mackworth

TX Advanced Ceiling Track Lift

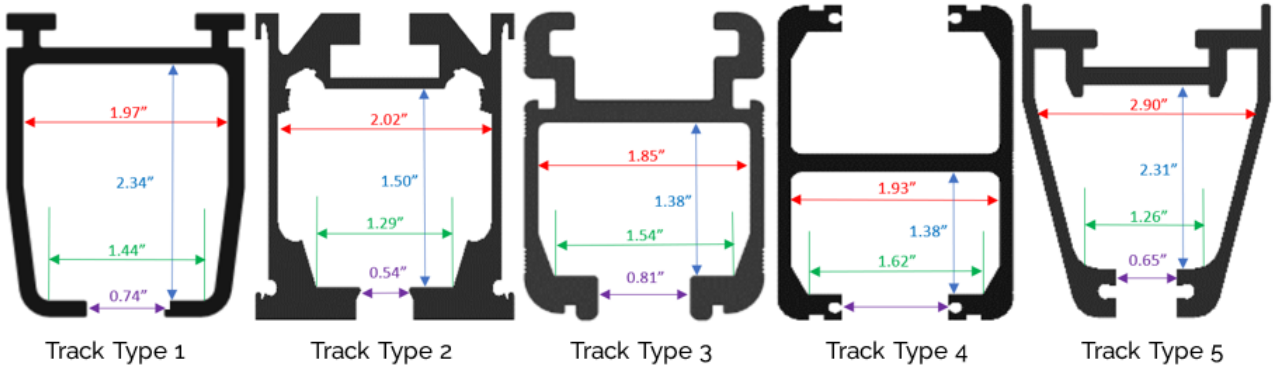
Service Manual

1 Introduction

This manual will explain how to carry out interim servicing and parts replacement on the Mackworth TX Advanced Ceiling Track Lift safely and effectively. This document is divided into sections to help a Service Engineer find the correct information. Each section will show in a step by step fashion the correct way to disassemble and assemble the Ceiling Track Lift. The aim of the manual is to advise and assist you, so that you can provide a successful service for the end user.

The Mackworth TX Advanced is available in different configurations dependent on track profile. The track profiles are shown below:

When Servicing the ceiling lift, one of the below track profiles should match.



Track Type 1 Track Type 2 Track Type 3 Track Type 4 Track Type 5

The list below includes all types of TX that are covered by this Service Manual and which track type they are suitable for.

TX400 Advanced Lift Type	Track Type	TX600 Advanced Lift Type	Track Type
TX440 Advanced MT – 122515	Type 1	TX600 Advanced MT – 122520	Type 1
TX440 Advanced MT – 122516	Type 2	TX600 Advanced MT – 122521	Type 2
TX440 Advanced MT – 122517	Type 3	TX600 Advanced MT – 122522	Type 3
TX440 Advanced MT – 122518	Type 4	TX600 Advanced MT – 122523	Type 4
TX440 Advanced MT – 122519	Type 5	TX600 Advanced MT – 122524	Type 5
TX440 Advanced PT – 122617	Type 1	TX600 Advanced PT – 122622	Type 1
TX440 Advanced PT – 122656	Type 3	TX600 Advanced PT – 122666	Type 3
TX440 Advanced PT – 122659	Type 4	TX600 Advanced PT – 122669	Type 4
TX440 Advanced PT – 122662	Type 5	TX600 Advanced PT – 122672	Type 5
TX440 Advanced QRT – 122678	Type 1	TX600 Advanced QRT – 122679	Type 1
TX440 Advanced QRT – 122688	Type 3	TX600 Advanced QRT – 122689	Type 3
TX440 Advanced QRT – 122693	Type 4	TX600 Advanced QRT – 122694	Type 4
TX440 Advanced QRT – 122698	Type 5	TX600 Advanced QRT – 122699	Type 5
TX440 Advanced RTC – 122703	Type 1	TX600 Advanced RTC – 122704	Type 1
TX440 Advanced RTC – 122708	Type 3	TX600 Advanced RTC – 122709	Type 3
TX440 Advanced RTC – 122713	Type 4	TX600 Advanced RTC – 122714	Type 4
TX440 Advanced RTC – 122718	Type 5	TX600 Advanced RTC – 122719	Type 5
TX440 Advanced MTCC – 122616	Type 1	TX600 Advanced MTCC – 122621	Type 1
TX440 Advanced MTCC – 122655	Type 2	TX600 Advanced MTCC – 122665	Type 2
TX440 Advanced MTCC – 122658	Type 3	TX600 Advanced MTCC – 122668	Type 3
TX440 Advanced MTCC – 122661	Type 4	TX600 Advanced MTCC – 122671	Type 4
TX440 Advanced MTCC – 122664	Type 5	TX600 Advanced MTCC – 122674	Type 5
TX440 Advanced PTCC – 122619	Type 1	TX600 Advanced PTCC – 122624	Type 1
TX440 Advanced PTCC – 122657	Type 3	TX600 Advanced PTCC – 122667	Type 3
TX440 Advanced PTCC – 122660	Type 4	TX600 Advanced PTCC – 122670	Type 4
TX440 Advanced PTCC – 122663	Type 5	TX600 Advanced PTCC – 122673	Type 5
TX440 Advanced MTPT – 122615	Type 1	TX600 Advanced MTPT – 122620	Type 1
TX440 Advanced PTPT – 122618	Type 1	TX600 Advanced PTPT – 122623	Type 1

2 Safety Precautions

Read and understand this manual in its entirety before servicing the Mackworth TX Advanced Lift.

- Mackworth authorised personnel must complete the full and interim services of the TX Advanced Ceiling Track Lift.
- The Lift must not be in use by the user during any form of servicing.
- The Lift must be turned OFF during any servicing that requires the external of the ceiling lift to be removed, or any dismantling of standard parts.
- Always ensure suitable clearance to remove the ceiling lift from the ceiling track.
- Ensure that all the servicing procedures are followed correctly as instructed in this manual.
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- All listed tools and equipment stated in this manual must be used to safely service this Lift.
- Ensure you have assessed all risks for your environment and any persons within that environment before commencing work.
- Ensure you have all PPE available to carry out the work before commencing.

3 Tools and Equipment List

When carrying out work on the Mackworth TX Advanced Lift, you will require the following:

Tools Required	Equipment Required	Lubricants and Sundries Required
2mm Allen Key	Step Ladder	Morris Grease – k42EP Multi-
2.5mm Allen Key	Multi-Meter	Purpose Grease
3mm Allen Key	Battery Tester	Loctite 222
4mm Ball Ended Allen Key	Marker Pen	Loctite 243
5mm Allen Key	Cloth	
8mm Spanner	Lint Free Cloth	
No. 2 Pozi Drive Screwdriver	Service Documentation	
2mm Slotted Screwdriver	Product User Manual	
5.5mm Slotted Screwdriver	Product Spare Parts Manual	
External Circlip Pliers 3-10mm	Product Commissioning Manual	
Long Nose Pliers	Test Weights –400lb or 660lb	
Side Snips	Weight Trolley	
Digital Vernier Calliper	Lifting Straps x2 (Attach weight to Carry	
Tape Measure	Bar)	
Second Cut Hand File	Cable Ties – 100x2.5mm (Part No. 000106)	
Power Drill		
8.5mm Drill Piece		

4 Preventative Maintenance

Maintenance should be completed by an approved service engineer every 6 months to ensure the products required standard is maintained. The service history of the product should be documented each service. This is documented in the service log, found in the back pages of the user manual.
When recording the service in the service log, ensure that the serial number of the ceiling lift and user manual align. Each ceiling lift is provided with its own user manual.

The below sub-sections provide detailed instructions on what must be inspected/tested for each component on the ceiling lift every service. Follow the guidelines below for a successful ceiling lift service.

4.1 Covers

- Visual inspection of the cover integrity, including cracks, burns or any impact damage.
- Ensure that the covers are fitted correctly, check that the screws are tight.
- Inspect the label integrity, ensure that they are legible and aren't peeling of the covers
- Ensure the serial number is legible.

4.2 Carry Bar

- Inspect the carry bar for damage such as deformation, cracks and large dents which may affect the function and safety of the component.
- Ensure that the carry bar spring clips remain functional.
- Check that the carry bar hooks and springs remain smooth, as sharp edges may cause damage to the slings.
- Ensure that the carry bar is fitted to the QRS Hook properly. See user manual for correct attachment. (Only applicable to QRS versions of ceiling lift)

4.3 Handset

- Inspect and test handset buttons are all functional.
- Ensure handset labels remain legible.
- Ensure the handset is connected to the lift ceiling correctly

4.4 Wheels

- Examine the wheels for damage such as cracking and general wear
- Ensure that the wheels are running smoothly in the track (track may have debris inside)
- Ensure that the ceiling lift traverses with handset command smoothly. (powered traverse lifts only)

4.5 Toggle Switch and Pull Cord

- Ensure that the three phase switch is fully operational.
- The ceiling lift should operate as normal when the switch is pushed into the top position.
- Power to the ceiling lift should be removed when the toggle switch is in its middle position.
- The ceiling lift should e-lower when the toggle switch is held in its bottom position
- Inspect the condition of the pull cord, ensure that the cord has not been modified (cut to length)
- Ensure that the pull cord label remains legible.

4.6 Batteries

- Ensure that the battery leads are attached properly between the battery terminals and the PCB
- General examination of batteries for burns at terminals and cuts/exposed wiring along the leads.
- Perform battery test to determine the condition of the batteries.

4.7 Lift Motor

- Visual inspection on the component for any abnormalities.
- Inspect the motor gear shaft for wear. Excess wear should be cleaned and an inspection on the gearing condition should be done after. If the gear shaft is badly warn it must be replaced.
- Ensure that the motor gear shaft is meshing correctly with the hub.
- Re-grease the motor gear shaft.
- Perform lift/lower test to ensure the lift motor is functioning correctly, this should be done with and without load. Ensure to listen for any unusual sounds and rattling coming from the motor.

4.8 Lift Tape Hub (Spool)

- Inspect the hub teeth for wear. Excess wear should be cleaned and an inspection on the gearing condition should be done after. If the hub is badly warn it must be replaced.
- Ensure that the hub teeth are meshing correctly with the lift motor gear shaft.
- Re-grease the hub.
- Test the function of the over-speed cam. Ensure that it returns to position after displacement.

4.9 Lift Tape

- Inspect the full length of the lift tape for any fraying or damage to the materials integrity.
- Ensure that the stitching remains in good condition, there should be no sign of any loose threads or fraying by the bindings, this should be checked at both ends of the lift tape.
- Ensure that the lift tape label remains legible.

4.10 Limit Switches

- Ensure that the limit switches remain functional.
- Test the bottom limit switch activates by fully lowering the lift tape out of the hub during normal use.
- Test that the bottom limit switch activates when the carry bar is removed from the ceiling lift.
- Test the upper limit switch activates by raising the lift tape all the way up to the top limit.
- Inspect the limit switch wires and solder points for any damage and exposed wire. Make sure to check inside the chassis as the cable runs inside.

4.11 Powered Traverse (Drive Motor)

- Visual inspection on the component for any abnormalities.
- Inspect the motor gearing is functional, between the motor, the motor shaft, the large idle gear, small idle gear and wheel gear pattern. Any warn or damaged part must be replaced.
- Perform left/right traverse test to ensure the drive motor is functioning correctly, this should be done with and without load. Ensure to listen for any unusual sounds and rattling coming from the motor.
- Ensure that the powered traverse function allows the ceiling lift to dock into the charging dock correctly. (without assistance)
- Ensure that the ceiling lift traverses in the correct direction. (Directional colours match between the handset and labels on underside of the ceiling lift).

4.12 PCB (Printed Circuit Board)

- Inspect the PCB for any damage such as cracks and electrical burns.
- Ensure that all the relevant components are plugged into the board correctly.
- Inspect the wiring for each component that plugs into the PCB. Ensure there are no exposed wiring.

4.13 Air Tubes and Grommet

- Ensure that the air grommet is undamaged and remains in the correct orientation where located on the underside of the chassis.
- Inspect the full length of the air tubes and that each colour coded tube is connected to the correct air switch and brass insert on the grommet.

4.14 LED Indicator

- Ensure that the LED casing is not cracked.
- Test LED is functioning correctly, ensure that the LED is indicating the correct light for each scenario (where applicable)

4.15 LCD Indicator

- Ensure that the LCD screen is not cracked
- Ensure that the LCD green backlight is functioning, to allow the messages to be visible.
- Test the LCD is functioning correctly, ensure that the correct messages are displayed for each scenario.

4.16 Charging

- Inspect the condition of the charging unit, ensure that the casing remains intact and there is no cuts or exposed wires.
- Inspect the condition of the charging dock, ensure it is fixed in place at the end of the track system and there is no exposed wiring or damage to the leaf springs.
- Inspect the condition of the charging beak, ensure the beak is intact from any damage and exposed wiring.
- Ensure that the ceiling lift docks correctly between the beak and dock and that it begins charging. (powered traverse ceiling lifts should dock through handset command without assistance). Docking should be tested with and without load.

4.17 Auxiliary Beak (Powered Turntables)

- Inspect the condition of the auxiliary beak, ensure the beak is intact from any damage or exposed wiring.
- Ensure that the beak docks correctly with the turntable and handset commands function as intended.

4.18 Quick Release Trolley (QRT)

- Ensure that the QRT system functions, that the ceiling lift is positioned on the trolley hooks and is secure.
- Ensure that the QRT pin is intact and can be used to lock the trolley in place in the track.
- Check that the QRT can traverse along the track smoothly. (There may be debris in the track that needs clearing).

4.19 Constant Charge

- Inspect that the constant charge beak is in contact with the constant charge strips on the inside of the track at all times. Test the connection along the length of the track system.
- Inspect the condition of the constant charge beak for damage such as a damaged spring or exposed wiring.
- Inspect the full length of the constant charge strip and that it remains smooth and flat along the full track system.

4.20 Return to Charge

- Test the return to charge function is working correctly and that the ceiling lift raises the carry bar to the set height and traverses the ceiling lift into the charging dock and begins charging.

4.21 Fixings

- Inspect all the main nuts, bolts, screws and other fixings are secure and tight, if any fixings are loose ensure to tighten accordingly.

4.22 Ceiling Track

- Ensure that the track profile matches the profile of the ceiling lift trolley.
- Inspect the integrity of the track system. Ensure that the track is not damaged and/or deformed.
- Inspect the condition of the track brackets, ensure that the brackets and track are secured in place with the track wedges. The track wedges should be locked in place with the M3 screws on either side.
- Ensure that the alignment between two track sections align, and that there is no gap between two aligning tracks. Test the traversing of the ceiling lift between the track sections is smooth and allows transfer.
- Ensure that the end stops, safety bolt and end caps are all secured correctly to the track system.
- Clear out the internal of the track profile from any debris.

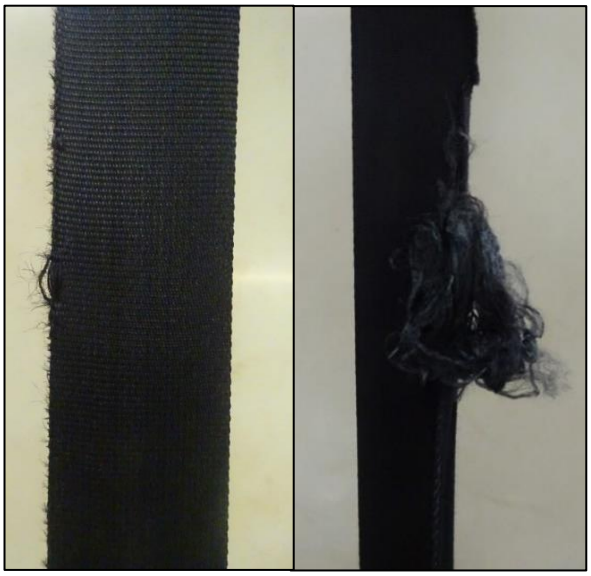
4.23 Slings

- Inspect the sling for cuts, frays, tears and burns along its full profile of the sling and straps.
- Inspect the slings stitching for any tears, stretching and loose threads along the full profile of the sling and straps.
- Ensure that the label remains secure and legible.

If there is a problem discovered with the sling, it should be noted on the service sheet and be brought to the attention of the person(s) who requested the service to be carried out. In addition, notify the customer on-site or the manager if it is a care facility. The serial number, type of sling, and condition should be noted on the service sheet. Mark the date of inspection on the sling service label.

5 Component Condition Guide

The section will assist in determining if the condition of any key components is suitable for use or if they require replacement. See images below as reference.

