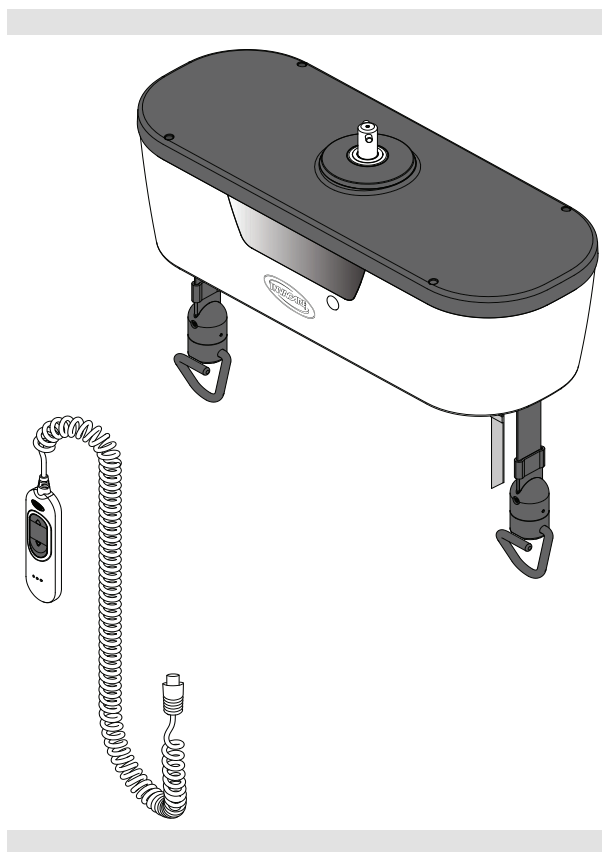


Invacare® Robin® EVO

en Ceiling Hoist Service Manual



PROVIDER: Keep this manual.
The procedures in this manual **MUST** be performed by a
qualified technician.



Yes, you can.®

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1 General

1.1 Introduction

This document contains important information about assembly, adjustment and advanced maintenance of the product. To ensure safety when handling the product, read this document and the user manual carefully and follow the safety instructions.

Find the user manual on Invacare's website or contact your Invacare representative. See addresses at the end of this document.

Invacare reserves the right to alter product specifications without further notice.

Before reading this document, make sure you have the latest version. You find the latest version as a PDF on the Invacare website.

Previous product versions may not be described in this manual's current revision. If you require assistance, please contact Invacare.

For pre-sale and user information, see the user manual.

For more information about the product, for example product safety notices and product recalls, contact your Invacare representative. See addresses at the end of this document.

1.2 Symbols in this Manual

Symbols and signal words are used in this document and apply to hazards or unsafe practices which could result in personal injury or property damage. See the information below for definitions of the signal words.



DANGER!

Indicates a hazardous situation that will result in serious injury or death if it is not avoided.



WARNING!

Indicates a hazardous situation that could result in serious injury or death if it is not avoided.



CAUTION!

Indicates a hazardous situation that could result in minor or slight injury if it is not avoided.



NOTICE!

Indicates a hazardous situation that could result in damage to property if it is not avoided.



Tips and Recommendations

Gives useful tips, recommendations, and information for efficient, trouble-free use.



Identifies required tools, components and items which are needed to carry out certain work.

Other Symbols

(Not applicable for all manuals)



UK Responsible Person

Indicates if a product is not manufactured in the UK.



Triman

Indicates recycling and sorting rules (only relevant for France).

2 Safety

2.1 General Safety Information



WARNING!
Risk of injury or damage to property

- The procedures in this manual must only be performed by a qualified technician.
- Use only original accessories and spare parts.
- Do not handle this product or any available optional equipment without first completely reading and understanding these instructions and any additional instructional material such as user manuals, installation manuals or instruction sheets supplied with this product or optional equipment.
- After each assembly, check that all fittings are properly tightened and that all parts have the correct function.



WARNING!
Risk of contamination

- Clean and disinfect the product before servicing.



NOTICE!
Assembly of accessories might not be described in this service manual. Refer to the manual, delivered with the accessory.

- Additional manuals can be ordered from Invacare. See addresses at the end of this document.



NOTICE!
Some replacement parts are only available as a kit. Always use the complete new kit when replacing a part.

- Spare parts can be ordered from Invacare. Refer to your local Invacare website to access the electronic spare parts catalogue (ESPC).



NOTICE!
When components are replaced, it is necessary to ensure their traceability by keeping the original serial number in the control unit (replacement of spare parts with serial numbers).

- Medical Devices must be identified at all times. If the Part where the product label is located is replaced, or if the Product label is no longer readable, a new Product label must be requested from Invacare. If you have any doubts regarding labeling, please contact Invacare.



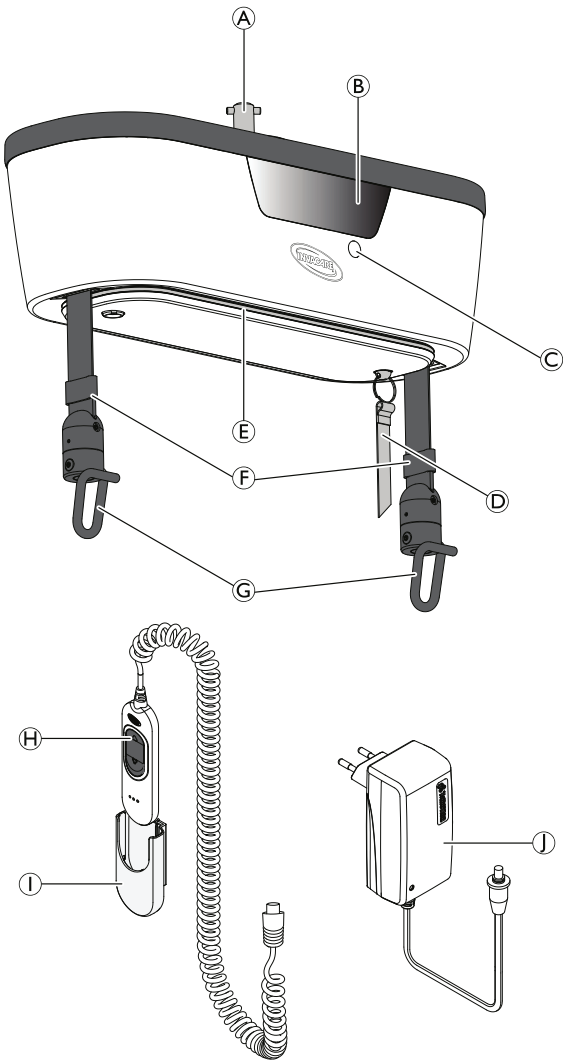
NOTICE!
Refer to the user manual of this product for information on:

- Technical data
- Product components
- Labels
- Additional safety instructions
- Cleaning and disinfection instructions



The information contained in this document is subject to change without notice.

2.2 Main parts of the ceiling hoist



Ⓐ	Suspension pin
Ⓑ	Display
Ⓒ	Mechanical emergency lowering plugs (Two — one on each side)
Ⓓ	Red emergency strap
Ⓔ	Indicator light
Ⓕ	Lifting straps
Ⓖ	Strap hooks
Ⓗ	Hand control
Ⓘ	Charging station
⓵	Power supply adapter

3 Setup

3.1 Installing the ceiling hoist

The ceiling hoist must be mounted to a rail system to perform its intended use. The rail system must be installed and approved according to ISO 10535 by a qualified technician.

This ceiling hoist requires a trolley, holding it inside the rail system. The trolley must be pre-installed by a qualified technician.

Refer to EC-Track installation manual.



WARNING!

