Arrow Shark

E-Starter V4

Owner Manual

www.arrowshark.com

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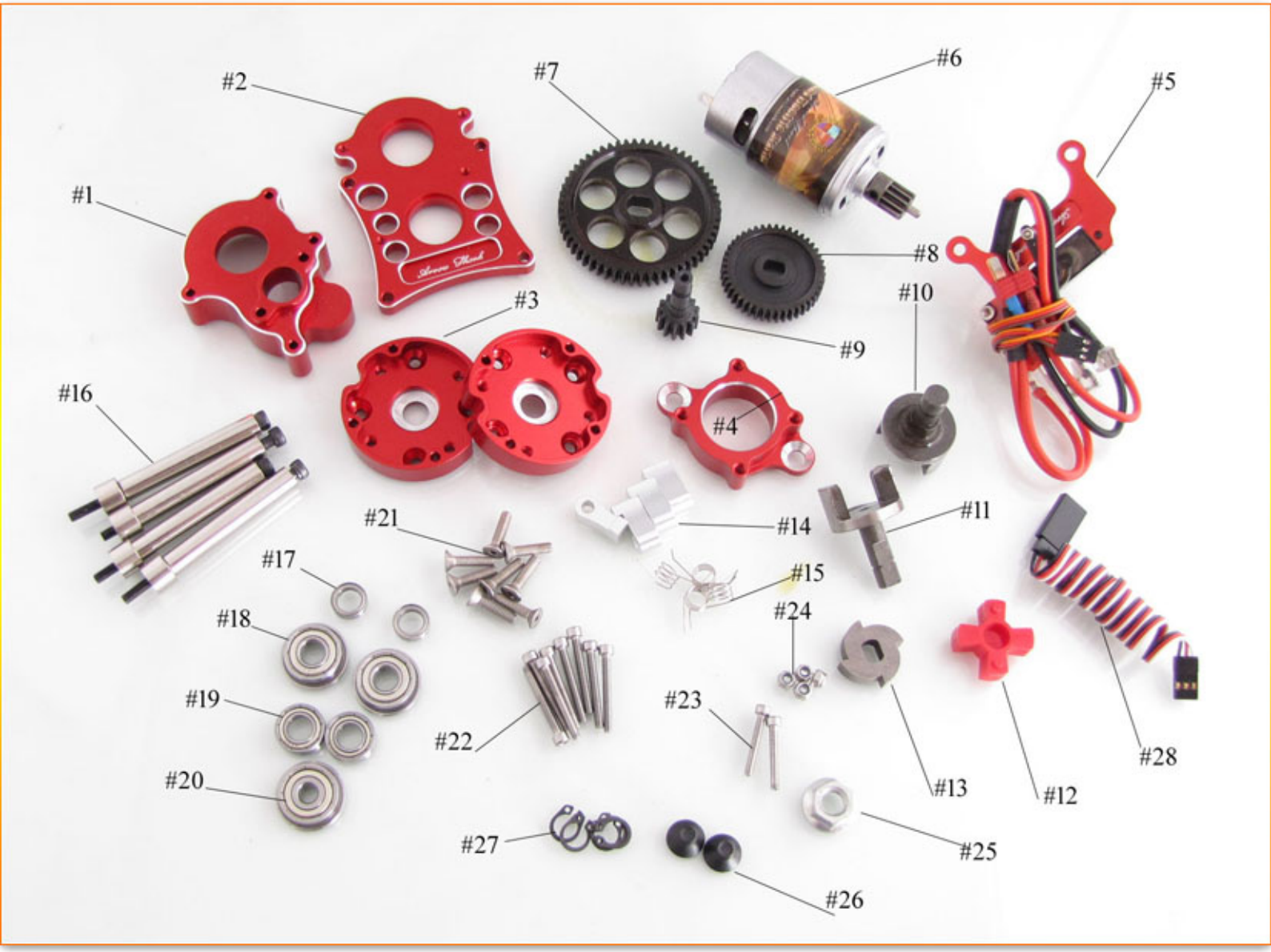

