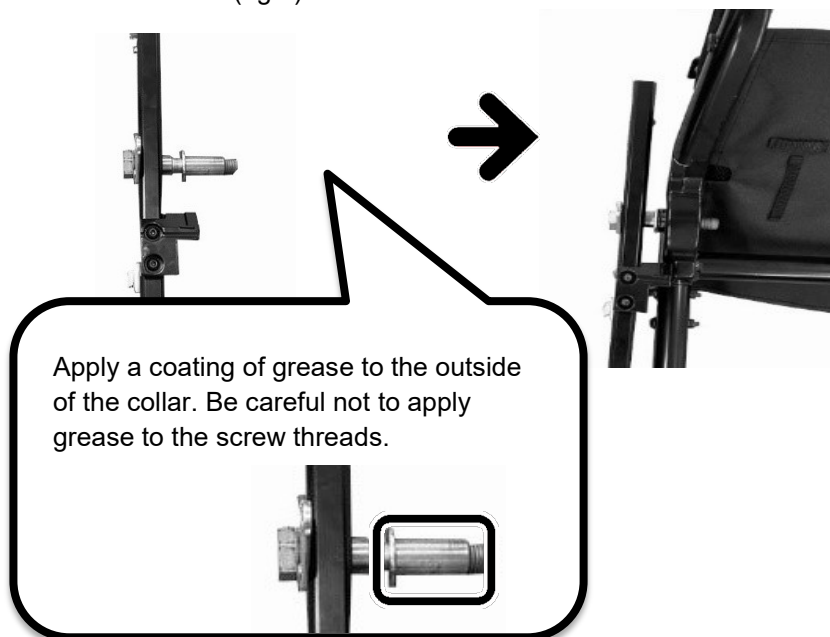


(2) Install the washer/nut.

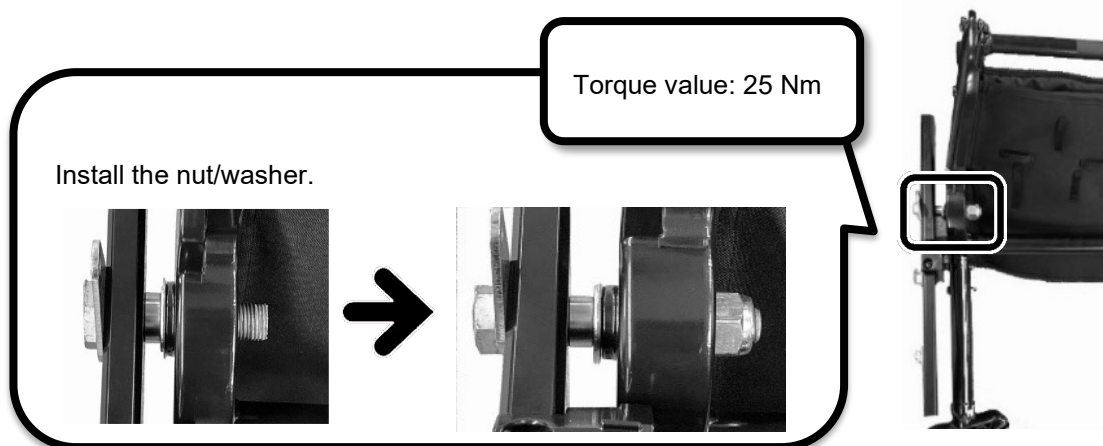


■ Installing the Arm Frame Assembly (left)

(3) Install the arm frame (right) on the seat frame.

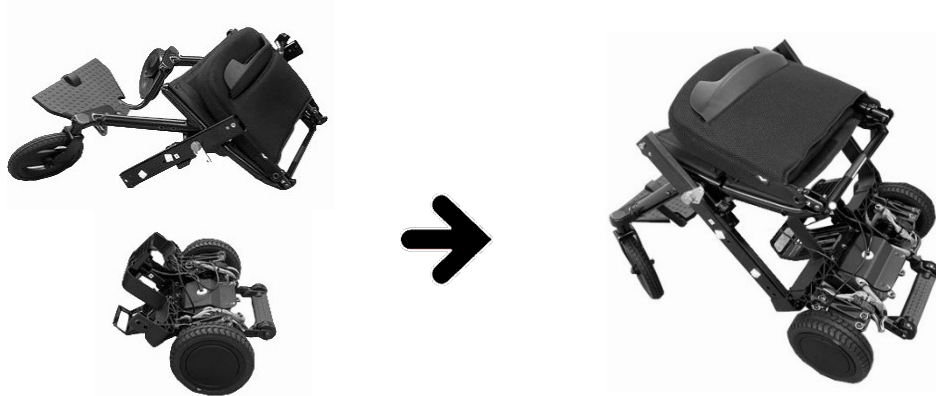


(4) Install the washer/nut.



■ Installing the Arm Frame Assembly

(5) Install the front / seat unit on the main body frame.



- (6) Install the four screws on the underside of the arm frame. (2 each on left and right)



Install the screws (2 pcs).

Likewise, remove the screws on the opposite side.

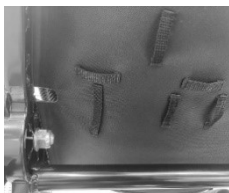


Torque value: 12.5 Nm

- (7) Route the wiring between the motor controller and under the seat.



2. Connect the cable to the underside of the seat.



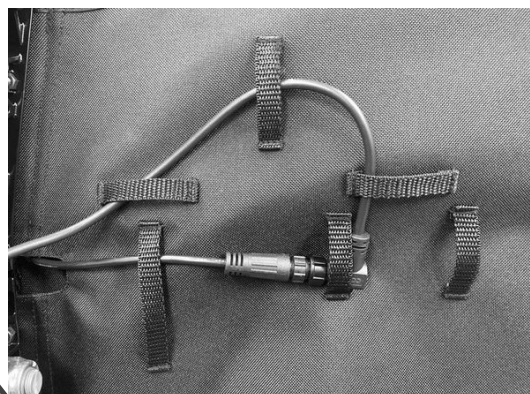
1. Connect the cable to the arm frame assembly.



Controller right side



Controller left side



Route the wiring by referring to the photographs.
If the cable is passed through the wrong locations, the cable might become damaged, for example, when the device is folded.

- (8) Referring to the respective replacement method, install the arm inner/outer frame and main body frame.



10.11 Replacing the Lock Release Button

Tool used: E-ring pliers

Replacement part: Lock release button kit (lock release button/E-ring)

Part No.: 24-14006-0

■ Removing the Lock Release Button

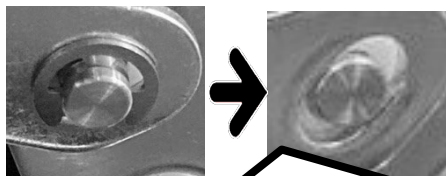
(1) Referring to the respective replacement method, remove the arm inner / outer frame.



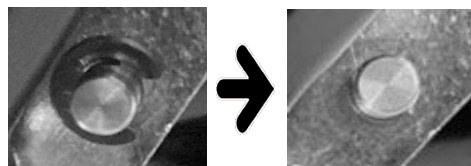
(2) Remove the E-rings (2 pcs).



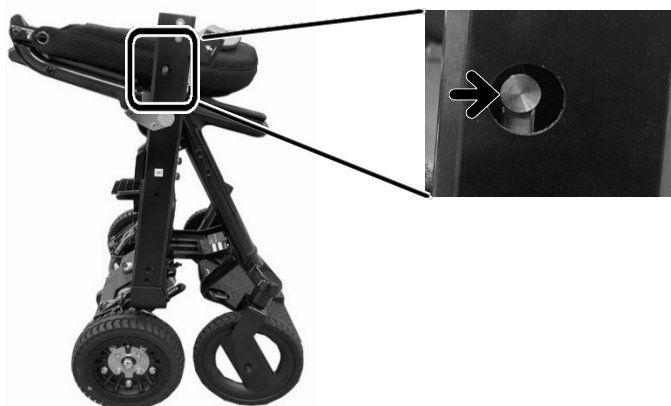
Remove the E-ring from the battery lock release button inner side.



Remove the E-ring from the battery lock release button outer side.



When removing the E-ring, press down on the E-ring. Otherwise, the mounting pin might fall off. For this reason, remove the E-ring while pressing down on the rear side of the mounting pin (shown by round frame).



(3) Remove the lock release button.



When storing, be careful not to lose the washers (4 pcs) and mounting pins (2 pcs).



■ Installing the Lock Release Button

(1) Install the lock release button.

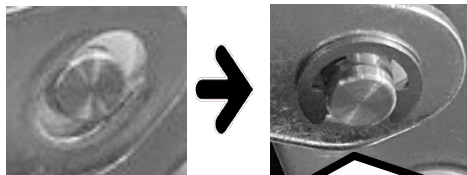


1. Pay attention to the washer installation position.
2. When installing the lock release button, press down on the rear side of the mounting pin.

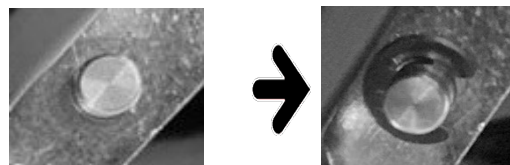
(2) Secure the lock release button with the E-ring.