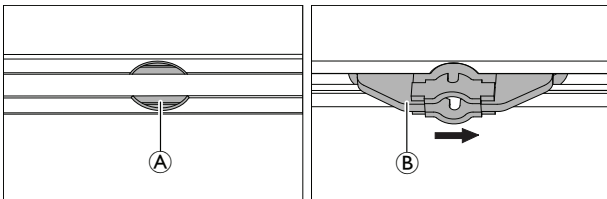
Risk of injury or damage

Non-original or incorrect rail system may affect the function and safety of this product.

- If a rail system from another manufacturer is intended to be used with the Invacare ceiling hoist, a risk assessment for the combination/compatibility of both products shall be performed by the responsible person/organization for the combination.

To mount the ceiling hoist to the trolley, do the following:

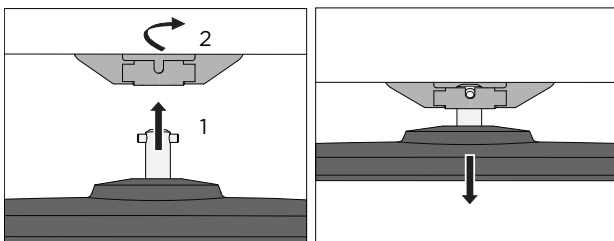
1. Locate the hoist trolley **B** at the $\varnothing$ 32 mm round recess in the rail **A**.



2. Lift the hoist and push the suspension pin through the trolley opening.
3. Turn the hoist by 90 degrees to fix it in the trolley.



Keep pushing the device to avoid the free rotation of the pin when fixing in the trolley.



4. Adjust the length of the emergency stop/lowering cord to within the user's reach.

4 Maintenance

4.1 General maintenance information


CAUTION!
Risk of injury or damage

- Do not perform any maintenance or service procedures while the product is in use.

Follow the maintenance procedures described in this manual to keep your product in continuous service.

4.2 Cleaning and Disinfection

4.2.1 General Safety Information


CAUTION!
Risk of Contamination

- Take precautions for yourself and use appropriate protective equipment.


CAUTION!
Risk of Electric Shock and Product Damage

- Switch off the device and disconnect from mains, if applicable.
- When cleaning electronic components consider their protection class regarding water ingress.
- Make sure that no water splashes to the plug or the wall outlet.
- Do not touch the power socket with wet hands.


NOTICE!

Wrong fluids or methods can harm or damage the product.

- All cleaning agents and disinfectants used must be effective, compatible with one another and must protect the materials they are used to clean.
- Never use corrosive fluids (alkalines, acid etc.) or abrasive cleaning agents. We recommend an ordinary household cleaning agent such as dishwashing liquid, if not specified otherwise in the cleaning instructions.
- Never use a solvent (cellulose thinner, acetone etc.) that changes the structure of the plastic or dissolves the attached labels.
- Always make sure that the product is completely dried before taking into use again.



For cleaning and disinfection in clinical or long-term care environments, follow your in-house procedures.

4.2.2 Cleaning Intervals


NOTICE!

Regular cleaning and disinfection enhance smooth operation, increases the service life and prevents contamination.

Clean and disinfect the product:

- regularly while in use,
- before and after any service procedure,
- when it has been in contact with any body fluids,
- before using it for a new user.

4.2.3 Cleaning instructions


NOTICE!

- The product does not tolerate cleaning in automatic washing systems, with high-pressure cleaning equipment or steam.

Cleaning the lift

Method: Wipe off with a damp cloth or soft brush.

Solvent/chemicals: Ordinary household cleaning agent and water.

Drying: Wipe dry with a soft cloth.

Cleaning the sling

Refer to the washing instructions on the sling and to the sling manual for cleaning details.

4.2.4 Disinfection Instructions

In Domestic Care

- Disinfectant: We recommend using an alcohol-based surface disinfectant (with 70-90% alcohol).



Read the instructions on the label of your disinfectant. It provides information on the activity spectrum (bacteria, fungi and/or viruses), material compatibility and the correct exposure time.

1. Ensure the surfaces are cleaned before disinfection.
2. Moisten a soft cloth and wipe-disinfect all accessible surfaces and keep them moistened for the exposure time stated on the label of the disinfectant.
3. Allow the product to air-dry.

In Institutional Care

Follow your in-house disinfection procedures and only use the disinfectants and methods specified therein.

4.3 Battery Maintenance


WARNING!
Risk of Injury or Damage

Improper handling of lithium batteries may cause injury or damage.

- Do not open the battery housing as damaging the cell or circuitry may develop excessive heat.
- Lithium batteries that are defective, have been damaged or might produce excessive heat or fire, are not allowed for transportation.
- In case the battery turns hot, disconnect it and avoid contact.
- Do not crush or puncture the batteries as it may ignite.

Partial discharge

Lithium-ion batteries perform better when you practice shallow discharges (between 20% to 80%) instead of full discharges. Frequent full discharges can stress the battery and lead to capacity loss over time.

Storage Recommendations

If you plan to store your product for an extended period, charge the battery at least 50% before storage and pull the emergency stop button. Store the product in a cool, dry place within the specified temperature range, and check the battery's charge level periodically during storage. For prolonged storage, ensure the battery retains a charge between 20% to 80% to prevent degradation.

4.4 Charging the Battery

If the charge status becomes low, an audible indicator sounds and the indicator light on the bottom of the ceiling hoist flashes red (see also the user manual). When this happens, there is usually sufficient power to perform at least one transfer.



It is not possible to use the hoist while the battery is charging.

1. Finish the current lift in progress.
2. Move the ceiling hoist to the charging station.
3. Assure that the hand control and charging station are clean and dry before charging starts.
4. Place the hand control into the charging station and make sure that the power supply adapter is plugged in.
A blinking orange led on the hand control indicates it is charging.



During the charging process, the LEDs of the hand control are permanently on and blinking.

5. When fully charged, the indicator lights on the hand control turn green (static light).
As long as the ceiling hoist is not in use, leave the hand control in the charging station.



The charging LEDs do not go into sleep mode until the charge has reached full.

6. To use the ceiling hoist, remove the hand control from the charger.



Keeping the batteries charged guarantees hoist functionality and maintains the battery to ensure a long lifetime.

If the ceiling hoist will not be used for more than 1 week, Invacare recommends disconnecting the charger and pulling the emergency stop.

The charger is connected to a power supply adapter which, in turn, connects to the mains with a mains plug. Make sure that the mains plug is accessible and can be unplugged if required.

5 Servicing

5.1 Service interval


WARNING!
Risk of injury or damage

Service must be performed only by a qualified technician.

— Contact your Invacare provider for service.

Service must be performed at least every 12 months unless otherwise stated in local requirements.

The frequency of inspection must be increased, if the product is continuously exposed to high humidity, high condensation and corrosives (e.g. chlorine or ammonia gases), to prevent product impairment.

5.1.1 LOLER Statement

The UK Health and Safety Executive's Lifting Operations and Lifting Equipment Regulations 1998, require any equipment that is used in the workplace to lift a load be subject to safety inspection on a six monthly basis. Please refer to the HSE web site for guidance www.hse.gov.uk.

The person responsible for the equipment must ensure adherence to LOLER regulations.

5.2 Transport and Storage

Invacare recommends that the ceiling hoist is always transported and stored in the original packaging. Place the ceiling hoist on a soft surface, such as a cloth or foam rubber mat.

For long term storage, the emergency stop must be activated. This will reduce the discharge of the battery. Refer to the user manual.

For transport and storage conditions of the ceiling hoist, refer to *8.3 Environmental conditions, page 27*.

5.3 Disposal


WARNING!
Environmental Hazard

Device contains batteries.

This product may contain substances that could be harmful to the environment if disposed of in places (landfills) that are not appropriate according to legislation.