Lift Tape Condition	
Acceptable Condition	Unacceptable Condition – Do not use
	
Lift Spool (Hub) Condition	
Acceptable Condition	Unacceptable Condition – Do not use
	

6 Testing

The section will assist in ensuring that the ceiling lift has undergone the required function testing and load testing following its service.

6.1 Functional Testing

The guidelines below will ensure that the main functional components of the ceiling lift are functioning as intended following a service. **Functional testing should be done after each service.**

1. Position the ceiling lift in a suitable position in the middle of the room (in track), clear of any obstacles.
2. Raise the ceiling lift to its upper limit. (Confirming the handset button and upper limit switch is functional). Once the upper limit switch has been reached, the ceiling lift should stop raising and the LCD will display **"Up Lim_Sw"**. Ensure to listen to the motor for any unusual noises during lift.
3. Lower the ceiling lift till the carry bar reaches the floor. (Confirming that the handset button and lower limit switch is functional). Once the carry bar reaches the floor, the ceiling lift should stop lowering and the LCD will display **"Down Lim_Sw!"**
4. Repeat step 2 and 3 with the ceiling lift loaded.
5. Traverse the ceiling lift left and right using handset commands to ensure powered traverse is functional. (Only applicable for powered traverse ceiling lifts).
6. Traverse the ceiling lift (manual or powered) into the charging dock, ensure it docks correctly and begins charging.
7. Repeat step 6 with the ceiling lift loaded.
8. Test the toggle switch is functioning correctly. Pull the pull cord down one step to ensure power is cut from the ceiling lift. Then pull and hold the pull cord to its lowest position to test the e-lower function. The ceiling lift should begin to lower while sounding an audible alarm.
9. Traverse the ceiling lift through the full track system to ensure movement is smooth throughout the tracks and the transition between track sections.
10. Ensure that transition gates (if applicable) are functioning as intended and allow the ceiling lift to pass through into a h-system.

6.2 Powered Auxiliary Testing (Turntables)

The guidelines below will guide on how to ensure that the powered auxiliary system is functioning correctly.

1. Traverse the ceiling lift into the centre of the turntable where the auxiliary beak contacts the turntable dock. Ensure that the contact is smooth and doesn't require excessive force to dock.
2. Operate the auxiliary buttons on the handset to ensure that the turntable rotates as intended.

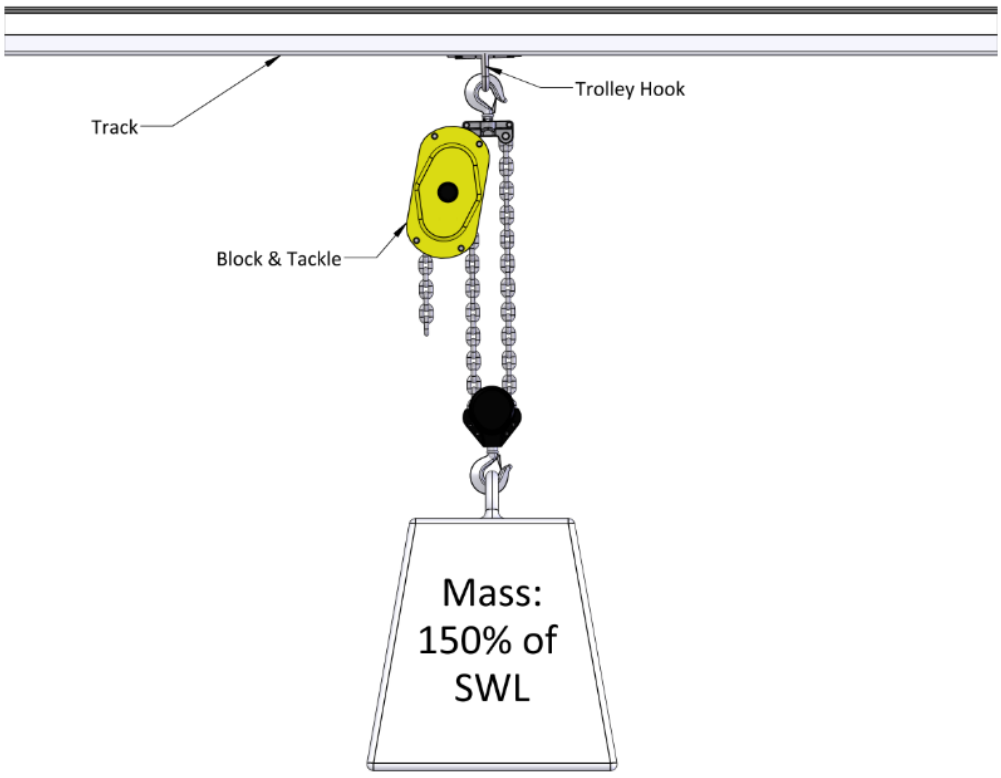
6.3 Powered Auxiliary Testing (H-System)

1. Operate the auxiliary buttons on the handset to ensure that the h-system traverses as intended.

6.4 Track Testing

The guidelines below will ensure that the track system is safe and suitable for use with the ceiling lift. **Track testing should be done annually.**

1. The full track system must be tested with 1.5x the SWL to ensure that the track fixings remain secure within the ceiling/wall. The test must be done with a pulley block (block and tackle) and not the ceiling lift. The ceiling lift is not suitable to lift more than its SWL.



7 Additional Documentation

See the list of available documents you may or may not need to refer to for a successful service. All documents will be available to view on the Mackworth website: **http://mackworthusa.com**

- Spare Part Manual – 992674
- User Manual -999674
- Commissioning Manual – 997674
- Troubleshooting Guide – 990674
- Battery Testing Guide – 990SD-02
- Program Mode Guide Sheet – 990SD-01
- Ceiling Track Installation Manual – 996080

8 Removal and Replacement

This section will cover the details of how to remove, refit and replace all serviceable parts of the ceiling lift. Ensure to read and understand each step thoroughly before removing any component from the ceiling lift.

Ideally, the ceiling lift should be removed from the track and placed on a work bench before any dismantling. But servicing can be done with the ceiling lift remaining within the track system. (Depending on the service required).

Unless stated otherwise, all images refer to a Mackworth TX600 Advanced with a standard wheel assembly (Track Type 1). Where necessary, additional images for alternative track and ceiling lift types have been included.

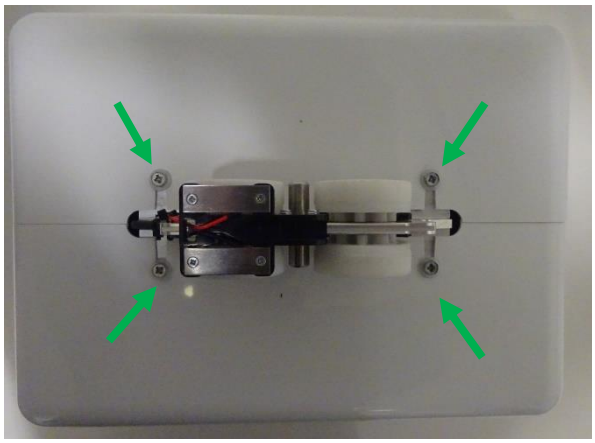
Before carrying out any dismantling of the ceiling lift, the power should be turned off using the red pull cord.

8.1 Side Covers

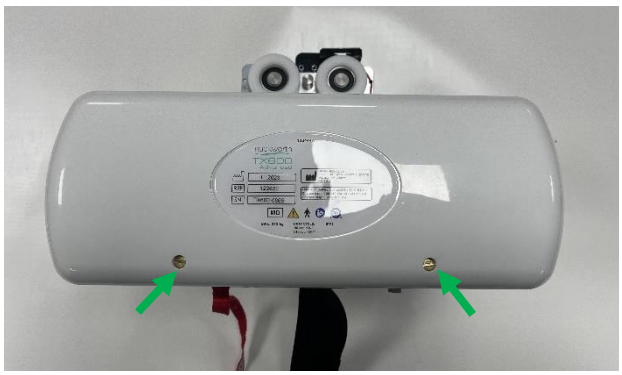
This section will cover the details of how to remove, refit and replace the ceiling lift side covers.

Removal

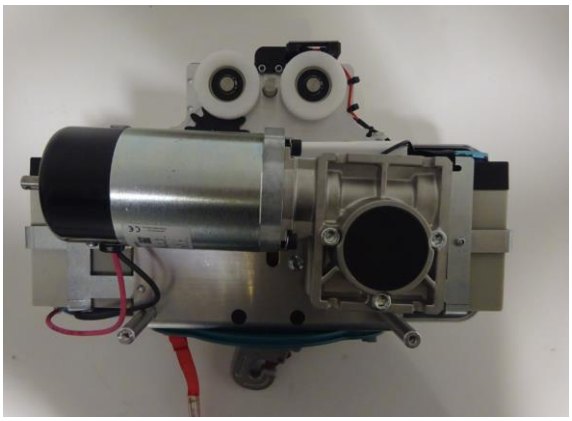
1. Using an 8mm combination spanner, loosen the four screws from the top face of the ceiling lift. The screws do not need to be removed.



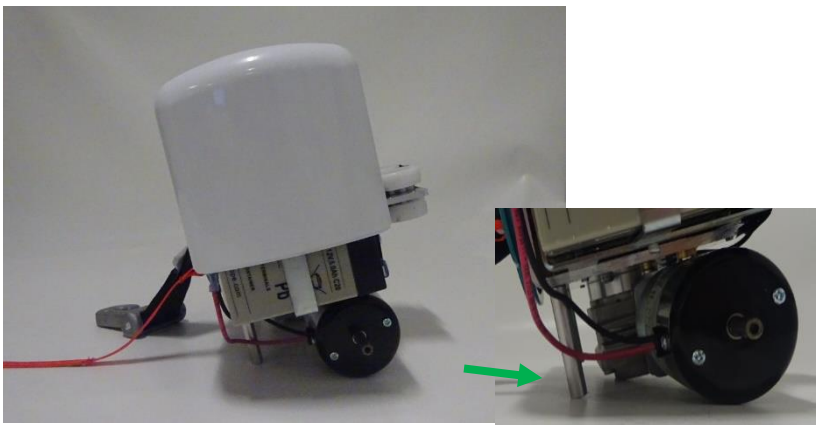
2. Use a slotted screwdriver to remove the two brass screws from the rear cover of the ceiling lift.



3. Gently remove the cover from the ceiling lift.

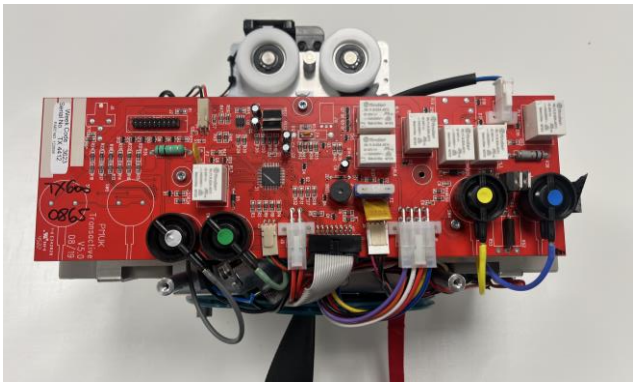


4. Rotate the ceiling lift 180˚ and gently rest the ceiling lift on the lift motor.

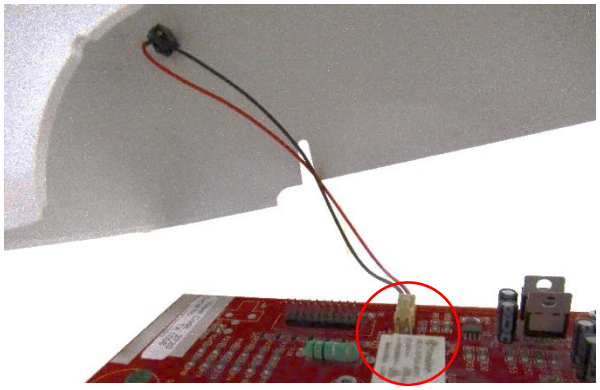


5. Using a slotted screwdriver, remove the two brass screws from the front cover.

6. Gently remove the cover from the Ceiling lift.



7. (Quick Release Trolley System Ceiling lifts only) – While removing the Cover, ensure to disconnect the charging lead from the PCB.



Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

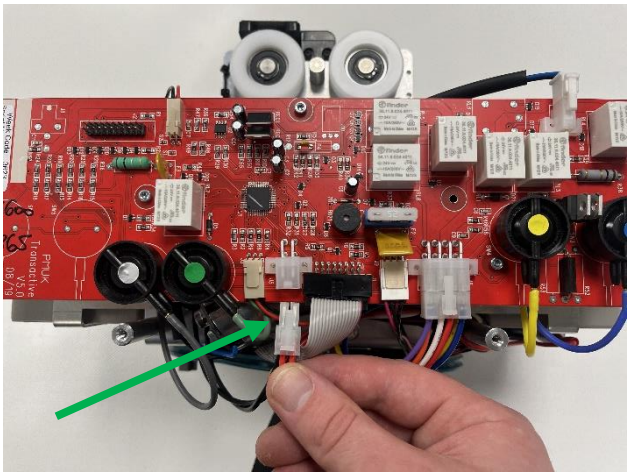
- Make sure the profile edges of the covers align with the bottom cover.
- Ensure the slots on the top side of the covers align with four pozi screws.
- Ensure you secure the brass screws first on both covers prior to tightening the four pozi screws.

8.2 Bottom Cover

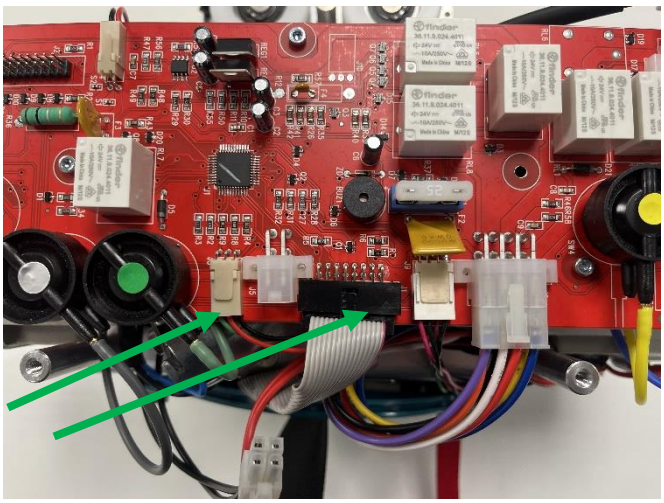
This section will cover the details of how to remove, refit and replace the ceiling lifts bottom cover.

Removal

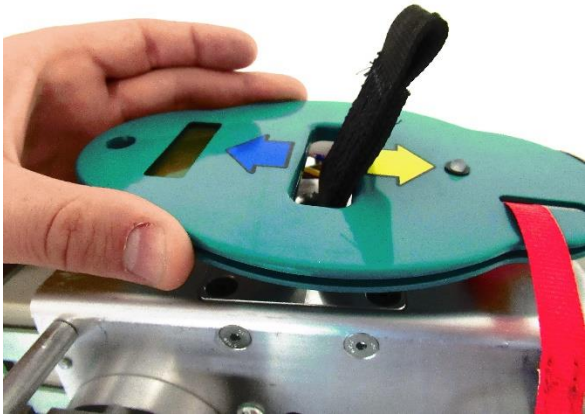
1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Remove the QRS Hook from the lift tape. (Refer to section 8.18)
3. Disconnect the power lead from the PCB.



4. Disconnect the LCD and LED cables from the PCB.



5. Gently move the bottom cover away from the chassis and feed the cover through the lift tape.



Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

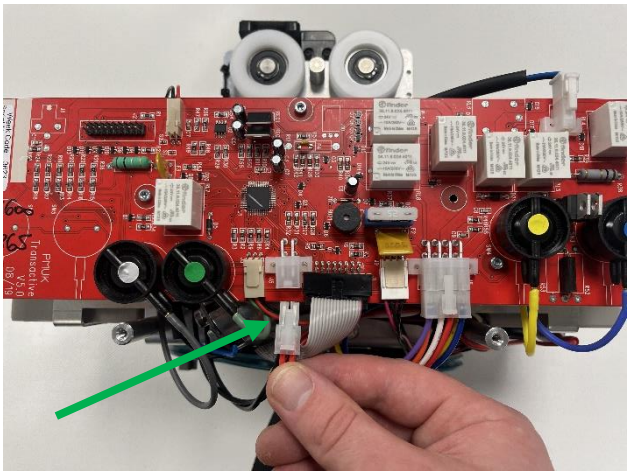
- Make sure cover slot is fed through the lift tape in the correct direction, so the red cord and grommet align with their slots.
- Ensure the red pull cord is pulled through its designated slot.
- Ensure that the grommet is pushed through its designated slot.
- Ensure that the bottom cover is flush up against the bottom of the chassis.

