



Faraday Motion – Spine

Assembly Manual

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Introduction

1. Read This Before You Start Assembling

There are some prerequisites that you need to accomplish before starting the assembly.

1. Make sure to always pre-drill the holes that you are going to screw screws in. The drill size should be close to the diameter of the screw you are about to use.
2. Make sure that before getting to the **Stage 2 Step 4: [Complete the assembly of the Spine Box](#)**, you are aware that your motor controller is configured and will not require to be connected to a computer via cable.
3. All support material from the 3D Printed parts needs to be removed before starting assembly
4. 3D Printed parts can be painted or clear coated to keep their visual looks better
5. Imperfect prints should be replaced as they may endanger your safety
6. Sometimes 3D Printed parts need to be fine touched with a knife in juncture place where two or more pieces come together.
7. Make sure you have downloaded and printed the latest parts based on the 3D files from <http://faradymotion.com>

2. Screw Size Table

Screw Type	Width	Height
XS	3mm	15mm
SM	3mm	20mm
M	3mm	25mm
L	5mm	35mm
XL	4,5mm	50mm

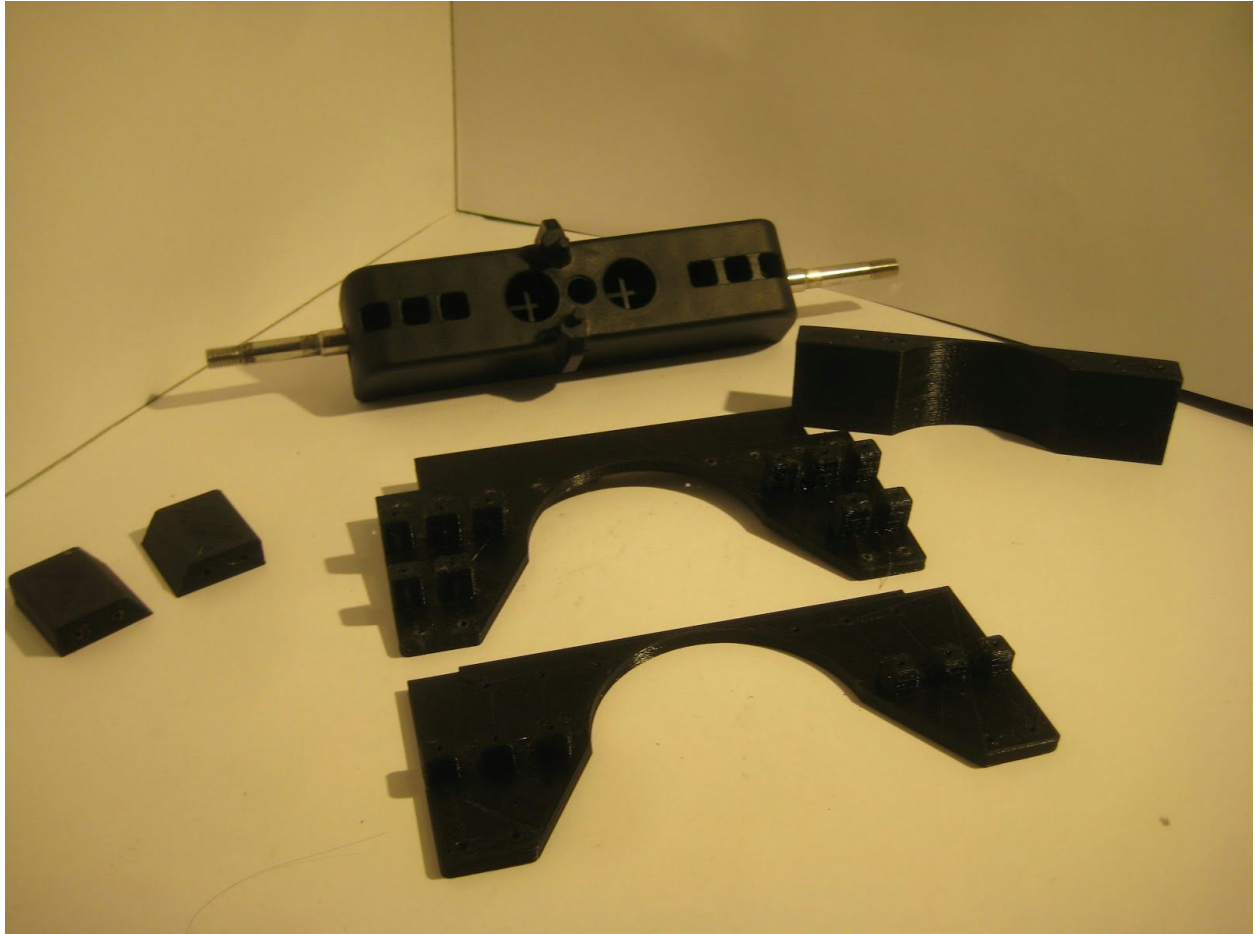
3. First Ride Check List

- The battery is fully charged
- All the screws, bolts and knots are tightened
- Your phone is at least at a 50% charge level
- Wheels are turning with no restriction and do not wiggle
- Wear a helmet before you get on the board
- Check all cables for punctures to dismiss possibility of shortage
- Motor is turning with ease and not making any sounds that could indicate that there is something inside itself



Stage 1 - Assemble the Spine Box

In this stage you will be assembling the back axle of the Spine that will be holding the Spine box with the motor, electronics and battery.

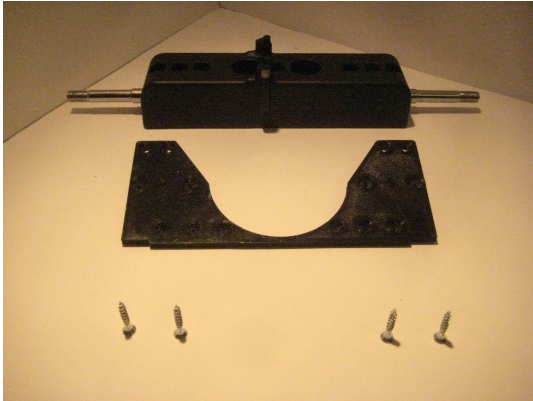


Required Parts:

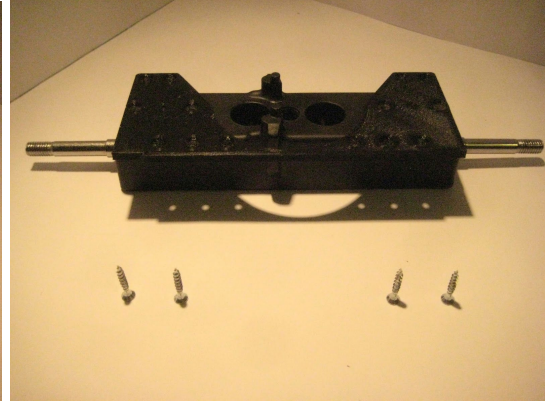
- Front and Back Enforcements
- Top and Bottom Box Connectors
- Back Axle
- XS, SM, M, XL Screws



Step 1 Mount the Top Box Connector

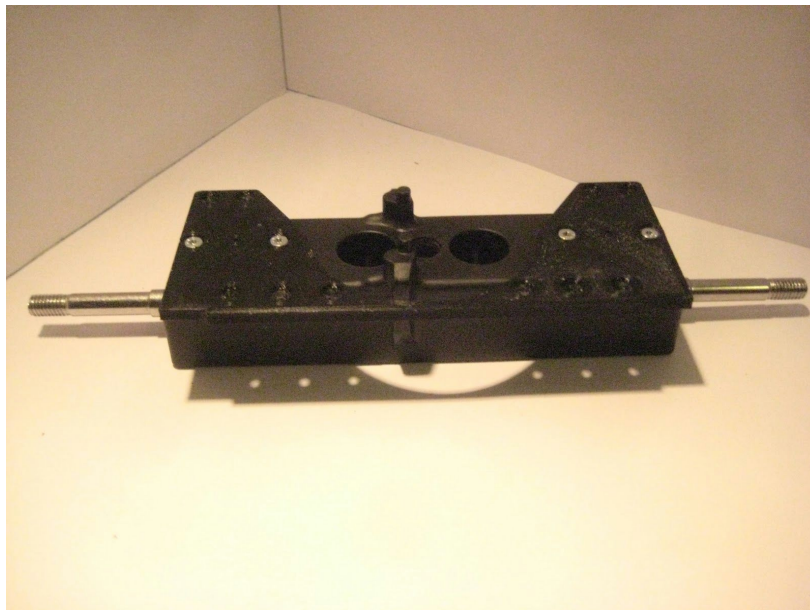


Picture 1.1.1



Picture 1.1.2

Now you will attach the top box connector to the axle. Note that the axle's top tips need to be to on the left side relatively to the center of the axle as in the picture 1.1.1. Mount the Top Box Connector onto the axle (picture 1.1.2).

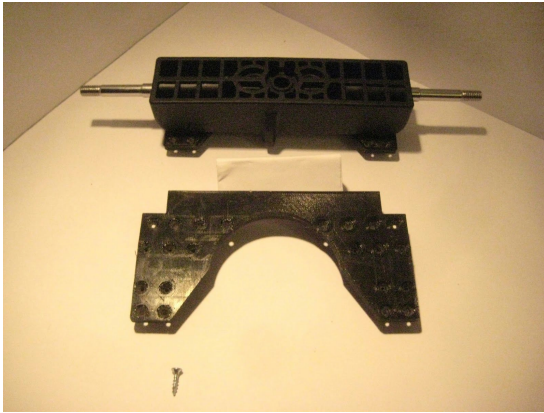


Picture 1.1.3

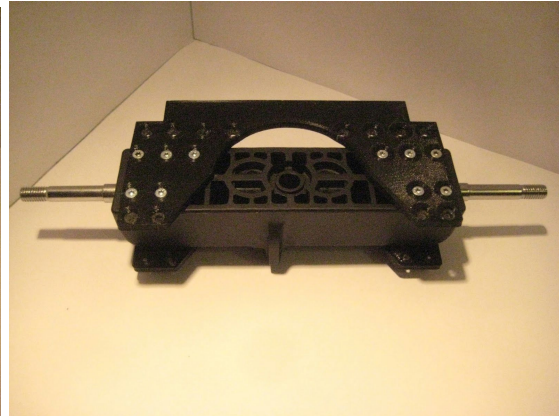
Use 4 SM screws to securely attach the elements as shown in picture 1.1.3.



