

Force sensor TDC slew upgrade for TM Cougar Throttle

Installation Instructions

Last updated – July 2023 V1.1



Parts:

You will receive these parts with your kit:



1. Sensor unit, contains the miniature 2 axis force sensor, and push button mechanism
2. Aluminium hat, with M3 x 4mm set screw (pre threaded into hat for shipping)
3. Plastic front plate, with 2 M2 x 6.5mm 'captive' style screws
4. 1.5mm Hex key

Tools required:

For the installation you will need the following tools:

Not included:

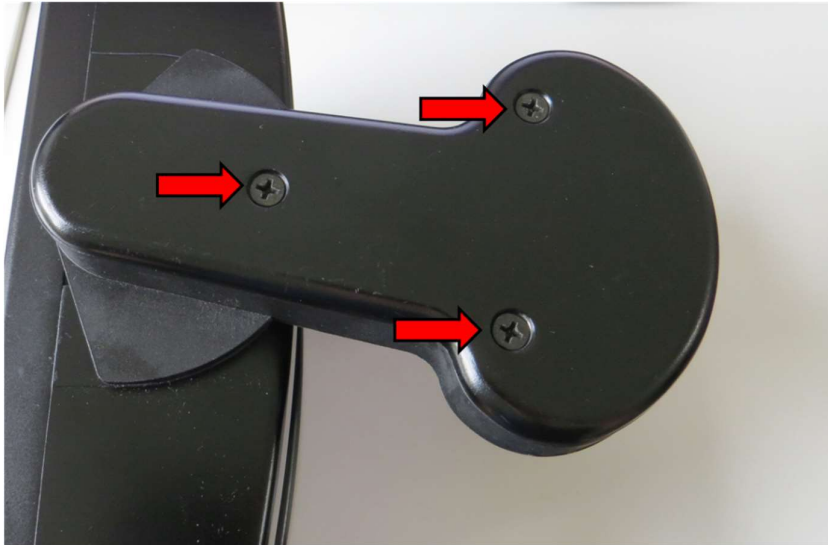
- Cross head screwdriver (PH1 recommended size)

Included:

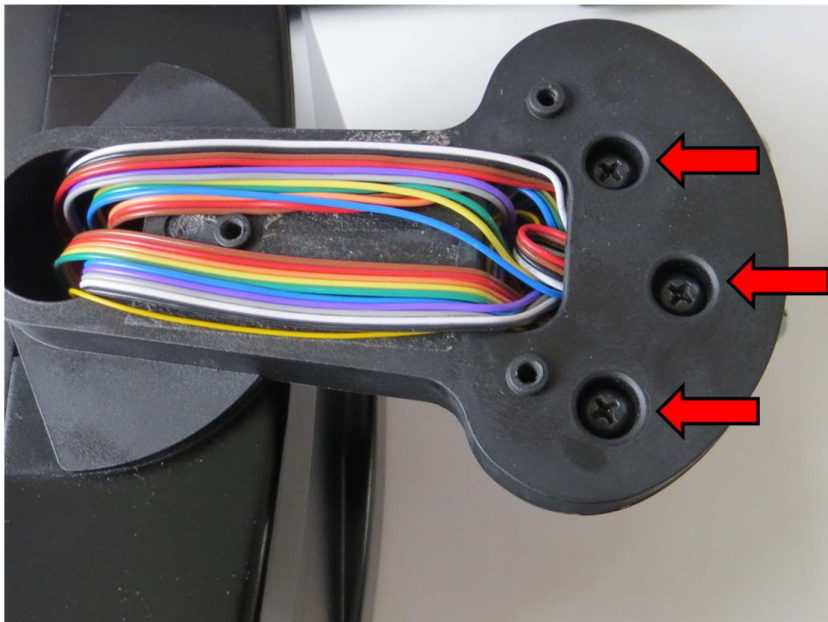
- 1.5mm Hex key

Removing the old sensor:

Start the installation by removing the 3 screws from the side of the throttle, and removing the side cover plate.



Once the side cover plate is removed, remove the 3 screws marked below so you can remove the whole throttle grip.



