Service guide TAWI Lifting Trolleys

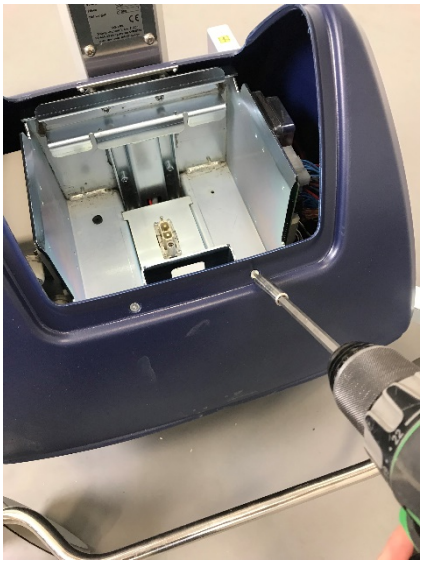
Content

General

Opening the top cover (A)

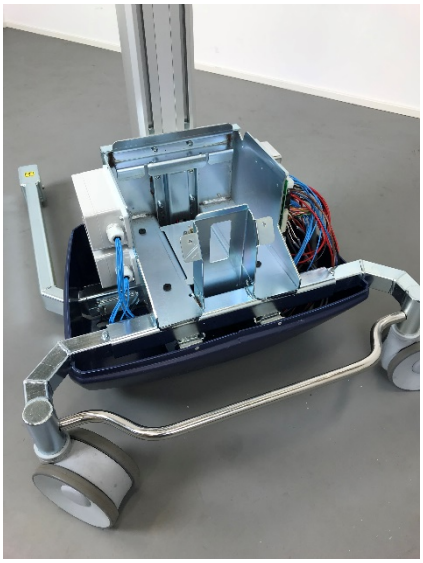
1. To get into main body of the lifter, start with removing the battery pack.

2. Use an Allen key to loosen the 4x bolts on the machine plate bracket (*make sure just to loosen the bolts, the attachment nuts will turn when screws are loosened so no need to remove screws completely*).



3. When the machine plate screws are loosened, then remove the two rear screws by using an Allen key.

4. When screws are removed, lift the top cover off the lifter.



5. The top cover is removed and now all components inside the unit, like motherboard, motor control board and circuit boards for any electrical tools, will be exposed.

Legs and wheels

Changing legs (B)

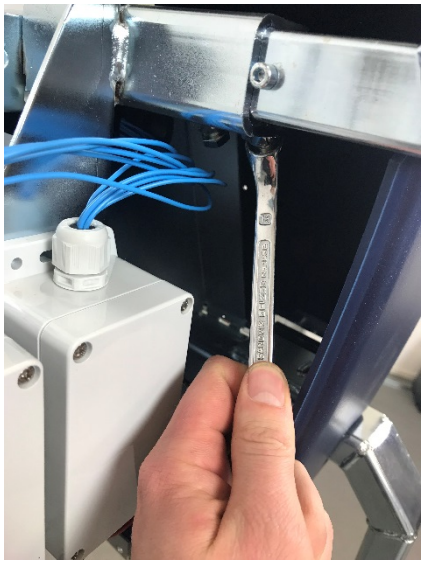
1. Lean the lifter and place it on its back.
2. Loosen and remove the screw closest to the mast.
3. Loosen, but do not remove, the other screw (located farthest away from the mast).

4. Refit the removed screw into the middle position to enable the leg to move.
5. Pull out leg.
6. Do same procedure on other leg.

More details about leg adjustment can be found in manual on page. 21.

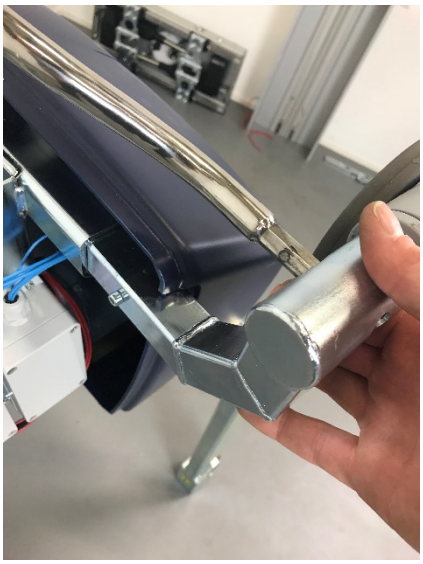
Changing rear wheels (C)

1. Lean the lifter and place it on its front, with the rear wheels pointing up.



2. Always start with the left-hand side leg (seeing from operators view).

3. Loosen 2x screws that hold rear leg into place. Don´t remove screws completely, just loosen hem enough so leg can be pulled out.



4. Pull out the leg.

5. Pull central brake bar from the right hand rear leg.

6. Loosen the bolt holding the rear wheels to the rear legs.

7. Pull out the wheel.

8. Replace wheel with new one.

   Important to verify which direction the brake function is and which direction the directional lock is. Mounting wheel 180° wrong will invert the brake and directional lock function.

Changing front wheel (D)

1. Lean the lifter so front wheel will be free from the ground.

2. Use an Allen key to loosen the 2x bolts.

3. Pull out wheel, axle and spacers.

4. Pull out axle from old wheel and replace wheel with new one.

5. Mount axle back into wheel and add spacers.

6. Mount back into leg.

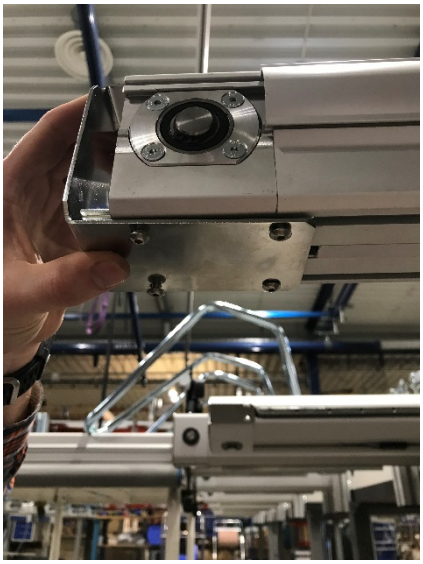
Mast

Changing belt, sleigh wheels and tightening belt (E)

1. Lean the lifter and place it on its back.

2. Start with loosen the two front bolts on top cover

3. Loosen the four bolts on the back of the top cover, make sure that bolts not are completely loosen. The can still be attached to the t-slot nut.