8.3 Batteries

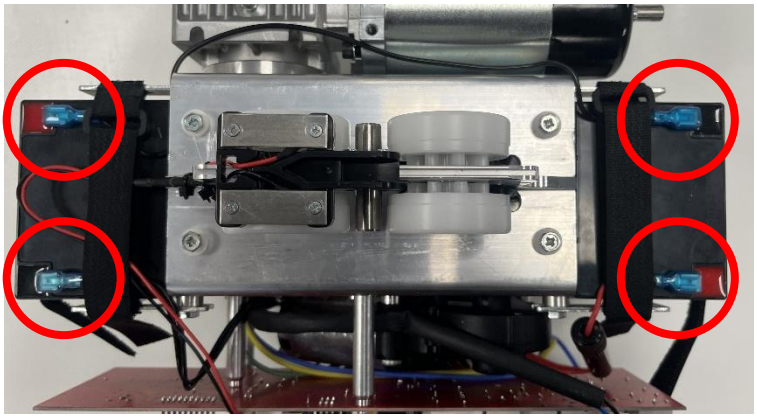
This section will cover the details of how to remove, refit and replace the batteries.

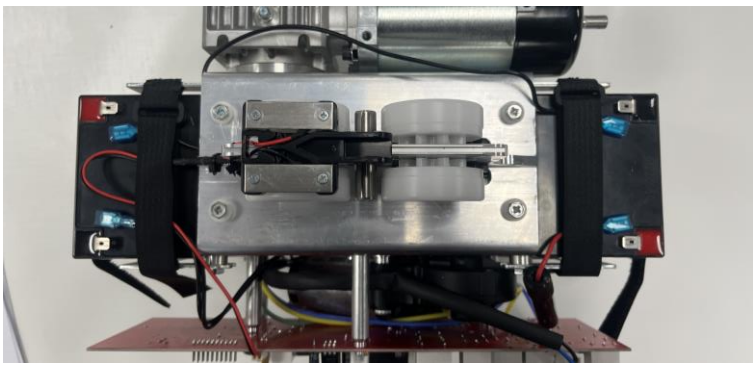
Removal

1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Disconnect the power lead from the PCB.

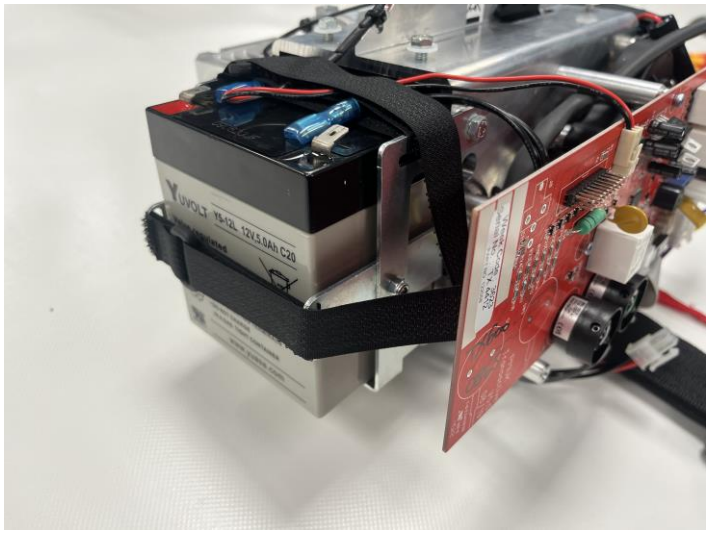


3. Disconnect the battery leads from their terminals. (this can be done without undoing the top Velcro straps.

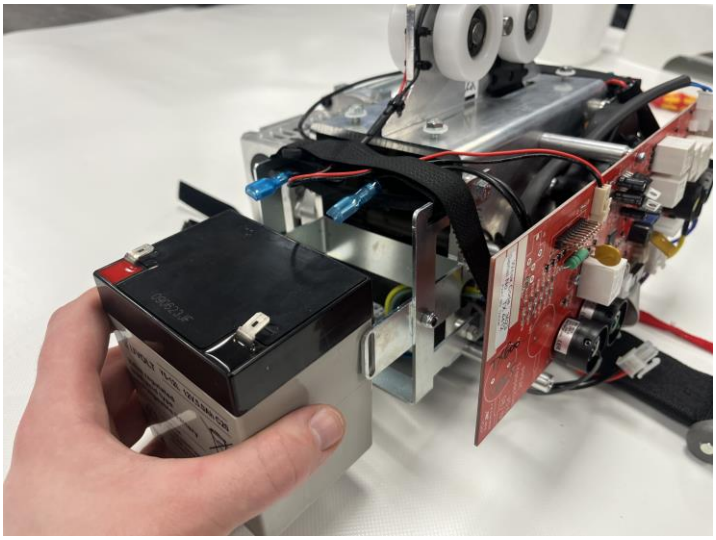




4. Release the side Velcro straps to give access to the batteries.



5. Slide the batteries out from their battery brackets to remove.



Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

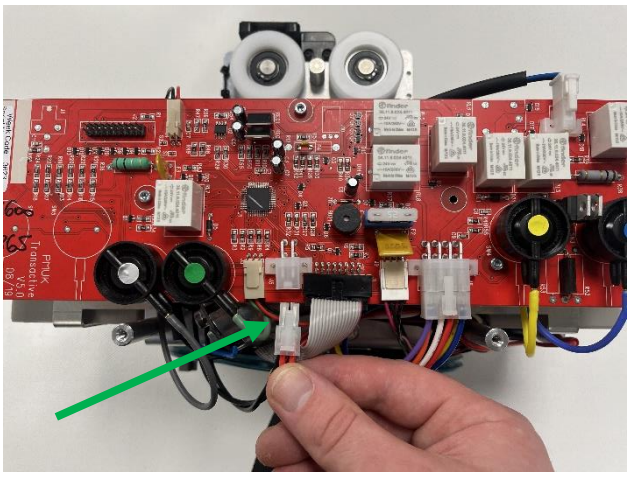
- Ensure to place the batteries back into the brackets in the correct orientation. (the terminals should be pointing inwards).
- Ensure the main power lead is re-attached with the red lead connecting to the red terminal on the battery and the black lead connecting to the black terminal on the battery.
- The link lead can be attached in either direction.
- Ensure the Velcro is reattached correctly.

8.4 PCB

This section will cover the details of how to remove, refit and replace the PCB. Images below refer to a 6-way board, the process is the same for each of the other PCB options, but with less connections.

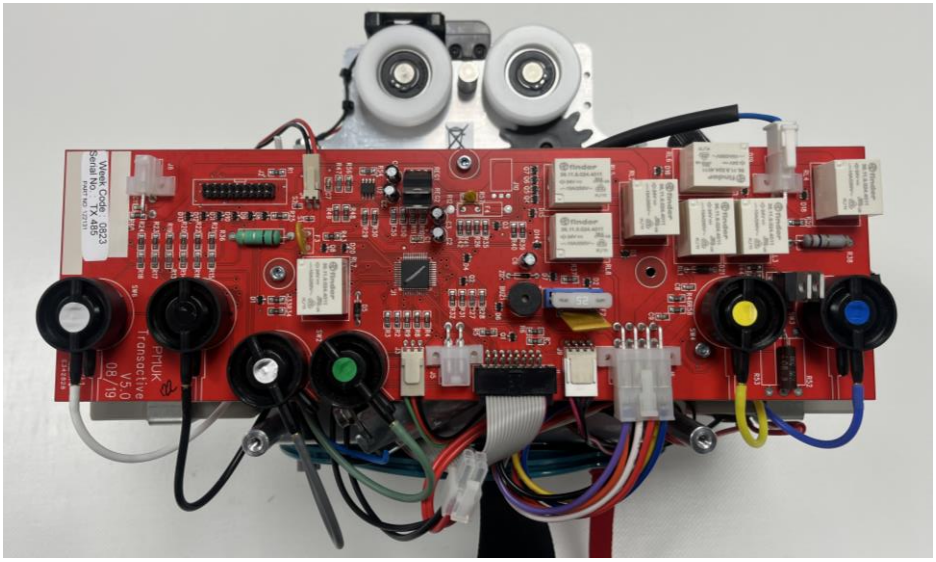
Removal

1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Disconnect the power lead from the PCB.

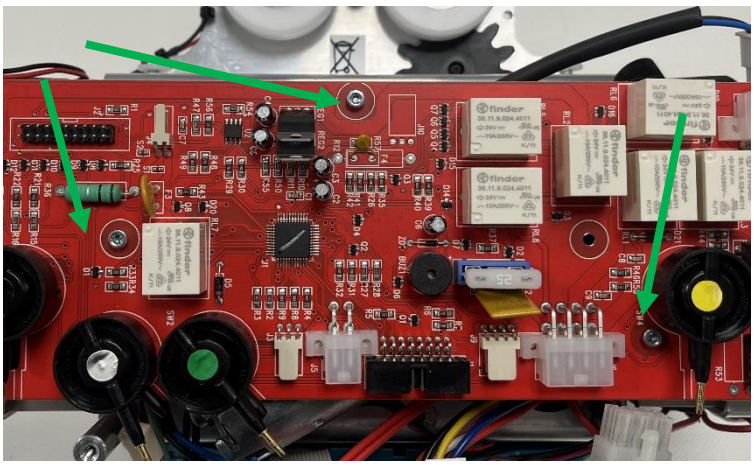


3. Remove the remaining connections from the PCB ports. There is no correct order to disconnect.

- Toggle Switch
- Limit Switch
- LCD
- LED
- Charging Beak
- Air Tubes (2 to 6)
- Traverse Motor (if applicable)
- Auxiliary beak (if applicable)



4. Using a 2.5mm Allen Key, remove the three M3 screws securing the board to the chassis.



5. The PCB can now be removed from the ceiling lift.

Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

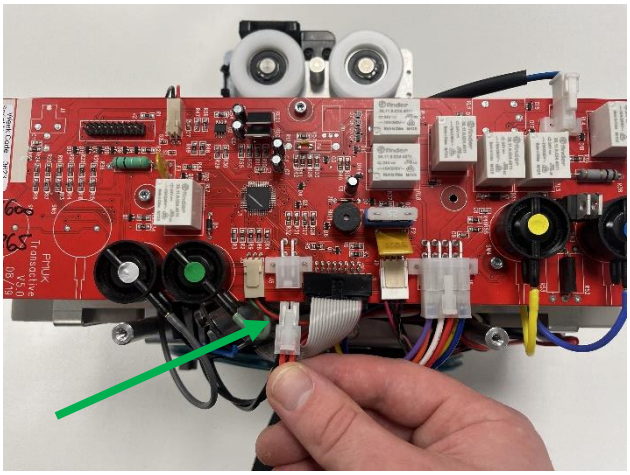
- The power lead should always be connected last.
- Make sure to connect each component to the correct port.
- Ensure that the air tubes are fully situated onto the brass inserts on the air switches.
- The air switches are colour coded with a sticker to guide on connecting the correct air tube to the correct air switch.
- Be careful not to split the air tubes during refitment.
- Make sure to secure the PCB to the chassis before reconnecting the power, do not allow the board to come into contact with the chassis other than its designated mounts.

8.5 Lift Motor

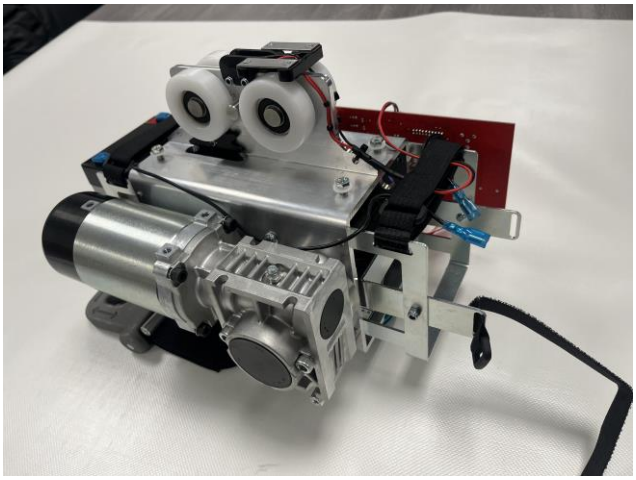
This section will cover the details of how to remove, refit and replace the Lift Motor.

Removal

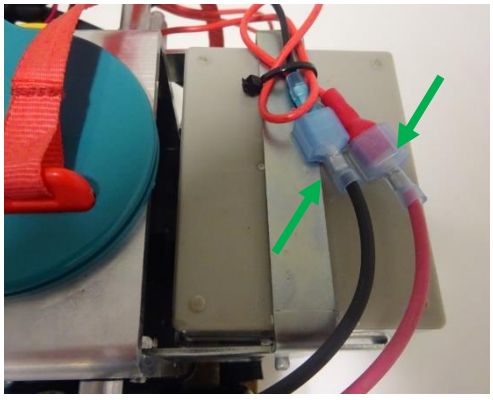
1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Disconnect the power lead from the PCB.



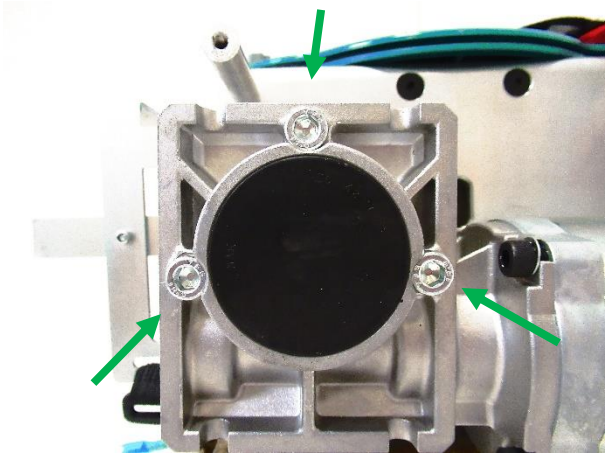
3. Remove the motor side battery, (recommended for easier refitment but not necessary). Refer to section 8.3.



4. On the underside of the motor side battery bracket, disconnect the motor lead terminals.



5. Using a 5mm Allen Key, remove the three bolts securing the motor to the chassis.

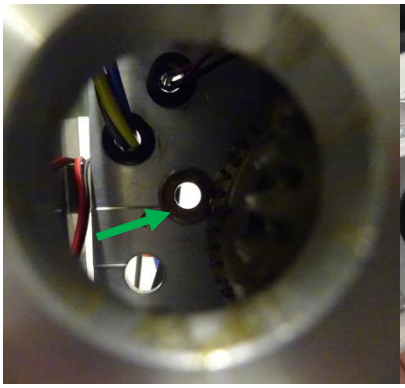


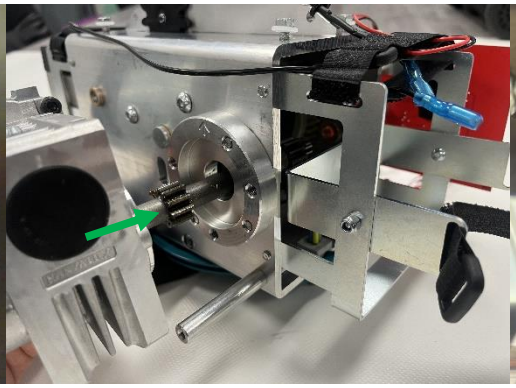
6. Remove the motor from the chassis, be careful not to damage the gear shaft during removal.

Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

- Ensure that the motor aligns with the tapped holes on the motor mount.
- Ensure that the motor gear shaft aligns and fits into the oilite bush found on the other face of the chassis.
- The motor shaft gearing should mesh with the hub teeth





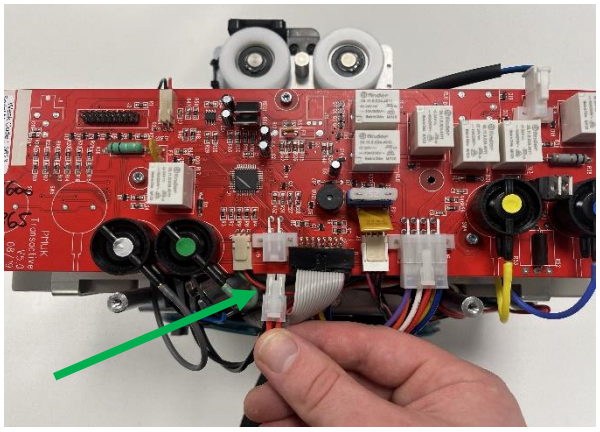
- Ensure to connect the motor cables with the correct terminals. Red to red, black to black.