- DO NOT dispose of batteries in normal household waste.
- DO NOT throw batteries into a fire.
- Batteries MUST be taken to a proper disposal site. The return is required by law and free of charge.
- Only dispose of discharged batteries.
- Cover terminals of lithium batteries prior to disposal.
- For information on the battery type see battery label or chapter .

Be environmentally responsible and recycle this product through your recycling facility at its end of life.

Disassemble the product and its components, so the different materials can be separated and recycled individually.

The disposal and recycling of used products and packaging must comply with the laws and regulations for waste handling in each country. Contact your local waste management company for information.

5.4 Tightening torques


NOTICE!

Do not overtighten the mounting hardware as this might cause damage to the product.

If not otherwise stated in the specific instructions the following guidelines apply:

Thread	Setting torque
M3	1.9 ± 0.5 Nm
M4	4.6 ± 0.5 Nm
M5	9.2 ± 1 Nm
M6	16 ± 1 Nm
M12	128.4 ± 5 Nm

5.5 Periodic Inspection Checklist | EC-Track System, Gantry and Robin EVO

In accordance with ISO 10535.



CAUTION!

Risk of injury and damage to property

Failure to ensure an adequate **Periodic Inspection** of the product can compromise the safety of people and property.

- A periodic inspection of the product must be performed at least every **12 months** unless otherwise stated in local requirements.
- The frequency of inspection must be increased if the product is continuously exposed to high humidity, high condensation and corrosives (e.g., chlorine or ammonia gases), to prevent product impairment.
- Inspections **MUST** be performed by a qualified person who is acquainted with the design, use and care of the product.
- The inspection record **MUST** be recorded in the logbook and reported to the owner.

Is the EC-Track on the installation?

☐ **Yes** (Complete the following section):

The Invacare EC-Track System installation label shows the following information:			
Maximum SWL		Installation Date	
Label Number (LN)			

☐ **No** (Proceed to **2. Checkpoints | Robin EVO**).

1. Checkpoints EC-Track and Gantry	✓	✗	Comments
1.1 The installation label is present, visible and readable.			
1.2 All connection points, brackets to structure are tightened with recommended torque. Retighten, if necessary (if NOT accessible please see point 1.21 on load test).			
1.3 All connection points, brackets to rail system are tightened with recommended torque. If the system is the Gantry, all the connections are tightened with recommended torque. Retighten, if necessary (if NOT accessible please see point 1.21 on load test).			
1.4 All rail ends are secured with end stops, sufficiently tightened. Retighten, if necessary.			
1.5 End stops don't show any sign of damage, wear and/or deformation.			
1.6 Brackets don't show any sign of damage, wear and/or deformation. If the system is Gantry, connections don't show any sign of damage, wear and/or deformation.			
1.7 Trolleys don't show any sign of damage, wear and/or deformation.			
1.8 The trolley (and if applicable, traverse trolleys) run smoothly and silently in the entire track system.			
1.9 Check and adjust if required the trolley friction brake.			
1.10 End Covers are assembled (If applicable).			
1.11 Rail systems with track connections: The connections are aligned. Re-align, if needed.			
Transit Coupling / Track Switch (if applicable)			
1.12 Lock fixtures all OK (secure to tracking, each claw moves independently, correctly aligned with tracking slots, no obstructions to prevent correct function, safety plate is fitted).			
1.13 Check traverse trolley mounting fixtures.			
1.14 The tracking is aligned.			

1. Checkpoints EC-Track and Gantry	✓	✗	Comments
Re-align, if needed.			
1.15 The gap between the track and the transit coupling/track switch is max. 3 mm.			
1.16 Function of transit coupling / lock fixture OK (10 times — disable left / right claw x 5).			
1.17 Function test performed under load through the track switch of the system (5 cycles with the maximum SWL).			
1.18 Inlay plate is fitted (L and M rail).			
Load test			
1.19 The track system is leveled and all fixings are sufficiently tightened before carrying out a load test.			
1.20 If all wall and ceiling brackets are accessible, and sufficiently secured a load test must be performed with the maximum SWL (200 kg). The load must be passed through the entire rail system.			
1.21 If all wall and ceiling brackets are NOT accessible a load test must be performed with 300 kg – 1,5 × maximum SWL (200 kg). This test must take a minimum of 20 minutes. The load must be suspended under each bracket/fixing point and passed through the entire rail system.			
1.22 The rail system remains the same height after the load test.			
1.23 The rail system remains leveled after the load test.			
1.24 Place a label with the date for next inspection (MM-YYYY) on the Tracks. Label Example: Date for Next Inspection 			

Does this inspection include the Robin Evo?

☐ Yes (Complete the following section).

☐ No (Skip to the **3. Final Steps** and make sure to check the hoist's manufacturer **Instructions / Installation Manual**).

2. Checkpoints Robin EVO	✓	✗	Comments
2.1 Check for broken, missing or misaligned parts.			
2.2 Product Label is present and legible (write SN on the comments section).			
2.3 The hoist is marked with the maximum SWL.			
2.4 The emergency stop and reset work correctly.			
2.5 The emergency lowering function and reset work correctly.			
2.6 The emergency lowering end stop switch operates correctly.			
2.7 The strap reset procedure works correctly.			
2.8 The full length of straps (tapes) have no signs of wear, fraying and/or loose stitching.			
2.9 Check if the end stop strap switch is working correctly (via hand control).			
2.10 Hooks and hook fixation (screws and pins) do NOT have signs of wear/damage that could endanger the lifting.			
2.11 Check suspension and cross pin.			
2.12 Steel and plastic gearwheels do NOT have signs of wear and damage. If gearwheels are dry, apply gearwheel grease. Refer to — step 5.			

2. Checkpoints Robin EVO	✓	✗	Comments		
2.13 Check tape guide cylinders.					
2.14 The hand control is connected correctly.					
2.15 The hand control is functional and in good conditions.					
Electrical Connections					
2.16 All cables are intact.					
2.17 No signs of rupture on cables and on isolation.					
2.18 Clamping and mechanical function of micro switches work correctly.					
2.19 The charger does not have signs of damage and is functional.					
2.20 Check that battery is charged when connecting the hand control to the charging station.					
Load Test					
2.21 Perform a full lifting cycle with the maximum SWL (200kg).  Note: Must be effortless and without jarring sound.					
2.23 Stick a label with the date for next inspection (MM-YYYY) on the Robin EVO hoist. Label Example: <table border="1" data-bbox="100 882 877 972"> <tr> <td>Date for Next Inspection</td> </tr> <tr> <td> </td> </tr> </table>	Date for Next Inspection				
Date for Next Inspection					

3. Final Steps	✓	✗	Comments
3.1 The owner has all the necessary User Manuals .			

Overall assessment

☐ Pass	☐ Fail
No safety or functional deficiencies were detected.	Safety or functional deficiencies were detected, and corrective actions are required. Comments:

Date of next inspection: _____

Service Company Name: _____

Inspection done by: _____

Date / Signature: _____

6 Instructions



NOTICE!

Static electricity can damage the PCBs inside the hoist.

Before working in the inside of the hoist:

- Pull the red emergency strap to turn off the hoist.
- Remove the hoist from the track system. (Refer to 6.1 *Dismounting the ceiling hoist*, page 12).
- Remove the cover from the hoist. Refer to 6.4 *Removing and assembling the Top Cover*, page 14.
- An anti-static mat must be used when working inside the ceiling hoist.



Preliminary Recommendations

Place the product on a base that:

- Prevents the reset of the emergency button.
- Does not collide with the hand control plug.
- Does not restrain the free movement of the lifting straps.

As soon as possible, pull out completely both lifting straps and physically disconnect the power source from the Main Circuit Board (PCB). Refer to 6.12 *Replacing the Main PCB Module Kit*, page 18.