4. Pull the top cover with the t-slot nuts out from mast top.

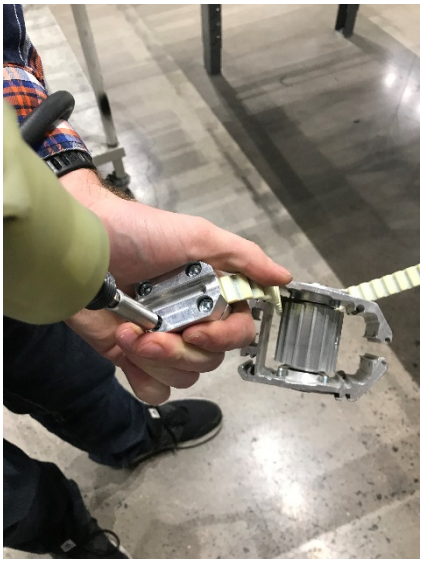
5. Push the sleigh to the top position.

6. Loosen the top security bolt with an Allen key.

7. Loosen the chain tension bolt with an Allen key.

   Note how far into the sleigh the belt lock is. This is an indication for the belt tension, when assembled back together the position of belt lock should be in the same position.

8. Pull the mast top and belt lock out through top of mast.



9. Loosen the four bolts clamping the upper and lower belt lock parts together.

10. Remove belt lock.

    Note which direction the belt lock is aligned.
    Also note how many belt teeth that are inside the belt lock.

11. Pull belt out from mast top profile.

12. Take approx. 1m tape or similar and stick it to the belt, then fold it together so it will generate a 500mm long extra support.

    This piece of tape will prevent the belt from disappearing inside the mast profile when pulling out the sleigh.

13. Pull out the sleigh carefully.

    Make sure now that the tape attached don't disappear fully inside the mast profile. This will be needed later when placing back the sleigh.

14. Open retaining rings carefully with a retaining ring pliers.

    Note that you don't use to much force, too much force on the retaining rings will damage then and they won't be able to reuse.

15. Remove sleigh wheel and replace with a spare wheel.

16. Redo the operation on existing wheels, until all are replaced.

    Note that if wheels are mounted with shims between spacer and wheel, that this should be replaced in the same conditions.

17. When all wheels are replaced, then place sleigh back into mast profile.

18. Use tape you mounted in step 12 to pull the belt out from the lower part of profile while you push the sleigh further down the profile.

19. Pull the belt trough the mast top part.

20. Place the belt lock halves on the belt.

    Make sure belt lock is in correct orientation.
    make sure that the same number of teeth of belt are inside the belt lock as it was originally.

21. Place mast top into place.

22. Pull the sleigh into top position.

23. Push belt lock into slot of sleigh.

24. Pull the sleigh towards you at the same time as you use the Allen key to push the belt lock into place and tighten the screw.

25. Screw until the belt lock is in the same position as it was originally.

26. Test the belt tension by pushing the Allen key for example on the belt, the belt should flex about 10mm when properly tightened.

27. Screw the top security bolt back into place.

28. Push the top cover into place.

29. Secure the 4 bolts on the back, and the two screws in the front.

30. Raise lift onto its legs.

31. Test function of sleigh up/down.

32. If downwards movement is to slow and have too much friction, try to loosen the belt tension slightly.

Motor

Changing motor (F)

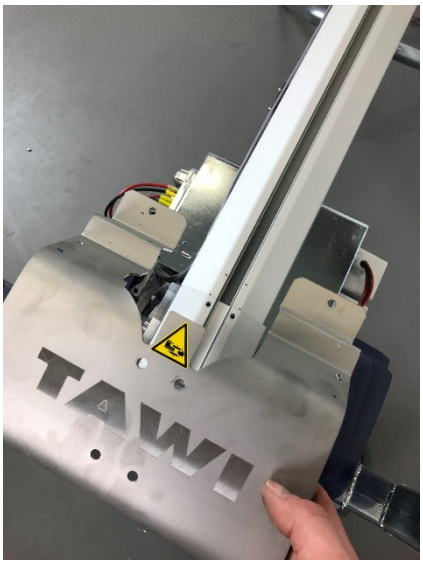
1. Start with removing the top cover, please see chapter (A) of how to remove the top cover.

2. Once top cover is removed, drill out the 2x pop rivets at the rear of the unit holding the bottom cover in place.

3. Loosen and remove the 6x screws holding the motor cover.

4. Loosen and remove the 2x bottom screws holding the motor cover.

5. Drill out the 8x pop rivets that connects the bottom cover to the motor cover.

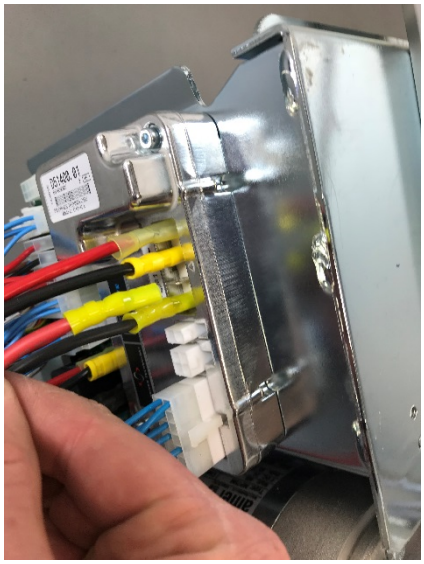


6. Remove side cover on the mast.

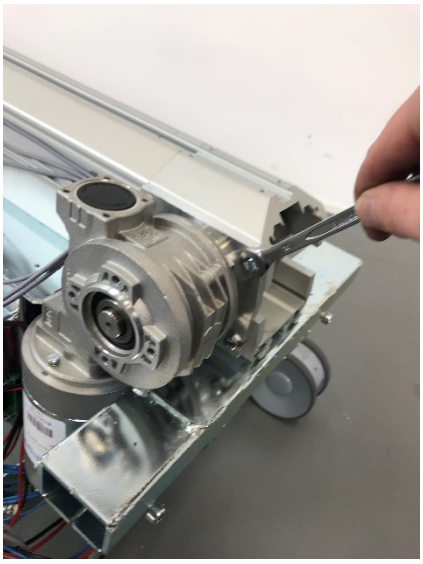
7. Motor cover should now be loose, pull out from trolley.