Once the throttle grip is removed, position it so you have access to the 4 screws on the bottom. **Be carefull as the grip is still attached to the rest of the throttle by the wires, which could be damage if they get exsessivly pulled or stressed.**

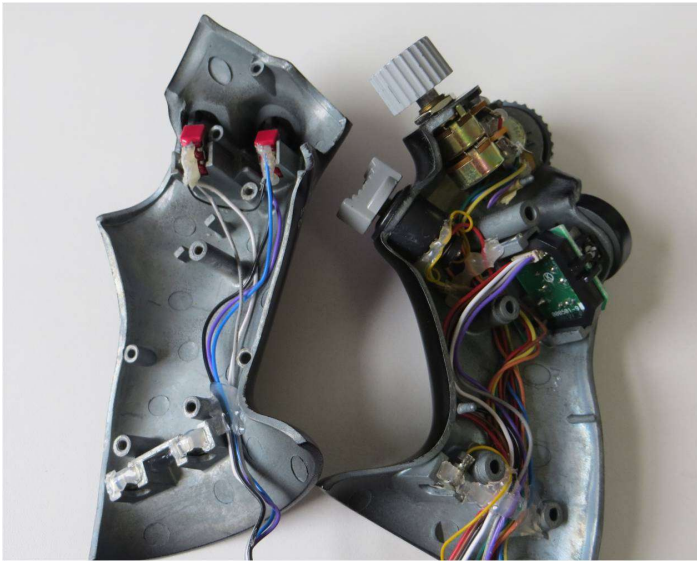
Remove the 4 screws from the underside of the throttle grip:



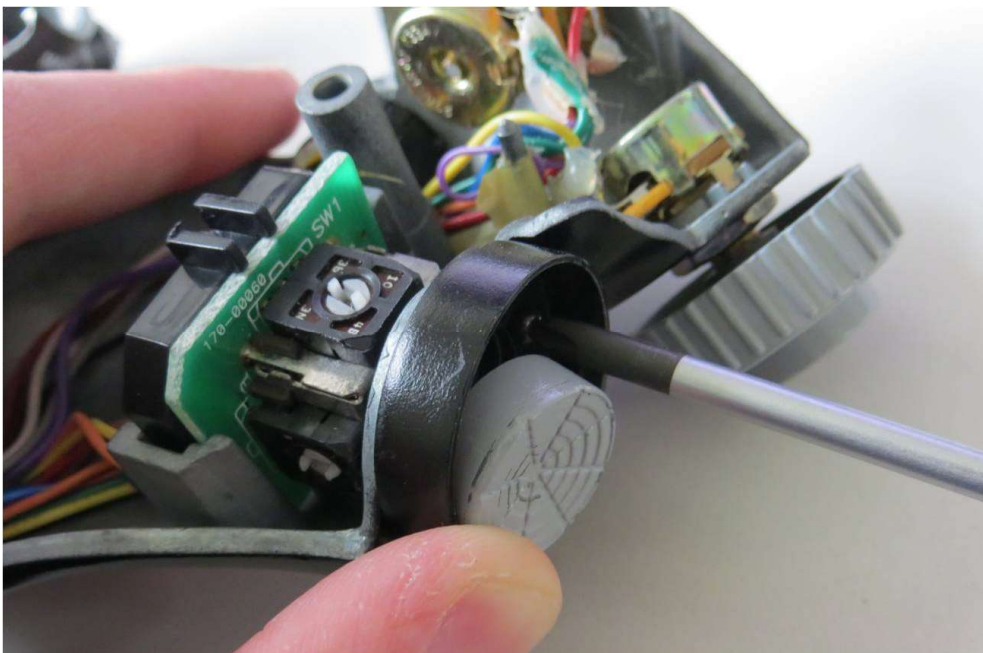
Keep the 4 screws safe, so they are not lost during the next steps.



Separate the two throttle halves to give access to the internal parts.



Next you need to remove the small metal 'collar' piece from in front of the sensor. To do this you may need to push the sensor to one side to get access and remove the **two** screws attaching it to the throttle.