Pull out, completely, both lifting straps.

Use the advanced TH12 hand control tool (only available for the qualified service technicians) to perform adjustments to the motors.

M1 and M2 indicate the side of the device.



After the replacement procedure, all the replaced old parts must be discharged. (Refer to 5.3 *Disposal*, page 8).

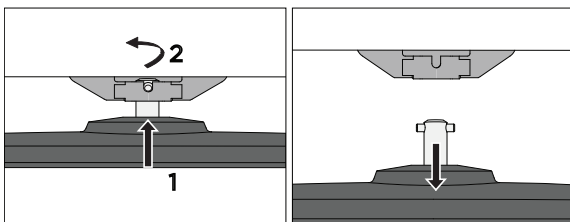


WARNING!

Risk of injury or damage to property

- Always perform and fill out the Periodic Inspection Checklist (Refer to 5.5 *Periodic Inspection Checklist | EC-Track System, Gantry and Robin EVO*, page 9).

6.1 Dismounting the ceiling hoist



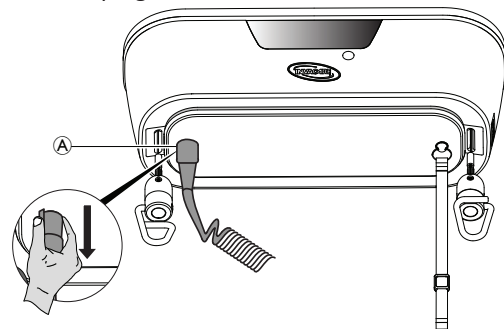
1. Lift the hoist slightly and push the suspension pin out of its holder in the trolley.
2. Turn the hoist by 90 degrees and pull it out of the trolley.

6.2 Replacing the Hand Control

Items	Hand control
Quantity	1

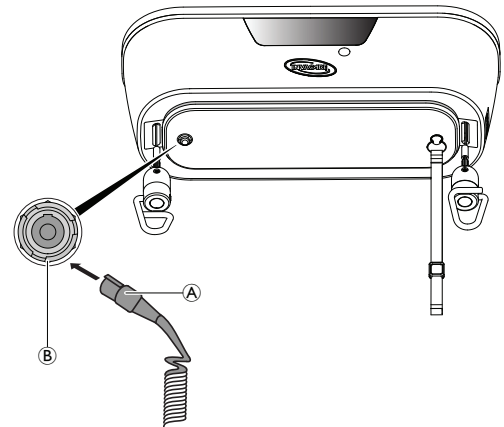
Removing the hand control plug

1. Pull the plug **A** out of its slot.



Inserting the new hand control

1. Make sure the hand control plug **A** is correctly aligned with the slot **B**. Insert the push pull self-locking hand control plug into the slot **B**.

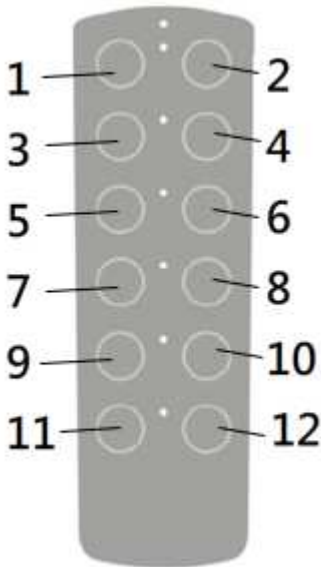


Check after installation:

- ☐ Check if the hand control is locked (does not fall).
- ☐ Make sure the hand control is working.

6.3 Advanced TH12 Tool Hand Control

The advanced TH12 hand control has twelve buttons, the combinations shown below allow to perform the described actions.

Layout	Buttons	Action
	SW1	Move up both straps (M1 & M2)
	SW2	Move down both straps (M1 & M2)
	SW3	Absolute weight calibration: 0 kg
	SW4	Absolute weight calibration: 200 kg
	SW5	Setting of M1 photo sensor value
	SW6	Setting of M2 photo sensor value
	SW7	Relative calibration: 0 kg
	SW8	Setting of automatic test mode: set the pause time when at upper limit (1~250 seconds)
	SW9	Setting of automatic test mode: to set as upper limit
	SW10	Setting of automatic test mode: to set as lower limit
	SW11	Start the automatic test
	SW12	Setting of automatic running test mode: the pause time at lower limit (1~250 seconds)
	SW1+SW2 (Press for 3 seconds)	Reset
	SW1+SW3 (Press for 3 seconds)	Move up M1 strap
	SW2+SW4 (Press for 3 seconds)	Move up strap of M2
	SW3+SW4 (Press for 3 seconds)	Enter 'Engineering mode'
	SW5+SW6 (Press for 3 seconds)	Enter/Save&Exit 'Photo sensor setting mode'
	SW5+SW7 (Press for 3 seconds)	Move down M1 strap
	SW6+SW8 (Press for 3 seconds)	Move down M2 strap
	SW7+SW8 (Press for 3 seconds)	Enter 'firmware flashing mode' Need to power off to exit firmware flashing mode.
	SW8+SW12 (Press for 3 seconds)	To enter or switch between 'Automatic test setting mode' and 'Duty setting mode'.

6.4 Removing and assembling the Top Cover

 Tools: Slotted screwdriver; TORX T20 screwdriver

- 1. Identify the four plugs on the top cover.
- 2. Using a thin slotted screwdriver remove all four plugs (take care to avoid any damage to the cover).



- 3. Remove all four screws from the top cover.



- 4. Remove the top cover carefully.
- 5. To close the top cover, tighten the screws and attach the top cover again.
- 6. End the procedure by manually applying the plugs.

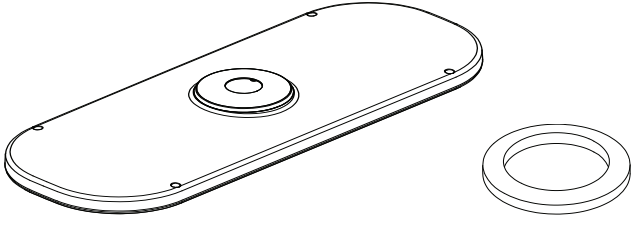
 **Note the indentations on the inside of the top cover:**
The indentations are not symmetrical on the length axis. There is only one correct position to apply the top cover.

Check after installation:

- ☐ Make sure that all the plugs are fitted.

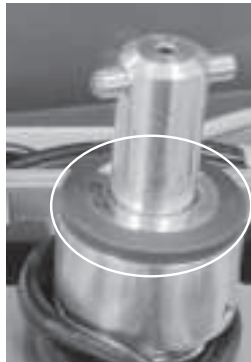
6.5 Replacing the Top Cover Kit and the Rubber Gasket

Items	Quantity
Top Cover	1
Top Cover Screws	4
Top Cover Plugs	4
Rubber Gasket	1

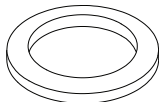
A line drawing diagram showing the top cover and the rubber gasket. The top cover is an elongated oval shape with a central circular hole and four small circular indentations. The rubber gasket is a ring with a central hole and a raised outer edge.

 Tools: Slotted screwdriver; TORX T20 screwdriver

- 1. Remove the old top cover. Refer to 6.4 Removing and assembling the Top Cover, page 14.
- 2. Remove the rubber gasket by pulling it upwards and replace by the new one.



 **Ensure the new gasket is positioned correctly, with the flat side facing up.**



- 3. Apply the new top cover carefully.

 **Note the indentations on the inside of the top cover:**
The indentations are not symmetrical on the length axis. There is only one correct position to apply the top cover.