8. Loosen and remove legs according to section “Legs”.

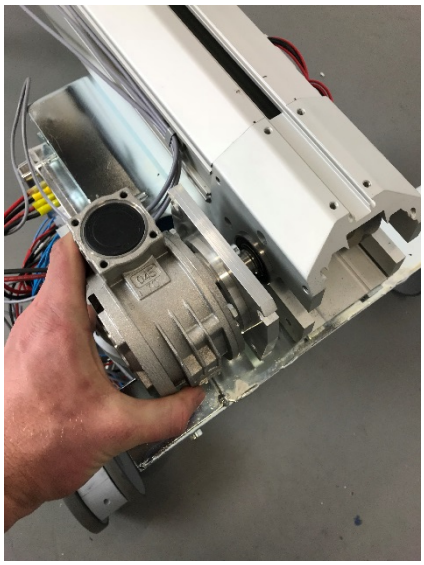
9. Bottom cover should now be able to be removed.



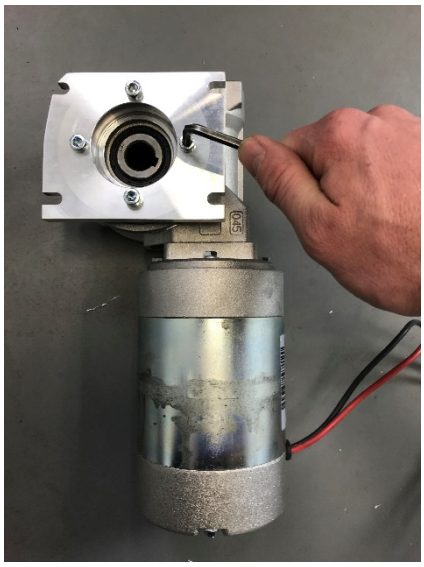
10. Start with removing the motor cables from the motor control board. Note which color is placed where on the motor control board.



11. Use a #10 wrench key to loosen and removing the 4x bolts connecting motor bracket to mast.



12. Motor and motor bracket should now be free, and could be removed by pulling the motor to side.



13. Motor can now be removed from the motor bracket by loosen and removing the 4x screws.

14. Replace motor, and mount the motor bracket back into place.

15. Place motor back onto shaft.

16. Tighten the 4x screws holding the motor and motor bracket to the mast profile.

17. Mount bottom cover back into place.

18. Place motor cover back into place.

19. Tighten the 6x screws holding motor cover onto mast and chassis.

20. Tighten 2x screws from bottom of motor cover.

21. Use new pop rivets and a pop rivets plier to fasten the 8x pop rivets between the motor cover and bottom cover.

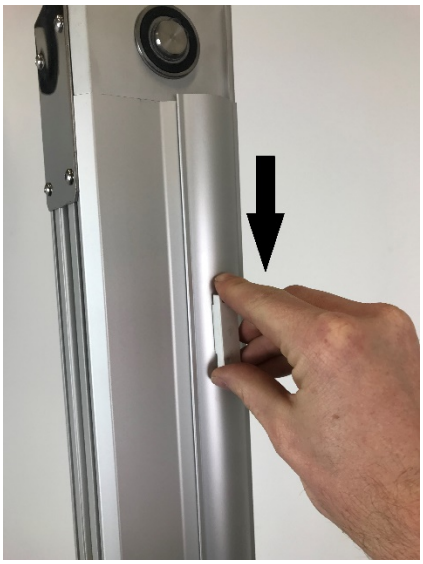
22. Turn trolley around and attach the 2x pop rivets with a pop rivet plier, that holds the bottom cover to the chassis.

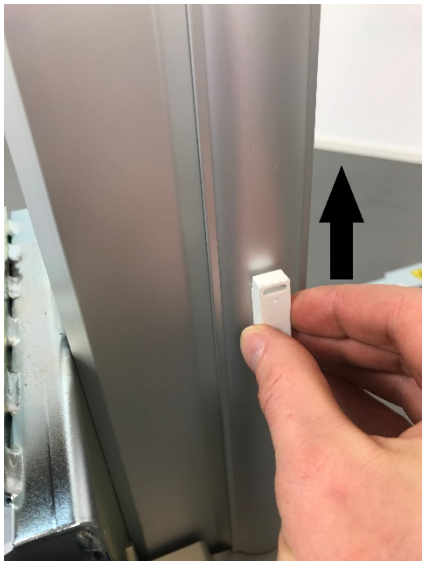
23. Stand trolley up, and mount back the side cover on the mast.

24. Mount back top cover.

Limit switches

Checking limit switches if not sleigh moves up/down (G)





1. If sleigh by any chance stopped moving up, check then that top limit switch haven´t been locked in activated position.
2. To verify this, use a magnet (any type of magnet will work), and drag it above the cover lid on the mast where the limit switch is located. Drag the magnet from above and downwards.
3. Then test and see if sleigh will move upwards by pressing “UP” button on the hand control.
4. Another way is to manually move the tool by pulling the tool to top position.
5. If sleigh on other hand won´t move downwards, do the same thing using a magnet but drag it from bottom and upward above the bottom limit switch.
6. Then test and see if sleigh will move downwards by pressing “DOWN” button on the hand control.
7. If none of these tests aren´t successful, then next step is to try to eliminate the limit switches by making a jumper on the mother board connection.

8. To get access to the motherboard, please see chapter (A) of how to remove the top cover.
9. Once top cover is removed, locate the motherboard mounted on one of the sides of the lifter (Pro40 and 80 have motherboard mounted on the opposite side to the motor control board)
10. Use a small flat screw driver to push the spring-loaded connections of the position 1&2 on connector K5. Pull out cable while the spring-loaded connection is engaged.

11. Make a jumper by cutting a piece of wire and expose the copper wire.

12. Mount the jumper cable between position 1&2 on connection K5 (*where the top limit switch previously was mounted).*

13. Make same thing on bottom limit switch in position 5&6 on connection K5 on mother board to disable the lower limit switch.

14. Now test if sleigh can be moved up down. If sleigh now moves, then the limit switches needs to be replaced.

    Important to be extra careful moving the sleigh up down without having limit switches mounted. Without the limit switches in place will it be possible to run the sleigh to mechanical stop, and damage parts of sleigh and mast profile.

Replace and re-position limit switch (H)

1. Open the side cover by entering a screw driver or similar in the opening in the top.

2. Gently bend the cover against you.

3. Pull away the complete lid.

4. Limit switches are a bi-stable type, which means that they switch between NO and NC when a magnet passes the limit switch. It will then stay in the activated state until the magnet passes from the other direction.