8.6 Lift Tape

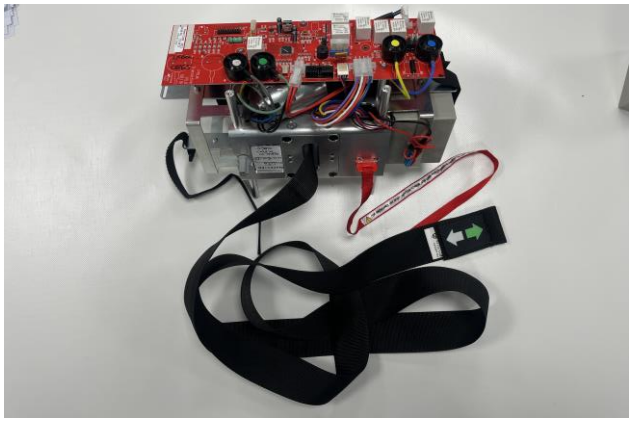
This section will cover the details of how to remove, refit and replace the Lift Tape.

Removal

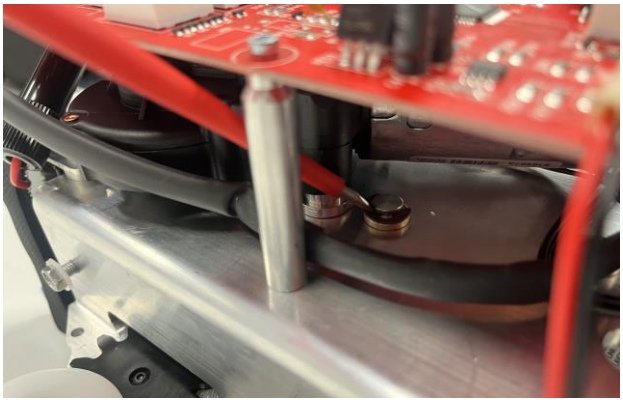
1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Disconnect the power lead from the PCB.



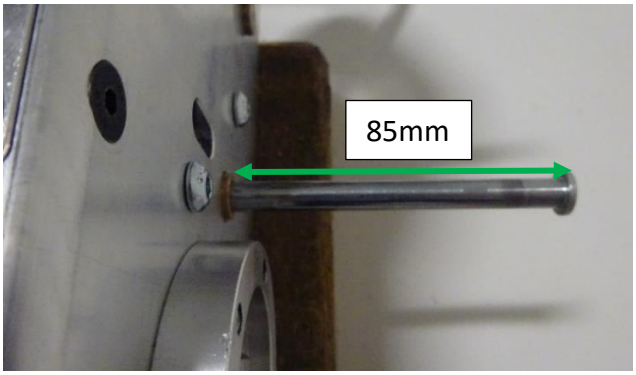
3. Remove the QRS hook from the ceiling lift. (Refer to section 8.18)
4. Remove the bottom cover from the ceiling lift. (Refer to section 8.2)
5. Remove the motor side battery from the ceiling lift. (Refer to section 8.3)
6. Remove the lift motor from the ceiling lift. (Refer to section 8.5)
7. PCB removal is recommended for easier access. (Refer to section 8.4)
8. Pull the lift tape from the ceiling lift until it has fully unwound from the hub.



9. Using a small slotted screwdriver, remove the 8mm e-clip from the strap pin. Be careful not to lose the e-clip.



10. Slide the strap pin out of the chassis until 85mm of the pin is visible, this allows lift tape removal without displacing the hub.

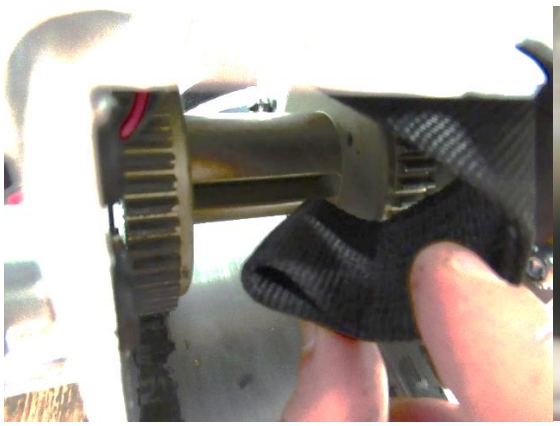


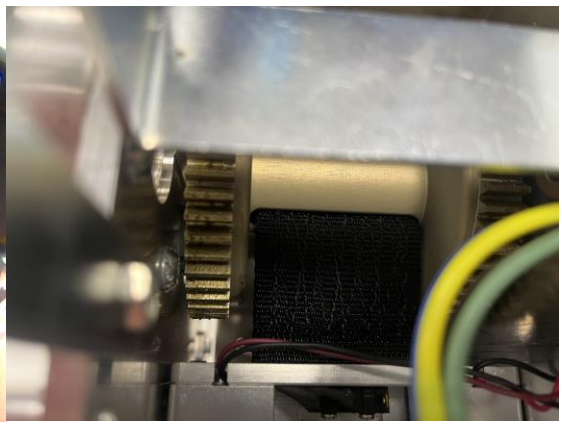
11. Gently pull the lift tape through the limit switch block to remove from the ceiling lift.

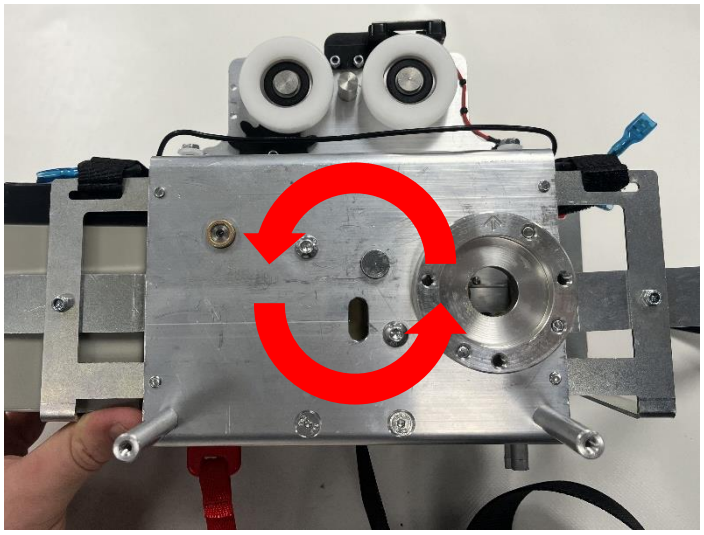
Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

- When refitting the lift tape, ensure that the stitching fold is facing the red pull cord. (See image above)
- For easier refitment, open up the loop of the tape as shown, this can make it easier for the strap pin to fit through the tape when inside the hub.
- When sliding the pin back through the chassis, be careful not to catch the lift tape and cause damage to its integrity.
- Inspect the condition of the e-clip, if the clip has been stretched, replace with a new e-clip.
- Once the pin is pushed back through the chassis, ensure to refit the e-clip. This is done using long nose pliers, be careful not to damage the PCB if it hasn't been removed.
- Wind the lift tape around the hub by rotating the hub in an anti-clockwise direction.
- Pull the lift tape while holding the hub to allow the lift tape to stretch and tighten, then continue to wind around the hub.
- Refit the removed components to the ceiling lift.





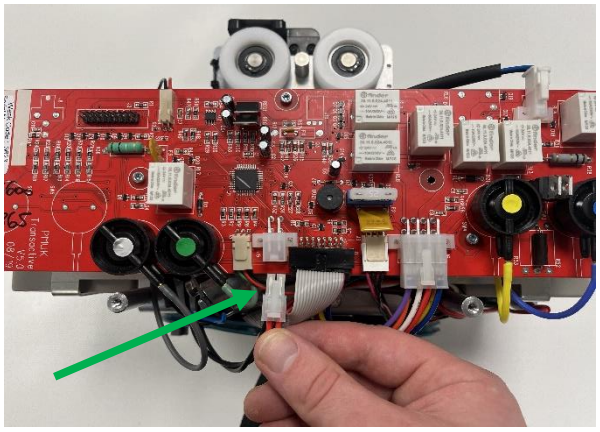


8.7 Hub

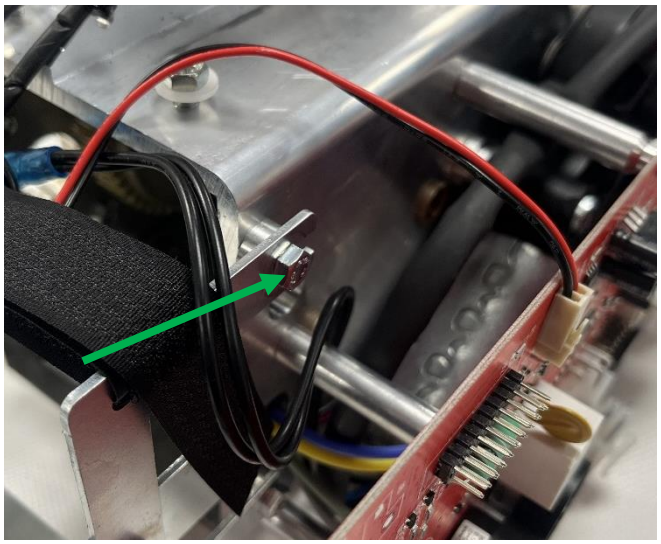
This section will cover the details of how to remove, refit and replace the Lift Tape.

Removal

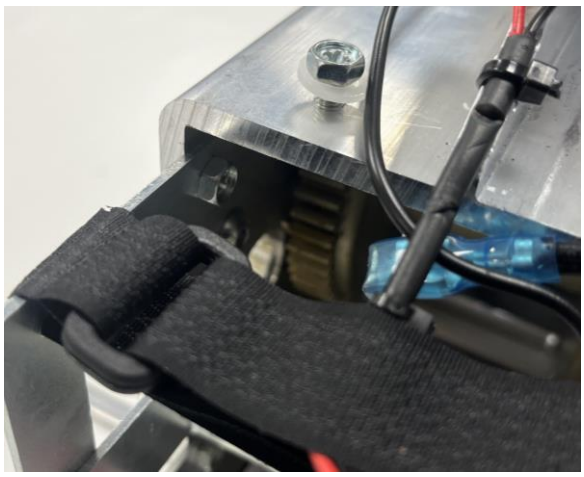
1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Disconnect the power lead from the PCB.



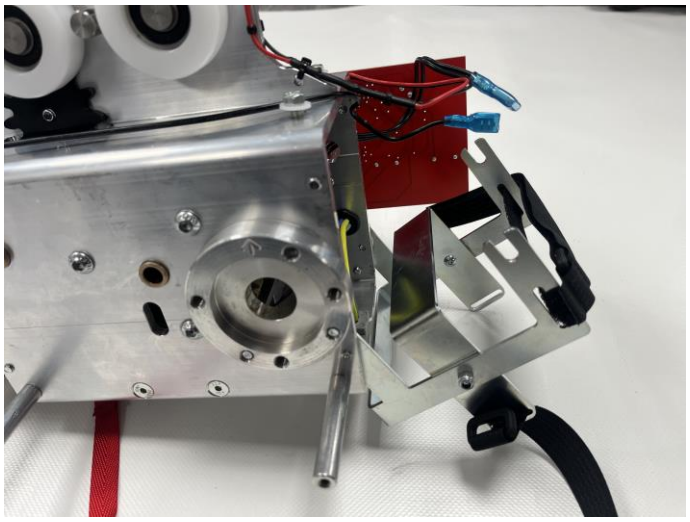
3. Remove the bottom cover from the ceiling lift. (Refer to section 8.2)
4. Remove the motor side battery from the ceiling lift. (Refer to section 8.3)
5. Remove the lift motor from the ceiling lift. (Refer to section 8.5)
6. PCB removal is recommended for easier access. (Refer to section 8.4)
7. Remove the lift tape from the ceiling lift (Refer to section 8.6)
8. Remove the air grommet assembly from the ceiling lift. (Refer to section 8.10)
9. Using an 8mm combination spanner, loosen the M5 x 12 screw (with the spacer behind) from the top end of the battery bracket on the motor side.



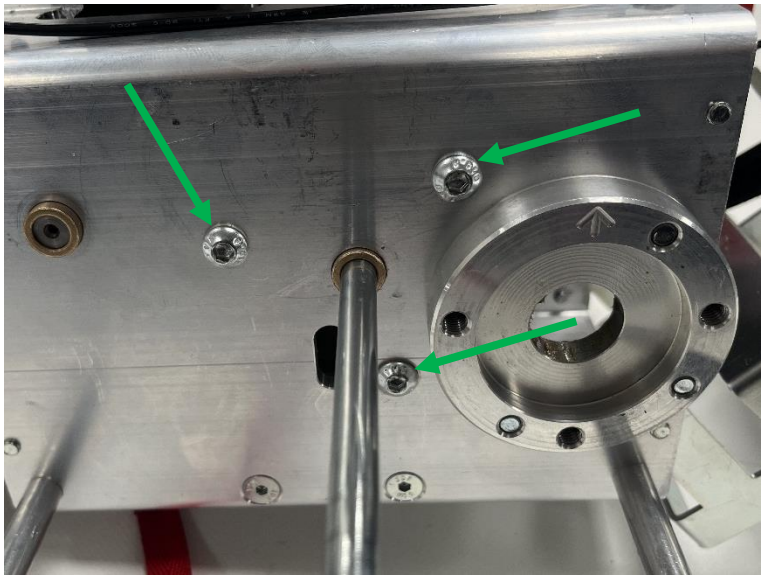
10. Using an 8mm combination spanner, remove the M5 x 12 screw (screw head is on inside of chassis) from the opposite side of the top end of the battery bracket on the motor side.



11. Pivot the battery bracket to allow access to the inside of the chassis.

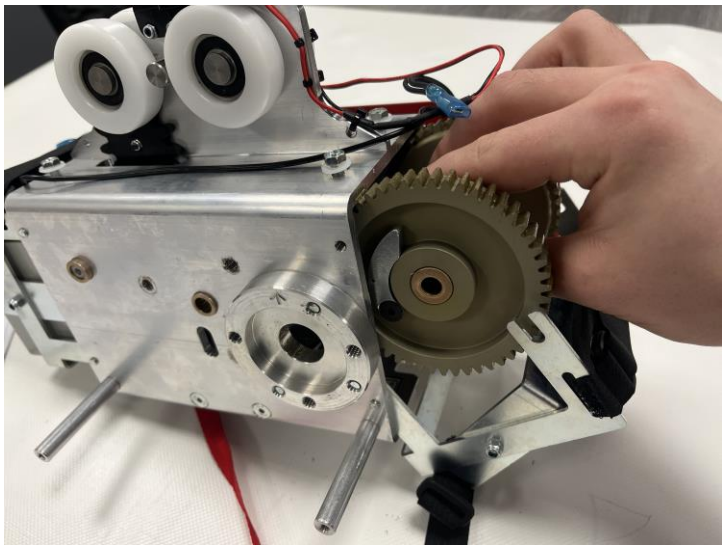


12. Using a 4mm Allen Key, remove the three M6 x 16 screws from the front face of the chassis (these are the over speed cam screws)



13. Fully remove the strap pin from the chassis, while supporting the hub with your other hand to avoid any damage.

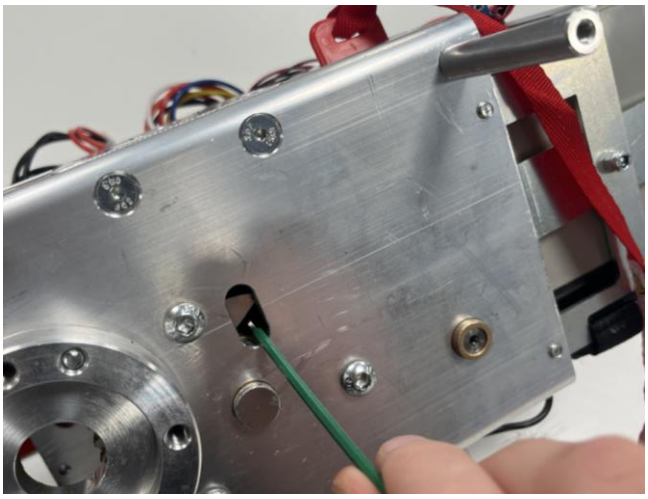
14. Guide the hub out of the chassis past the pivoted battery bracket



Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

- When refitting the hub, if required, grease the hub using the recommended grease (Morris Grease – K42EP multi-purpose).
- When inserting the hub back into the chassis, make sure the overspeed cam is facing the rear face of the chassis (Lift Motor side).
- Make sure to refit the overspeed cam screws into the chassis.
- Test the overspeed cam is working by flicking the cam with an Allen Key through the slot in the chassis. (See image below)
- Refer to the lift tape refitting guide for further details.