4. Tighten all four screws on the top cover.

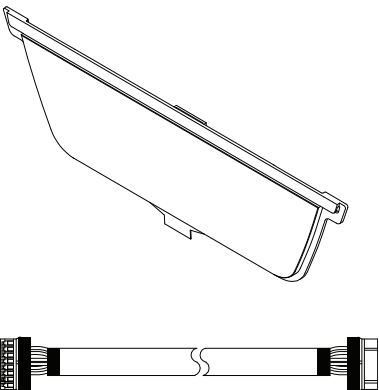


5. End the procedure by manually applying the new plugs.

Check after installation:

- ☐ Make sure the cover is attached properly with all 4 screws and there are no loose parts. There shall be no gap between cover, main body and the oled display of the ceiling hoist.
- ☐ Make sure that all the plugs covering the screws are fitted.
- ☐ Do a full lifting cycle to check if the device operates properly.

6.6 Replacing the OLED Display Kit

Items	Quantity
OLED Display Kit	1
	

1. Locate the display module.
2. Locate the connector to the Main PCB.



3. Remove the cable plug.

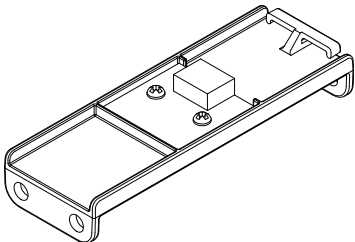


4. Replace the display module.
5. Reattach the cable plug.

Check after installation:

- ☐ Press a hand control button to activate and validate if the display is working.

6.7 Replacing the Photo Sensor Kit

Items	Quantity
Photo Sensor Kit	1
Screws	4
	

 Tools: PH1 screwdriver

1. Locate both photo sensors.



2. Unplug the cable from the photo sensor.



3. Remove the four side screws.



4. Install new parts in the reverse order.



The Photo sensor’s function is not limited to detecting the white square. It also detects when the strap starts to loosen inside the device (as it gets close to the sensor).

It might be required to re-program the new sensitivity parameters of the photo sensor.

- Usually, values ranging from 400 to 800 assure a correct behavior of the photo sensor.
- The ideal is the minimal value of the range and test for false positives.

To re-program it, you must use the advanced TH12 hand control tool:

- Enter engineering mode by pressing simultaneously SW3 and SW4, for 3 seconds.
- Enter “Photo Sensor Setting” mode by pressing simultaneously SW5 and SW6, for 3 seconds.
- Press SW5 to edit the set value of Motor 1’s (M1) photo sensor.
- Press SW6 to edit the set value of Motor 2’s (M2) photo sensor.
- Press SW5 and SW6 to exit the “Photo Sensor Setting” mode.
- Press SW3 and SW4 to exit the engineering mode.

Check after installation:

- Perform a full strap cycle and check that there are no errors. The strap outlet must stop automatically when the strap is completely out.
- With the straps completely rolled in, block the outlet of one strap and press the down button. The device must stop showing ‘strap jam’ error. Check the height difference relatively to the free strap. If longer than 500 mm, the sensor sensitivity parameter must be adjusted.

6.8 Replacing the Mechanical Emergency Plugs

Items	Quantity
Mechanical Emergency Plugs	2
	



Tools: Slotted screwdriver

1. Identify the plugs on the front and back of the device.



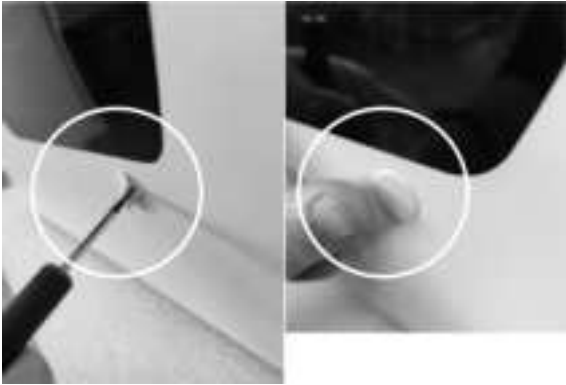
2. Using a thin slotted screwdriver, carefully pull the plug away from the device and remove the plug with your fingers.



3. Apply the new plugs using a thin slotted screwdriver to help push the base of plugs inside their slits.

For information on M1 and M2 location , refer to 6 Instructions, page 12.

4. End the procedure by fitting the plugs in tightly with your fingers.



Check after installation:

- Make sure that all the plugs are fitted.

6.9 Replacing the Red Emergency Strap

Items	Quantity
Red Emergency strap	1

1. Remove the red emergency strap (including its metal ring).



2. Install new parts in the reverse order.

Check after installation:

- Make sure the red emergency strap is properly installed.

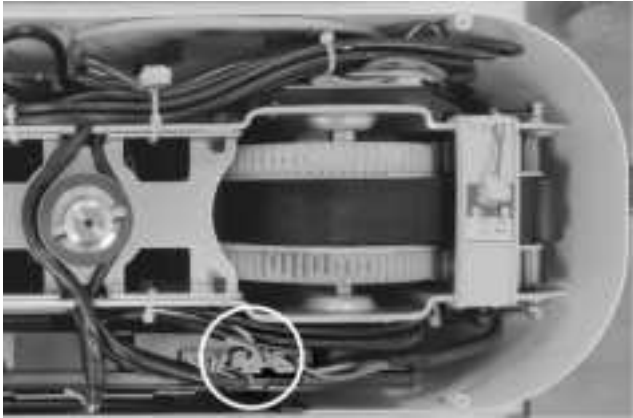
6.10 Common Initial Procedure for all Remaining Replacement Kits

Removal of the device from its plastic casing

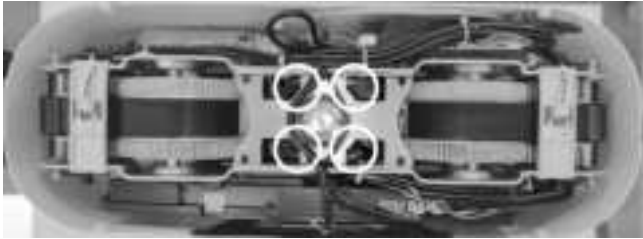
Tools: TORX T25 screwdriver

1. Remove the top cover. Refer to 6.4 *Removing and assembling the Top Cover*, page 14.
2. Remove the emergency strap. Refer to 6.9 *Replacing the Red Emergency Strap*, page 17.

3. Locate the power plug and disconnect it, to avoid undesirable gear movements.



4. Locate the four screws securing the chassis of the device to its plastic casing.



Notes on the TORX T25 screwdriver:

- To reach the screws - on the bottom of the casing - a screwdriver with a minimum reach of 15 cm is needed.
- Use a magnetized screwdriver to ensure you can successfully retrieve the screws.

5. Remove the plug connecting the Display to the main PCB.



6. Locate the cable plug from the LED PCB connecting to the main board and unplug it.



7. Pull up the chassis out of the plastic shell.



Tools: PH1 screwdriver



CAUTION!

Risk of damage to the property

Incorrect installation of the cables may cause malfunction of the product.

- Please DO NOT change the order of the cables.
- Pay attention to the highlighted Photo Sensor plugs before removing the cables.

1. Remove all plugs that remain connected to the battery module.



2. Remove both screws and washers that secure the battery module.



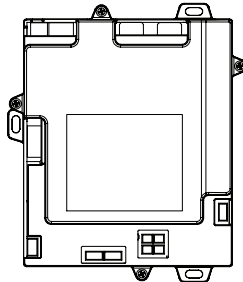
3. Apply the new battery module.
4. Repeat the process in the reverse order.

Check after installation:

- ☐ Reset the emergency stop (push the button back in). The ceiling hoist must blink a dark blue light once.
- ☐ Press down or up button and check for strap movement.

6.12 Replacing the Main PCB Module Kit

Items	Quantity
Main PCB Module	1
Screws	3
Washers	3



WARNING!