Step 2 Mount the Bottom Box Connector



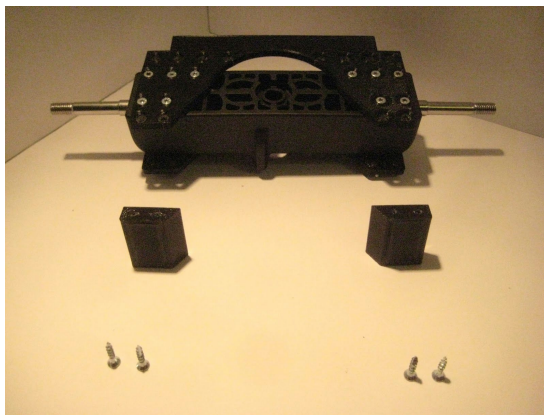
Picture 1.2.1



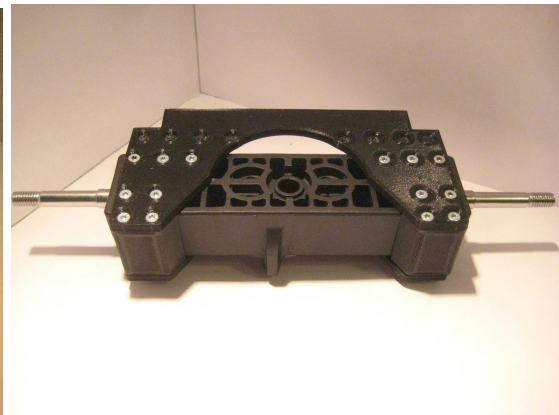
Picture 1.2.2

In this step you will attach the bottom box connector to the axle (picture 1.2.1). Just like in step 1 first mount the bottom box connector and then use 10 XS screws to secure the mount as shown in picture 1.2.2.

Step 3 Mount the Front Right and Left Enforcements

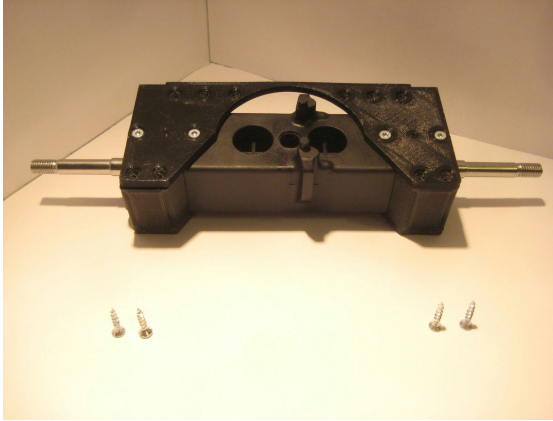


Picture 1.3.1

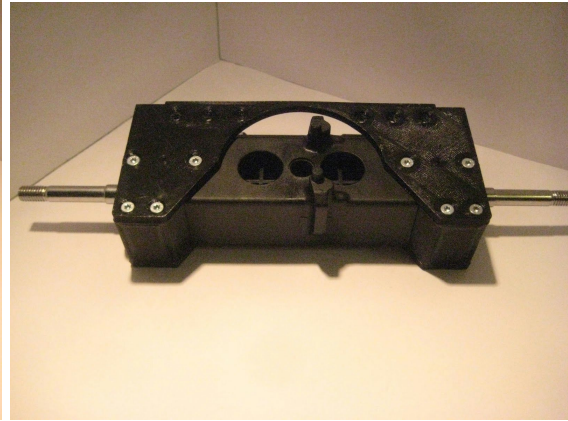


Picture 1.3.2

Get the front right and left enforcements to and align them according to picture 1.3.1. Using 2 XS screws fixate the enforcements as shown in picture 1.3.2.



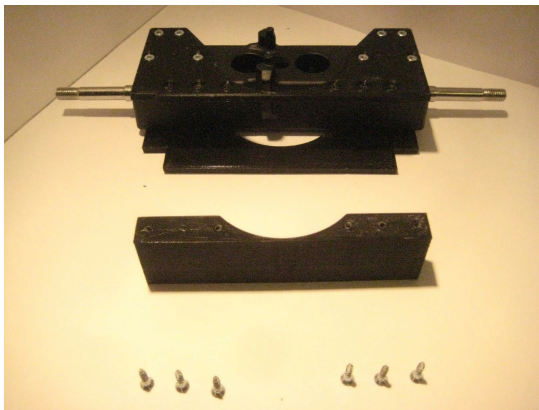
Picture 1.3.3



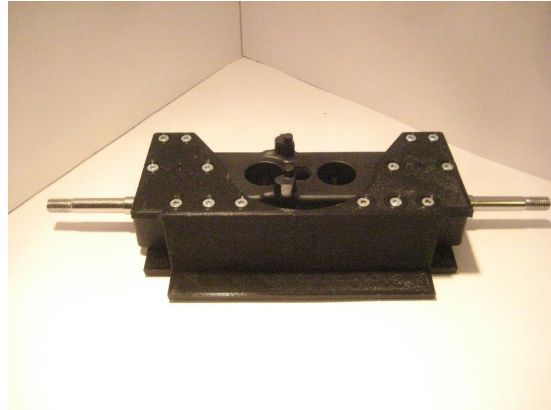
Picture 1.3.4

Turn the axle upside down and use 2 more XS screws to fixate the enforcements from the other side (picture 1.3.3 & 1.3.4).

Step 4 Mount the Back Enforcement

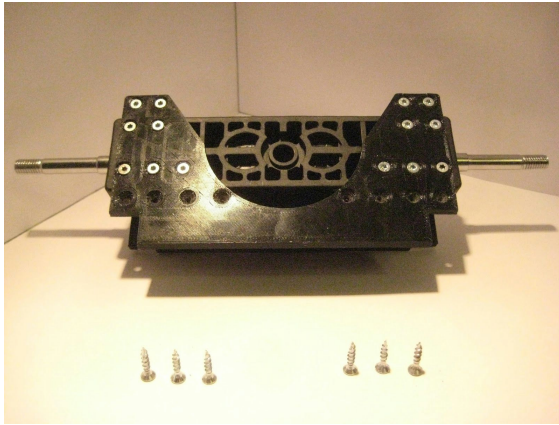


Picture 1.4.1

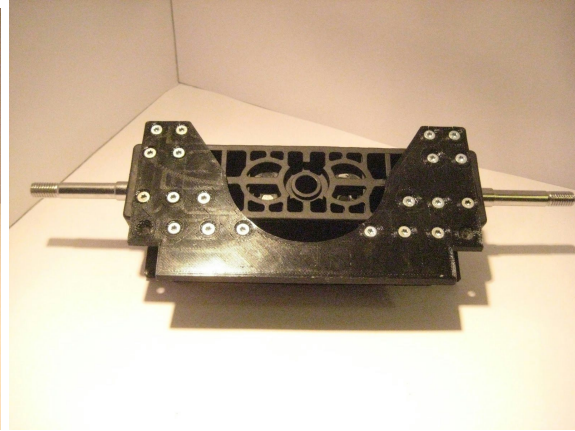


Picture 1.4.2

Align the back enforcement according to picture 1.4.1. As shown in picture 1.4.2, use 6 XS screws to securely attach the back enforcement to the axle on one side.



Picture 1.4.3



Picture 1.4.4

Do the same with 6 more XS screws as shown in picture 1.4.3 and 1.4.4.

Stage 2 - Assemble the Spine Box

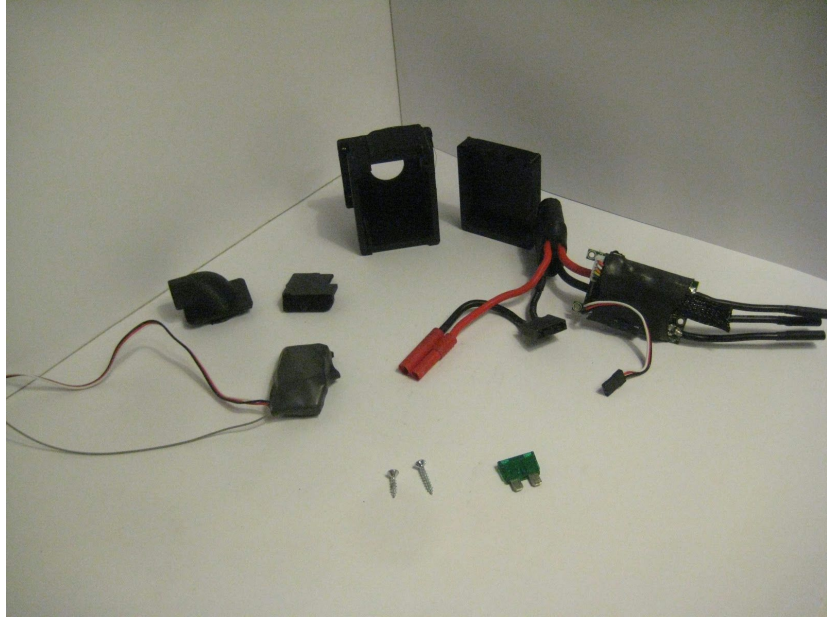
In this stage you will be mounting the electronics of your Spine.

Required Parts:

- Motor
- Motor Bracket
- Motor Controller
- Battery
- 2 Cable Protectors
- Electronics Box
- Electronics Box Lid
- Inner Top Box Lid
- Inner Bottom Box Lid
- XS, SM, M screws
- Small Knots
- Spacers & Bolts
- Pulley
- Metal Fixator
- Pulley Screws



Step 1 - Assemble the Electronics Box

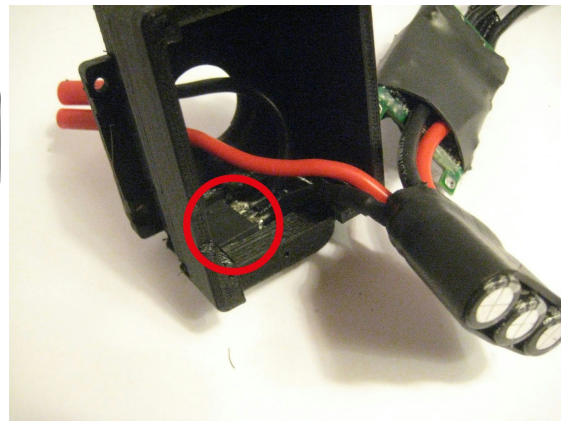


Picture 2.1.1

In this step we will assemble the electronics box (containing the motor controller, Wi-F receiver & fuse) using the parts shown in picture 2.1.1.