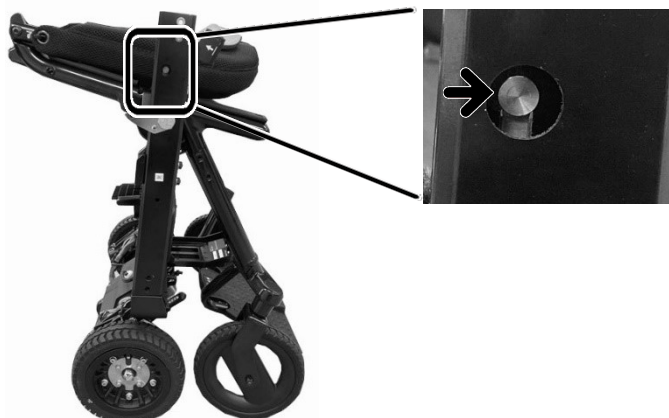
Install the E-ring on the lock release button inner side.



Install the E-ring on the lock release button outer side.



When installing the E-ring, press down on the E-ring. Otherwise, the mounting pin might fall off. For this reason, remove the E-ring while pressing down on the rear side of the mounting pin (shown by rectangle frame).



- (3) Referring to the respective item, install the main body upper cover (Section 10.8), arm inner/outer cover (Section 10.9) and controller (Section 10.4).



10.12 Replacing the Seat Frame

Tool used: Hex wrench/spanner/hex torque wrench

Replacement part: 24-14008-0 Seat Frame Assy Kit [F]

■ Removing the Seat Frame

- (1) Referring to Section 10.13, Remove the Back Support Frame.



- (2) Referring to Section 10.10, Remove the Arm Frame.



(3) Referring to 10.18, remove the footrest frame from the seat frame.



(4) Referring to Section 9.2, Remove the Seat Base Fabric.



■ Installing the Seat Frame

(1) Refer to Section 9.2, Install the Seat Base Fabric.



(2) Refer to Section 10.18, Install the Footrest Frame.



(3) Refer to Section 10.10, Install the Arm Frame.



(4) Refer to Section 10.13, Install the Back Support Frame.



10.13 Replacing the Back Support Frame

Tool used: Hex wrench/spanner/hex torque wrench

Replacement part: 24-14009-0 Back Support Upper Frame Kit [F]

24-14010-0 Back Support Hinge Assy Kit [F]

■ Removing the Back Support Frame

- (1) Referring to Section 9.3, remove the back support fabric.



- (2) Remove the screws/nuts (2 pcs) and the back support frame.



When removing the screws, take care not to lose the washer (location indicated by arrow).



■ Installing the Back Support Frame

- (1) Install the washers on both sides of the base of the back support frame.



Place on the base for washer installation.



(2) Install the back support frame with the screws/nuts (2 pcs).



Tighten the screw from the outside with the nut set on the inside.

(3) Referring to Section 9.3, install the back support fabric.



10.14 Replacing the Motor Unit

Tool used: Hex wrench/spanner/hex torque wrench

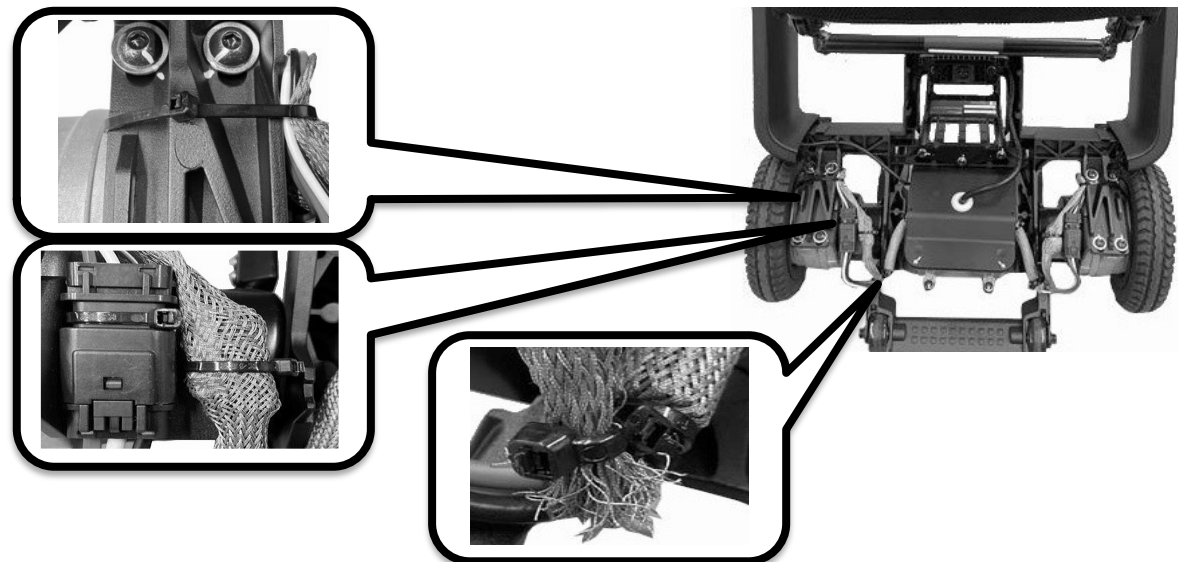
Replacement part: 24-14020-0 Motor Brake Assy Kit (Left) [F] (motor/screws x 4/washers x 4)
24-14020-1 Motor Kit Assy (Right) [F] (motor/screws x 4/washers x 4)

■ Removing the Motor Unit

(1) Refer to Section 10.8, Remove the Main Body Upper Cover.



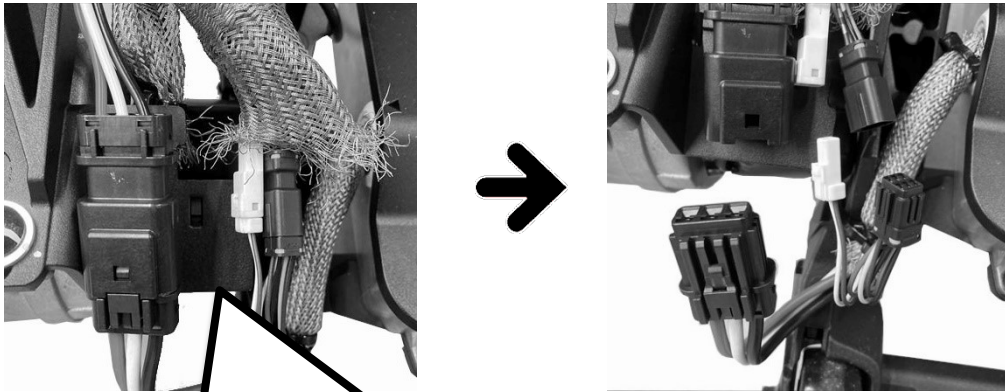
(2) Cut and remove the bundling bands (4 pcs) securing the motor cable.



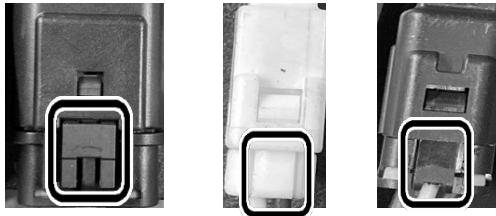
(3) Referring to 10.3, remove the rear wheel.



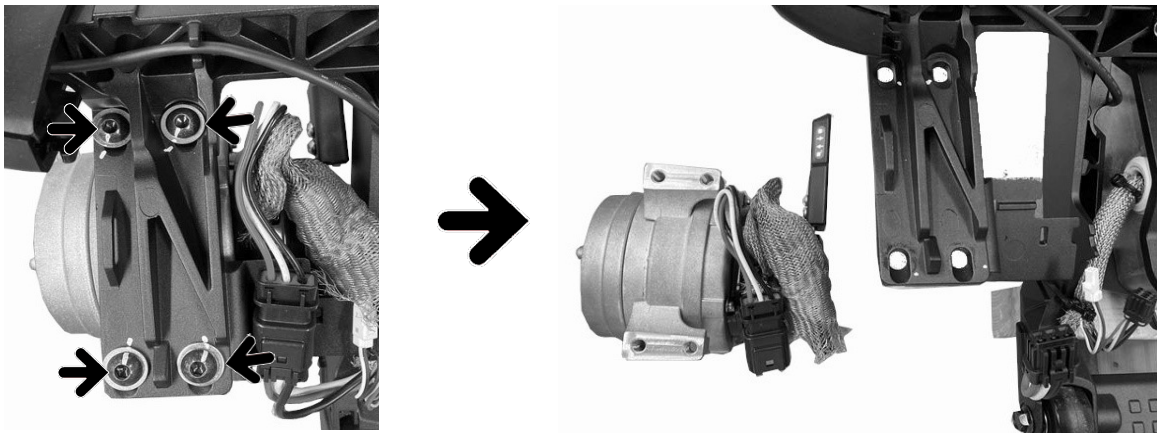
(4) Disconnect the motor cables (3 pcs).



When disconnecting the cables, press the locations below and pull downwards to remove.