Risk of Injury or Damage

Improper handling of lithium batteries may cause injury or damage.

- Do not open the battery housing as damaging the cell or circuitry may develop excessive heat.
- Lithium batteries that are defective, have been damaged or might produce excessive heat or fire, are not allowed for transportation.
- In case the battery turns hot, disconnect it and avoid contact.
- Do not crush or puncture the batteries as it may ignite.

Items	Quantity
Battery module	1
Screws	2
Washers	2



Tools: PH1 screwdriver

1. Locate the main PCB module.



2. Remove all plugs.



3. Remove the three screws and washers securing the PCB module to the chassis.



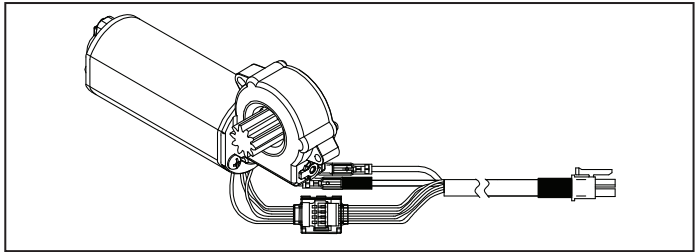
4. Apply the new PCB module.
5. Repeat the process in the reverse order.

Check after installation:

- ☐ All buttons and functions are working.

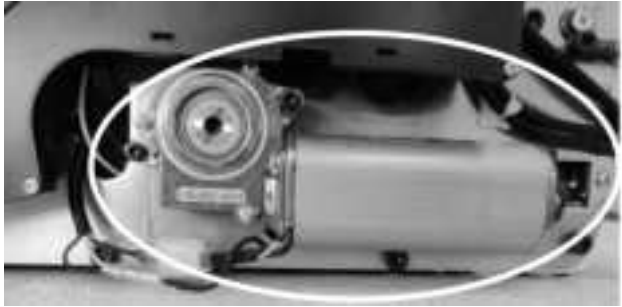
6.13 Replacing the Gear motor

Items	Quantity
Gear motor	1
Screws	2
Washers	2



Tools: HEX key 3 mm

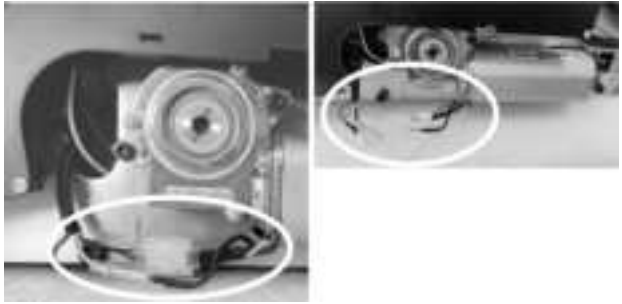
1. Locate gear motor TGM7.



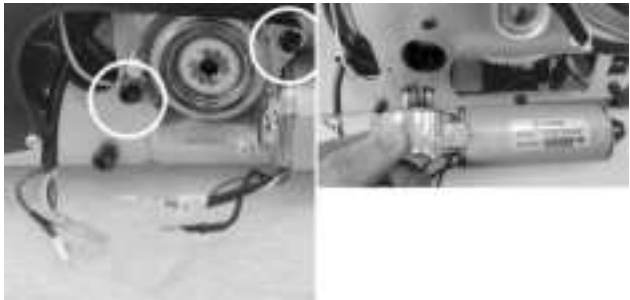
There are two gear motors on the device.

Each one of them is located on opposite sides of the chassis.

2. Locate and disconnect all plugs.



3. Locate and remove both HEX 3 mm screws securing the gear motor to the chassis.



4. Apply the new gear motor.



Apply grease if necessary.

Recommended high load-bearing and extreme pressure resistant grease (i.e. Lepus GS 42–152 Worm gear self-locking grease).

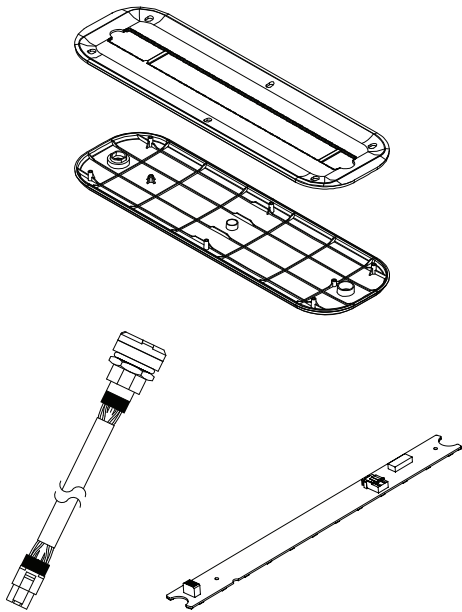
5. Repeat the process in the reverse order.

Check after installation:

- ☐ Test the ceiling hoist with one lifting cycle with no load. If required, perform the strap reset procedure.
- ☐ Test the ceiling hoist with one lifting cycle with SWL.
- ☐ Check for unusual meshing noise.

6.14 Replacing the Hand Control Plug or Led Light PCB

Items	Quantity
Led Light Shield	1
Led Light Diffuser	1
Led PCB	1
Hand Control Plug	1



 Tools: T10 Torx Screwdriver; HEX key 17 mm

1. Starting off the empty lower part of the casing, locate its six TORX T10 screws.



2. Remove the screws.



3. The inferior circuit boards (at this point still secured) can be removed.
4. Disconnect all plugs.

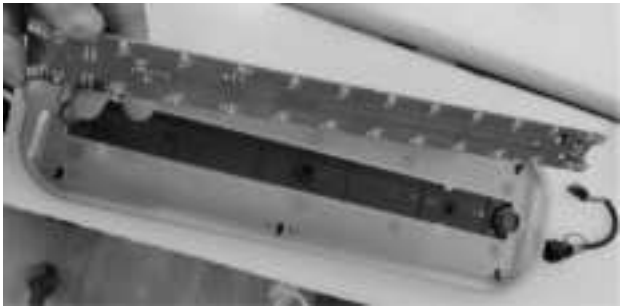
5. Remove the hand control plug (secured by a 17 mm nut).



6. Locate and remove the two torx T10 screws.



7. Remove the LED PCB and revert the assembly process.

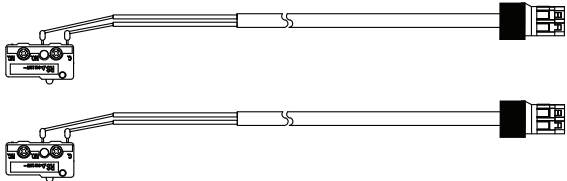


Check after installation:

- ☐ Press down or up button and check for blinking blue light.
- ☐ Remove the hand control and check for red blinking light.
- ☐ Insert the hand control and check for a single blink green light.

6.15 Replacing the End Switch Kit

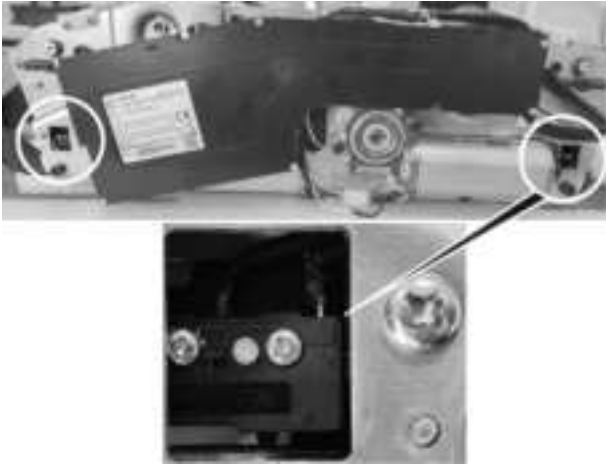
Items	Quantity
End Switch with cables	2



 Tools: PH0 screwdriver

1. Remove the Battery module. Refer to 6.11 *Replacing the Battery Module Kit*, page 18 (steps 1 and 2).

- Identify all four end switches (there are two on each side of the module).