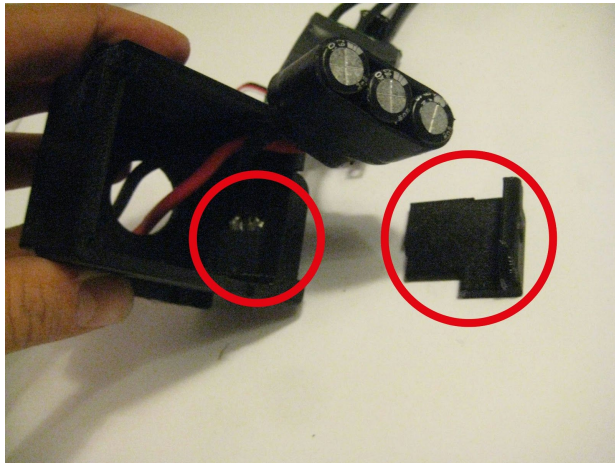


Picture 2.1.2



Picture 2.1.3

First using picture 2.1.2 and 2.1.3 as an example mount the fuse input into the plastic compartment inside the electronics box.

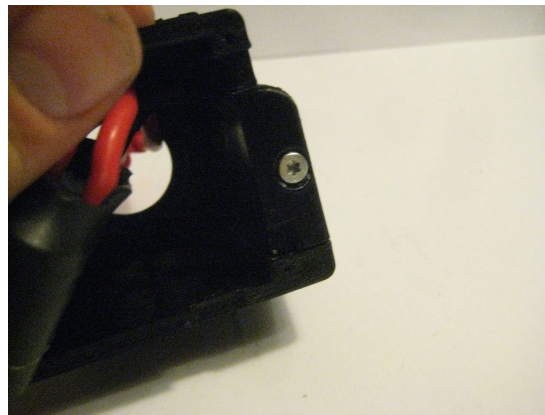


Picture 2.1.4



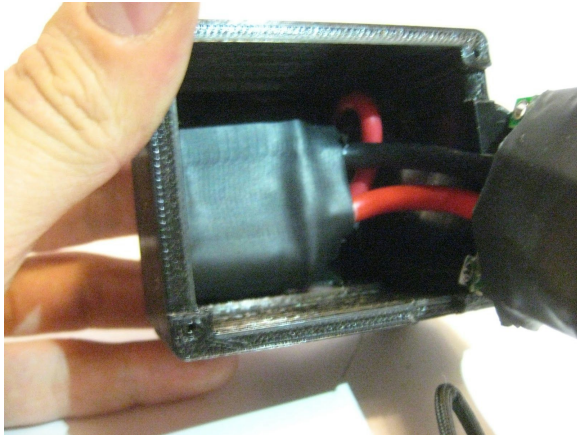
Picture 2.1.5

Pictures 2.1.4 and 2.1.5 show how to enclose the fuse input in the electronics box using the plastic gate.

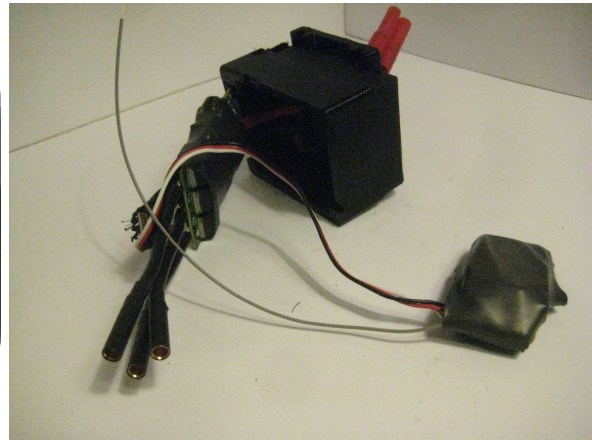


Picture 2.1.6

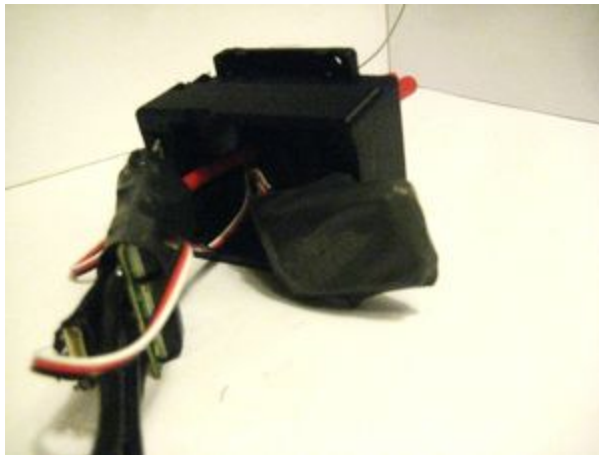
Finally just fixate the plastic gate with one XS screw (picture 2.1.6).



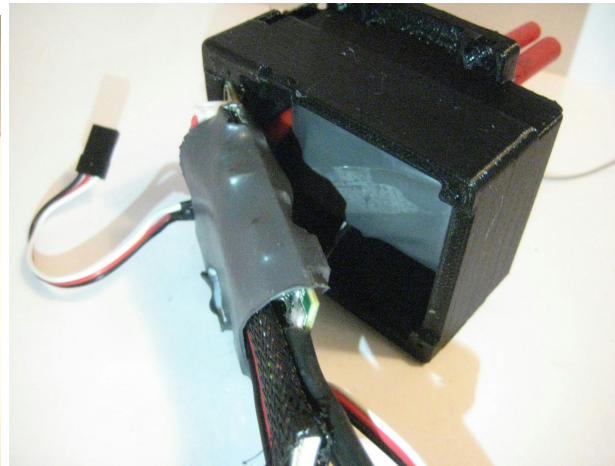
Picture 2.1.7



Picture 2.1.8



Picture 2.1.9

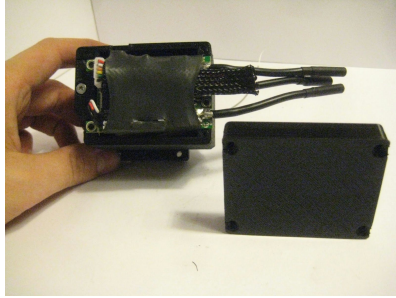


Picture 2.1.10

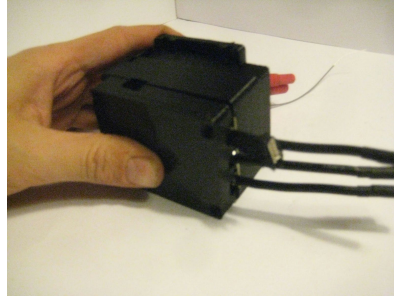
Now you will insert the motor controller, Wifi receiver and the capacitors in the electronics box.

First take the cables through the round hole so that they are available for future use as you can see in picture 2.1.14 & 2.1.15. Now push the capacitors to the bottom of the box just as shown in picture 2.1.7. On top of the capacitors place the Wi-Fi receiver as shown in picture 2.1.8 - 2.1.10. Finally lay the motor controller on top of the box as if it would be the lid of the box (picture 2.1.11). At this point you can take the plastic lid of the electronics box (picture 2.1.12) and try to adjust it on top of the motor controller. Make sure none of the cables are representing an obstacle to tightly close the lid (picture 2.1.12).

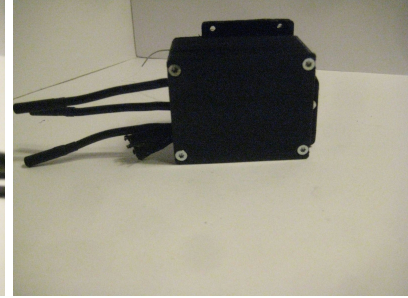
Finally use 4 SM screws to mount the lid on top of the electronics box picture (2.1.13). Be careful not to “bite” into any of the cables as this might cause shortages in the future.



Picture 2.1.11

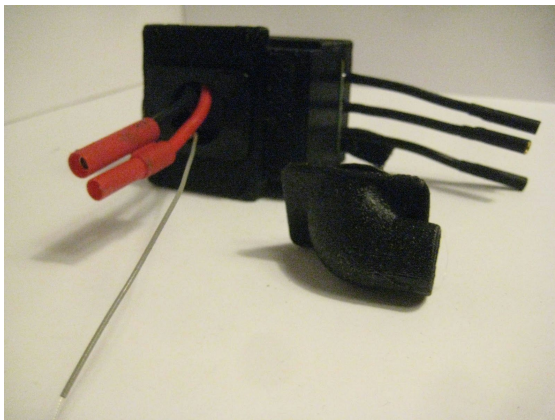


Picture 2.1.12

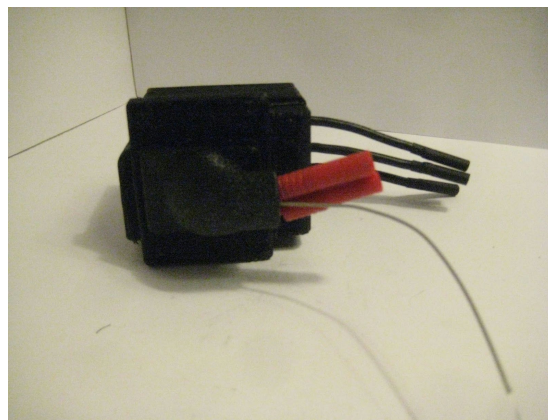


Picture 2.1.13

Now that the lid is on and the cables are outside you need to protect them using the rubber cable protector (picture 2.1.14 - 2.1.15).



Picture 2.1.14



Picture 2.1.15

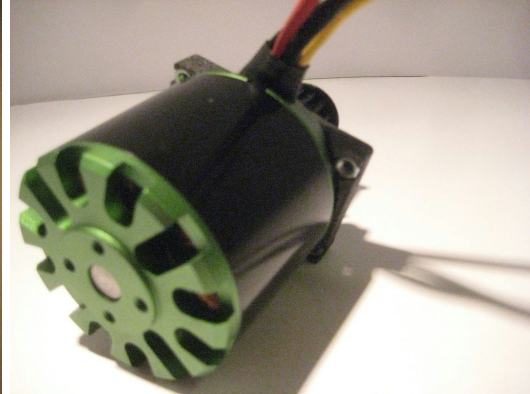


Step 2 - Assemble the Faraday Motion Motor

NOTE: It could be that your motor was already assembled when you received your Spine. You can still use this step to inspect your motor and understand how Faraday Motion is securing a safe usage of the electric motor.