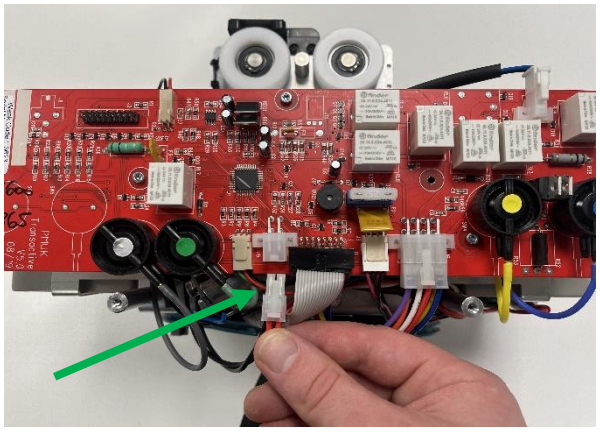


8.8 Limit Switch Block

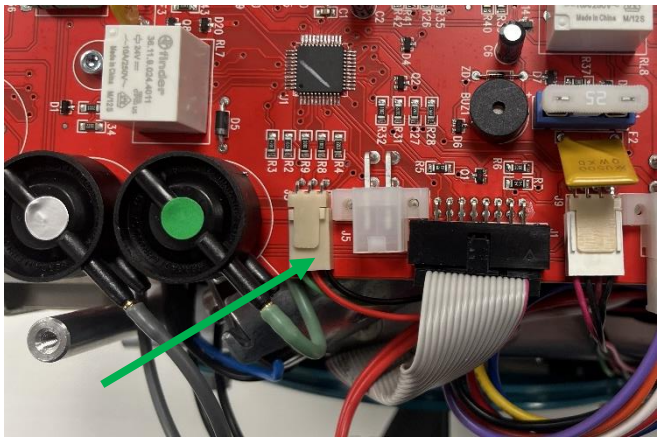
This section will cover the details of how to remove, refit and replace the Limit Switch Block.

Removal

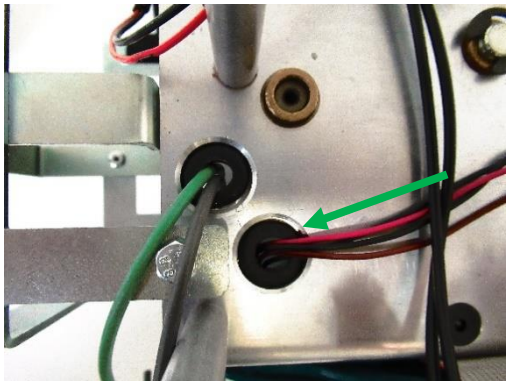
1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Disconnect the power lead from the PCB.



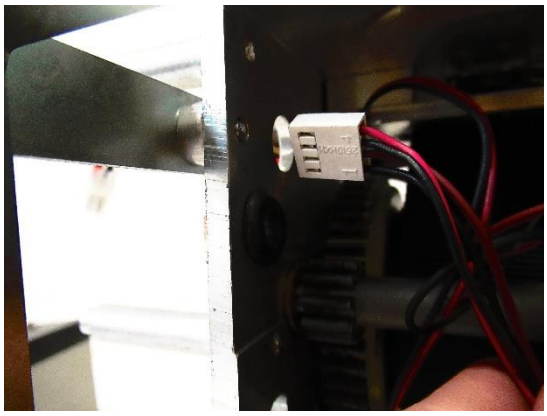
3. Remove the bottom cover from the ceiling lift. (Refer to section 8.2)
4. Remove the motor side battery from the ceiling lift. (Refer to section 8.3)
5. Remove the lift motor from the ceiling lift. (Refer to section 8.5)
6. PCB removal is recommended for easier access. (Refer to section 8.4)
7. Remove the lift tape from the ceiling lift (Refer to section 8.6)
8. If the PCB hasn't been removed, disconnect the limit switch cable from its allocated port on the PCB.



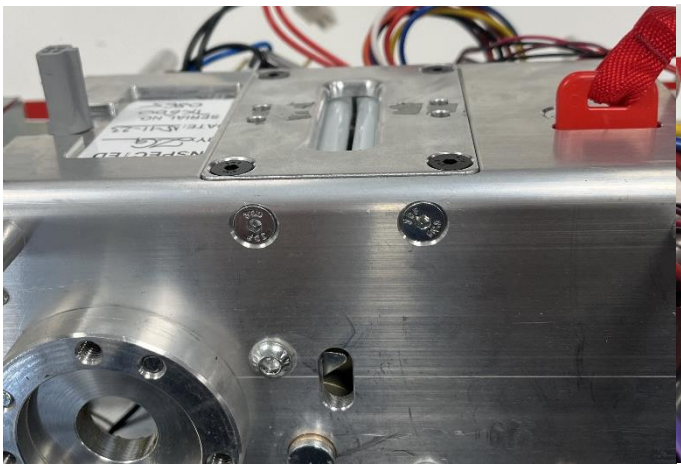
9. Using a slotted screw driver, prise the limit switch cable grommet from the chassis.

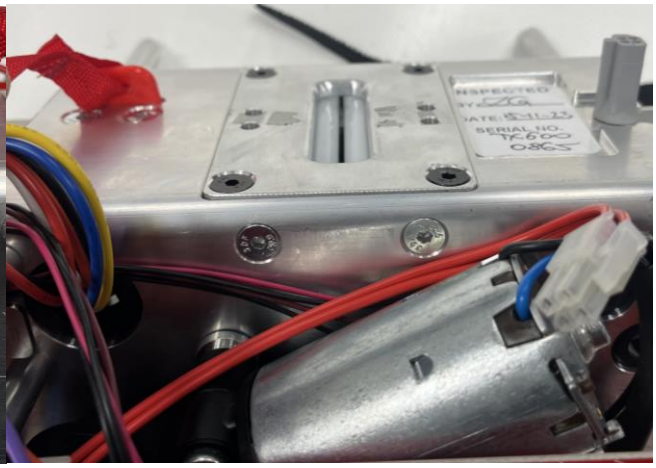


10. Guide the limit switch cable through the chassis.

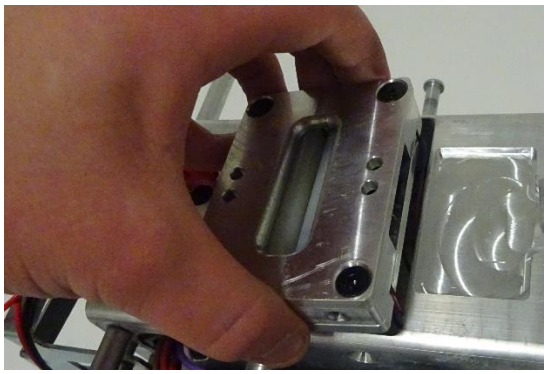


11. Using a 3mm Allen Key, remove the four screws securing the limit switch block on either face of the chassis.





12. Once the four screws have been removed, remove the limit switch block from the underside of the chassis. Be careful not to trap/catch the wiring while removing.

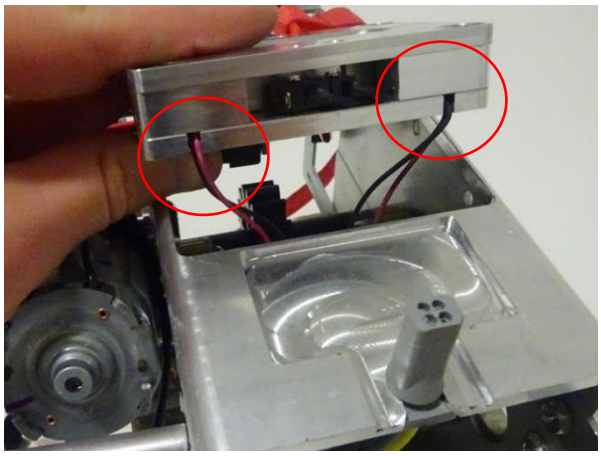


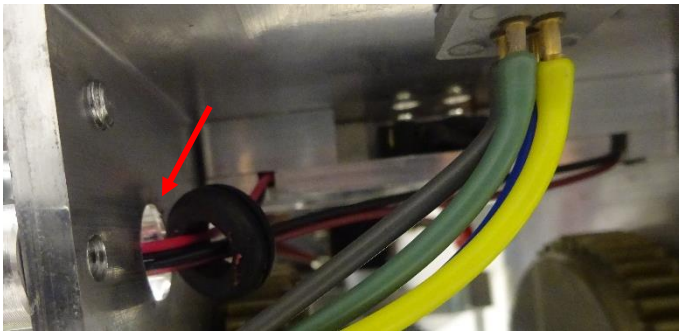
Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

- Ensure that the wiring is inserted through the chassis opening first.
- Be careful not to trap the wiring during fitting.
- Ensure that the limit switch block is fitted in the correct orientation. The wiring should be facing the motor side of the ceiling lift (wires will face the same direction as the air grommet).

- Once the limit switch block is secured, pull the wiring through the grommet hole and ensure the wiring slackness is on the outside of the chassis. Do not allow slack cable on the inside of the chassis as this could risk contact with the gearing.
- Ensure that the grommet is secure in the chassis.



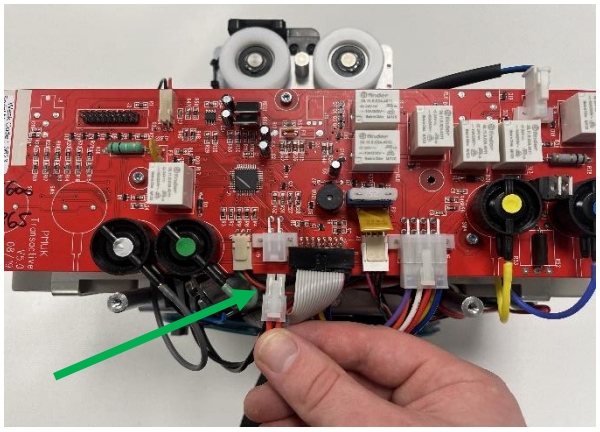


8.9 Toggle Switch and E-Lower Cord

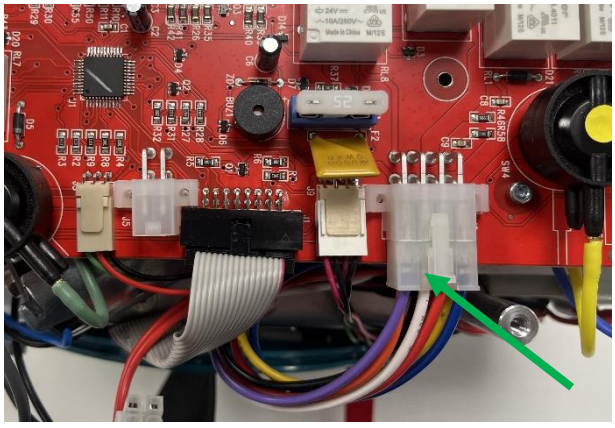
This section will cover the details of how to remove, refit and replace the Toggle Switch.

Removal

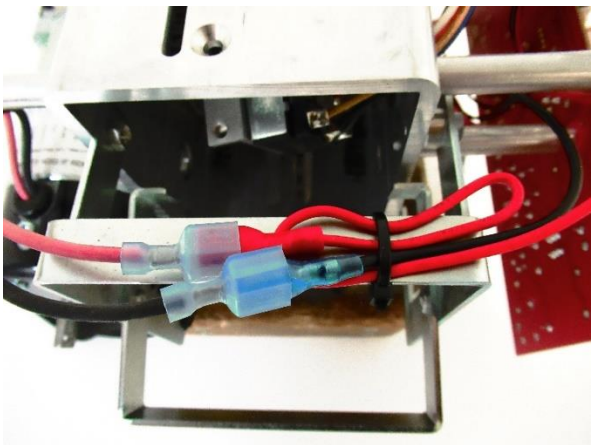
1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Disconnect the power lead from the PCB.



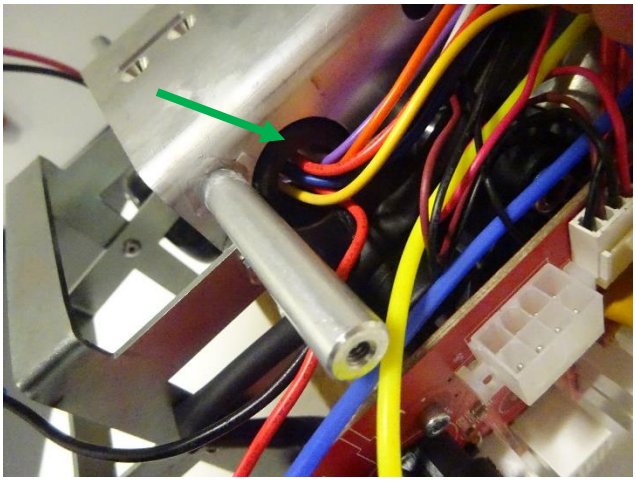
3. Remove the bottom cover from the ceiling lift. (Refer to section 8.2)
4. Remove the toggle switch side battery from the ceiling lift. (Refer to section 8.3)
5. Disconnect the toggle switch from the PCB.



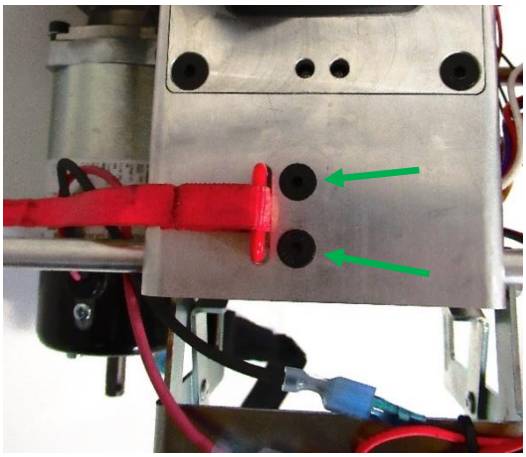
6. Disconnect the motor wires from the toggle switch terminals.



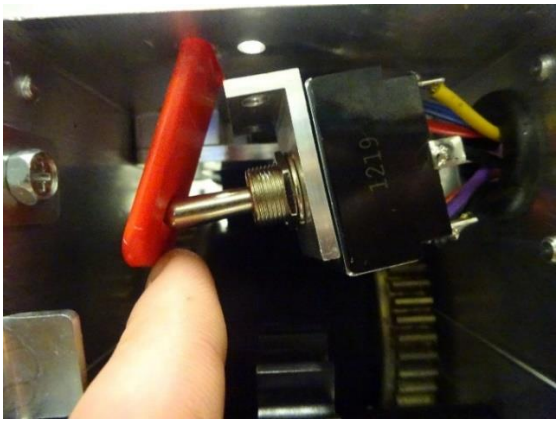
7. The cable tie may need cutting to release the toggle switch cables.
8. Using a slotted screw driver, detach the large grommet by pushing it through the chassis.



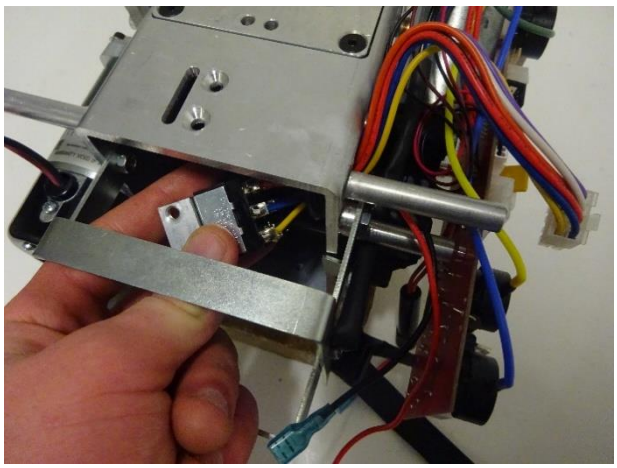
9. Using a 3mm Allen Key, remove the two M5 countersink screws from the underside of the chassis.



10. Unhook the e-lower cord from the toggle switch inside the chassis.



11. Pull the red cord through the chassis slit to remove.
12. Pull the toggle switch block through the side opening of the chassis, be careful not to damage the wiring during removal.



Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

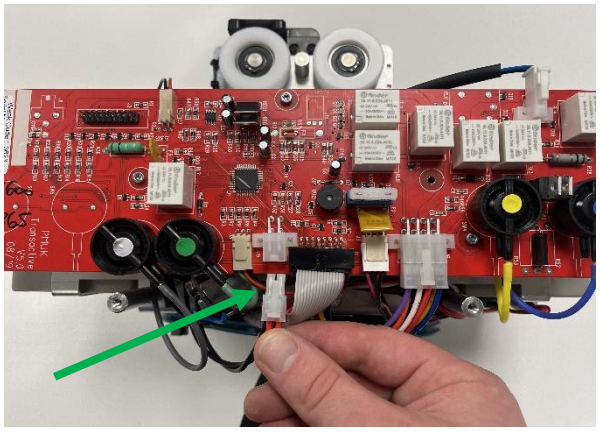
- Be careful not to trap the wiring during fitting.
- Once the toggle switch block is secured, pull the wiring through the grommet hole and ensure the wiring slackness is on the outside of the chassis. Do not allow slack cable on the inside of the chassis as this could risk contact with the gearing.
- Ensure that the grommet is secure in the chassis.
- A cable tie is required to secure the motor cables to the underside of the battery bracket.
- The red cord warning label should be facing the lift motor.
- The red cord will sit on the switch before securing the M5 countersink screws.

8.10 Air Grommet

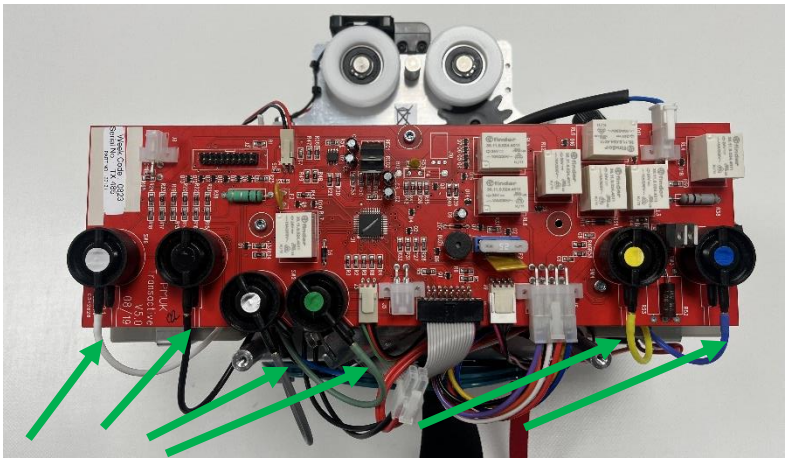
This section will cover the details of how to remove, refit and replace the Air Grommet.

Removal

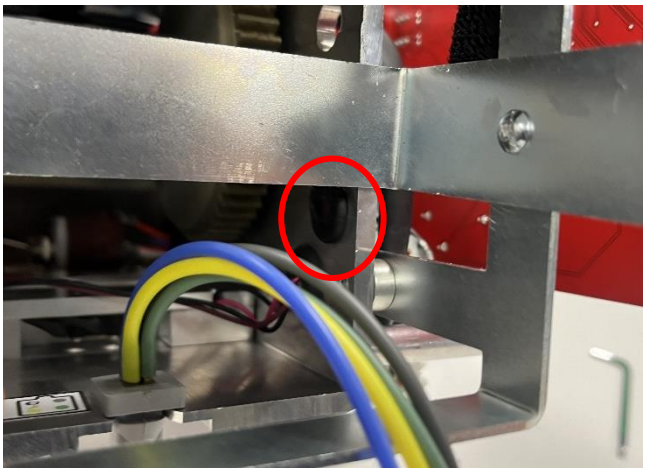
1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Disconnect the power lead from the PCB.



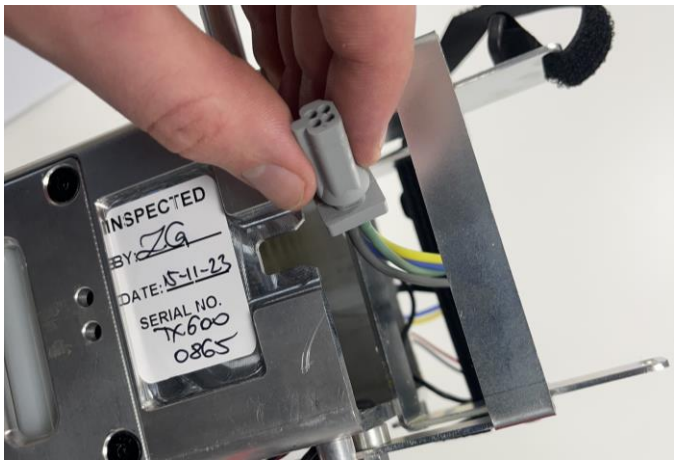
3. Remove the bottom cover from the ceiling lift. (Refer to section 8.2)
4. Remove the motor side battery from the ceiling lift. (Refer to section 8.3)
5. Disconnect the air tubes from their designated air switches on the board. The tubes are colour coded to match the stickers found on the air switches.



6. Pull the air tubes through the grommet on the side face of the chassis.



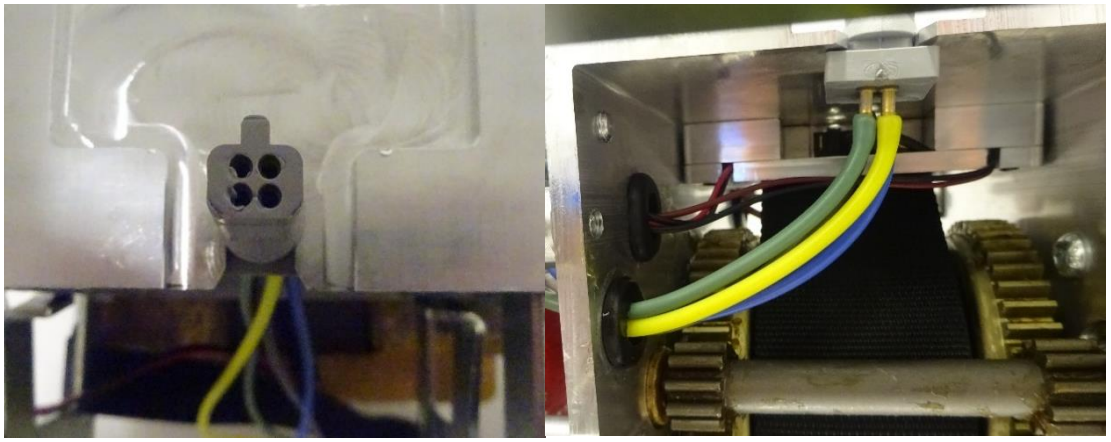
7. Slide the air grommet out of the chassis as shown.



Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

- Fit the air grommet back into position and ensure to align in the correct orientation.
- Be careful not to trap the air tubes during fitting.
- Once the air grommet is secured, pull the air tubes through the grommet hole and ensure the tube slackness is on the outside of the chassis. Do not allow slack tubes on the inside of the chassis as this could risk contact with the gearing.
- Insert the coloured air tubes back onto their colour matching air switches. Make sure to fit the air tube fully onto the brass inserts for secure connection.

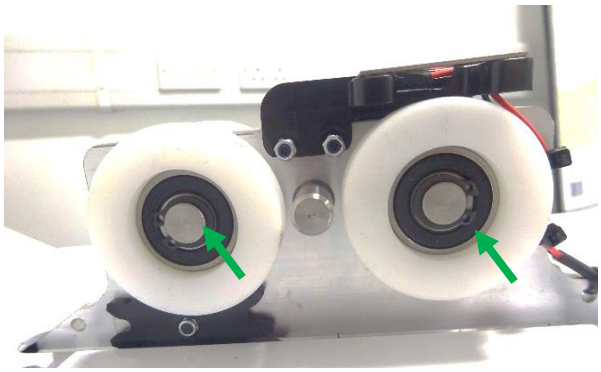


8.11 Standard Wheels

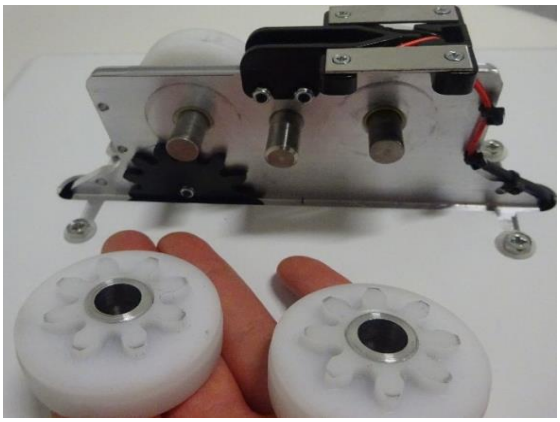
This section will cover the details of how to remove, refit and replace the standard wheels, this section covers all wheel variants excluding the QRT wheel assembly. The images below refer to track type 1 wheels but the same procedure will apply to all other track types.

Removal

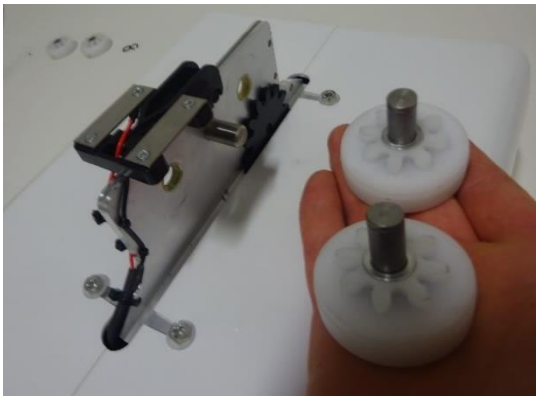
1. Using circlip pliers, remove the circlips from the wheel axel on both wheels.



2. Remove the wheels and spacers from the circlip side of the chassis trolley.



3. Remove the axels with the remaining wheels and spacers from the opposite side of the chassis.

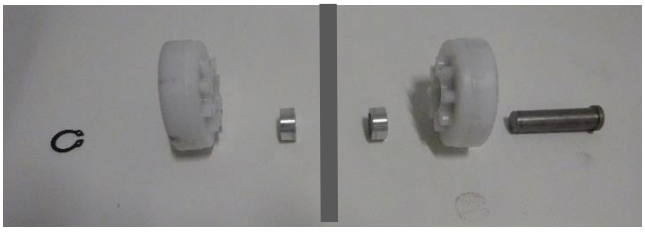


4. There may be shim washers found spacing out the wheels on either side. Ensure to note their location for refitment.

Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

- When refitting the wheels, see the exploded diagram below for guidance on the assembly order.
- Inspect the condition of the e-clips, if the clips have been stretched, replace with a new e-clip.

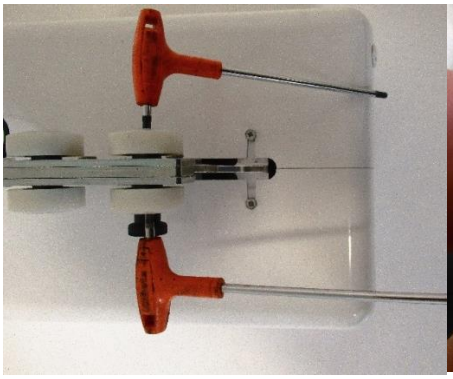


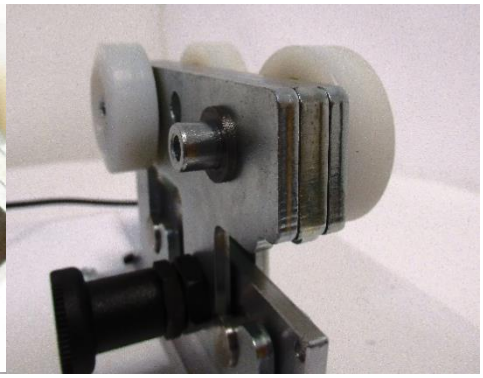
8.12 QRT System Wheels

This section will cover the details of how to remove, refit and replace the QRT system wheels. The images below refer to track type 1 wheels but the same procedure will apply to all other track types.

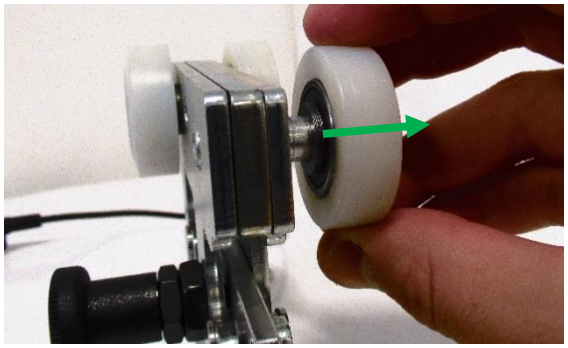
Removal

1. Using two 4mm Allen Keys, remove the screw, the wheels and the seven washers from the axels securing the wheel assemblies.





2. Remove the axels with the remaining wheels and washers from the opposite side of the chassis.



Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

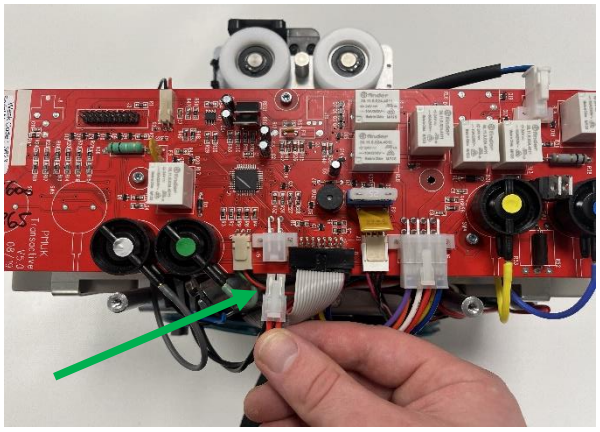
- Make sure to fit the seven washers on either side of the trolley during refitment.

8.13 Standard Charging Beak

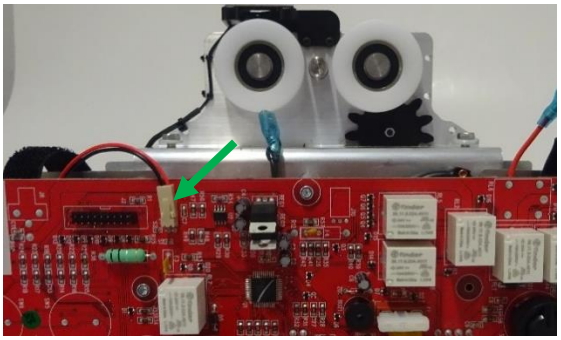
This section will cover the details of how to remove, refit and replace the standard charging beak.

Removal

1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Disconnect the power lead from the PCB.

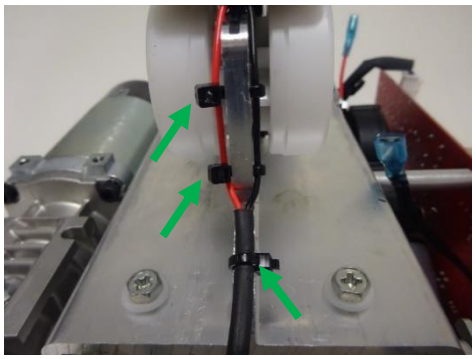


3. Disconnect the charging beak cable from the PCB port.

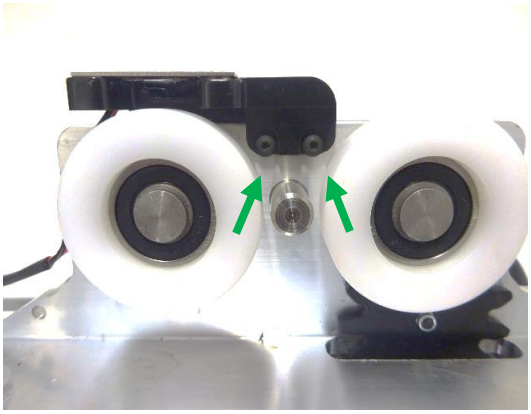


4. Release the top Velcro strap from the motor side battery.

5. Cut the three cable ties which route the beaks cable up to the top of the trolley.



6. Using a 2mm Allen Key, remove the two M3 screws which secure the charging beak to the trolley top. It is easier to remove the screws by using long nose pliers to pinch the M3 nyloc nuts on the rear side.