- Remove the plugs connecting the End Switch to the main PCB (only of the End Switch you need to replace).



-  If necessary, cut off the securing cable ties until the cable is completely loose. In these cases, the securing of the cable ties should be re-applied upon performing the reverse assembly process.



- Identify both screws connecting the End Switch to the Chassis.

-  **Note the orientation of the original End Switch.** The new End Switch must be connected respecting the same orientation.

- Remove both screws.
- Remove the End Switch by moving it simultaneously down and, to the side of the gear motor.
- Guide the cable threading.
- Apply the new End Switch.
- Repeat the process in the reverse order.



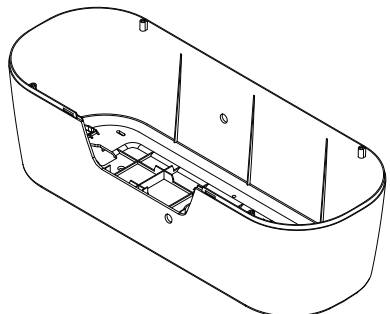
- If any securing cable ties were cut off at the earlier stages of this process, make sure to re-apply new ones.

Loose cables may prevent the correct installation of the battery module.

Check after installation:

- ☐ Make sure that the End Switch is installed respecting the same orientation.
- ☐ Manually check that end switches can be activated pressing the swiveling inlet plastic parts. Listen carefully for the end switch clicking sound.
- ☐ Do not forget to re-apply the cable ties, if they were cut off in the earlier stages of this process.
- ☐ Perform a full lifting cycle and check that up movement stops when the hooks press on the swiveling inlet plastic part.

6.16 Replacing the Bottom Cover Kit

Items	Quantity
Bottom Cover	1
	



Tools: T20 Torx Screwdriver;



- To remove the bottom casing cover, it is mandatory to detach either the hooks or straps.

When the straps are removed, the full set (straps with hooks) is detached.

- There are two hooks. Locate them.
- Locate the central axis locked by two T20 TORX screws.



- Using two TORX keys (one on each side of the central axis), remove one of the screws.



4. Remove the central axis.



5. Remove the strap from inside the hook.



6. Substitute the bottom cover.



7. Repeat the process in the reverse order.

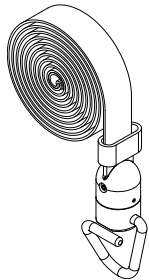
- 
- Flatten the end of the strap before inserting it back into the hook, to facilitate this process.

Use a cylindric tool to revert the flattened strap to facilitate the insertion of the central axis.

Check after installation:

- ☐ Make sure that the bottom cover is properly fastened to chassis and to the led light shield parts.
- ☐ Make sure that the hooks were properly reinstalled and perform a full lifting cycle with SWL.

6.17 Replacing the Strap with Hook Kit

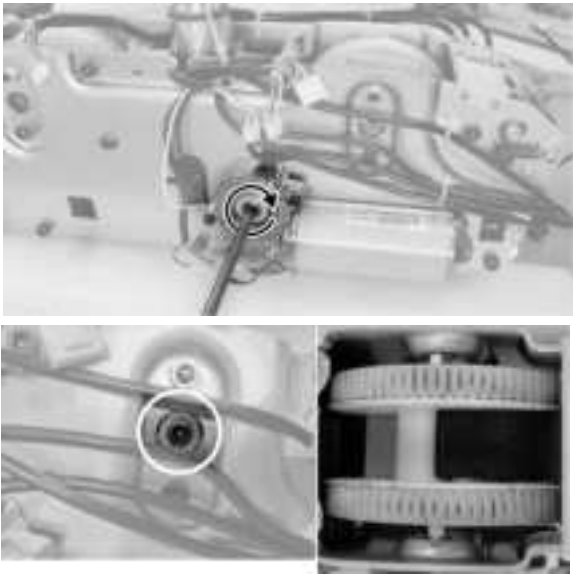
Itens	Quantity
Strap with Hook	2
	

- 
- Tools: HEX key 3 mm; HEX key 6 mm; HEX key 5 mm; 10 mm socket wrench

- 
- Make sure the strap is fully unrolled.**

If the strap is not fully extended outside the module, provide power supply to the PCB, and unroll the strap completely.

1. Manually, using the mechanical emergency, turn the gear clockwise until the screw securing the strap is aligned with the slit on the chassis, and there is no strap rolled around the gear cube.

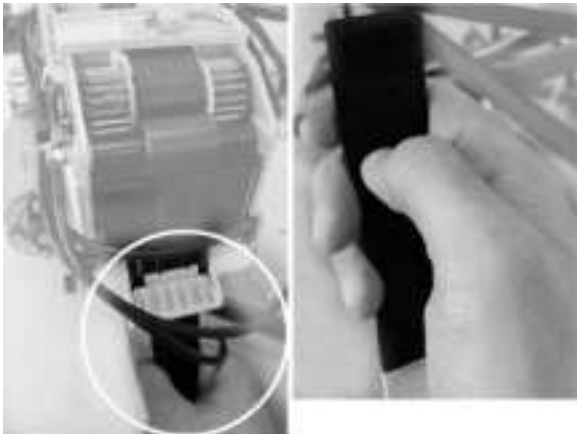


2. Remove the 5 mm hex screw holding the nut on the opposite side of the gear.

- 
- To be careful with the spacers to avoid letting them fall.



3. Remove the strap by pulling on the extremity of the hook.



4. To insert the new strap, it is necessary to relieve pressure on the one-way bearing.
5. Locate and remove both HEX 3 mm shoulder screws securing the clamping springs (one at each end of one-way bearing).



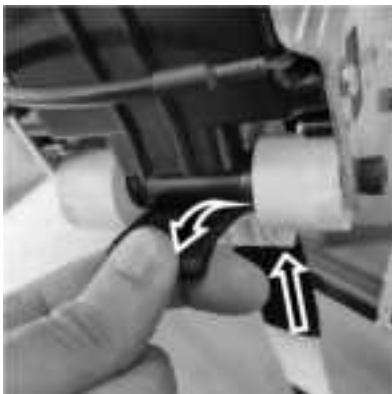
6. Move the rollers away.



7. Insert the free end of the new strap from the swivel inlet.



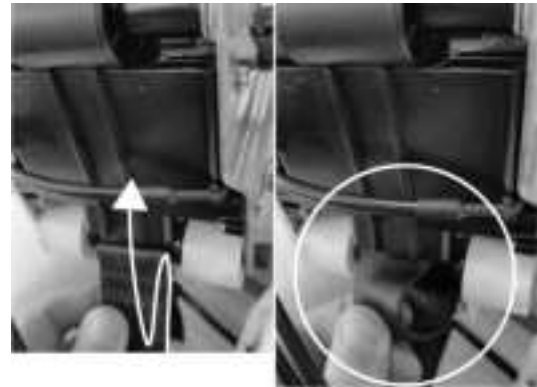
Flattening the end makes it easier to insert.



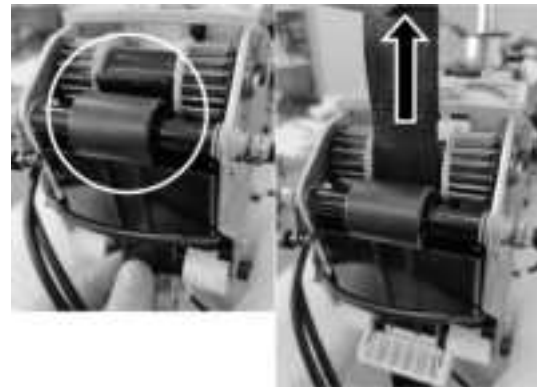
8. In the first phase, make the strap come out right after the swivel inlet.