5. Note that top switch must have the cable pointing upwards to work properly.

6. Note that bottom switch must have the cable pointing downwards to work properly.

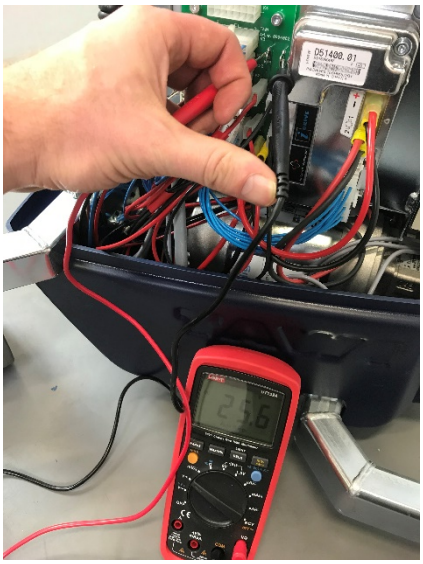
7. To replace or re-position the switch loosen the two screws.
   If the switch only should be re-positioned, don´t loosen the screws completely, just enough to be able to slide switch up/down.

   Note that it´s strictly forbidden to move top switch higher up, moving top switch higher up will result in mechanical damage of the lifter.

8. Slide switch into position and tighten the screws.

Battery pack

Checking batteries (I)



1. Voltage check of batteries can be done in two ways. Either by measuring direct on the battery pack as showed first, then direct on the unit which will be showed further down.

2. Pick out the battery pack from the lifter, and place it on a table or similar.

3. Use a voltmeter and place pins in the connector in the bottom of battery pack.
   A healthy charged battery should be between 24-27,5V.

4. Second option is to measure direct on the mother board of the lifter.

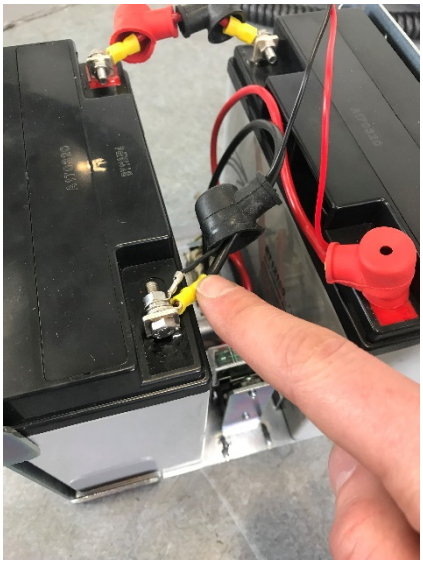
5. Use the voltmeter pins and place them on the power output connectors of the mother board. If unit is turned ON, will now battery voltage be displayed in the voltmeter.

6. To verify the actual status of batteries will it be best to operate unit up or down while voltmeter is connected. Battery voltage should then not drop more then 2-3V. If dropping much more then this will batteries be drained, and need replacement.

Changing batteries (J)

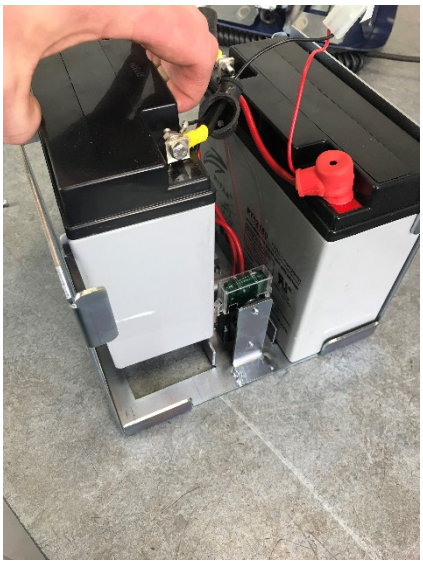
1. To change batteries, use an Allen key to remove the 4x bolts holding the top lid in place.

2. Gently pull up top lid from bottom part.
3. Loosen the two-pin connector that connects the charger to the batteries.
4. Place the complete top lid to the side.



5. Remove the rubber pole cover to expose the connections (Pro40/80 battery pack will not have any rubber covers).
6. Use a wrench to loosen the bolts on the connectors.

   Make sure that wrench don´t touch the opposite pole of the battery when loosen the connection screws.



7. When all cables are removed from the connectors, pull batteries out from the frame.

8. Replace batteries with new ones and attach cables in same way as they originally were installed.

9. Add rubber covers into place before closing the battery pack together.

   Important that TAWI original parts are used when replacing any spare parts.

Checking battery charger (K)

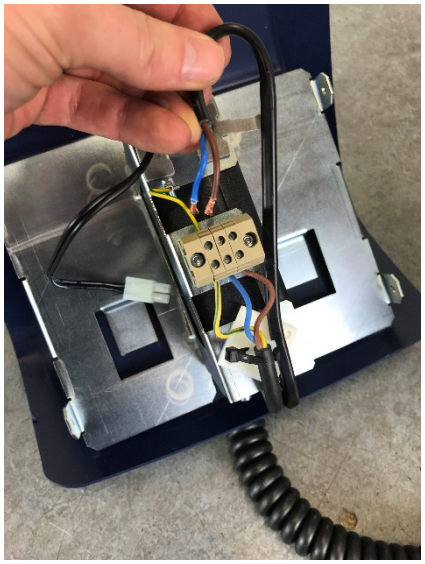
1. To check battery charger, open top lid as described in points 1-3 in in chapter (J).

2. Plug outlet cable into an outlet, to get AC power to charger.

3. Connect the voltmeter pins to the 2-pole connector that comes from the charger.
   If charger is working properly should a value between 27,5-29,4VDC be indicated.

4. If charger don´t show any voltage or much lower voltage, the charger needs replacement.

Changing charger (L)



1. To change battery charger, open top lid as described in points 1-3 in chapter (J).

2. Loosen the two screws in the connection plinth holding the blue and brown charger cables.

3. Cut the cable ties that holds the charger cables in place.

4. Pull out the LED from the lens in the battery pack top cover.

5. When all cables are loose, gently remove the charger from its holder.

6. Replace charger with new one and mount cables, LED and cable ties back to original place.

   Important that TAWI original parts are used when replacing any spare parts.

Changing fuse (M)

1. To change fuse in battery pack, remove lid over fuse. Pull out fuse, and replace with new one with same ampere size.

Hand control and control box

Changing hand control (N)

1. To change hand control, loosen the M12 connector in bottom control box of the lifter.

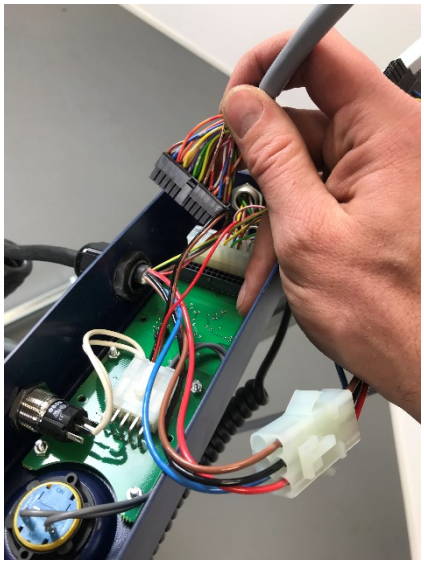
2. Before installing new hand control, make sure that all pins are aligned in connector in correct way.