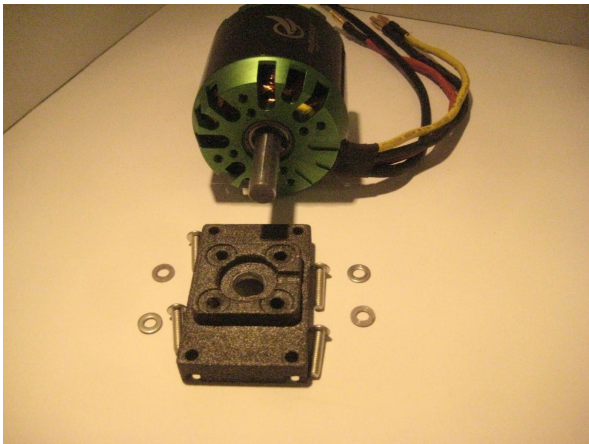


Picture 2.2.1

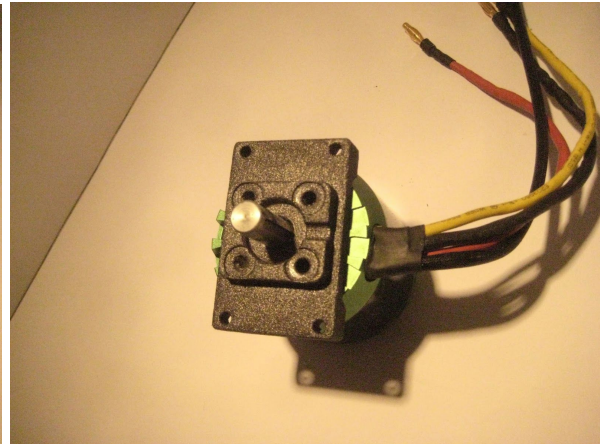


Picture 2.2.2

Use picture 1.2.1 as a reference to align the motor and the motor bracket. Get 4 small knobs and attach them to the motor bracket as shown in picture 1.2.2 & 1.2.3.

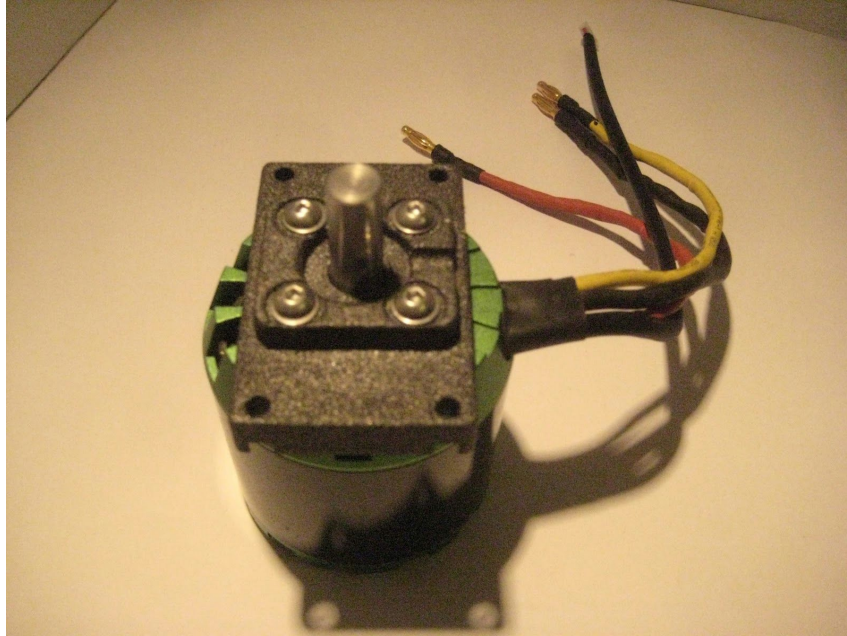


Picture 2.2.3



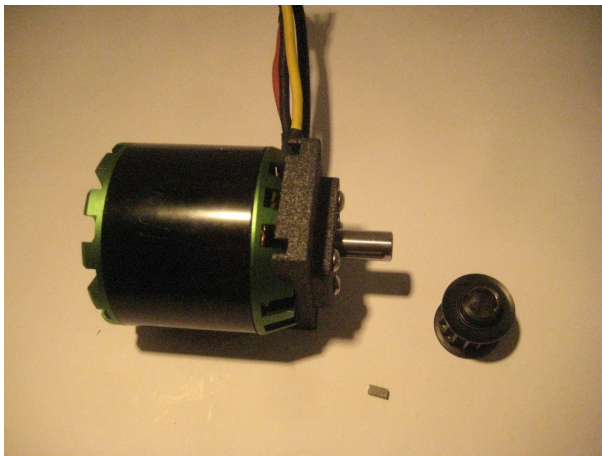
Picture 2.2.4

Prepare 4 bolts and 4 spacers for the motor bracket (picture 1.2.3). Align the motor bracket onto the motor as shown in the picture 1.2.4 (note that the motor bracket should be position exactly as in the picture).

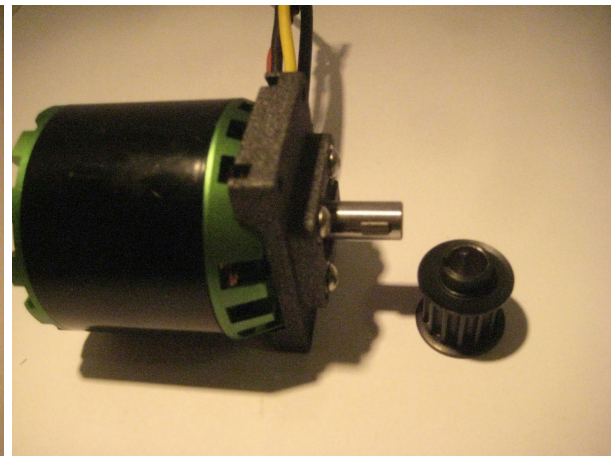


Picture 2.2.5

Use Loctite on the tip of the bolts before screwing the motor bracket onto the motor. Now your motor should look like the one in picture 2.2.5.



Picture 2.2.6



Picture 2.2.7

Prepare the pulley and the metal fixator (picture 1.1.16). Use a drop of Loctite on the metal fixator before attaching it to the motor axle as shown in picture 1.1.16.



Picture 2.2.8

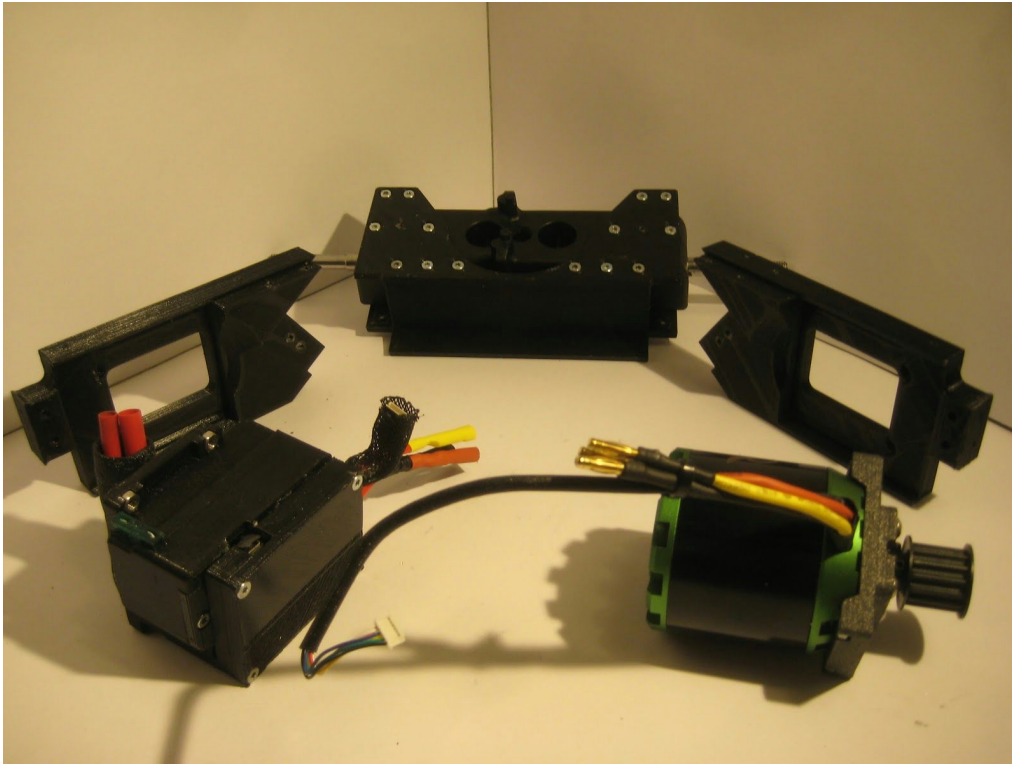


Picture 2.2.9

Now attach the pulley onto the motor axle. It should fit perfectly as there is only one position for it to go inside (picture 2.2.7). Push the pulley all the way in and use the two pulley screws to fixate the pulley onto the motor axle as shown in picture 2.2.7.



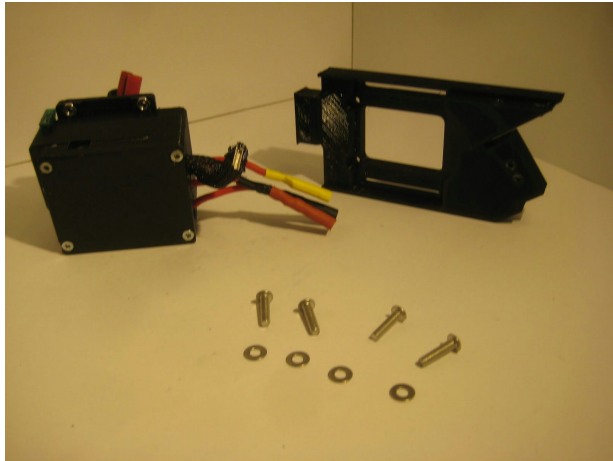
Step 3 - Mount the motor and electronics box to the brackets



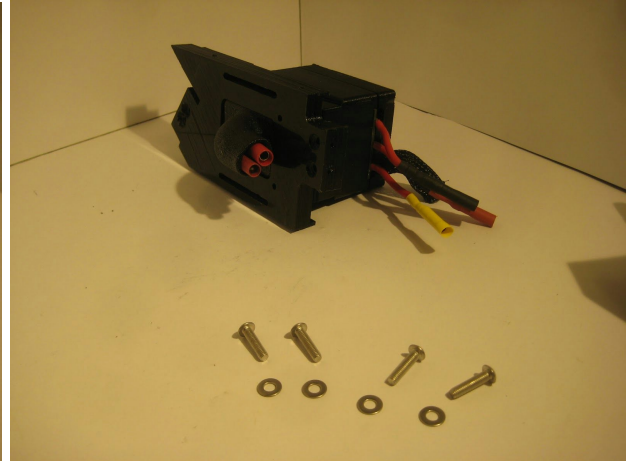
Picture 2.3.1

In this step you will attach the axle that you have assemble in the first stage to the two brackets that will have the electronics box and the motor attached to.