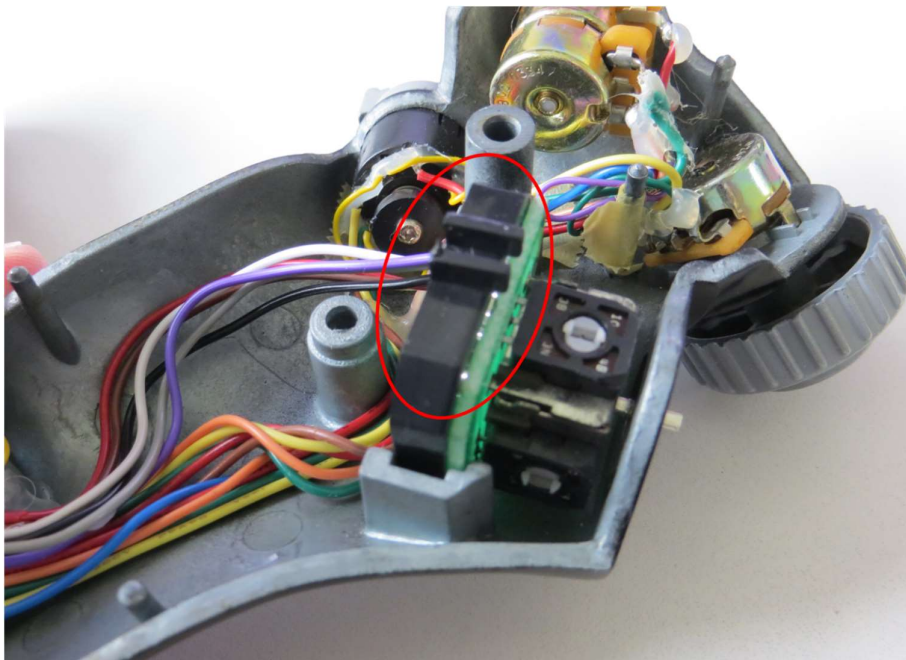


Once the two screws are removed, gently pull the collar piece and the grey hat part away from the sensor.

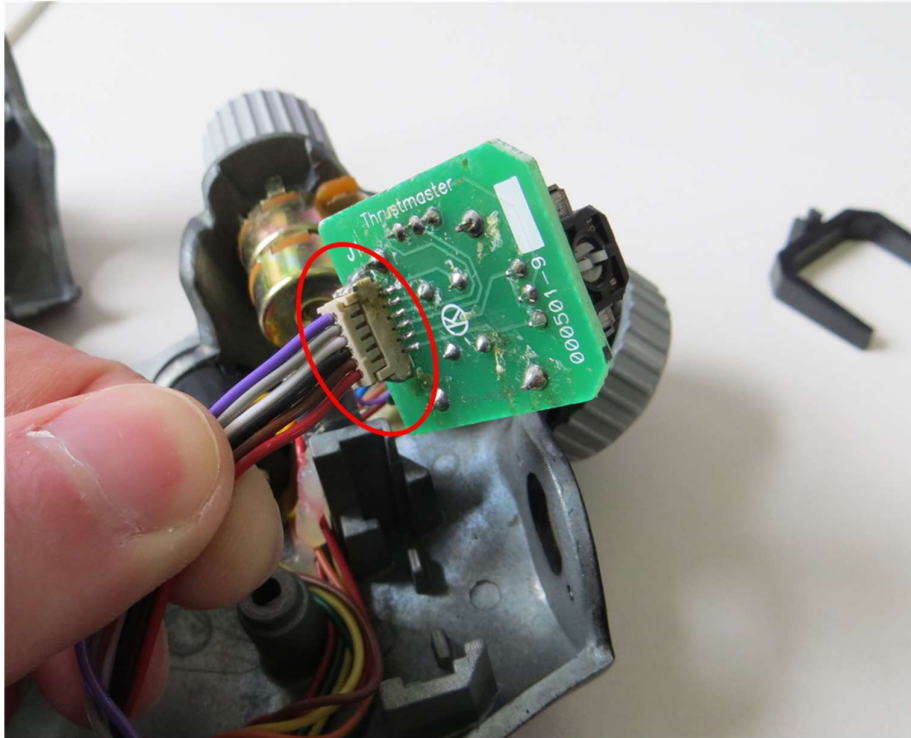
The hat part is a press fit onto the old sensor, so it may require a small amount of force to remove it.