3. Push new hand control connector into place and tighten the connector.

Checking signal between control box and mother board (O)

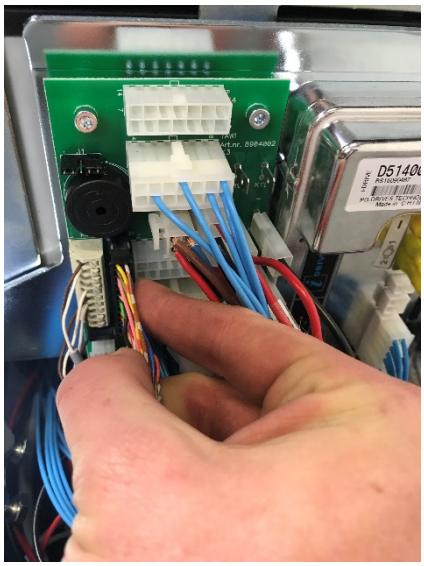
1. If there is a signal fault between the control box and the mother board, is easiest way to check this is to use a separate signal cable.

2. Open control box by loosen the 4x bolts on the sides.



3. Remove the “faulty” signal cable from the connector.

4. Install the new separate signal cable.



5. Remove the “faulty” signal cable from the connector on the mother board.

6. Install the new separate signal cable.

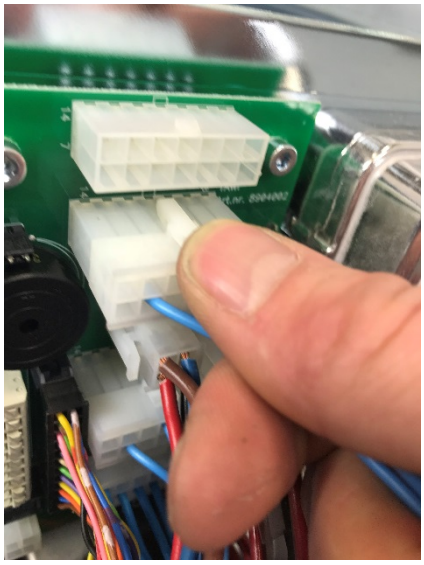
7. Test if unit is working.

Circuit boards and mother board

Changing mother board (P)

1. To get access to the motherboard, please see chapter (A) of how to remove the top cover.

2. Once top cover is removed, locate the motherboard mounted on one of the sides of the lifter (Pro40 and 80 have motherboard mounted on the opposite side to the motor control board)



3. Start by removing all connectors on the mother board. Make sure to note which cables are mounted where before starting removing any cables.

4. Loosen the 4x screws that holds mother board in place.

5. When removed, replace with new mother board, screw back into place and relocate all cables like they were positioned on the faulty mother board

Changing motor control board (Q)

1. To get access to the motor control board, please see chapter (A) of how to remove the top cover.

2. Once top cover is removed, locate the motor control board, it is mounted on one of the sides of the lifter (Pro40 and 80 have motor control board mounted on the opposite side to the mother board)

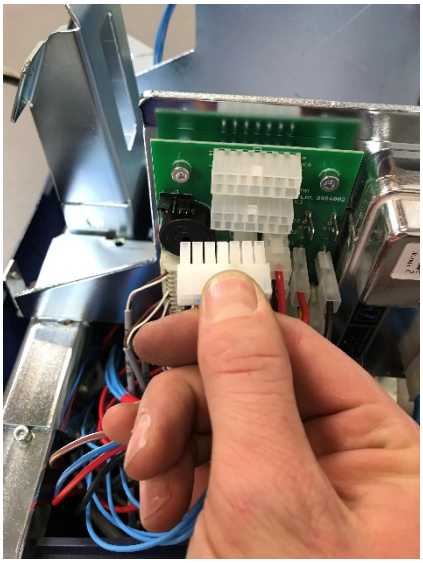
3. Start by removing all connectors on the motor control board. Make sure to note which cables are mounted where before starting removing any cables.

4. Loosen the 2x screws that holds motor control board in place.

5. When removed, replace with motor control board, screw back into place and relocate all cables like they were positioned on the faulty motor control board

   Note that motor control board MUST be programmed for the actual lift that needs a replacement board. Wrong settings may cause damage to the trolley.

Changing circuit board box for electrical tools (R)

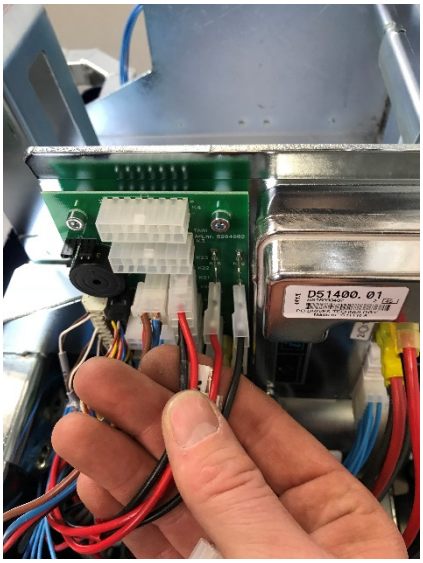


1. To get access to the circuit board box, please see chapter (A) of how to remove the top cover.

2. Once top cover is removed, locate the circuit board box, it is mounted on the opposite side to the motor control board and mother board.

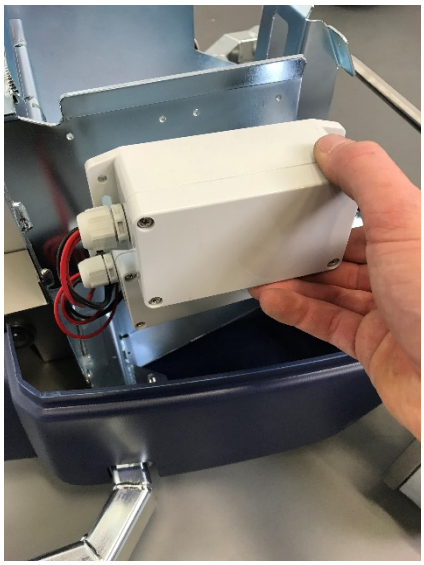
3. It's easier to change the complete circuit board box rather than replacing the board inside. So, if the board needs to be replaced, change then complete box.