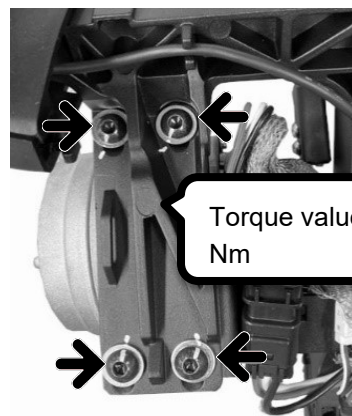


(5) Remove the screws (4 pcs) and the motor unit.



■ Installing the Motor Unit

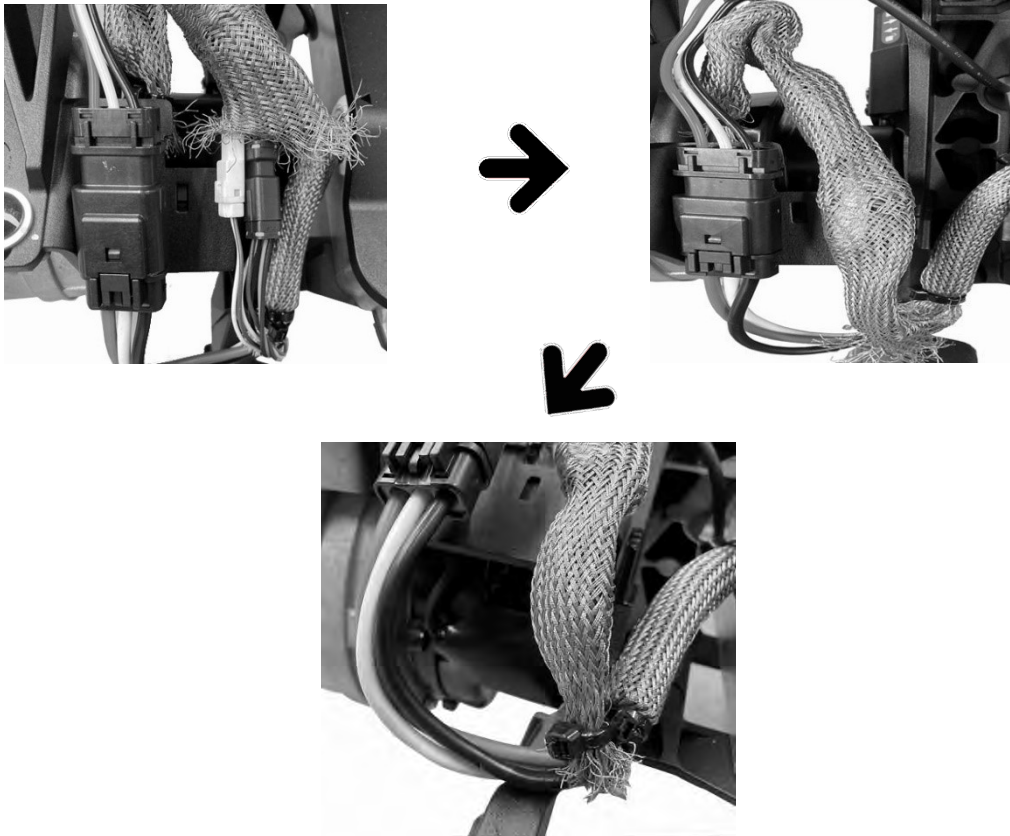
(1) Install the motor unit with the screws (4 pcs).



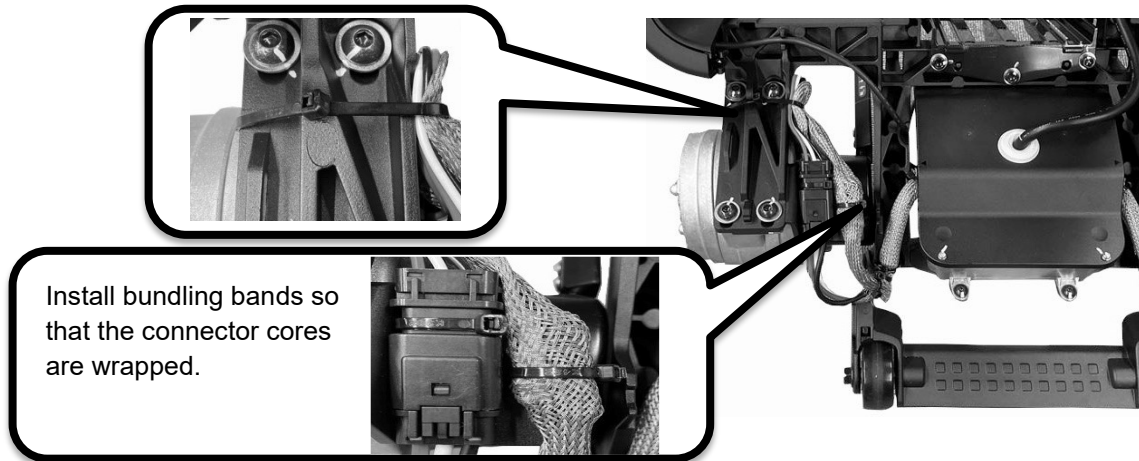
(2) Connect the motor cables (3 pcs).



(3) Cover the two connectors with aluminum shielding, and secure with bundling bands.



(4) Secure the cables with bundling bands.



- (5) Referring to 10.3, install the rear wheels, and referring to 10.8, install the main body upper cover.



- (6) Referring to Section 10.20, perform calibration "M".

10.15 Replacing the Brake Release Lever

Tool used: Drive ratchet

Replacement part: 24-14022-0 Brake Lever Kit [F]

■ Removing the brake release lever

- (1) Set the device to a tilted state so that the battery side is facing downwards.

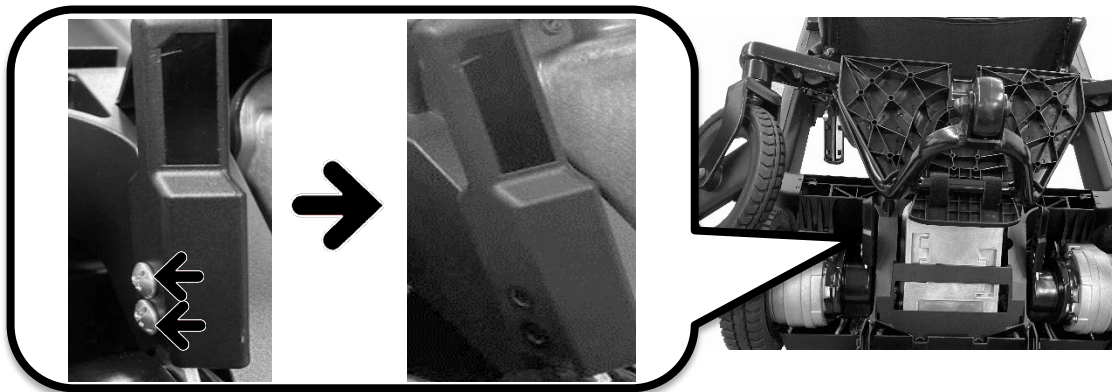


Insert a cushion or the like between the device and installation location to prevent the exterior from being scratched.

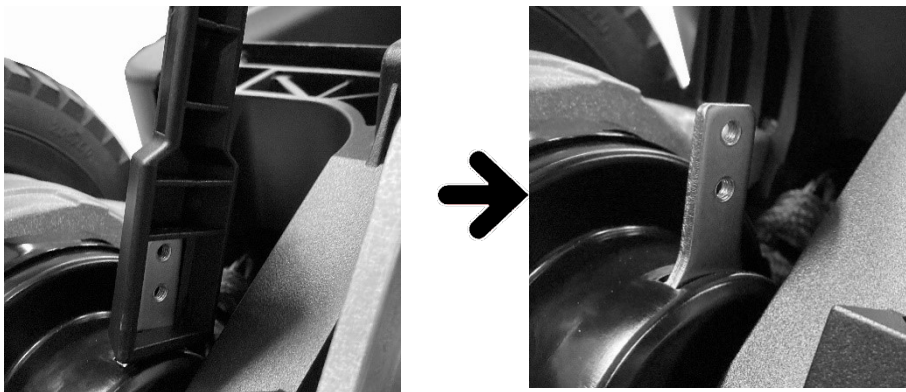
- (2) Remove the nuts (2 pcs).



(3) Remove the screws (2 pcs).