#1	CNC Gear Box	#15	Pawl Springs x 4
#2	CNC Mounting Plate	#16	Installation Stands & Bolts
#3	CNC Clutch Box	#17	M3.5 x 8 Bearing x 2
#4	Flywheel Adaptor	#18	M21 x 8 Bearings x 2
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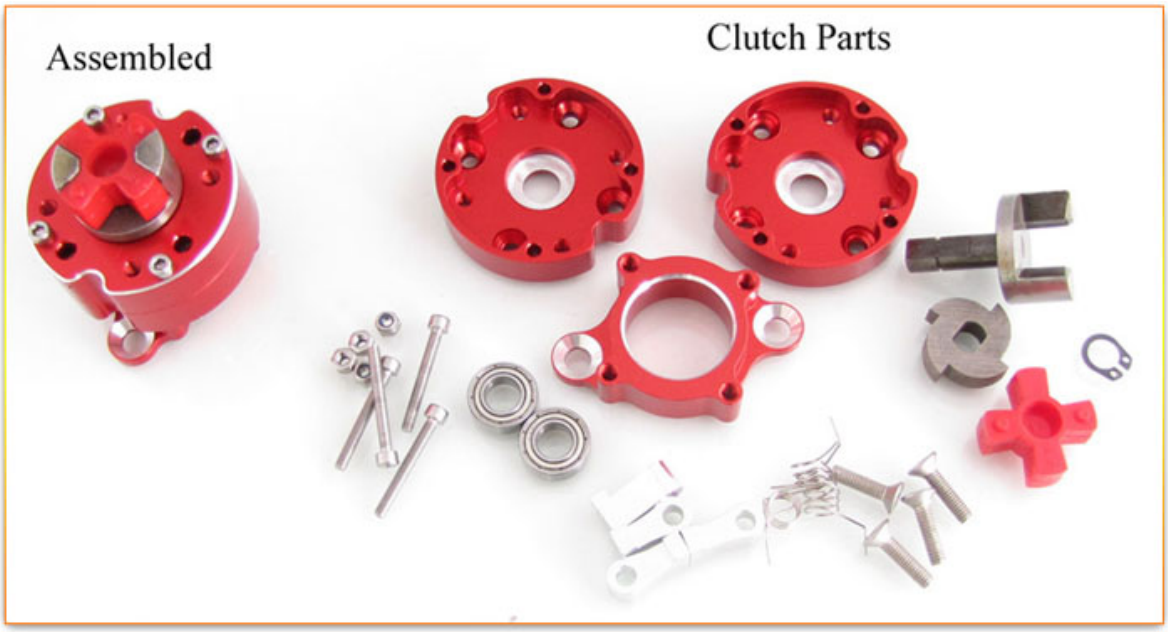
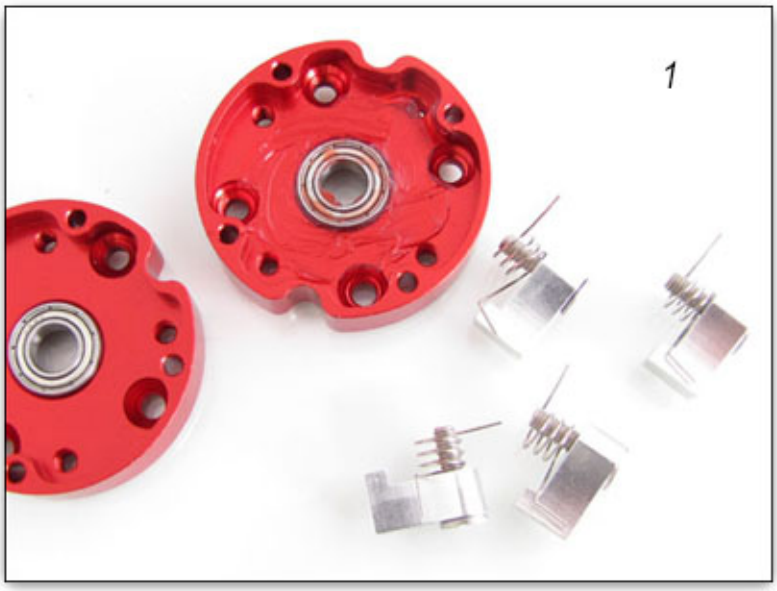
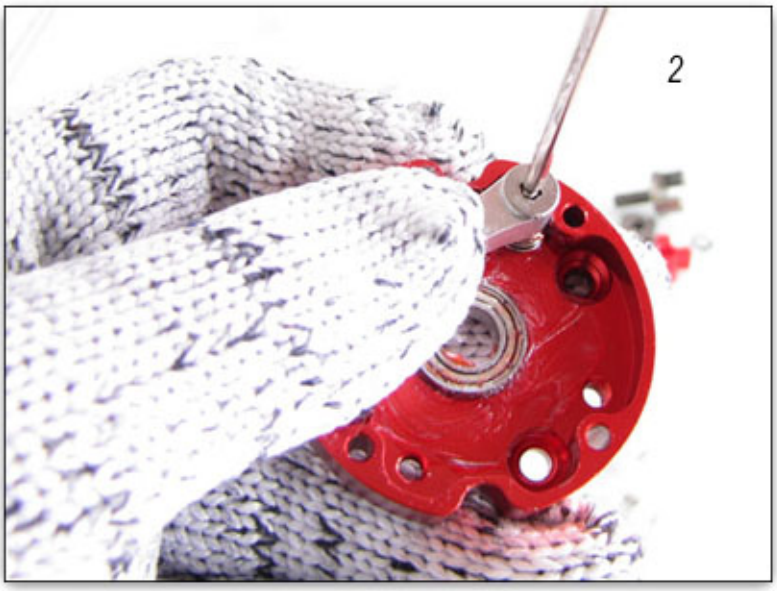
#14	CNC clutch Pawls x 4	#28	500mm Extension Wire