9. Reinsert the free end into the strap guide.



10. Push until the free end appears between the rod and the idler.



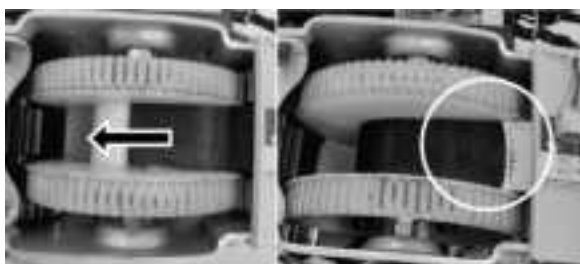
11. Align the strap loop until it is concentric with the fixing screw hole.



12. Tighten the screw and nut. Attention to the spacer orientation.



13. Manually, turn the gear counterclockwise using the Emergency Mechanical System until the white marker has completely passed the photosensor.



14. Retighten the shoulder screws holding the springs.



15. Check that they are properly tightened..

Check after installation:

- ☐ Test the ceiling hoist with one lifting cycle with no load. Perform the strap reset procedure.
- ☐ Test the ceiling hoist with one lifting cycle with SWL.

7 Troubleshooting

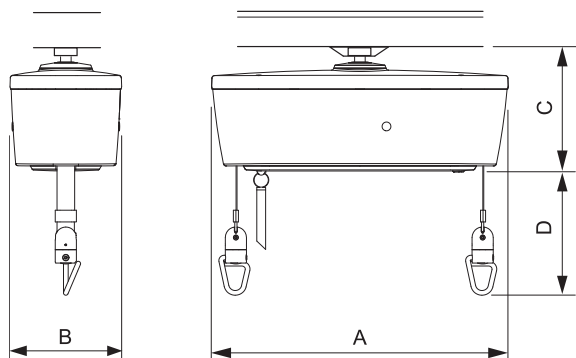
7.1 Identifying and Resolving Faults

Malfunction	Possible Cause	Solution
Audible signal	Overload detected and/or low battery level.	Reduce the load and try again or charge the unit.
Symbol on display and indicator light flashing red. 	Overload detected.	Reduce the load and try again.
Symbol on display and indicator light flashing red. 	Strap is loose or jammed inside the lifting module.	Pull the lifting straps down to stretch them and try again.
Symbol on display and indicator light flashing red. 	Strap length reference lost (after using the emergency lowering function).	Perform a system reset. Refer to the user manual.
Symbol on display and indicator light flashing red. 	Hand control is not properly connected or is defective.	Check the connection of the hand control. If a proper connection of the hand control does not solve the problem, contact your Invacare provider for service.
Symbol on display and indicator light flashing red. 	Failure of the internal weight sensor.	Do not use the ceiling hoist and contact your Invacare provider for service.
Symbol on display and indicator light flashing red. 	Strap blockage detected or failure of the internal motor sensor.	Remove any possible blockage at the strap inlet (e.g. twisted straps or other objects touching) and perform a system reset. Refer to the user manual. If the error persists, do not use the ceiling hoist and contact your Invacare provider for service.
Symbol on display and indicator light flashing red. 	Failure of the internal strap length sensor.	Do not use the ceiling hoist and contact your Invacare provider for service.
Symbol on display and indicator light flashing red. 	Over-current Motor Stall.	Do not use the ceiling hoist and contact your Invacare provider for service.
Symbol on display. 	Low battery.	Charge the battery. Refer to 4.4 <i>Charging the Battery</i> , page 7.
Ceiling hoist does not respond to the hand control's buttons and the display is blank.	Emergency stop activated.	Check that the emergency stop is not activated. Refer to the user manual.
	System does not have power or battery is discharged.	Charge the battery. Refer to 4.4 <i>Charging the Battery</i> , page 7.

Malfunction	Possible Cause	Solution
Lifting straps will only move down and not up.	Hand control defective.	Do not use the ceiling hoist and contact your Invacare provider for service.
	Strap length reference was lost.	Perform a system reset. Refer to the user manual.
Lifting straps will only move up and not down.	Hand control defective.	Do not use the ceiling hoist and contact your Invacare provider for service.
	Strap length reference was lost.	Perform a system reset. Refer to the user manual.
Lifting straps are twisted and do not straighten out.	Lifting hooks do not turn freely enough.	Check that the hook rotate freely and clean if necessary.
	Straps are frayed.	Do not use the ceiling hoist and contact your Invacare provider for service.
Lifting module emits excessive noise when activated.	Bearings, gearwheels or motor defective.	Do not use the ceiling hoist and contact your Invacare provider for service.
No indicator light on lifting module.	System does not have power or battery is discharged.	Charge the battery. Refer to <i>4.4 Charging the Battery, page 7</i> .
The emergency strap does not turn the lift off	Ceiling hoist requires service.	Do not use the ceiling hoist and contact your Invacare provider for service.
The emergency lowering strap does not lower the lifting straps.	Ceiling hoist requires service.	Use the mechanical emergency lowering. Do not use the ceiling hoist and contact your Invacare provider for service.
Ceiling hoist does not traverse the rails.	Rails require service or cleaning.	Contact your Invacare provider for service.
	Trolley worn or damaged.	Trolley must be replaced. Contact your Invacare provider for service.
Ceiling hoist does not charge.	System has no power.	Ensure the hand control is correctly plugged to the charging station. Leds blink to indicate charging is ongoing.
		Contact your Invacare provider for service.

8 Technical Data

8.1 Dimensions and weight



Dimensions

Robin® EVO	
Hoist length (A)	505 mm
Hoist width (B)	190 mm
Hoist height (C)	211 mm
Maximum lifting range (D)	2.5 m

Weights

Robin® EVO	
Maximum lifting capacity (Safe Working Load)	200 kg
Total weight without sling	9.5 kg

8.2 Electrical System

Robin® EVO	
Maximum current input	2.3 A
Protection class ¹	Entire device: IPx4 (ceiling hoist: IP24; hand control: IP44)
Insulation class	Class II equipment
	Type BF applied part Applied part complying with the specified requirements for protection against electrical shock according to IEC 60601-1.
Sound level	55 dB (A) [measured 1.0 m away from the device]
Number of lifts per charge	90 lifts of 0.5 m with 80 kg 60 lifts of 0.5 m with 200 kg
Intermittent (periodic motor operation)	10%, max. 2 min. / 18 min.
Battery	Li-Ion 36 V / 3.35 Ah
Charging time	Up to 7 hours at 20°C
Lifting speed — without load	4.2 cm/s

Robin® EVO	
Lifting speed — with a 200 kg load	3.7 cm/s

Power Supply

Voltage output	36 V DC
Voltage supply	100 – 240 V AC, 50 / 60 Hz, 1A
Protection class ¹	IP00

¹ See product label and label on each electric device for correct protection class. The lowest IP classification decides the overall classification of the device.

- IPx4: Protected against water splashed from any direction.
- IP24: Protected against objects larger than 12.5 mm and protected against water splashed from any direction.
- IP44: Protected against objects larger than 1 mm and protected against water splashed from any direction.

8.3 Environmental conditions

	Storage and transportation	Operation
Temperature	-10 °C to +50 °C	+5 °C to +40 °C
Relative humidity	20 % to 90 %	20 % to 90 % at 30 °C, not condensing
Atmospheric pressure	860 hPa to 1060 hPa	

Allow the product to reach operation temperature before usage:

- Warming up from minimum storage temperature might take up to 24 hours.
- Cooling down from maximum storage temperature might take up to 24 hours.

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