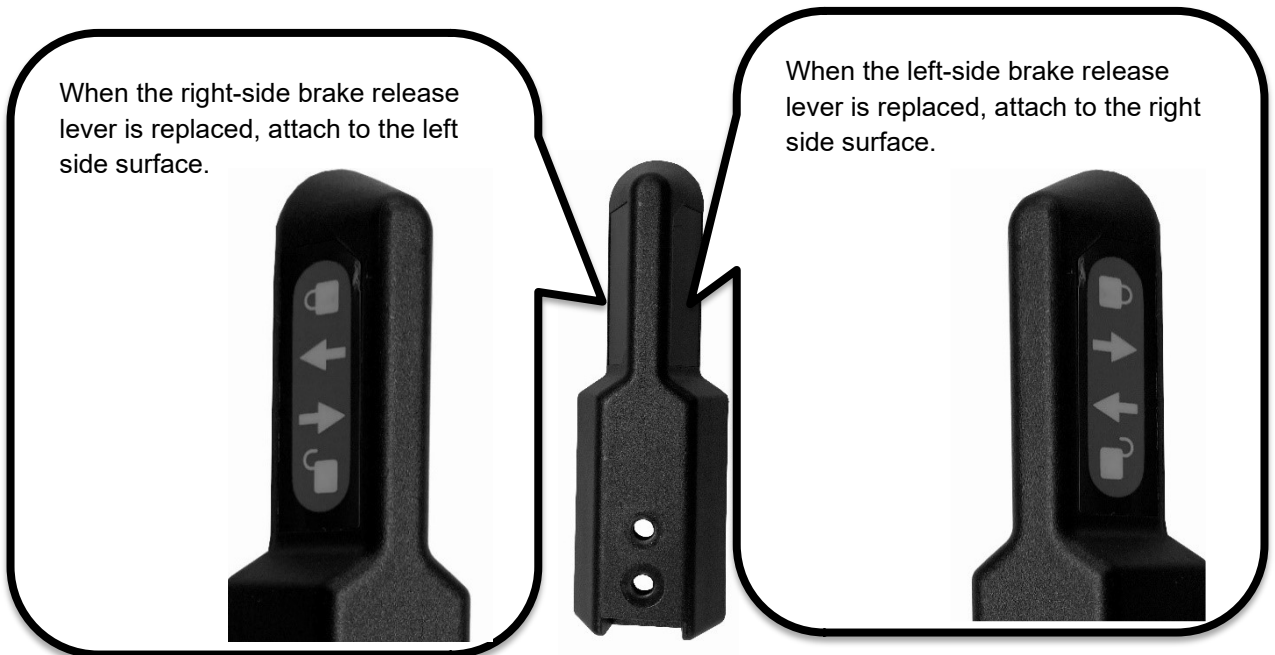


(4) Remove the brake release lever.

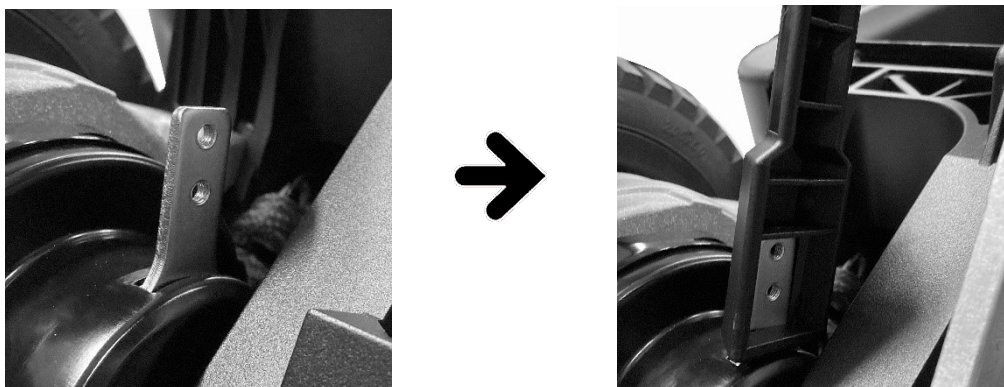


■ Installing the Brake Release Lever

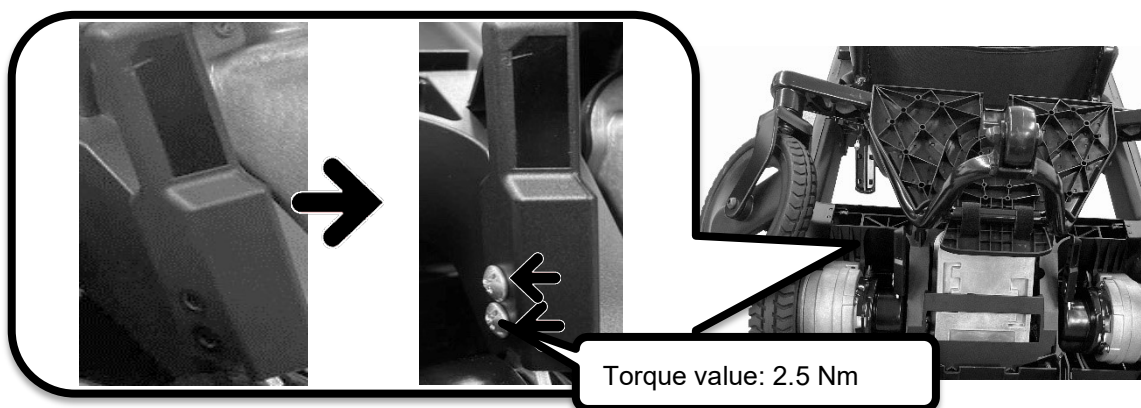
(1) Attach the sticker to the brake release lever.



(2) Install the brake release lever.



(3) Install the screws (2 pcs).



(4) Install the nuts (2 pcs).



(5) Shake the brake release lever up and down (without setting the lever to the ON or OFF positions) to check for rattling.

10.16 Replacing the Stand Wheel

Tool used: Hex wrench/hex torque wrench

Replacement part: 24-14013-0 Stand Roller Kit [F]

■ Removing the Wheel

(1) Lift up the footrest and remove the screw/nut from the wheel.



■ Installing the Wheel

(1) Install the wheel with the screw/nut.



Torque value: 3 Nm

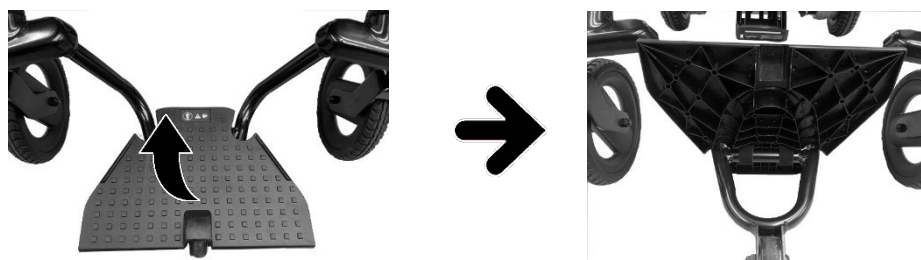
10.17 Replacing the Footrest

Tool used: None

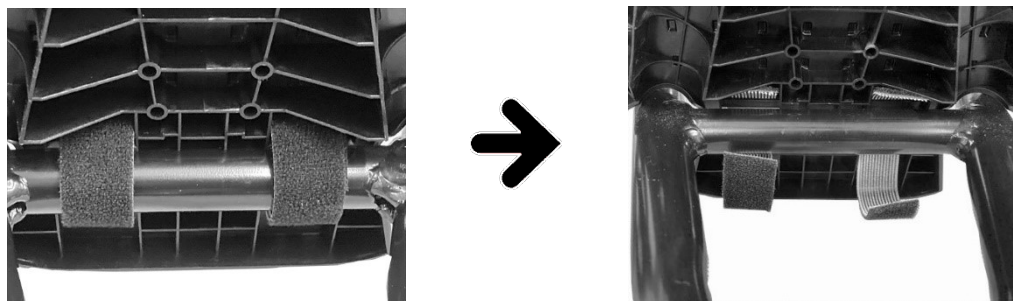
Replacement part: 21-14006-0 Foot Support Assembly [F]

■ Removing the Footrest

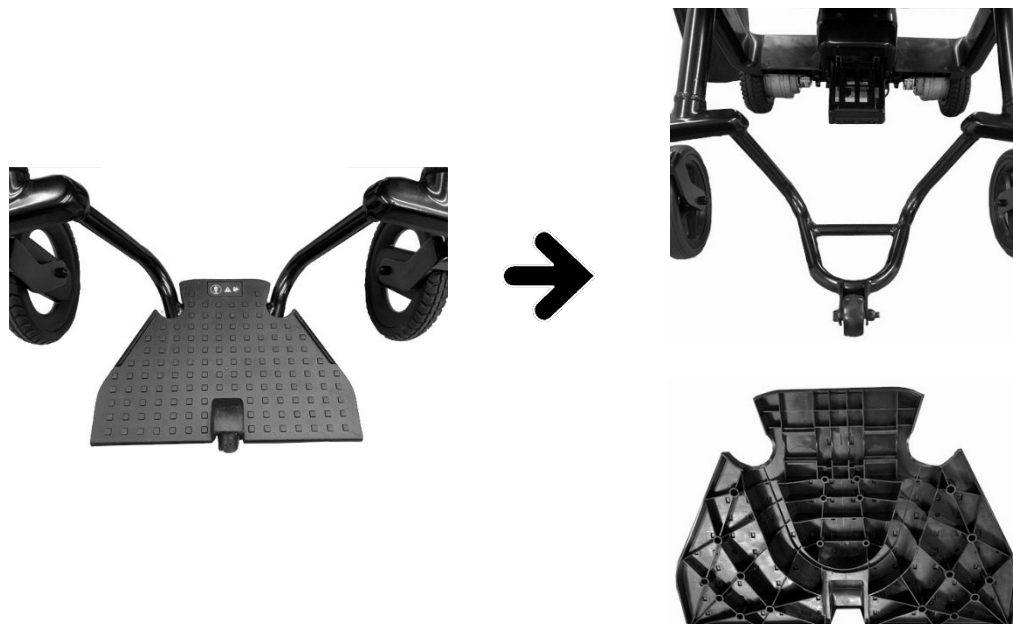
(1) Lift up the footrest.