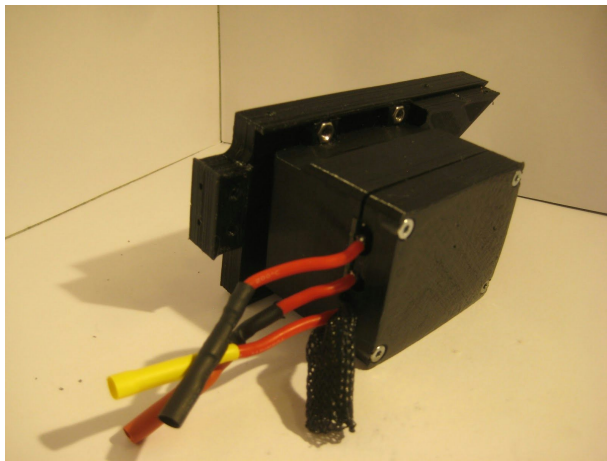
NOTE: Use picture [picture 2.3.1](#) to make sure you mount the right piece to the right bracket. This way you will avoid having your motor and electronics box having switched positions.



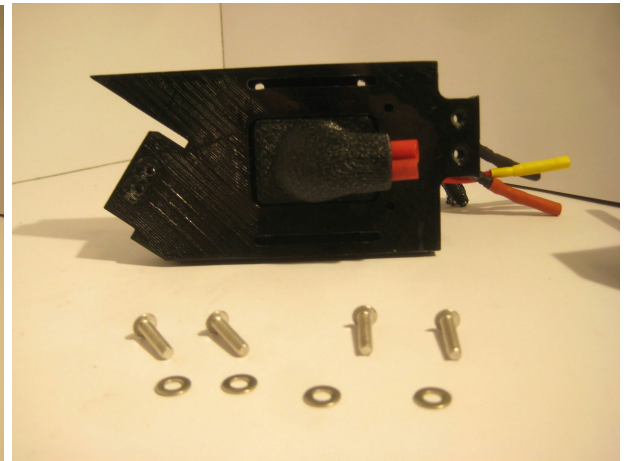
Picture 2.3.2



Picture 2.3.3



Picture 2.3.4

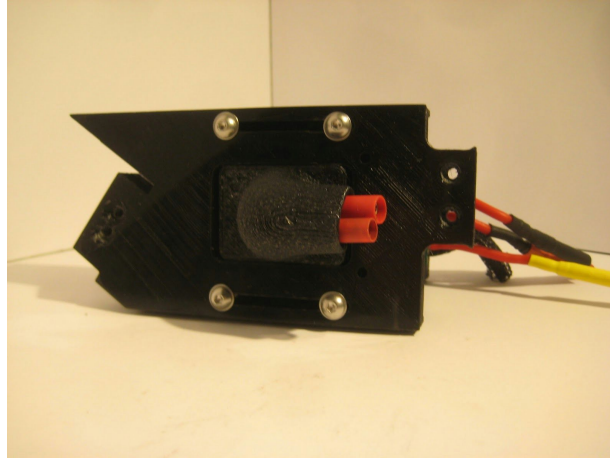


Picture 2.3.5

NOTE: It is important to position the electronics box in such a way that the cables are coming out on the bracket side that does not have a sharp edge (picture 2.3.4 & 2.3.5).

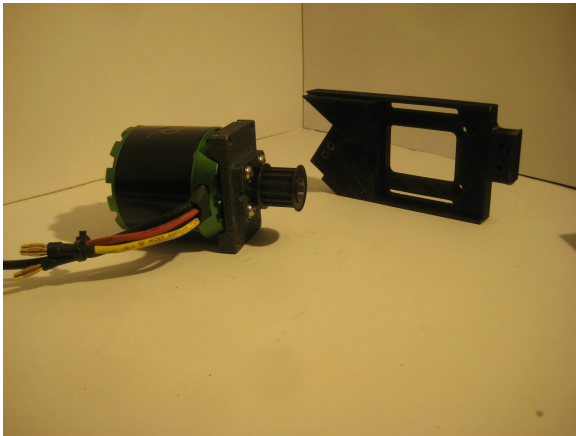
Now that you know what part belongs to what bracket you can mount the electronics box onto the left bracket.

First push the electronics box into the inside part of the bracket as shown in pictures 2.3.2 & 2.3.3 so that you get a result shown in pictures 2.3.4 and 2.3.5.

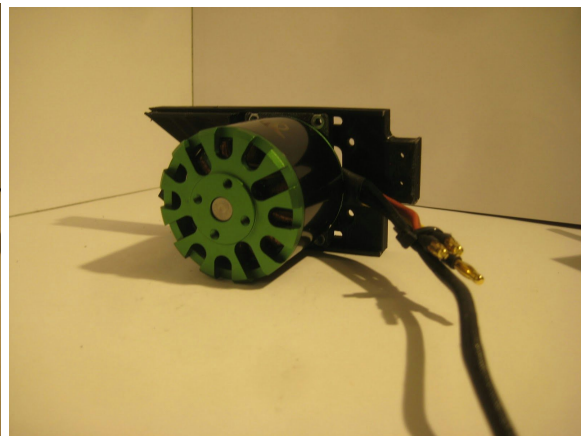


Picture 2.3.6

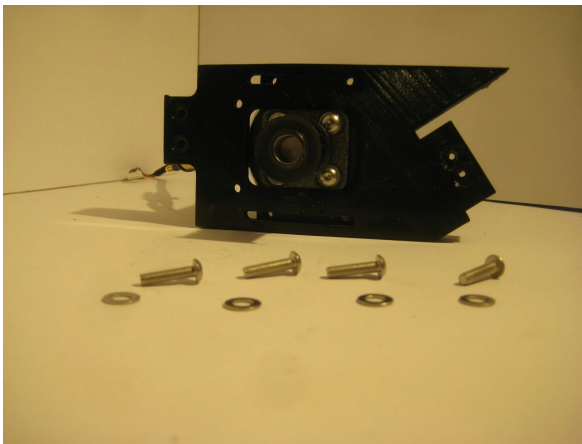
Using the 4 bolts and 4 spacers fixate the electronics box onto the left bracket as shown in picture 2.3.6.



Picture 2.3.7



Picture 2.3.8



Picture 2.3.7



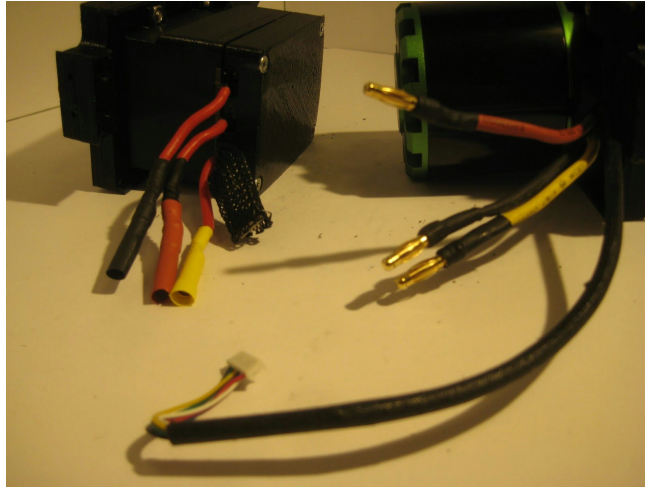
Picture 2.3.8

Now do the same process with the motor. **Remember** that the cables should be on the side of the right bracket where there is NOT an sharp edge. Use pictures 2.3.7 - 2.3.8 as a reference for pushing the motor into the inside part of the right bracket. Then use 4 more bolts and 4 more spacers to fixate the motor onto the the bracket.



Step 4 - Mount the brackets onto the battery container

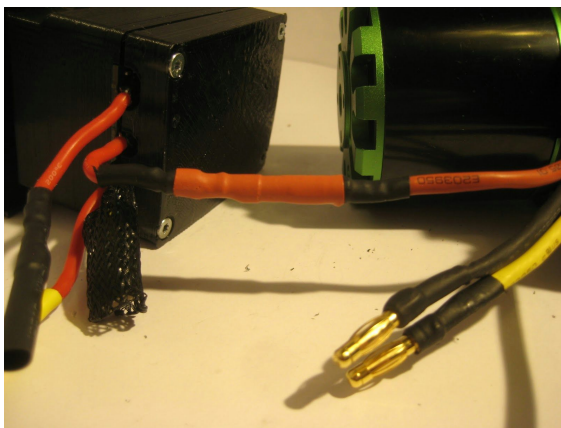
In this step you will be mounting the two brackets on the battery container. Before that you will have to connect the electronics box to the motor.



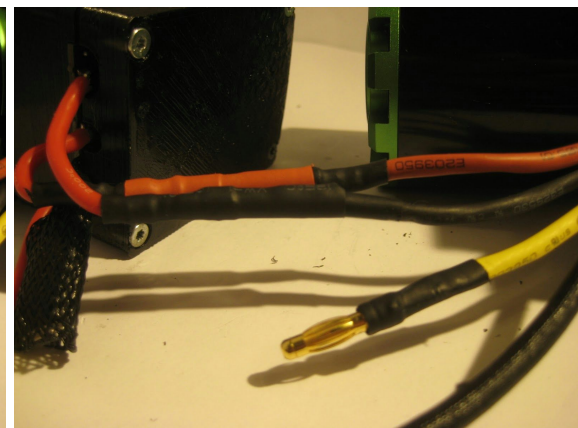
Picture 2.4.1

Use picture 2.4.1 as a reference for connecting the color coded cables to each other. Yellow tip cable from electronics box goes to the yellow cable of the motor. The black tip should be connected to the black motor cable and finally the red tip to red cable. Then connect the motor sensor cable that has a rectangular tip. Pictures 2.4.2 through 2.4.5 will guide you through this process.