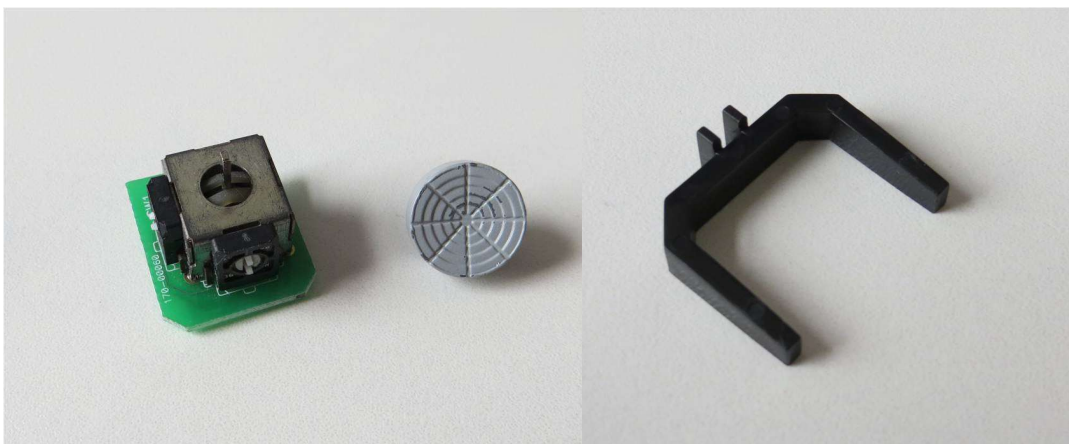
Next turn your attention back to inside the throttle grip. Remove the plastic part holding the old sensor in place. Pull this part vertically upwards to remove it, again it is a press fit so may need a small amount of force to remove.



The old sensor should now lift free from the throttle. Carefully disconnect the cable from the old sensor board.



The old sensor parts have now all been removed. You might want to keep these somewhere safe in case you ever need them in the future.



New sensor installation:

Due to the small amount of space inside the throttle, the new sensor is a tight fit, and to avoid needing to make any modifications to the throttle, the screws used are slightly unusual.

We ***strongly recommend*** to follow the next steps ***very closely***, to avoid any damage to the screw threads or sensor housing.

If the screws don't go in easily at any point, **STOP, slowly back the screw off slightly, wiggle the sensor slightly, and try again. DO NOT FORCE THE SCREWS**, or there is a high chance the threads will be damaged.

Start with the two M2 'captive' screws, put them through the holes in front plate, and then into the two threaded holes in the throttle housing.