(2) Remove the Velcro tape in the center (2 pcs).



(3) Remove the footrest.

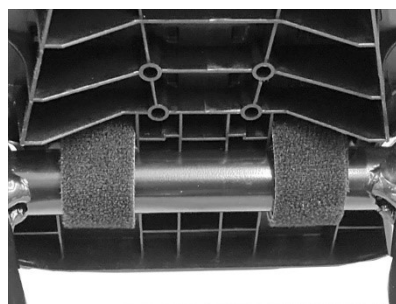


■ Installing the Footrest

- (1) Install the Velcro tape on the footrest.



- (2) Install the footrest and secure the frame with Velcro tape.



- (3) Lower the footrest.



10.18 Replacing the Footrest Frame

Tool used: Combination spanner/hex torque wrench

Replacement part: 24-14026-0 Foot Support Frame Kit [F]

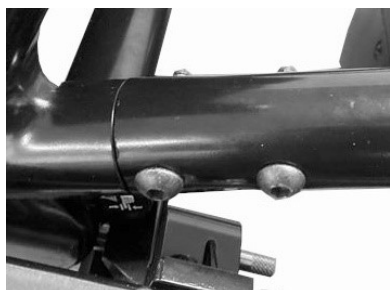
■ Removing the Footrest Frame

(1) Set the device to a tilted state so that the battery side is facing downwards.



Insert a cushion or the like between the device and installation location to prevent the exterior from being scratched.

(2) Remove the screws/nuts (4 pcs).



Likewise, remove the screw/nut on the opposite side.

(3) Remove the footrest frame.



- (4) Referring to the respective item, remove the front wheel (Section 10.1), fork (Section 10.2) and footrest (Section 10.17).



■ Installing the Footrest Frame

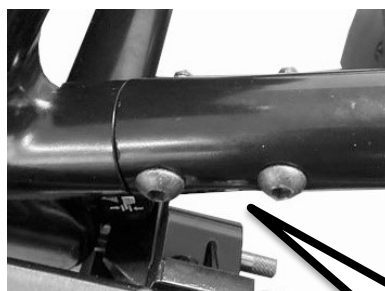
- (1) Referring to the respective item, install the front wheel (Section 10.1), fork (Section 10.2) and footrest (Section 10.17) on the footrest frame.



- (2) Install the footrest frame.



(3) Install the screw / nut.



Likewise, install the screw/nut on the opposite side.

Torque value: 12
Nm

(4) Lift the device up from the rear.



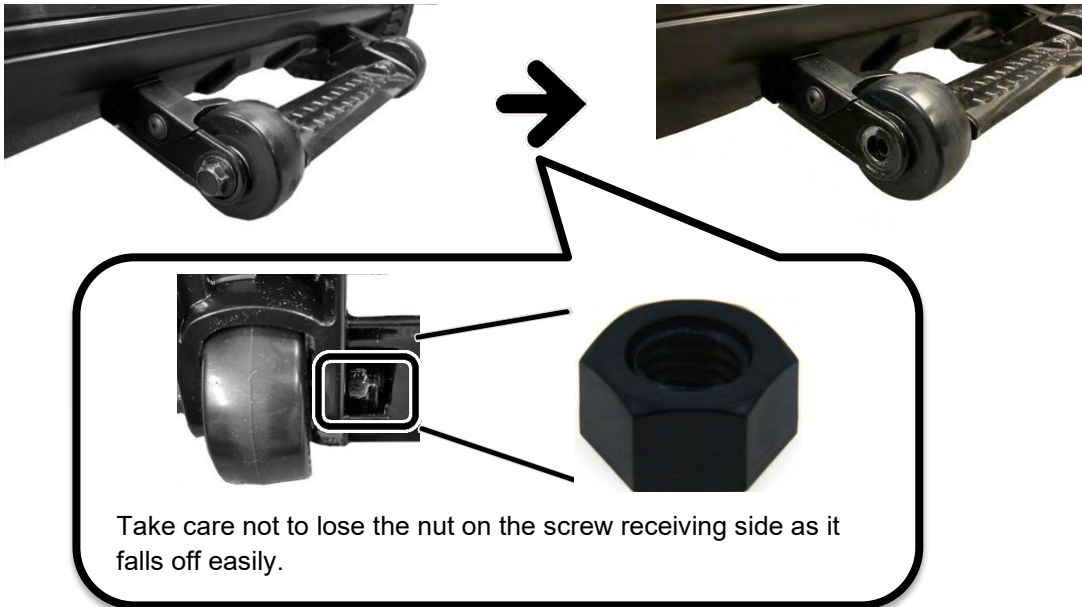
10.19 Replacing the Anti-tip Roller

Tool used: Combination spanner/hex torque wrench

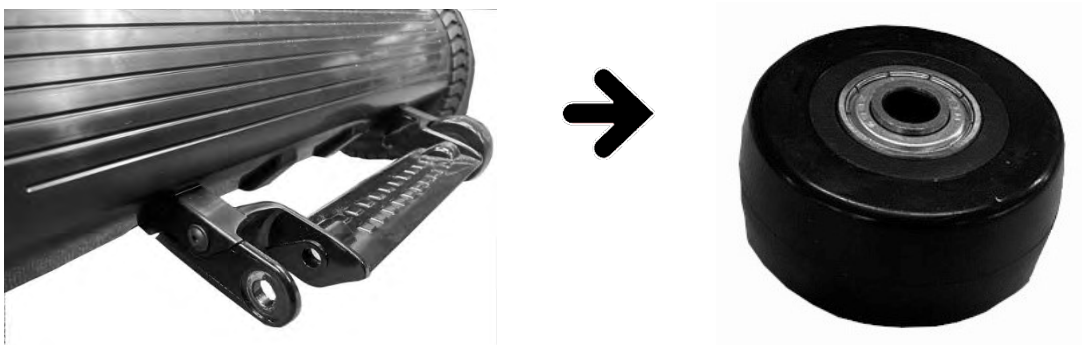
Replacement part: 24-14016-0 Tipping Roller Kit [F]

■ Removing the Roller

- (1) Remove the screw (1 pc).

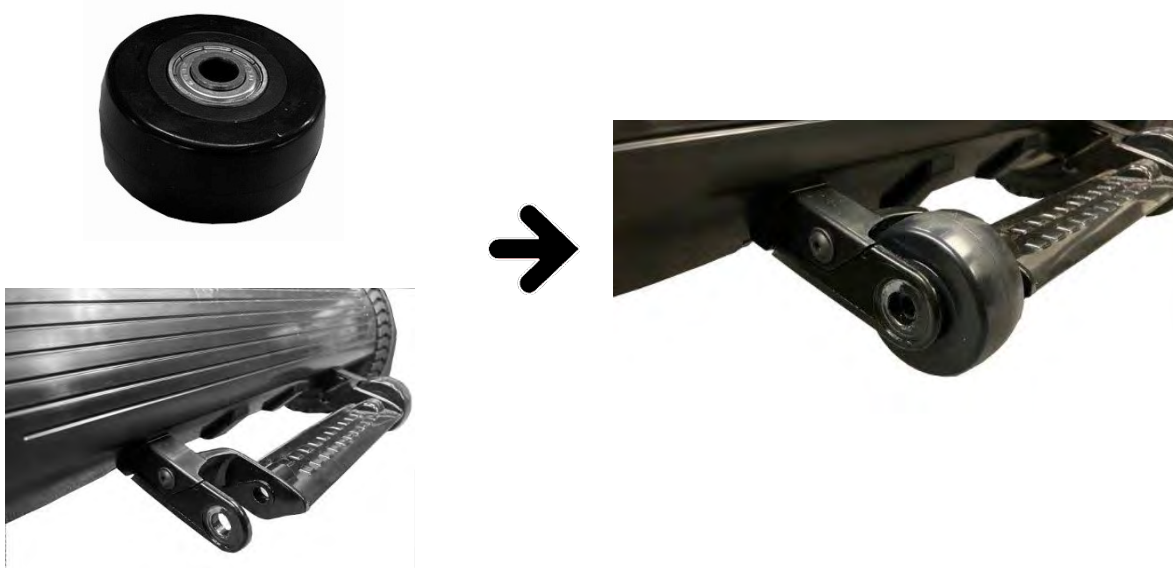


- (2) Remove the roller.

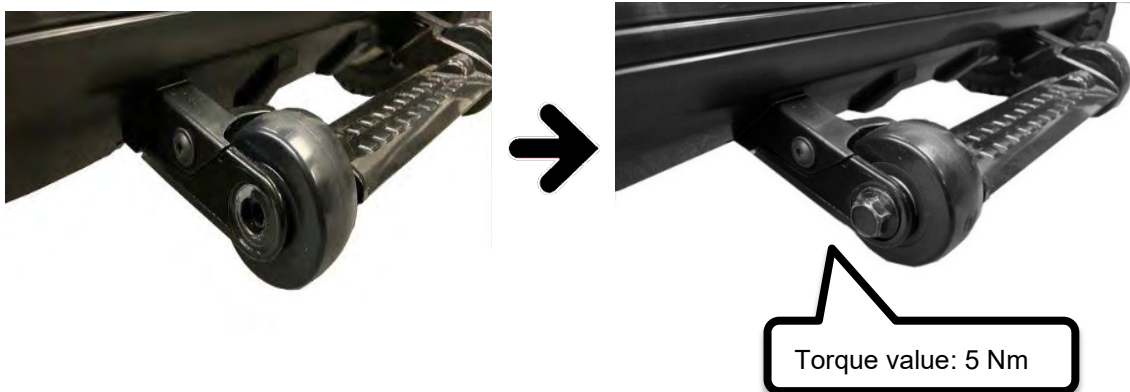


■ **Installing the roller**

(1) Install the roller.