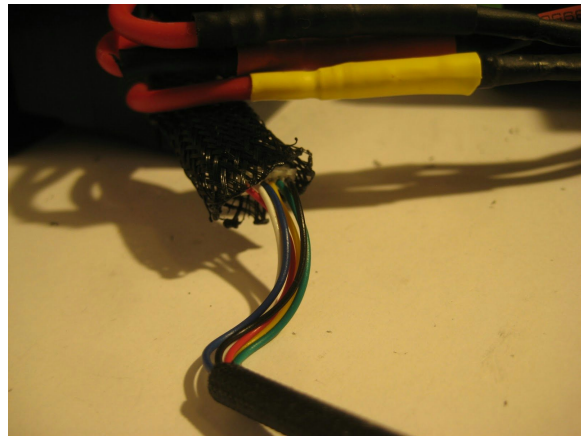
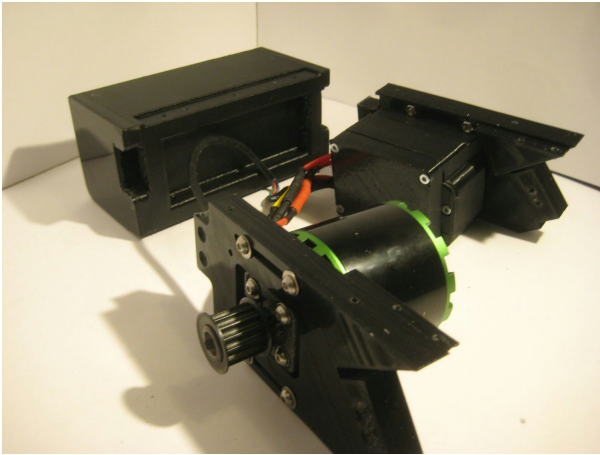
NOTE: If you mix up the cables your Spine will not be able to drive.



Picture 2.4.2



Picture 2.4.3

*Picture 2.4.4**Picture 2.4.5**Picture 2.4.6**Picture 2.4.7*

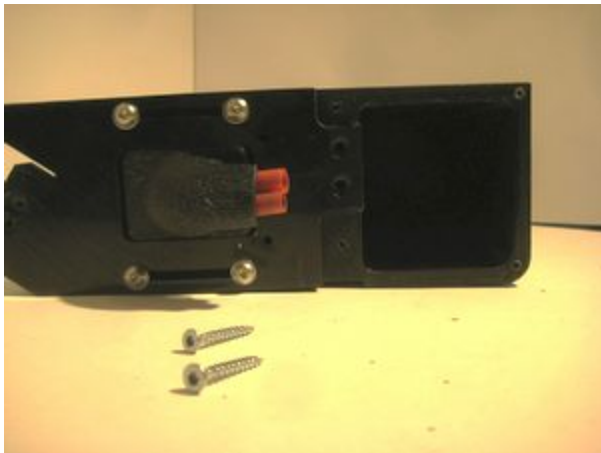
Now that the motor and the electronics are connected we can mount the brackets onto the battery container as shown in pictures 2.4.6-2.4.7. Be careful not to unplug the cables by accident as it will be tricky to reconnect them when the Spine box is fully assembled.



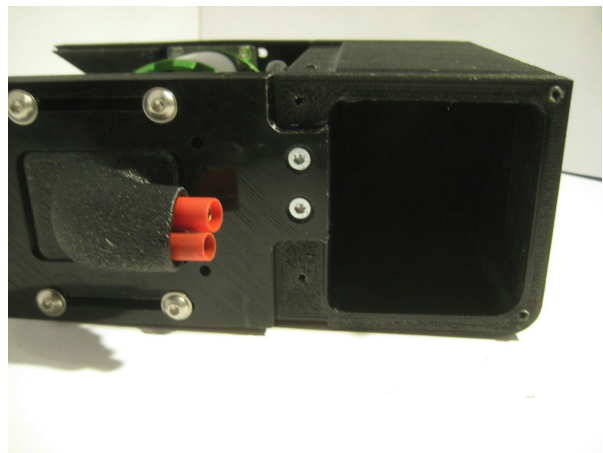
Picture 2.4.8



Picture 2.4.9

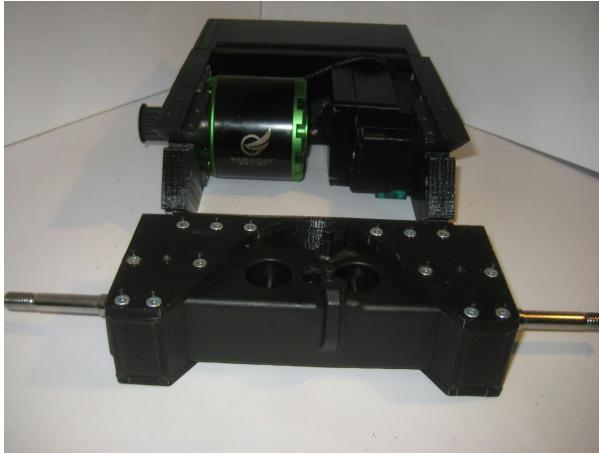


Picture 2.4.10

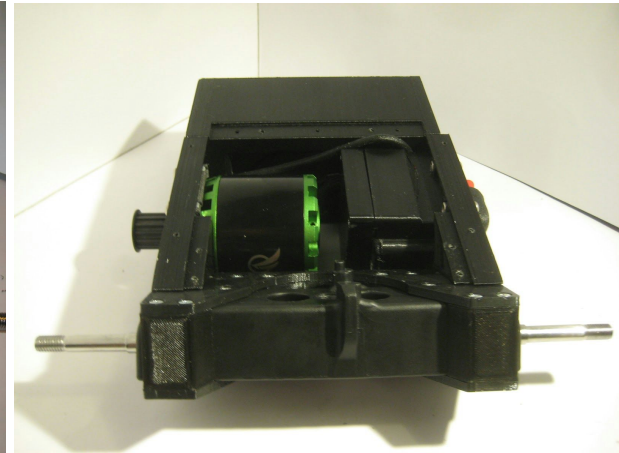


Picture 2.4.11

Now you have to secure the connection of the battery container and the brackets by screwing 2 SM screws on each side of the construction as shown through pictures 2.4.8 - 2.4.11.

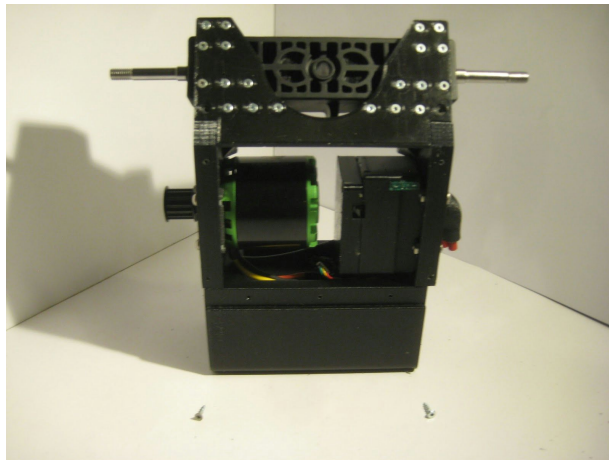


Picture 2.4.12

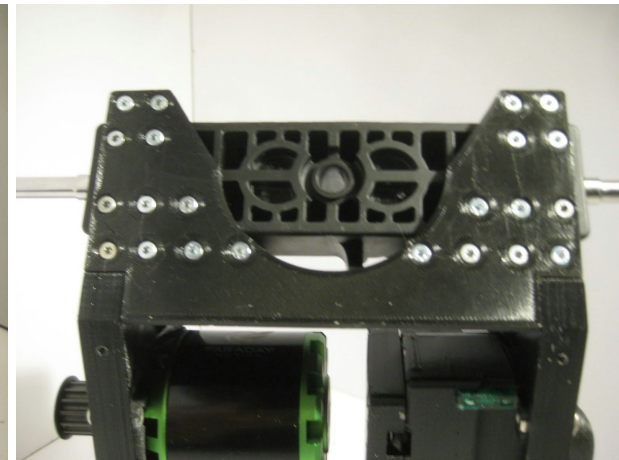


Picture 2.4.13

Next you will connect the battery pack and the brackets to the back axle that you have assembled in the first stage. Use pictures 2.4.12 & 2.4.13 to align correctly the parts and slide them into each other.

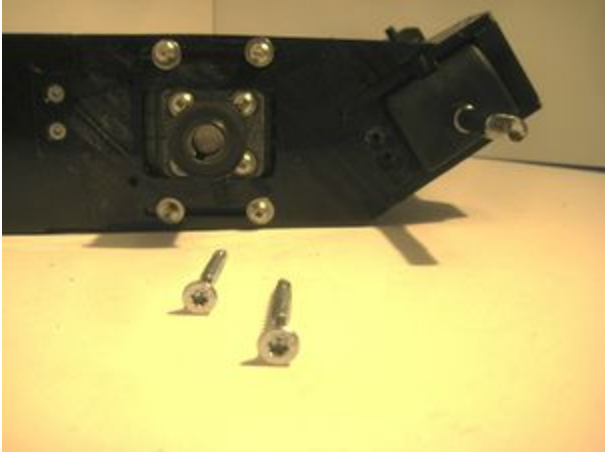


Picture 2.4.14

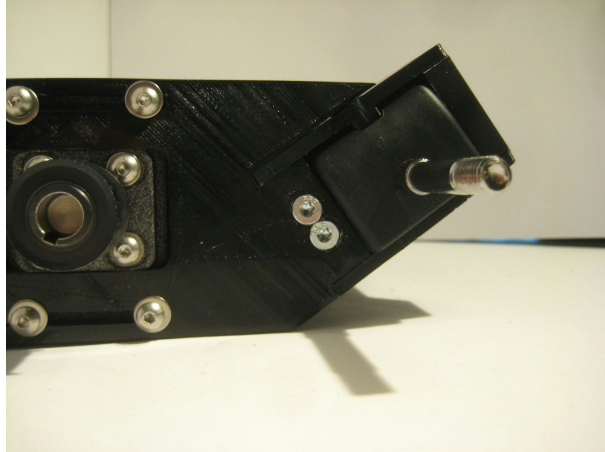


Picture 2.4.15

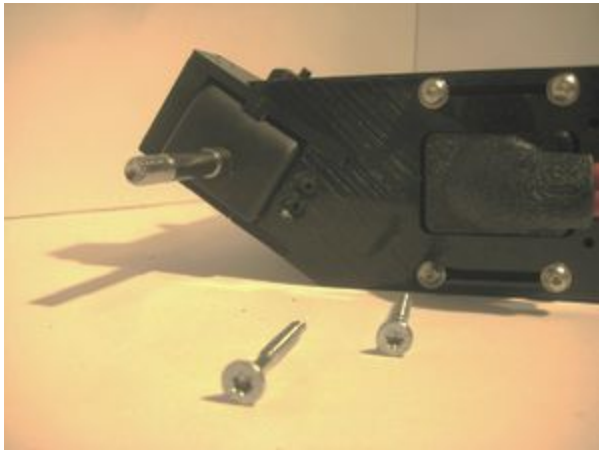
Pictures 2.4.14 & 2.4.15 show how to use 2 XS screws in order to initially fixate the 2 parts.