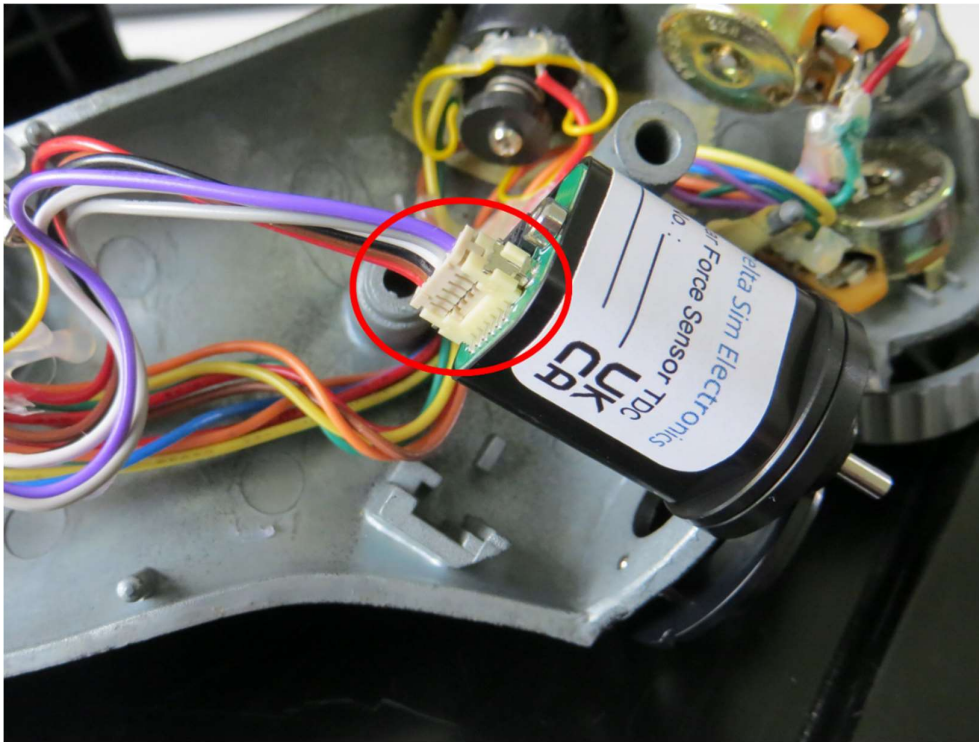




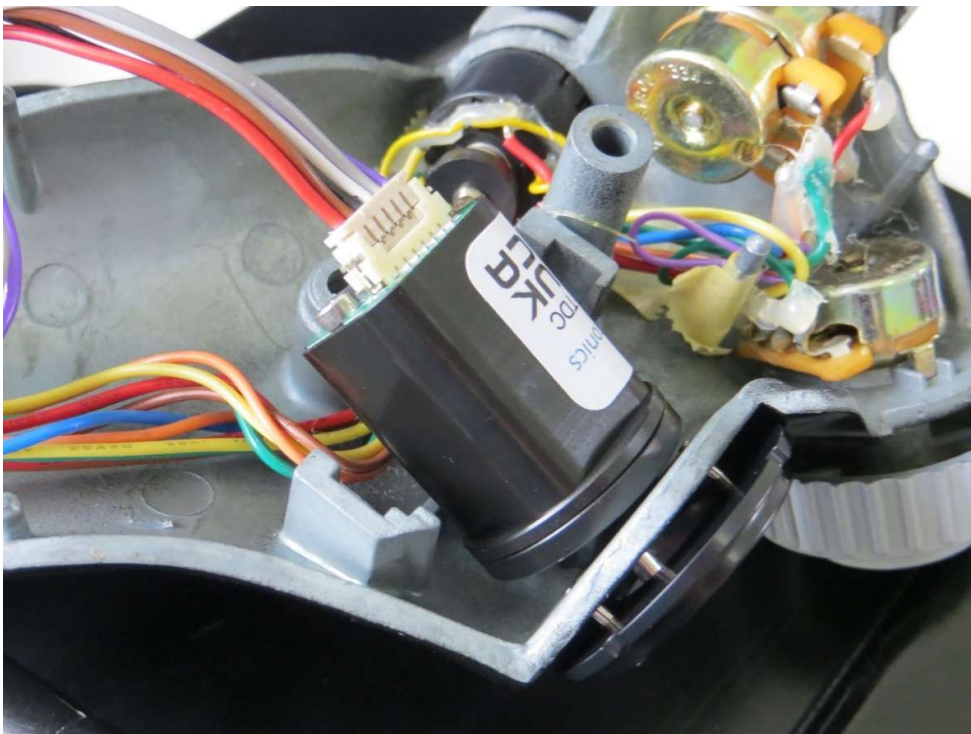
Screw them in until they *just* start to come through the throttle.



Next, connect the sensor to the 6-pin sensor cable.



Install the sensor in the throttle, **start with the sensor at an angle, shaft end first**, though the hole in the throttle housing.



Lower the sensor until it is level inside the throttle.