(2) Secure with the screw (1 pcs).



10.20 Calibration Adjustment

Tool used: None

Replacement part: None

Calibration functions:

"J": This is the setting for correctly outputting acceleration and direction when driving.

Main application: Performed after the controller is replaced

"M": This is the setting for correctly outputting motor acceleration and speed.

Main application: Performed after the motor is replaced

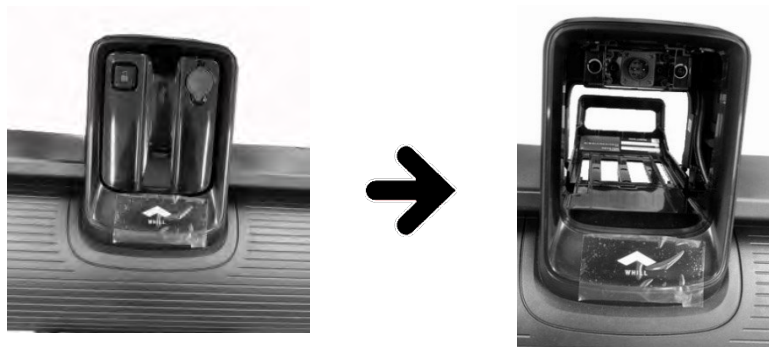
Abnormal noise might be rectified by executing this when abnormal noise occurs on the rear wheel.

■ How to Enter the Calibration Mode

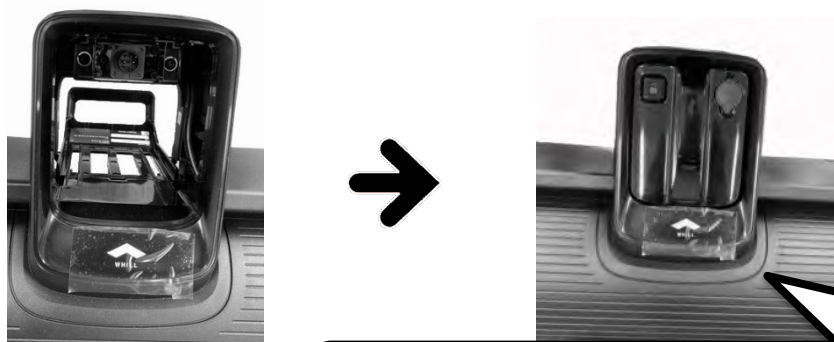
- (1) Press the power button to turn the power OFF.



- (2) Remove the lithium-ion battery.



- (3) Install the Lithium-ion battery.



Allow at least ten seconds after removing the lithium-ion battery before re-installing the battery.

(4) Turn the power ON while pressing the horn button with 4 to 10 seconds of installing the lithium-ion battery.



1. Press the horn button. (Keep the button pressed down.)

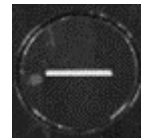


2. Press the power button to turn the power ON.



(5) The calibration mode is started up.

Check that "C" (calibration mode) is started up.

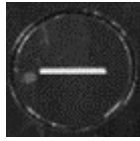


The "J" and "M" modes can be switched by pressing the +/-.

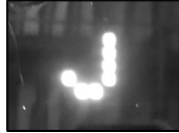


■ Performing "J" (joystick) calibration

(1) Operate the controller to display the "J" item and press the horn button to execute calibration.



Press the +/- button to display the "J" mode.



Press the horn button.



(2) LED display (Up/down/left/right arrows are displayed as shown in the figure on the right.)



The LED display changes in the following order. (The arrows are displayed twice in sequence.)

Operate the joystick in the direction of the indicated arrows. (Perform this operation twice as indicated by the arrows.)



(3) "OK" is displayed on the controller's LED display.



After "OK" is displayed, press the power button to turn the power OFF.



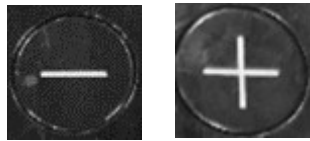
■ "M" calibration (motor control)

(1) Place a stand (e.g., wooden block) under the anti-tip roller so that the rear wheel is lifted off the floor surface.



Be sure to perform this with the "rear wheel" raised off the ground.

(2) Operate the controller to display the "M" item.



Press the +/- button to display the "M" mode.

(3) Press the horn button to execute calibration.



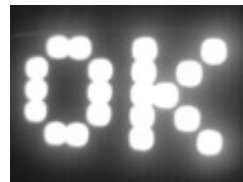
Repeat the operation stated below to move the left and right rear wheels backwards and forwards.
(For about 10 seconds)

1. Acceleration/slow operation on both left and right
2. Acceleration/slow operation in different directions on left and right

(4) "OK" is displayed on the controller's LED display, and the power is turned OFF.



When calibration is completed, "OK" is displayed and the power is turned OFF.

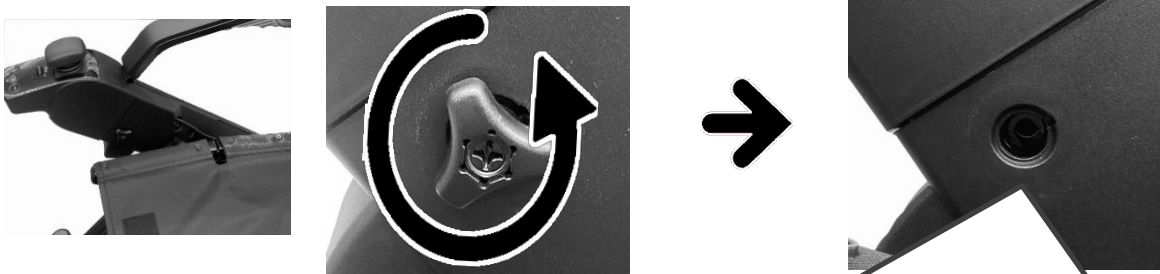


11 Device Adjustments

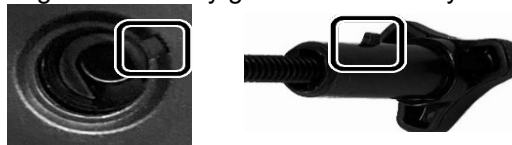
11.1 Adjusting the Arm Height

Tool used: Phillips head screwdriver

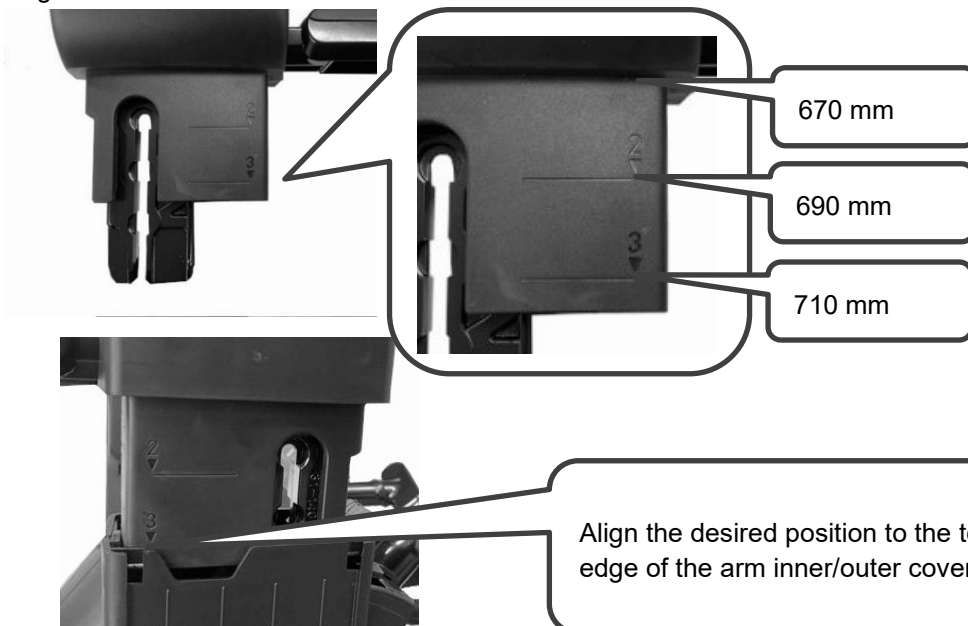
(1) Remove the arm rest adjustment screw.



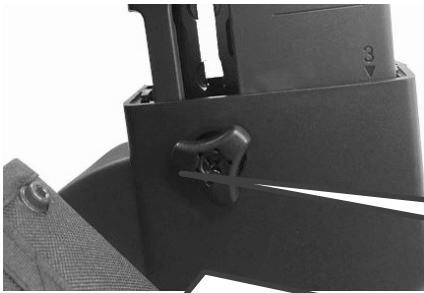
When installing the arm rest adjustment screw, remove the screw after aligning it with the key groove indicated by the rectangle frame below.