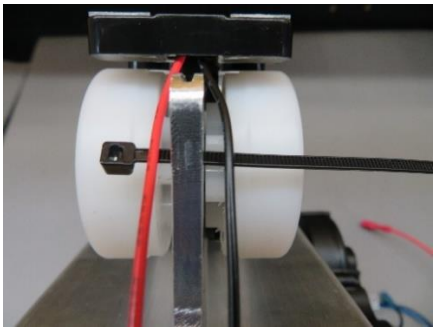
Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

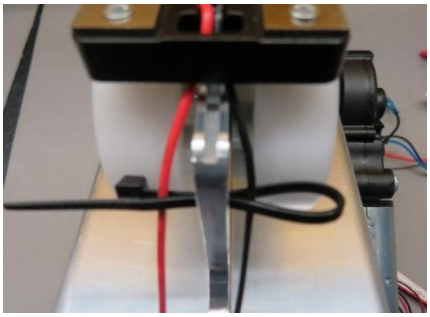
- Three cable ties are required to re-route the cable along the side face of the chassis trolley.
- Ensure to route the beak cable under the top Velcro strap on the battery bracket.

Cable tie instructions

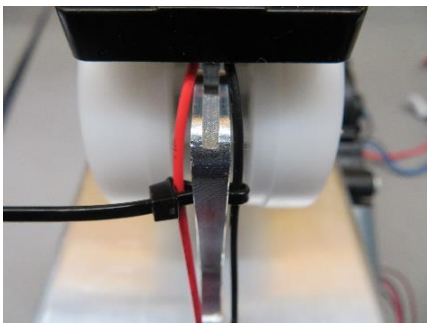
1. Insert the first cable tie through the top hole in the chassis and along the back of the red and black wires



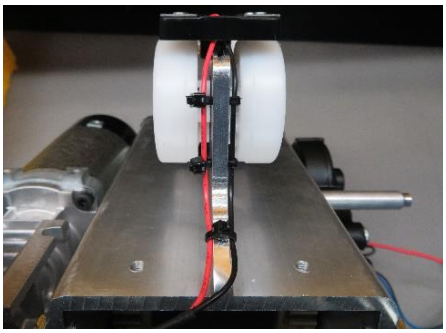
2. Fold the cable tie around the Black wire and pass the cable tie back through the hole and over the Red wire.



3. Tie the cable tie to retain the black and red wire.



4. Repeat step 1-3 for the second cable tie.
5. For the final cable tie, (bottom hole), pass the cable tie through the hole and then back around across the red and black wires and chassis face.



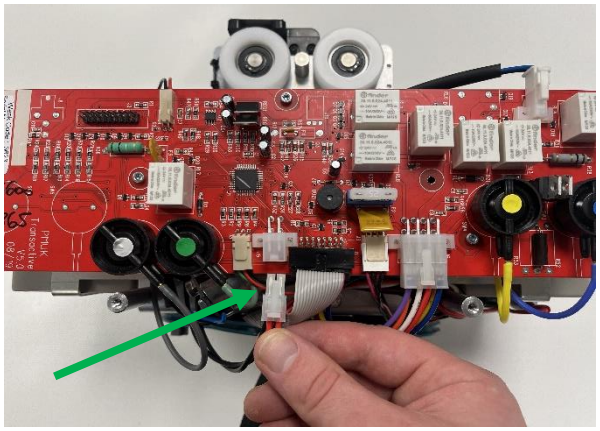
6. Cut the surplus of the three cable ties once secure.

8.14 Charging Beak (Varient Beak type)

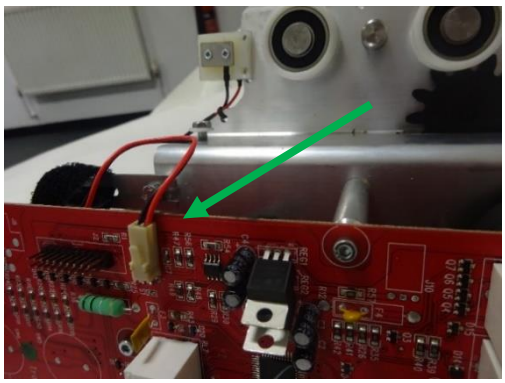
This section will cover the details of how to remove, refit and replace the variant charging beak.

Removal

1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Disconnect the power lead from the PCB.

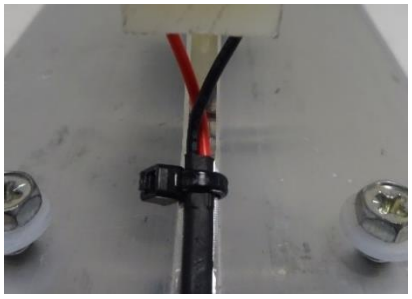


3. Disconnect the charging beak cable from the PCB port.

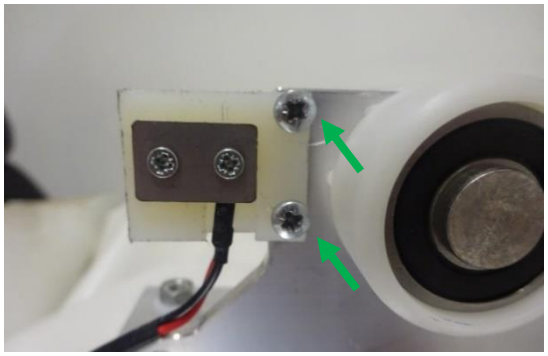


4. Release the top Velcro strap from the motor side battery.

5. Cut the single cable tie which route the beaks cable up to the top of the trolley.



6. Using a pozi-screwdriver, remove the two screws securing the beak to the trolley.



Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

- One cable tie is required to re-route the cable along the side face of the chassis trolley.
- Ensure to route the beak cable under the top Velcro strap on the battery bracket.

Cable tie instructions

1. Pass the cable tie through the hole and then back around across the red and black wires and chassis face.

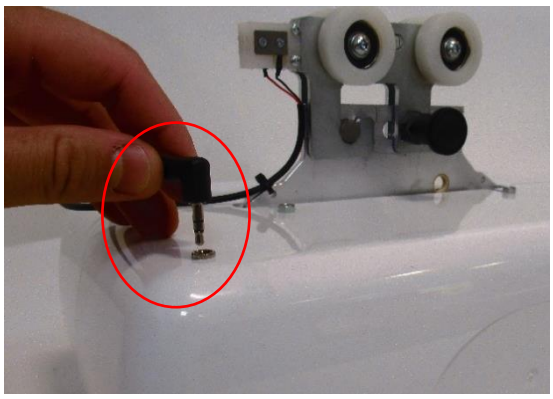
2. Cut the surplus of the cable tie once secure.

8.15 QRT System Charging Beak

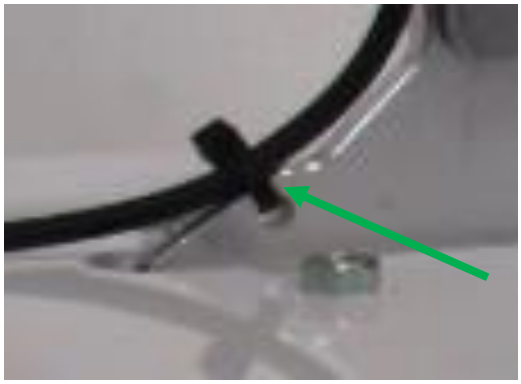
This section will cover the details of how to remove, refit and replace the QRT system charging beak.

Removal

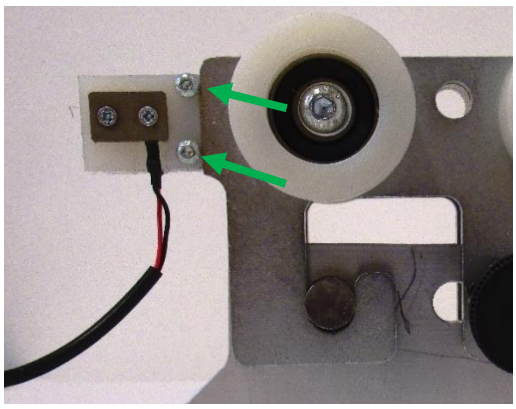
1. Disconnect the beak jack plug from the top side of the side cover port.



2. Cut the cable tie securing the wire to the chassis trolley.



3. Using a pozi-screwdriver, remove the two screws securing the beak to the trolley.



Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

- One cable tie is required to re-route the cable along the side face of the chassis trolley.

Cable tie instructions

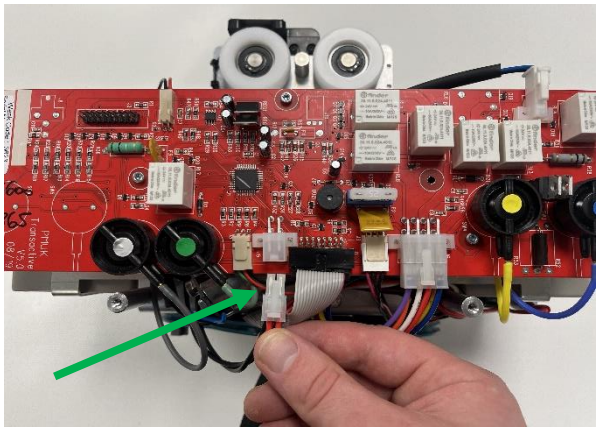
1. Pass the cable tie through the hole and then back around across the red and black wires and chassis face.
2. Cut the surplus of the cable tie once secure.

8.16 Constant Charge Beak

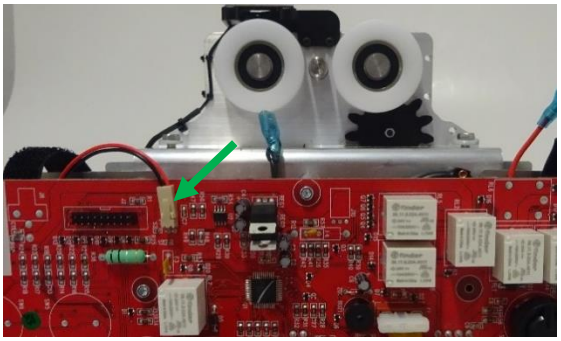
This section will cover the details of how to remove, refit and replace the constant charge beak.

Removal

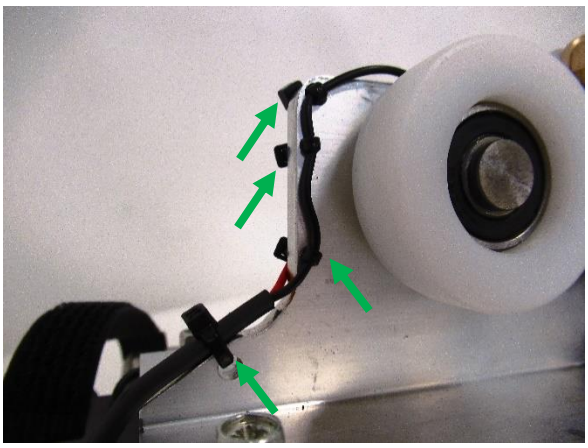
1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Disconnect the power lead from the PCB.



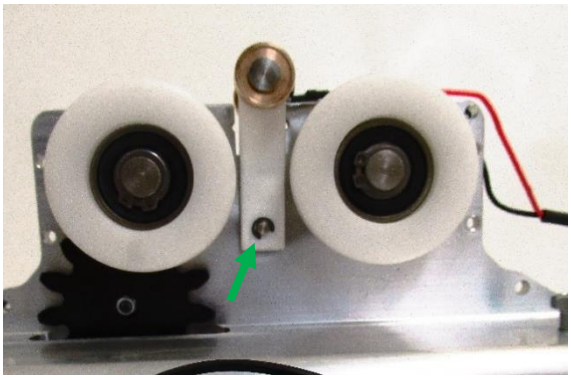
3. Disconnect the charging beak cable from the PCB port.



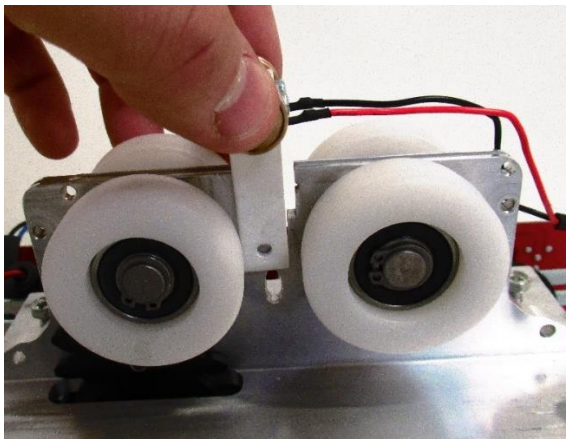
4. Release the top Velcro strap from the motor side battery.
5. Cut the four cable ties which route the beaks cable up to the top of the trolley.



6. Using a 2mm slotted screwdriver, remove the e-clip securing the charging beak pin.



7. Remove the pin to release the charging beak. Ensure not to lose the spring situated inside the beak.



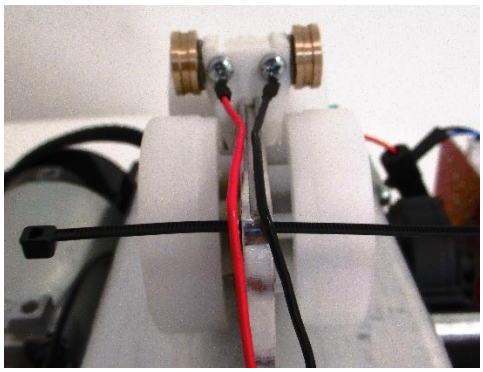
Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

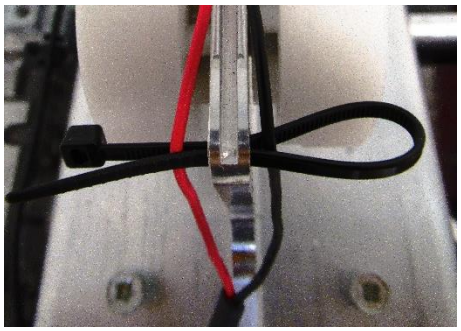
- When sliding the constant charge beak into position, ensure to fit the spring into the hole at the top of the chassis trolley before placing the beak on top. The spring allows the beak to move vertically and touch onto the charging strips.
- Three cable ties are required to re-route the cable along the side face of the chassis trolley.
- Ensure to route the beak cable under the top Velcro strap on the battery bracket.

Cable tie instructions

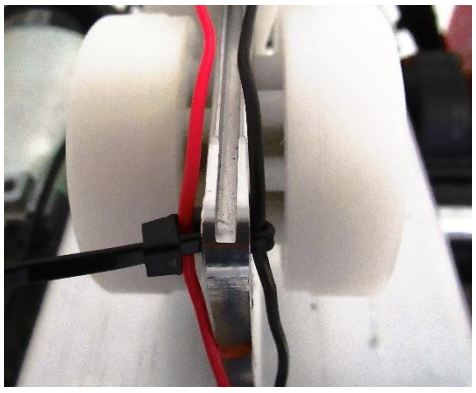
1. Insert the first cable tie through the top hole in the chassis and along the back of the red and black wires



2. Fold the cable tie around the Black wire and pass the cable tie back through the hole and over the Red wire.



3. Tie the cable tie to retain the black and red wire.



4. Repeat step 1-3 for the second and third cable tie.
5. For the final cable tie, (bottom hole), pass the cable tie through the hole and then back around across the red and black wires and chassis face.

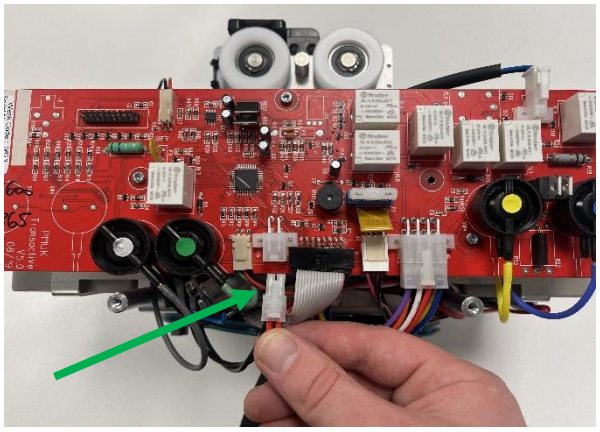
6. Cut the surplus of the four cable ties once secure.

8.17 Battery Fuse

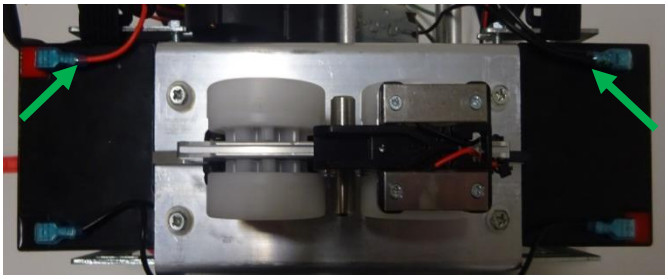
This section will cover the details of how to remove, refit and replace the battery fuse.