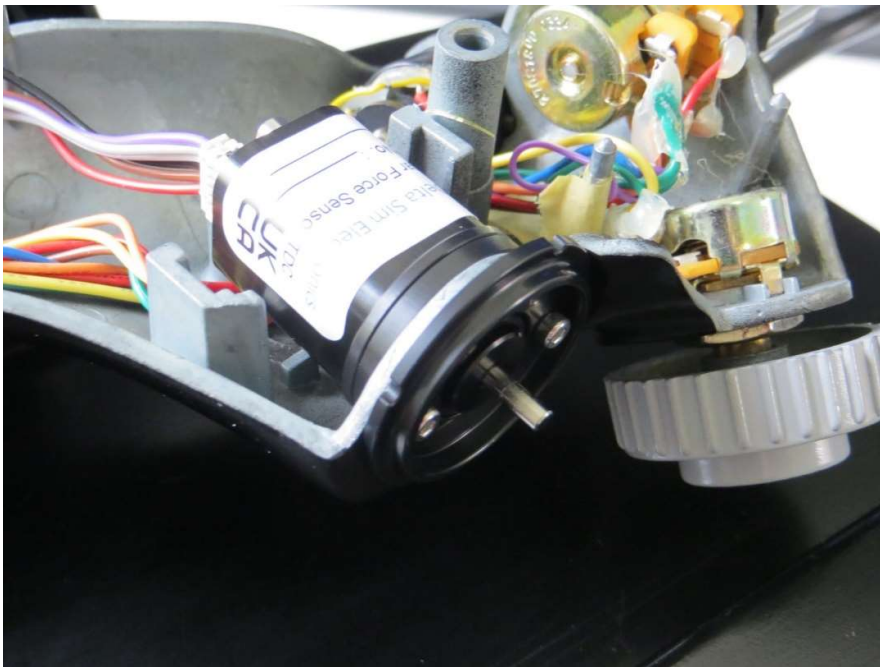
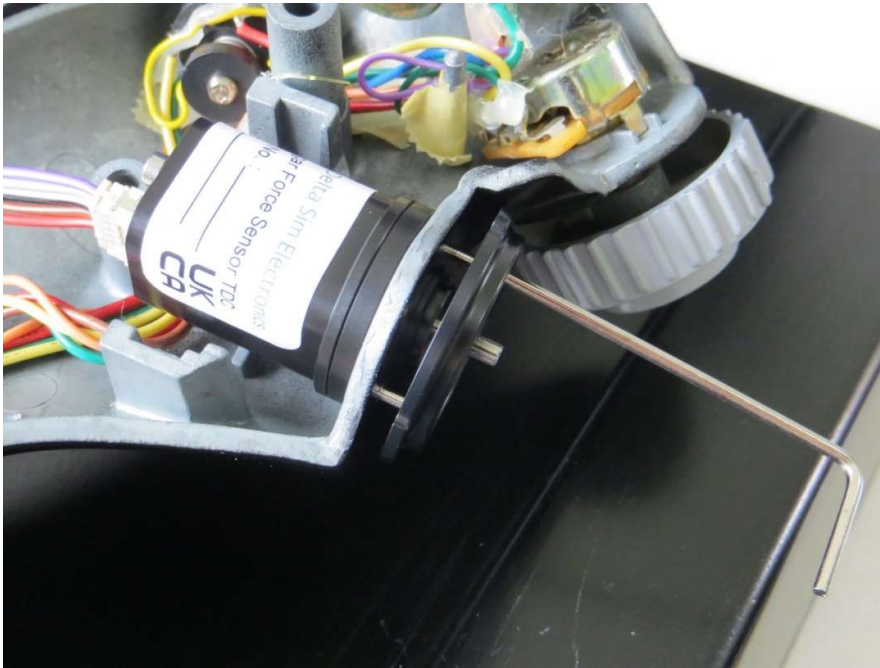
Rotate the sensor, so it is in position as below, **with the label facing upwards**, and the cable / connector to the side of the metal post in the throttle.