(2) Align with the lines referenced to the side of the arm cover.

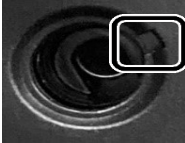


(3) Secure the arm with the arm rest adjustment screw.



Secure with the arm rest adjustment screw.

When installing the arm rest adjustment screw, insert the screw after aligning it with the key groove indicated by the rectangle frame below.



11.2 How to Change the Controller Width and Position

Normal controller unit configuration

Controller position: right side/arm rest position: Standard

Side with controller

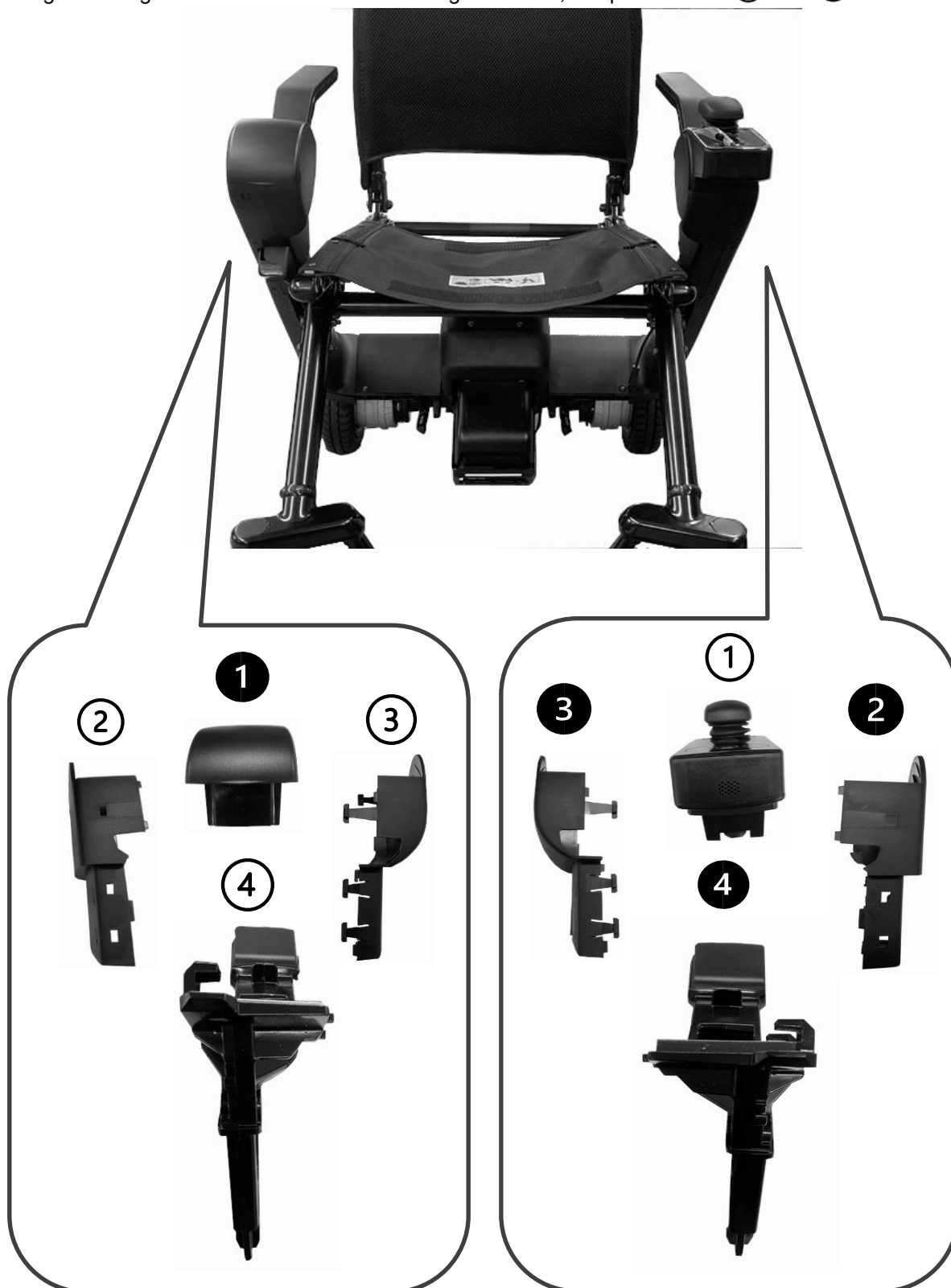
Side without controller



Controller position: left side / arm rest position: Standard

For details on how to remove and install the controller, see Section 10.4

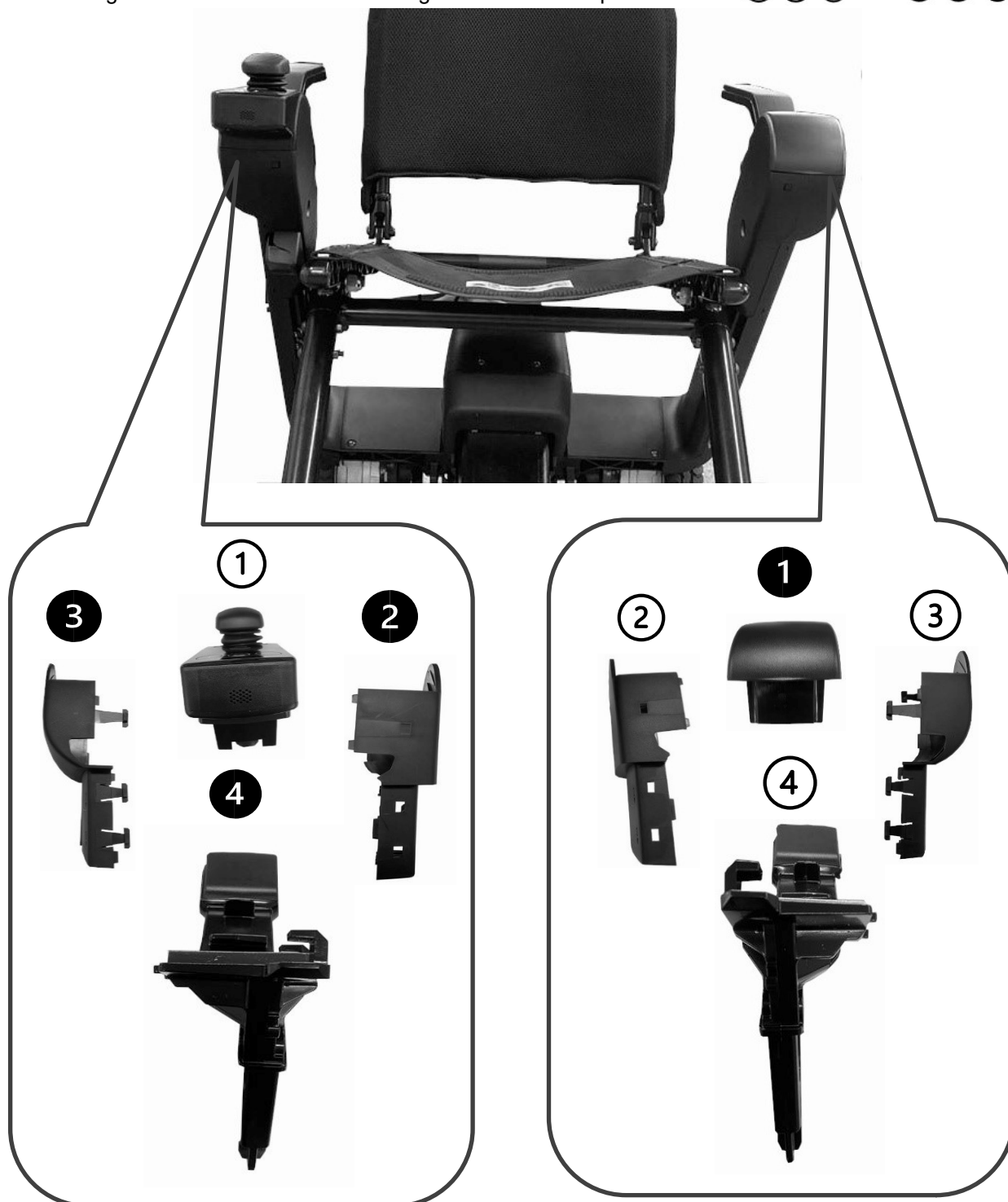
Referring to the regular disassembled structure diagram below, swap and install ① and ① .