4. Start by loosen the connectors from the circuit board box on the mother board.



5. Loosen the motor and power cables from the mother board.
   Make sure to remember which connections that where fitted where.

6. Loosen the 2x screws that holds circuit board box in place.



7. Remove the box from unit

8. Replace box with new one and screw it back into place.

9. Connect the new cables to correct position on mother board.

   Note that control board box MUST be programmed for the actual function that needs a replacement board. Wrong settings may cause damage to the tool.

Programming the motor control board (UP/DOWN) (S)

1. To get access to the motor control board, please see chapter (A) of how to remove the top cover.

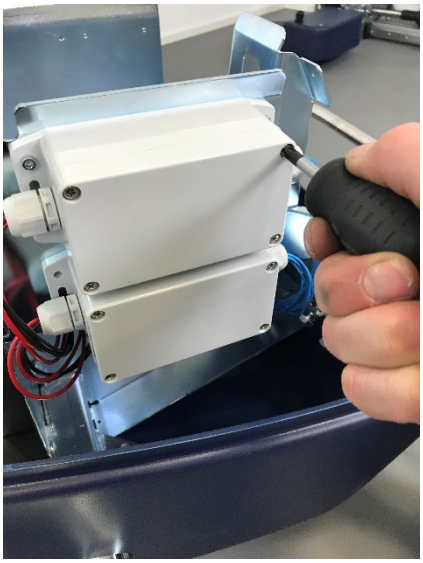
2. Once top cover is removed, locate the motor control board, it is mounted on one of the sides of the lifter (Pro40 and 80 have motor control board mounted on the opposite side to the mother board)

3. Use the program cable art. Nr. 8904900 to get access to the motor control board.

4. Connect cable to USB in PC and to port on motor control board according to picture.

5. See separate program manual for instructions of how to use the software.

Programming the circuit board for electrical tools (ES and ET) (T)

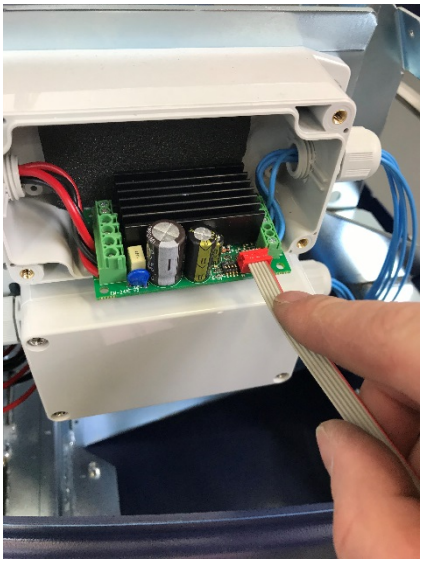


1. To get access to the motor control board, please see chapter (A) of how to remove the top cover.

2. Once top cover is removed, locate the motor control board, it is mounted on one of the sides of the lifter (Pro40 and 80 have motor control board mounted on the opposite side to the mother board)

3. Use a screw driver to open the lid of the box of the board you want to reprogram.

4. Use the program cable art. Nr. 8904901 to get access to the circuit board.



5. Connect cable to USB in PC and to port on motor control board according to picture.

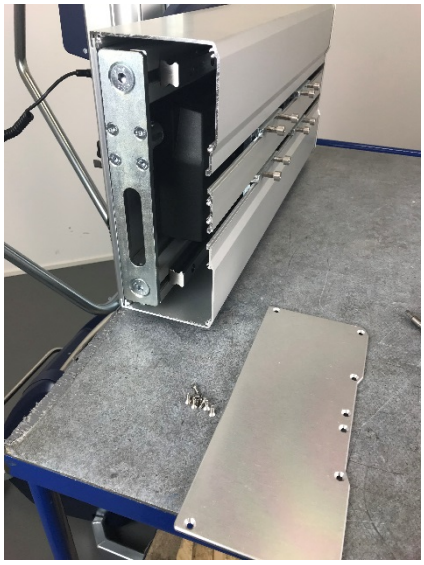
6. See Appendix 2 for instructions of how to use the software.

EasySqueeze and EasyTurn

Change actuator on EasySqueeze (U)

1. Start with removing the arms by loosen 4x bolts on each arm.

2. Then loosen 8x screws on one side of the ES cover.

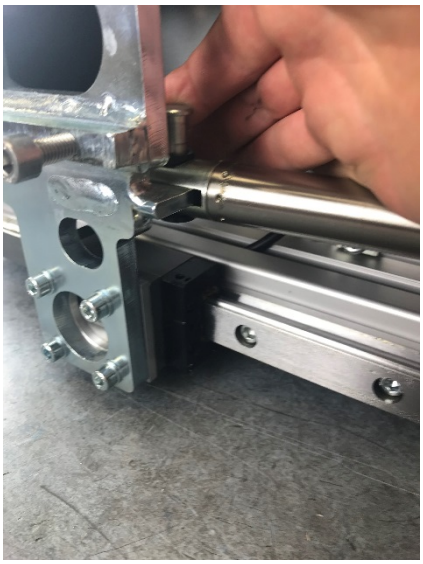


3. Loosen one of the side plates.

4. Slide the cover sideways, to expose the inside of the ES.

5. Open arms to get better access to the parts.

6. Remove the rear pin holding the actuator.



7. Remove the front pin connecting actuator with sleigh.

8. Also remove front pin of the second actuator.

9. Disconnect the actuator by pulling out connector from socket.

10. Push the loose sleigh to the middle.

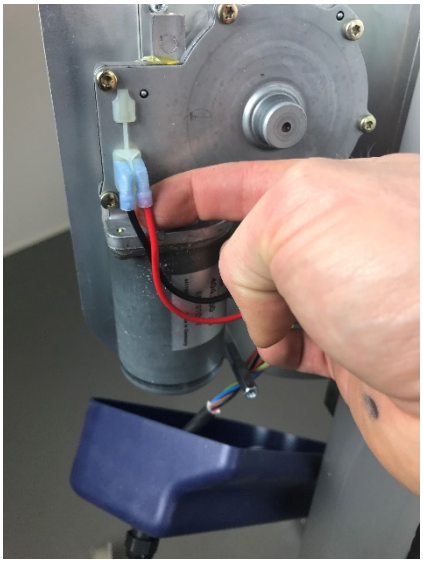
11. Loosen the cable ties.