Picture 2.4.16



Picture 2.4.17



Picture 2.4.18

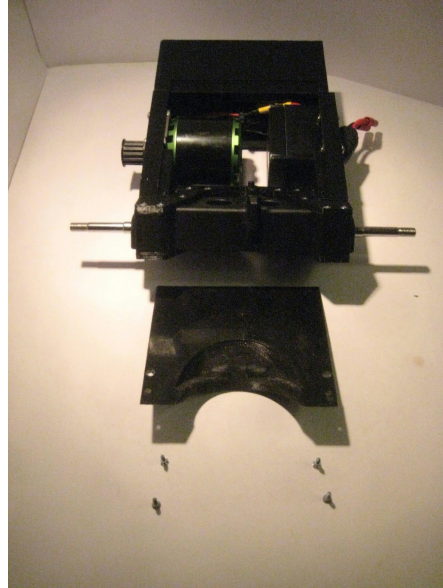


Picture 2.4.19

In order to have a strong and secure connection between the two parts you have to screw in 2 L screws on each side of the construction as shown through pictures 2.4.16 - 2.4.19.

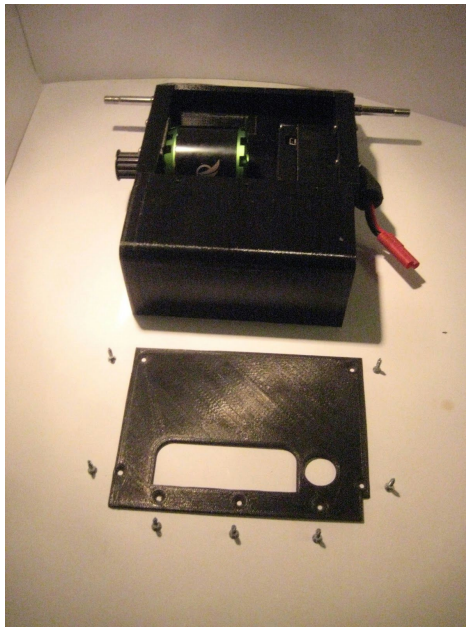


Step 5 - Complete the assembly of the Spine Box



Picture 2.3.1

Prepare the inner top lid and 4 XS screws. Mount the lid as shown in pictures 2.3.1.



Picture 2.3.2

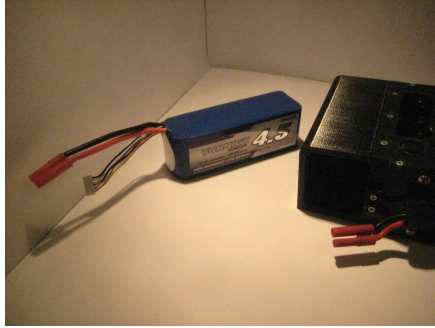


Picture 2.3.3



Now do the same for the the inner bottom lid as shown in pictures 2.3.2 - 2.3.3.

Step 6 - Insert the battery

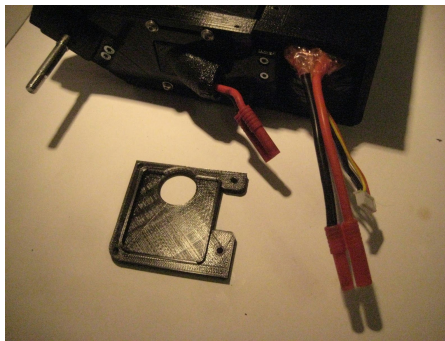


Picture 2.4.1



Picture 2.4.2

Use the bubble wrap to protect your battery as shown in pictures 2.4.1 - 2.4.2.



Picture 2.4.3

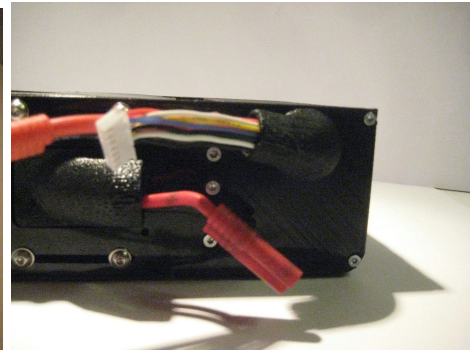


Picture 2.4.4

Add the cable protector to the the battery lid and pull the battery cable through it. Now insert the battery into the battery box as shown in picture 2.4.3 - 2.4.4.



Picture 2.4.5



Picture 2.4.6

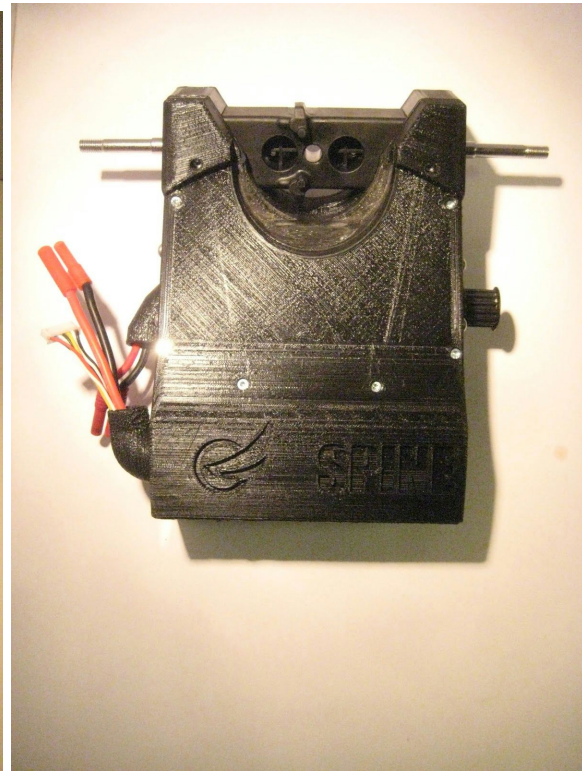
Use 4 SM screws to fixate the battery lid onto the battery box as shown in pictures 2.4.5 - 2.4.6.



Step 7 - Mount the Top Lid



Picture 2.5.1



Picture 2.5.2

Use 2 M screws and 6 XS screws to mount the top cover of the spine box (pictures 2.5.1 - 2.5.2)

Congrats! You have finished assembling the Spine box.



Stage 3 - Mount the Spine Box onto the Deck

In this stage you will be mounting the Spine Box onto the deck.

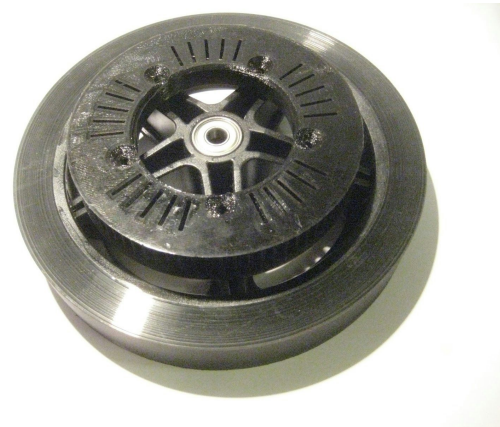
Required Parts:

- 4 Wheels
- 1 Gear
- 5 XL Screws
- 4 Shocks
- 2 XL Bolts and 2 Large Knobs
- 1 Motor Belt
- 4 Wheel Knobs

Step 1 - Mount the Gear onto the Wheel

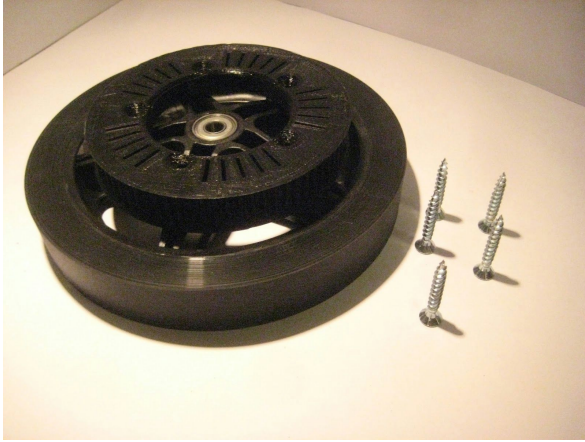


Picture 3.1.1



Picture 3.3.2

Picture 3.1.1 shows the gear and the back wheel onto which you will attach the gear. First align the gear onto the wheel so the screw holes correspond to each other (picture 3.1.2).



Picture 3.1.3



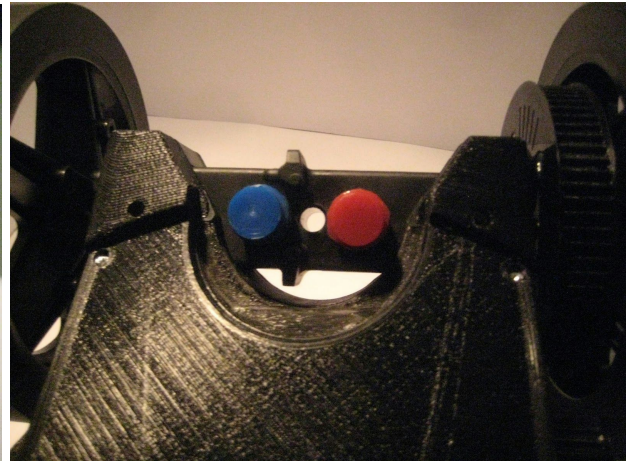
Picture 3.1.4

Now use 5 XL screws to screw fixate the gear onto the wheel (picture 3.1.3). Tighten the screws manually to ensure firmness (picture 3.1.4)

Step 2 - Mount the Spine Box onto the Decks Back side.



Picture 3.2.1



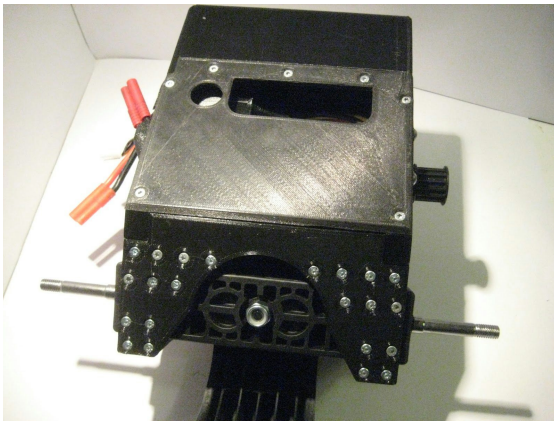
Picture 3.2.2

Take 2 shocks (1 blue and 1 red) as in picture 3.2.1 and attach them to the axle of your Spine box (picture 3.2.2).



Picture 3.2.3

Now as you can see in the picture 3.2.3 the deck has a compartment for those shocks as well.