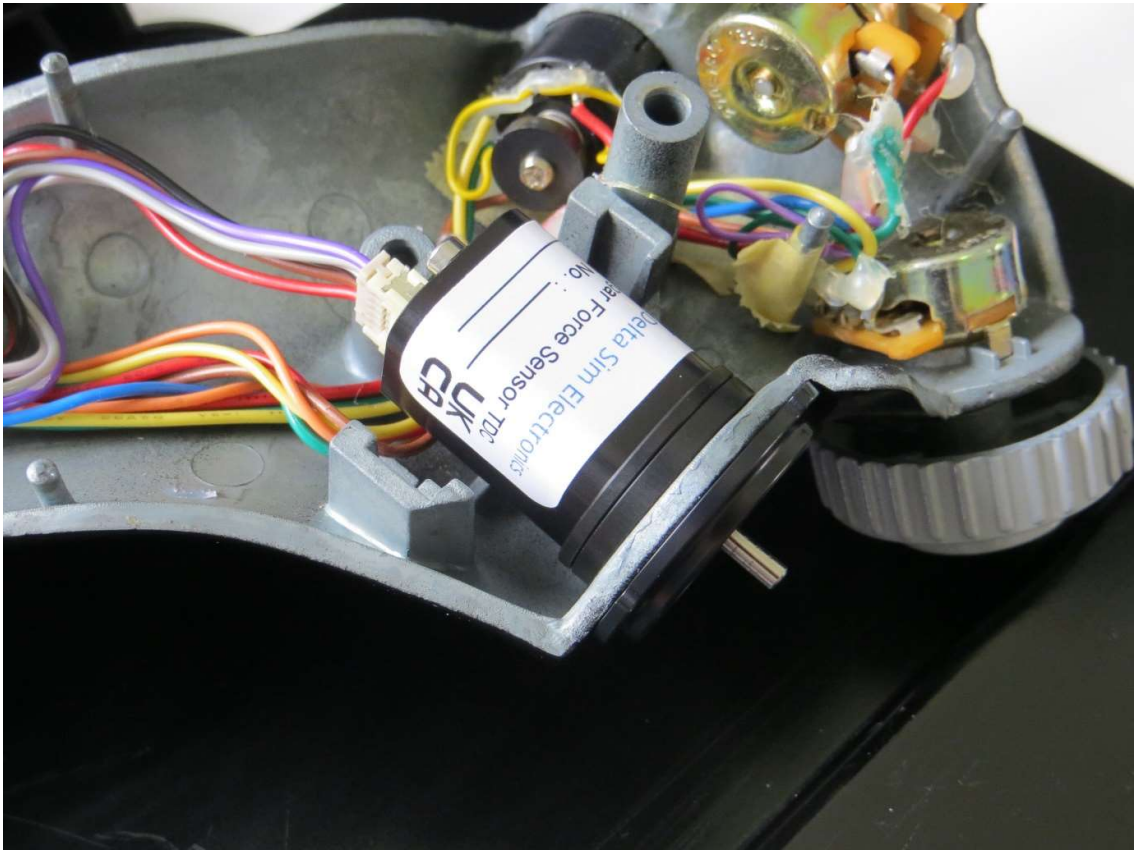
Very carefully, screw the M2 screws through the throttle housing and into the threaded holes in the sensor. **Alternate between each screw, turning 1-2 turns at a time.** You will need to wiggle the sensor housing around until the screws find the threaded holes. If at any point the screws get tight:

STOP, slowly back the screw off very slightly, wiggle the sensor slightly, and try again. DO NOT FORCE THE SCREWS, or there is a high chance the threads will be damaged.

Alternate side to side, 1-2 turns at a time, until both screws are fully in position.



Make sure both screws are snug, and then the sensor housing is installed.



Now the sensor is fully installed, you can reassemble the throttle the opposite of how we disassembled it earlier.

Due to the tight fit of the new sensor inside the throttle, and manufacturing tolerances, there is a chance the new sensor might slightly impede the throttle halves closing all the way. If this happens, slightly loosen the two M2 screws, which will give enough slack for the sensor housing to move to a position where the throttle halves will close fully. You can then retighten the M2 screws.

Put the two halves back together, and reinstall the 4 screws, **be careful how you route the wires out of the throttle so none become crushed between the two halves, which could damage them.**