12. Gently remove the actuator.

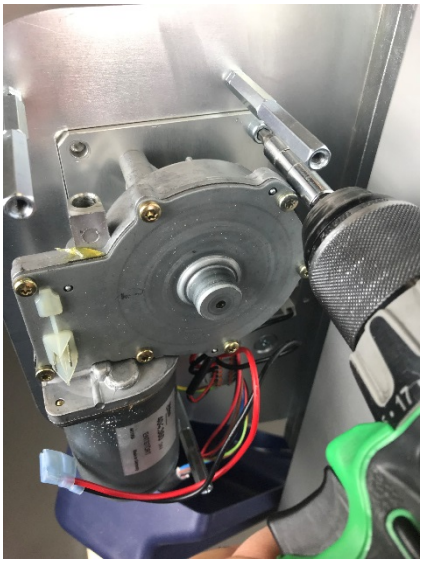
13. Take new actuator assemble it by doing everything in reverse order.

Change turn motor on EasyTurn, and checking cog wheel (V)

1. Start with removing the rear cover of the EasyTurn by loosen 3x screws on the rear side.



2. Remove the cables from the motor.
   Note which cable which was connected to which connector.



3. Loosen the motor by removing 3x screws holding the motor plate to the base plate.

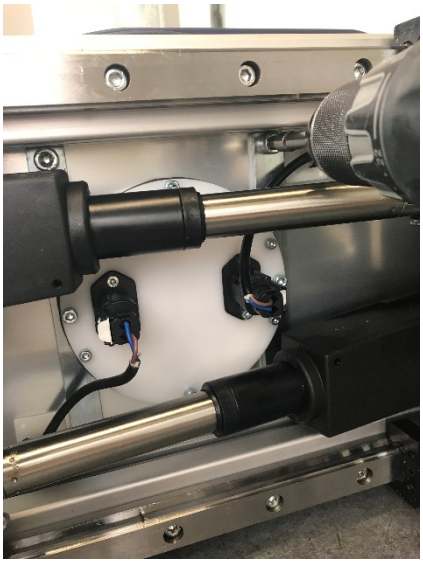
4. Pull out motor from its position.

6. Check that pin is properly secured. If pin has moved or is missing replace this pin with a new conical pin.

7. Replace motor by removing the motor plate, and replace motor with new one.

8. Mount back in place by doing earlier steps in reverse order.

Remove EasySqueeze and test function of slip ring (W)



1. To get access to screws that hold EasySqueeze in place follow step 1-5 in above instruction in chapter (U).

2. Lower the EasySqueeze onto a table.

3. Loosen the 4x screws that hold the EasySqueeze onto the EasyTurn.

4. Separate EasySqueeze from EasyTurn.

5. To test the function of the slip ring and actuators on the EasySqueeze take two pieces of cable and connect them directly to the battery pack.

   Important that not connect the two wires together, since you will then make a short circuit, and damage parts, or in worst case cause a fire.

6. Place the two wires from the battery pack to the two pins on the slip ring.

7. If actuators aren´t moving change either the actuator or check with voltmeter that you have connection from slip ring pins to actuator.

8. When problem solved, mount back EasySqueeze by following the steps in reverse order.

Important that not connect the two wires together, since you will then make a short circuit, and damage parts, or in worst case cause a fire.

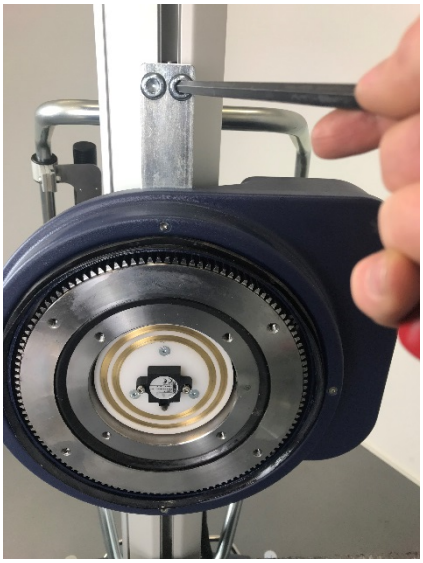
Remove EasyTurn and test function of slip ring

1. To remove the EasySqueeze follow step 1-5 in above instruction in chapter (U), and step 1-4 in chapter (W)

2. Use a voltmeter and place voltmeter pins on each slip ring path.

3. Press close button on control panel.
   If everything works fine, you should get a voltage reading on the voltmeter.

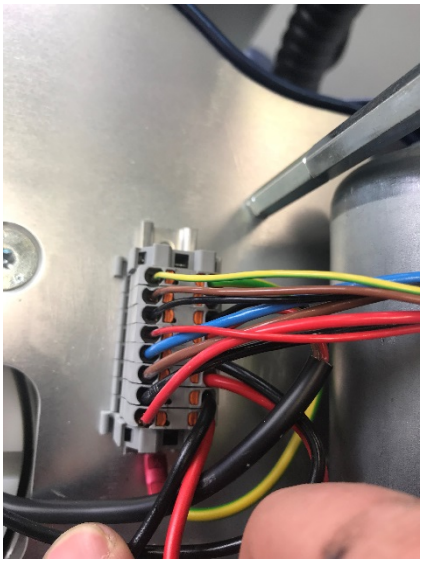
4. If not working start by checking any of the other faults in this manual.



5. To remove the EasyTurn, start with loosen the 4x screws that hold the EasyTurn onto the sleigh bracket.

6. Separate EasyTurn from the bracket by lifting it slightly up and then out.

7. Place EasyTurn on a table or similar.



8. To remove cable from EasyTurn, then remove rear cover on EasyTurn, see chapter xx for more info.

9. Remove all cables from the connection plinth. Make sure to note where all cables are located before these are removed.

Appendix 1 – Tools

Following tools can be useful when performing service on the TAWI lifting trolleys.

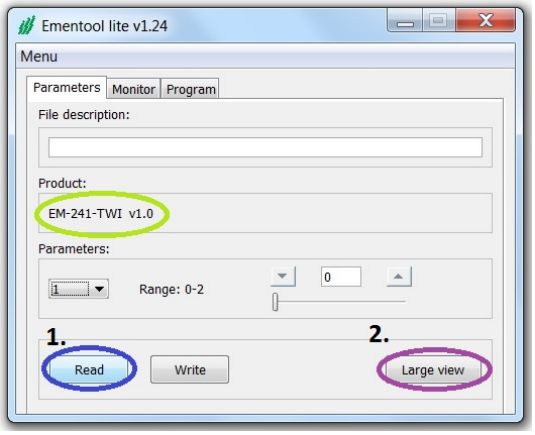
1. Rubber hammer
2. Pop rivet pliers
3. Drilling machine
4. Tape measure
5. Ø3,2-3,5mm drill (for drilling the pop rivets)
6. Pop rivets
7. Allen keys (in various sizes and versions)
8. Cable ties
9. Cutting pliers
10. Small flat screw driver
11. #10 & #13 wrench key

Appendix 2 – Programing guides

Install software and change squeeze pressure

1. Install and open EmentoolLite.
   You need to have the program cable art. No. 8904901 and the program "EmentoolLiteInstall" before you start this guide.
   Make sure that program cable art. No. 8904901 is connected before you start the installation.