Picture 3.2.4

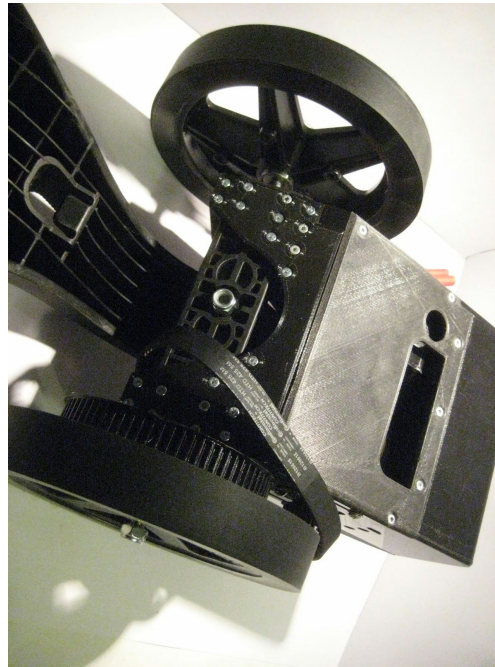


Picture 3.2.5

Now mount the Spine box onto the deck (picture 3.2.4) and use the XL bolts together with the large knob to fixate the box onto the deck (picture 3.2.5).

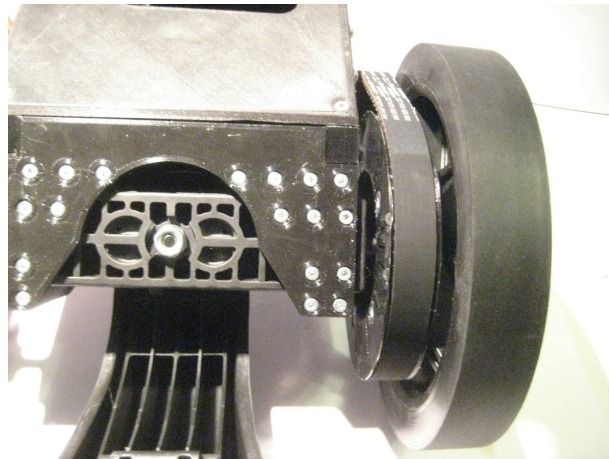


Step 3 - Mount the Belt



Picture 3.3.1

First put the belt around the rear axle of the deck and then mount the wheel (picture 3.3.1). Loosely screw the knob of the wheel.



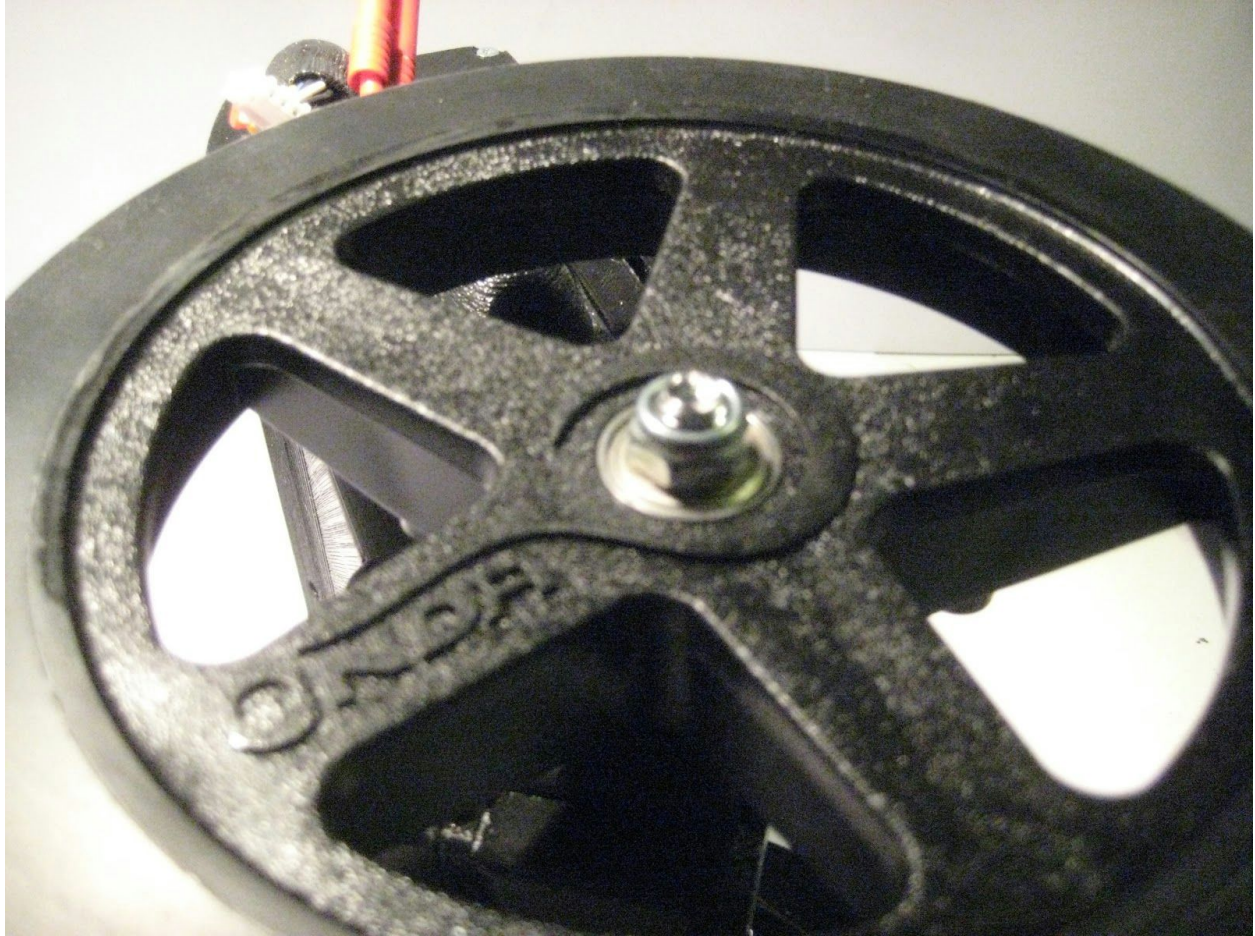
Picture 3.3.2

Now just like you would do it on a bike tighten the belt connecting the motor pulley and the wheel gear (picture 3.3.2)

Once the belt is tightened firmly screw the wheel knob to make sure it does not wiggle sideways. Note do not for the knob too much as it may damage the wheel.



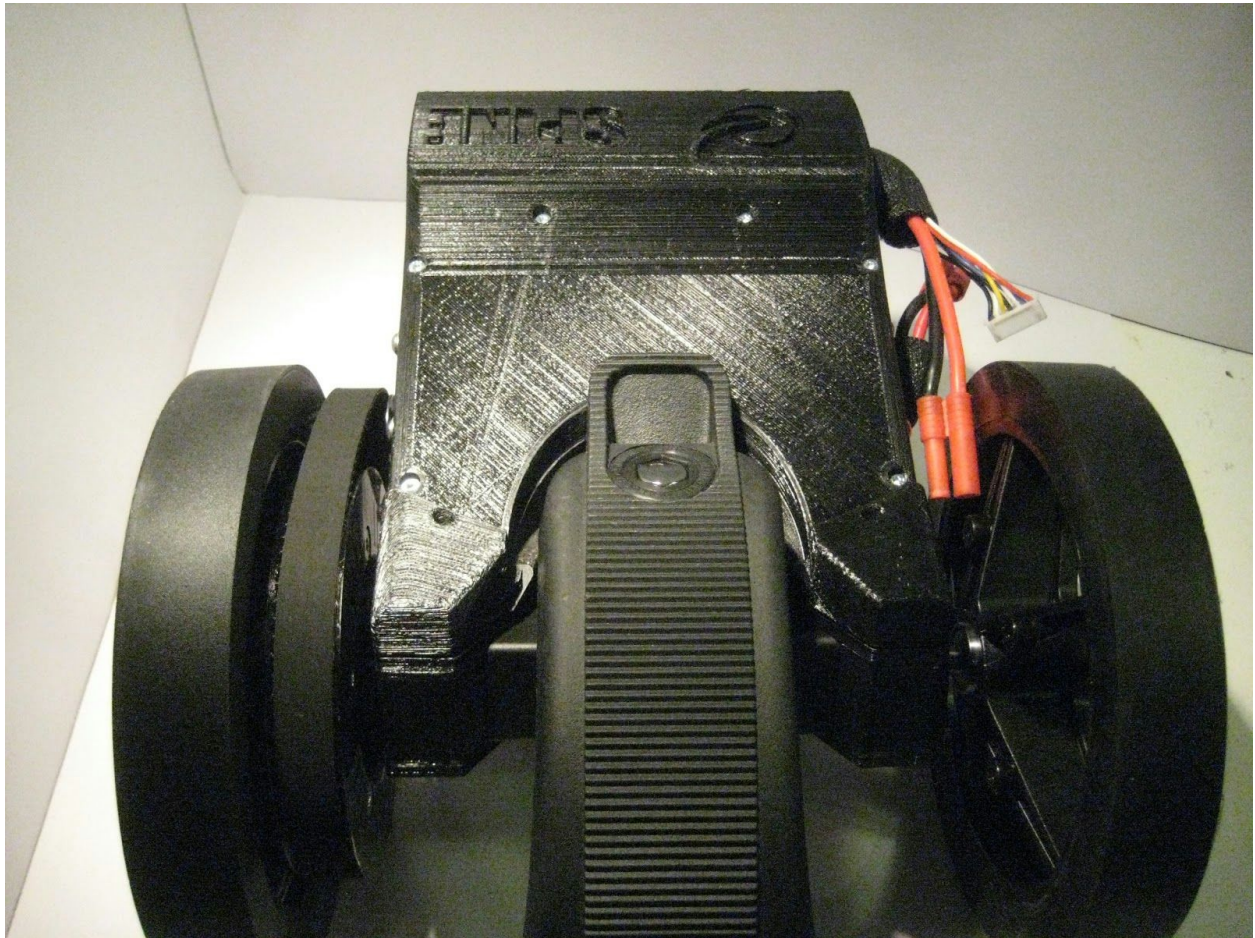
Step 4 - Mount the rest of the wheels and the front axle



Now mount the remaining 3 wheels. Finally mount the front axle of the board using the same technique we used for mounting the back one.



Step 5 - Tighten all the bolts, knobs and screws and get moving



After you have ensured yourself that all the parts are firmly mounted, plug the battery into the motor controller and use your mobile phone or nunchuck to connect to the board. Do a test turn of the wheel. Before you attempt to drive it please refer to the [First Ride Check List](#) .