Controller position: right side / arm rest position: Loose

For details on how to remove and install the controller, see Section 10.4

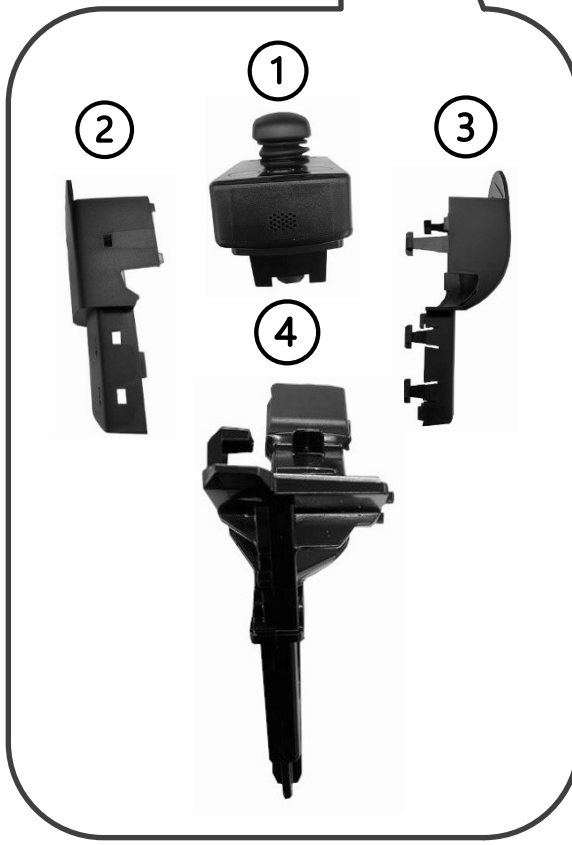
Refer to the regular disassembled structure diagram below to swap and install. ② ③ ④ and ② ③ ④ .



















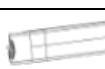




Controller position: left side / arm rest position: Loose

For details on how to remove and install the controller, see Section 10.4

Refer to the regular disassembled structure diagram to swap all parts.

















12 Model F series Parts List












Parts No. Part	Part Name	Photo	Qty Used	Included Items
21-00005-0	Controller [F]		1	
31-00190-0	Joystick Boot [C2/F]		1	
22-00044-0	Joystick Knob Assy [C2/F]		1	
31-00323-0	Joystick Knob		1	
31-00191-0	Knob Insert Base		1	
22-00048-0	HMI Controller upper case [C2 / F]		1	
31-14012-0	Arm Rest Frame (L) [F]		1	
31-14012-1	Arm Rest Frame (R) [F]		1	
31-14013-0	Arm Rest Cover [F]		2	
31-00299-0	Holder Plate [C2 / F]		2	
41-10137-0	Grip Screw M4_L10		2	
24-14028-0	HMI Controller Cover Kit (Left) [F]		1	
24-14028-1	HMI Controller Cover Kit (Right) [F]		1	
21-00021-0	HMI Opposite Assy Oval [C2/F]		1	
24-14004-0	Arm Inner Cover Kit (Left) [F]		1	Flange bolt M5_L12 x 3 Flange bolt M5_L30 x 1 Nut M5 x 4
24-14004-1	Arm Inner Cover Kit (Right) [F]		1	Flange bolt M5_L12 x 3 Flange bolt M5_L30 x 1 Nut M5 x 4
24-14005-0	Arm Outer Cover Kit (Left) [F]		1	Flange bolt M5_L12 x 3 Flange bolt M5_L30 x 1 Nut M5 x 4
24-14005-1	Arm Outer Cover Kit (Right) [F]		1	Flange bolt M5_L12 x 3 Flange bolt M5_L30 x 1 Nut M5 x 4
31-14049-0	Arm Outer Cover Color Plate_White [F]		1	
31-14049-1	Arm Outer Cover Plate_Black [F]		1	
31-14049-2	Arm Outer Cover Plate_Red [F]		1	



Maintenance Manual

WHILL Model F
series
: 32-14027-1
Version 1.0.1 [EN]
Page 96/99

Parts No.	Part Name	Photo	Qty Used	Included Items
31-14049-3	Arm Outer Cover Color Plate_Light Green [F]		1	
31-14049-4	Arm Outer Cover Color Plate_Light Blue [F]		1	
24-14006-0	Release Button Assy Kit [F]		1	POM washer x 4 Snap ring x 3 Lever collar x 2
24-14007-0	Arm Frame Kit (Left) [F]		1	Spacer for arm frame x 1 Seat frame collar x 1 Washer M14 x 2 Nylon nut M14 x 1 Nut M8 x 2 Cap bolt M8_L15 x 2 Seat hinge shaft plate x 1 Hexagon head bolt M14_L90 x 1
24-14007-1	Arm Frame Assy Kit (Right) [F]		1	Spacer for arm frame x 1 Seat frame collar x 1 Washer M14 x 2 Nylon nut M14 x 1 Nut M8 x 2 Cap bolt M8_L15 x 2 Seat hinge shaft plate x 1 Hexagon head bolt M14_L90 x 1
24-14008-0	Seat Frame Assy Kit [F]		1	Special bolt M6_L42 x 4 Nut M6 x 4 Button bolt M8_L35 x 2 Nylon nut M8 x 2 Washer x 4 Flange cap bolt M5 x L15 x 8 Nut M5 x 8
24-14009-0	Back Support Upper Frame Kit [F]		1	Nylon nut M5 x 2 Cap bolt M5_L38
24-14010-0	Back Support Hinge Assy Kit [F]		1	Button bolt M8_L35 x 2 Nylon nut M8 x 2 POM washer x 4
24-14011-0	Front Wheel Fork Kit [F]		2	Bearing x 2 Front fork stem cap x 1 Nylon nut M12 x 1 Hexagon head bolt M12_L60 x 1 Distance collar x 1 Washer x 2
24-14012-0	Front Wheel Kit [F]		2	Button bolt M8_L60 x 2 Nylon nut M8
24-14013-0	Stand Roller Kit [F]		1	Button bolt M8_40 x 1 Cap nut x 1
31-14004-0	Main Body Upper Cover Kit [F]		1	Nut M5 x 6 Flange button bolt M5_L12x6
24-14016-0	Tipping Roller Kit [F]		1	Flange hexagon head bolt x 1 Nut M6 x 1
24-14017-0	Rear wheel Assy kit [F]		2	* Flange cap bolt M6_L15 x 5 or Flange Hex bolt M6_L15 x 5

	Maintenance Manual			WHILL Model F series : 32-14027-1 Version 1.0.1 [EN] Page 97/99
21-14032-0	Rear Wheel Cover Assy [F]			
24-14020-0	Motor Brake Assy Kit (Left) [F]		1	Button bolt M8_L20 x 4 Washer x 4 Bundling band x 6
24-14020-1	Motor Kit Assy (Right) [F]		1	Button bolt M8_L20 x 4 Washer x 4 Bundling band x 6
24-14022-0	Brake Lever Kit [F]		2	Guidance seal x 1 Truss bolt M4_L12 x 2 Nylon nut M4 x 2
31-14036-0	Back Support Fabric [F]		1	
24-14025-0	Seat Fabric Kit [F]		1	Flange cap bolt M5 x M5_L15 x 8 Nut M5 x 8
22-14001-0	Seat Cushion [F]		1	
21-14006-0	Foot Support Assembly [F]		1	Footrest band x 2
24-14026-0	Foot Support Frame Kit [F]			Bearing x 4 Distance collar x 2 Front fork stem cap x 2 Special bolt M6 x L42 x 4 Nut M6 x 4
23-00006-0	Battery			

* Flange cap bolt M6_L15x5 is only for the device whose serial number is FA1203U21B0089～FA1203U21B0272. For other devices, use Flange Hex bolt M6_L15 x 5.



Maintenance Manual

WHILL Model F
series
: 32-14027-1
Version 1.0.1 [EN]
Page 98/99

Periodic Inspection Sheet

Date (YYYY/MM/DD): / /

Name of Customer	
Name of Device	

Exterior

Location to Check	Details to Check	Judgment/Check
Color plate	Are there any scratches, damage, deformation, dents, or looseness?	
Main body upper cover	Are there any scratches, damage, deformation, or dents?	
Wheel cover	Are there any scratches, damage, deformation, or dents?	
Arm rest cover	Are there any scratches, damage, deformation, or dents?	
Controller exterior	Are there any scratches, damage, deformation, or dents?	
Front wheel	Is gravel trapped in the rubber grooves of the tire?	
Rear wheel	Is the groove depth the specified value or more? (0.5 mm or more) Measuring instrument ID: _____	
	Measure the air pressure. Is it within the normal range? (Standard: 40 psi)	
Battery	Are there any scratches or damage?	
Charger	Is the cable damaged?	
	Is the device scratched or damaged?	

Driving test

Location to Check	Details to Check	Judgment/Check
Front wheel	Perform a number 8 turn test. Is there any looseness?	
Rear wheel	Perform a number 8 turn test. Is there any looseness?	
Controller	Are there any problems in left/right/up/down operation?	
	Do the speed select buttons (UP(+), Down(-)) respond normally?	
	Does the power button operate normally?	
	Does the horn emit a normal sound?	

Battery/charger

Location to Check	Details to Check	Judgment/Check
Battery	Connect the battery to the charger. Check if the LED lights. The charger indicator begins flashing green, and charging starts. You can check the charge level of the battery on the color of lit LEDs on the charger. • Full charge: green • Approx. 30% to less than full charge: orange • Approx. 30% charge or less: red • No charge: purple	
Charger	Connect the charger to the battery. Check if the LED lights red.	

Remarks

Judgment/Check Symbol

N/A	/	No abnormality	Tick	Replace	✕	Repair	△	Adjust	A	Tighten	T	Clean	C
Work Performed by				Checked by									



Maintenance Manual

WHILL Model F
series
: 32-14027-1
Version 1.0.1 [EN]
Page 99/99