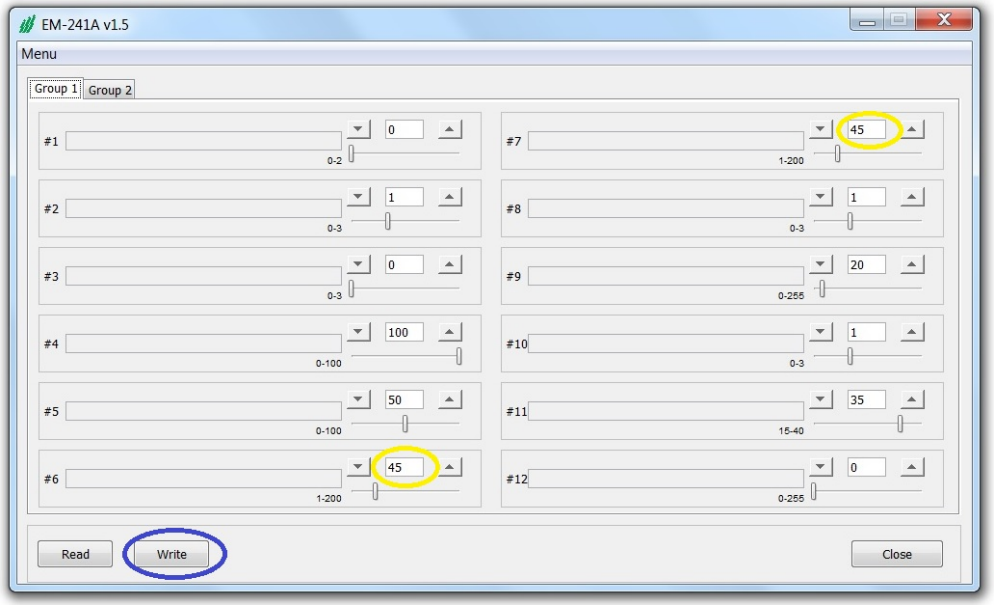
2. Connect cable to board and open program according to manual "EN_em-ementool_lite.pdf"



3. When connected properly with board should you see the version type in the "Product" field (green circle above)

4. Klick on button "Read" (blue circle above), this will download settings from circuit board to EmentoolLite software.

5. Now to adjust any wanted setting, klick on button "Large view" (purple circle above) to get better view of all parameters.

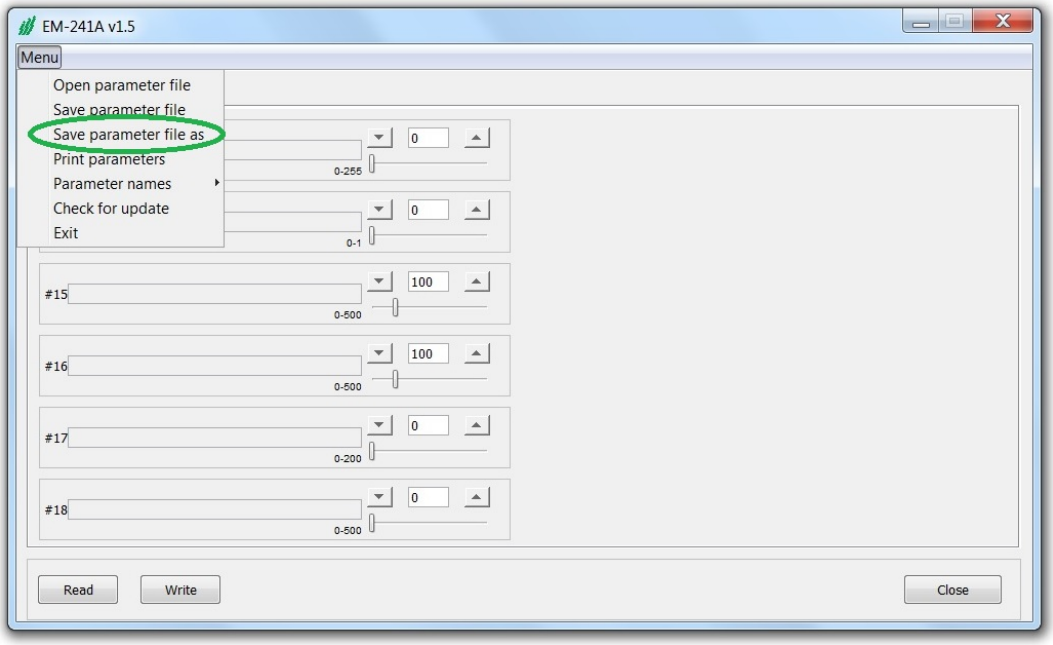


6. To change squeeze force, adjust the parameters in #6 (current limit FW) and #7 (current limit REV) (yellow circles above). Test by increase or decrease values by steps of 5, to find the best value for your application.
   Standard value for 100kg ES is 45
   Standard value for 200kg ES is 70

   Important! Do not exceed the value 70 before consulting TAWI, this may cause damage to parts.

7. When the values are adjusted, press “Write” (blue circle above), then the new settings will be uploaded to circuit board.

8. Now test and evaluate if desired squeeze pressure is achieved. If not redo point 6-7.



9. When reached final setting, then press “Menu” and then “Save parameter file as” (green circle above). Save the actual setting on desired location on your computer for future use.

Turn angle adjustment

1. Install and open EmentoolLite.

2. Connect cable to board and open program according to manual “EN_em-ementool_lite.pdf”

3. Klick on button “Read”, this will download settings from circuit board to EmentoolLite software.

4. Klick on tab “Group 2”

5. To change stop position, adjust the parameters in #22 (stop position 1) and #23 (stop position 2).
   The digits are scaled from 1-359°
   Min value of #22 is 1, and #22 must be lower than #23.
   Max value of #23 is 359.

6. When the values are adjusted, press “Write”, then the new settings will be uploaded to circuit board.

7. Now test and evaluate if desired turn angle is reached. If not redo point 5-6.