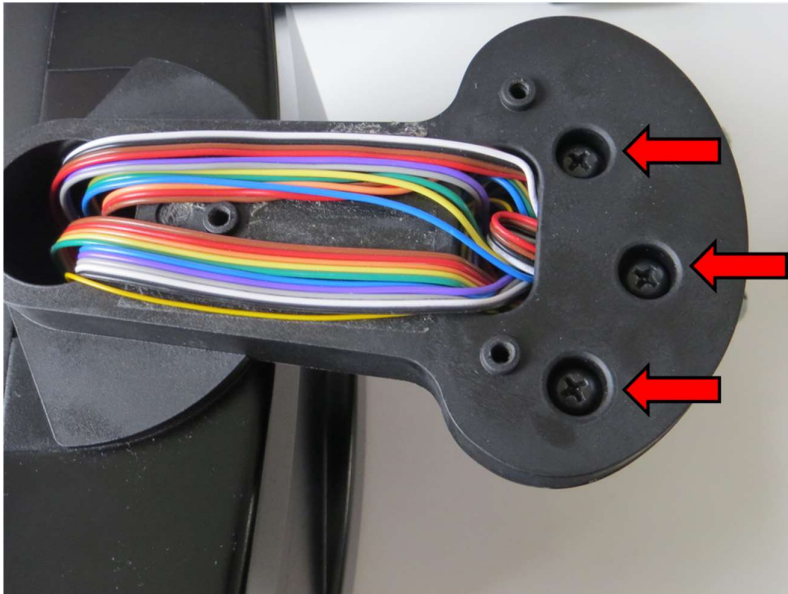


Next install the aluminium hat into the sensor haft, we recommend **to position the set screw so it is facing down**, and is less visible on the finished throttle.

Tighten the set screw onto the sensor shaft, this should be fairly tight, so it doesn't come loose.

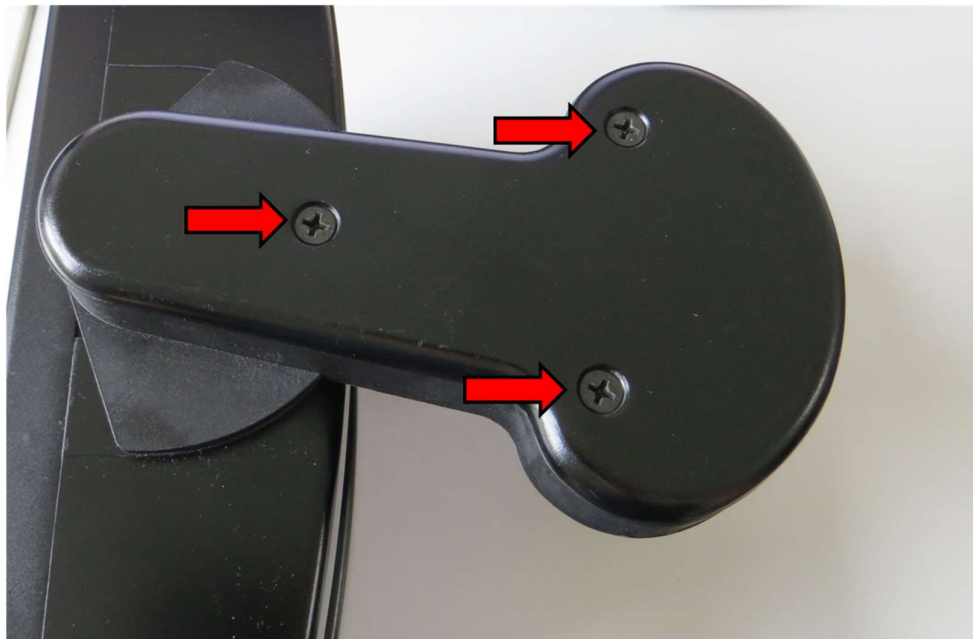


Reattach the throttle grip to the main body with the 3 screws we removed earlier.



Make sure the exposed cables are running as flat as possible, and not covering any screw holes or overhanging the edges. Any excess cable must be pushed up into the throttle grip or down into the throttle base.

There is very limited space behind the side plate, so it will not go on properly unless care is taken to manage the cables so they are flat and away from the screw holes and edges, as show in the above picture.





You are now done with the installation!

The new sensor will require recalibration of the throttle. Since we expect many customers will be using aftermarket or modified controller electronics, we cannot give detailed instructions for every situation, but please contact us if you have any issues.

Note on removing the sensor:

If you ever need to remove the sensor from the throttle, take extreme care when removing the two M2 screws attaching the sensor to the throttle housing.

Follow the installation procedure in reverse, alternate loosening each screw side to side, 1-2 turns at a time, and wiggling the sensor until the screws find their thread back into the throttle housing.