Removal

1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Disconnect the power lead from the PCB.



3. Release the top Velcro strap from both batteries to access the battery cables.
4. Disconnect the power lead from the batteries to remove.



5. Unscrew the fuse holder on the power lead to access the fuse.

Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

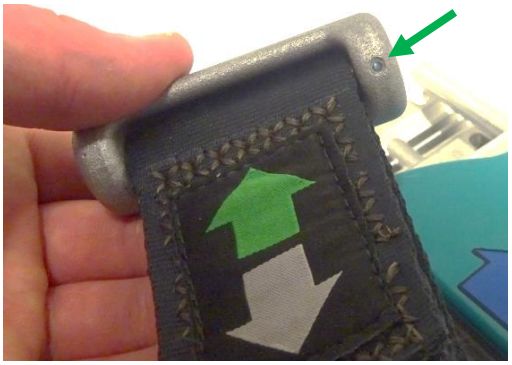
- Ensure to connect the red lead back to the red battery terminal and the black lead to the black battery terminal.

8.18 QRS Hook

This section will cover the details of how to remove, refit and replace the QRS Hook.

Removal

1. Using a 2mm Allen Key, loosen the grub screw from the hook until it releases the pin. The grub screw doesn't need to be fully removed.

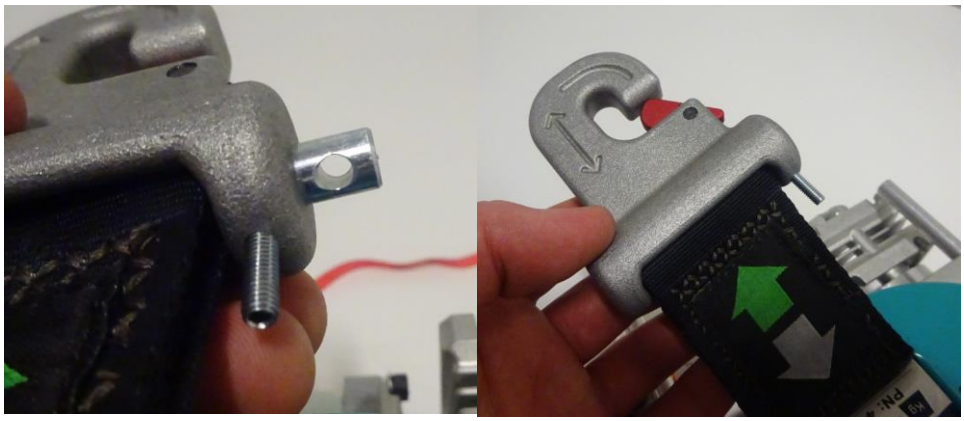


2. Slide the pin out from the lift tape to release the QRS Hook.

Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

- Ensure that the hole in the pin aligns with the grub screw.
- Ensure that the red tab on the QRS Hook is facing the motor face of the chassis.
- Care must be taken not to damage the lift tape when inserting the pin through the loop.

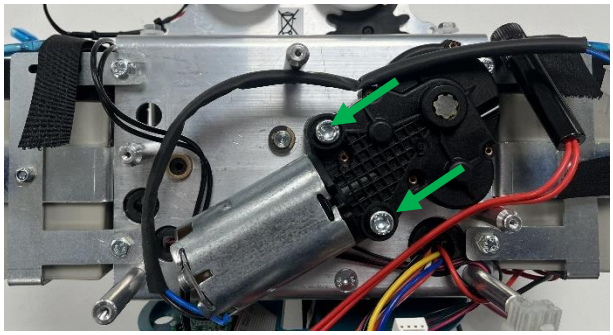


8.19 Drive Motor

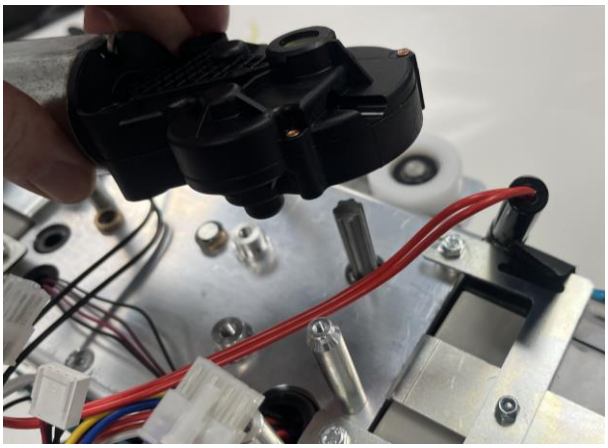
This section will cover the details of how to remove, refit and replace the Drive Motor. (Only applicable to powered traverse ceiling lifts)

Removal

1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Remove the PCB from the ceiling lift. (Refer to section 8.4)
3. Using a 5mm Allen Key, remove the two M6 Bolts which secure the drive motor to the chassis.



4. Slide the motor of the drive shaft.



Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

- Ensure to align the drive motor in the correct orientation for mounting

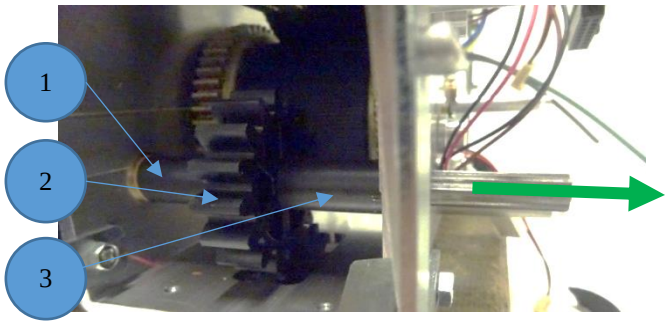
8.20 Drive Shaft Assembly

This section will cover the details of how to remove, refit and replace the Drive Shaft Assembly. (Only applicable to powered traverse ceiling lifts)

Removal

1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Remove the PCB from the ceiling lift. (Refer to section 8.4)
3. Remove the drive motor from the ceiling lift. (Refer to section 8.19)
4. Remove the toggle switch side battery from the ceiling lift. (Refer to section 8.3)
5. Using a slotted screwdriver, remove the 8mm e-clip from the traverse shaft.

6. Remove the washer situated behind the e-clip.
7. While supporting the two black spacers and the large idle gear, slide the drive shaft out of the chassis. (It's good to note which spacer is which as they are different lengths and must be refitted correctly).

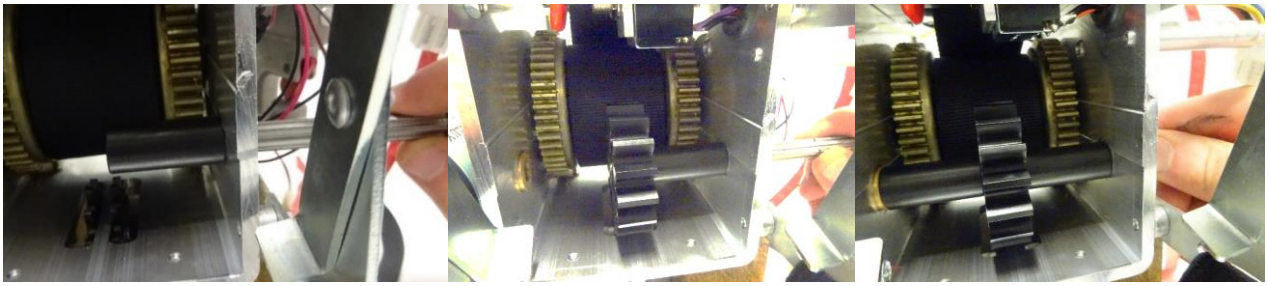


8. Remove the two black spacers and large idle gear from the chassis.

Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

- Begin to insert the drive shaft, with the longest spacer (37.1mm) placed on the shaft first, then the large idle gear then the shortest spacer (34.3mm).
- Push the shaft into the bush at the opposite end of the chassis. Ensure the shaft is flush with the bush.
- Make sure to position the washer and secure the e-clip to the shaft once inserted.

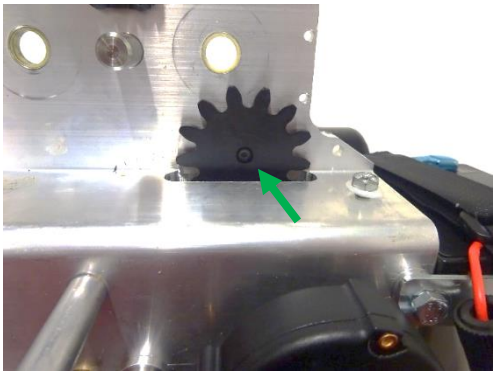


8.21 Small Drive Idle Gear

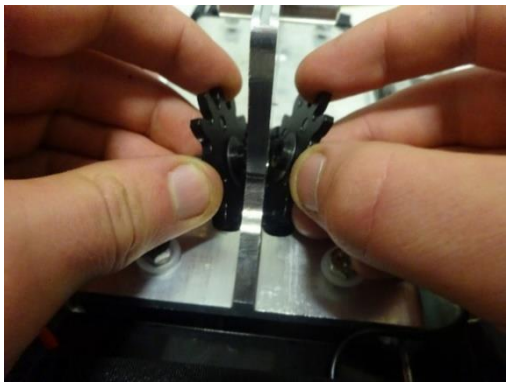
This section will cover the details of how to remove, refit and replace the Small Drive Idle Gear. (Only applicable to powered traverse ceiling lifts)

Removal

1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Remove the wheel directly above the idle gear. (Refer to section 8.11)
3. Using a 2mm Allen Key, remove the M3 screw and M3 nyloc nut to release the idle gear. We recommend using long nose pliers to grip the nyloc nut.



4. Split the male and female parts of the idle gear and remove. Ensure to grab the washers placed behind the mating parts.



Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

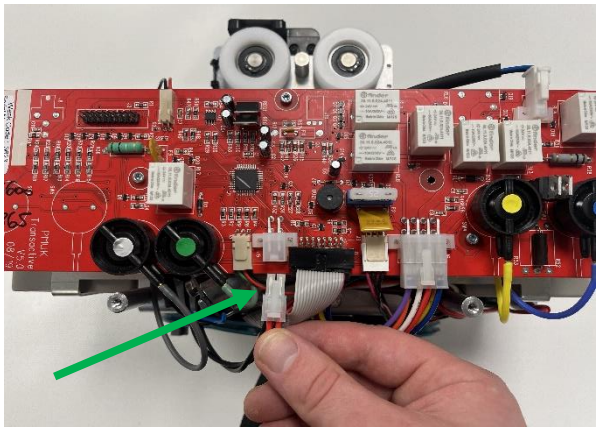
- Ensure to position the shim washers behind the mating parts when joining the idle gear.
- Position the female mating part on the same chassis face as the PCB.
- When securing the two parts together with the screw, do not overtighten. Once tight, loosen the screw by a half turn to allow the gear to rotate freely.

8.22 Auxiliary Beak

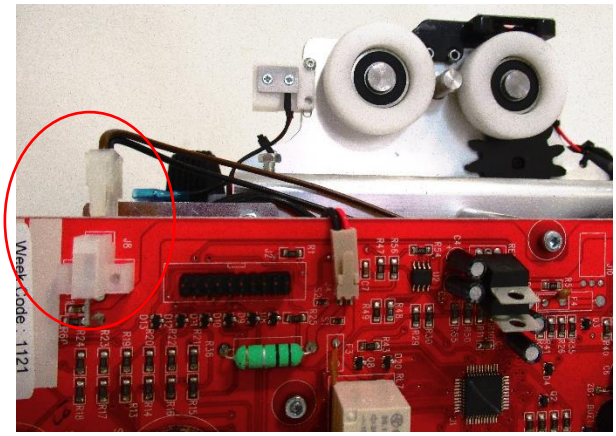
This section will cover the details of how to remove, refit and replace the auxiliary beak . (Only applicable to auxiliary ceiling lifts – 6-way ceiling lift)

Removal

1. Remove the side covers from the ceiling lift. (Refer to section 8.1)
2. Disconnect the power lead from the PCB.

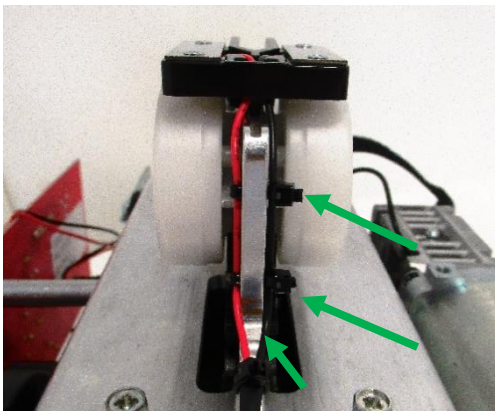


3. Disconnect the auxiliary beak cable from the PCB port.

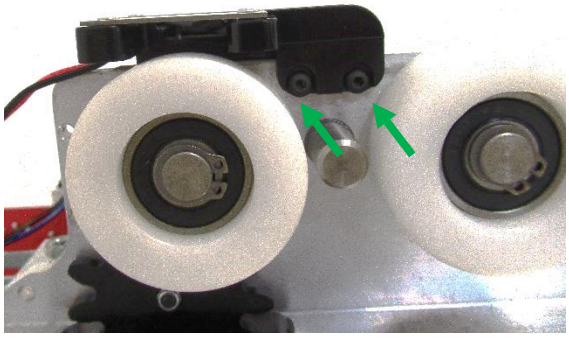


4. Release the top Velcro strap from the toggle switch side battery.

5. Cut the three cable ties which route the beaks cable up to the top of the trolley.



6. Using a 2mm Allen Key, remove the two M3 screws which secure the charging beak to the trolley top. It is easier to remove the screws by using long nose pliers to pinch the M3 nyloc nuts on the rear side.



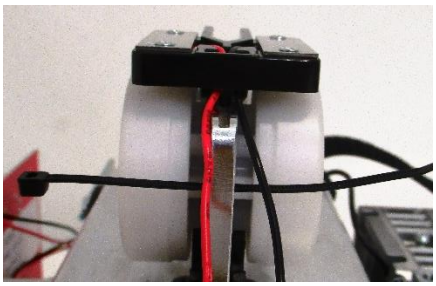
Refitting / Replacement

Refitting is a reversal of the removal process noting the following points:

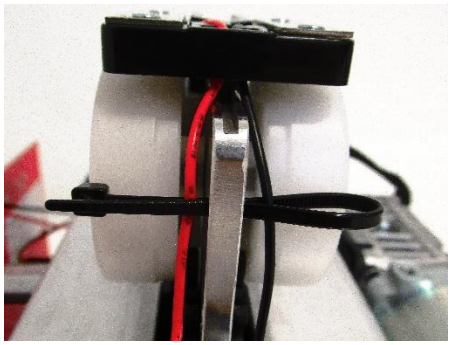
- Three cable ties are required to re-route the cable along the side face of the chassis trolley.
- Ensure to route the beak cable under the top Velcro strap on the battery bracket, then route the cable behind the PCB up until the auxiliary port on the opposite side.

Cable tie instructions

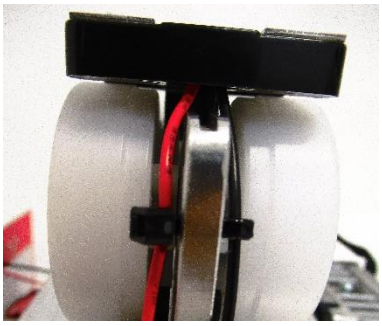
1. Insert the first cable tie through the top hole in the chassis and along the back of the red and black wires



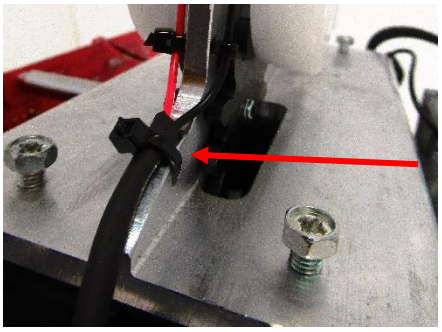
2. Fold the cable tie around the Black wire and pass the cable tie back through the hole and over the Red wire.



3. Tie the cable tie to retain the black and red wire.



4. Repeat step 1-3 for the second cable tie.
5. For the final cable tie, (bottom hole), pass the cable tie through the hole and then back around across the red and black wires and chassis face.



6. Cut the surplus of the three cable ties once secure.

Dealer/service contact details:

Contact details:

Mackworth USA
54 West Industrial Drive
O'Fallon, MO 63366 USA
314-889-1000
www.mackworthusa.com

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