Clutch Box Assembly



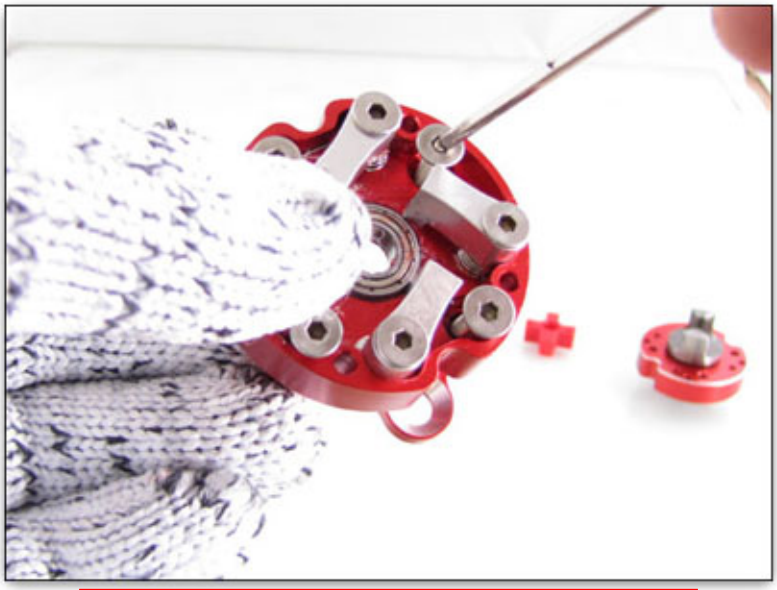




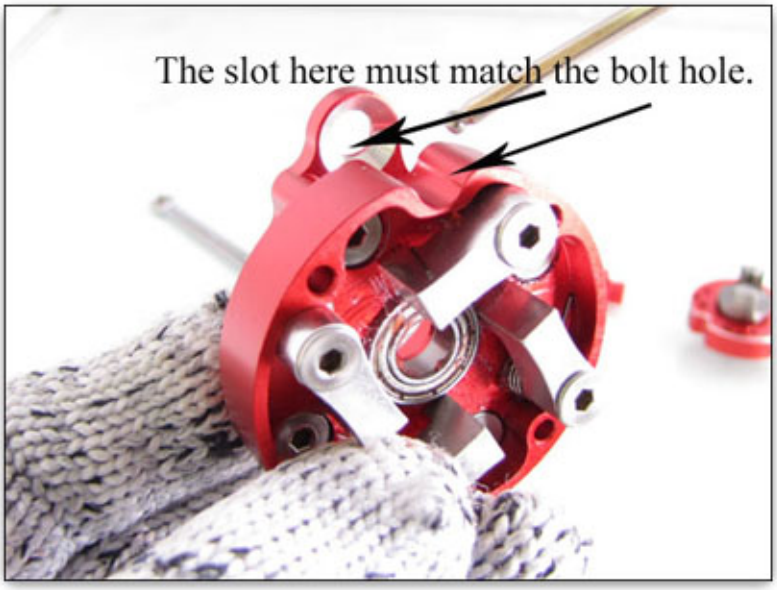
1: Lower half clutch box installation: apply some grease around the bearings and also apply some Loctite inside the thread holes. Place the springs onto the bolts and pawls as pictured above.
2: Screw a bolt into the clutch box thread hole, but do not tighten - make sure the pawl can move up and down freely by its spring
3: Repeat the same installation on the other three pawls and springs to complete the lower half clutch box.
4: Upper half clutch box installation: insert the lower plum coupling part via the upper clutch box center bearing hole.

Insert the four leg spinner onto the coupling shaft.

Apply the C-clip onto the shaft in order to hold the spinner in place.



Install the upper clutch box assembly to the flywheel adaptor, and tighten it with four bolts.



Make sure the slot on the upper clutch box will match the bolt hole on the flywheel adaptor.

Assemble the upper and lower clutch boxes together - making sure the slot will match.

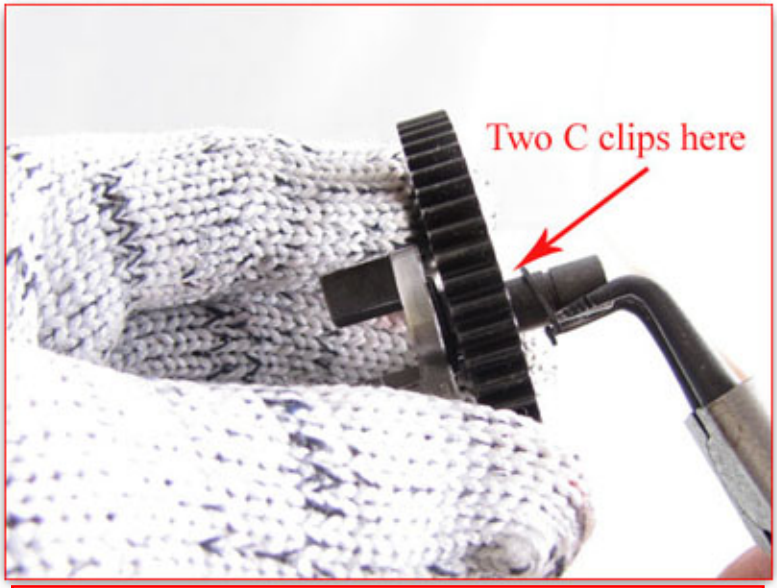
Tighten these two clutch box pieces with bolts and nuts.

Apply some grease on both plum couplings and the softer adaptor, then attach them together.
Clutch box assembly complete!

Gear Box Assembly

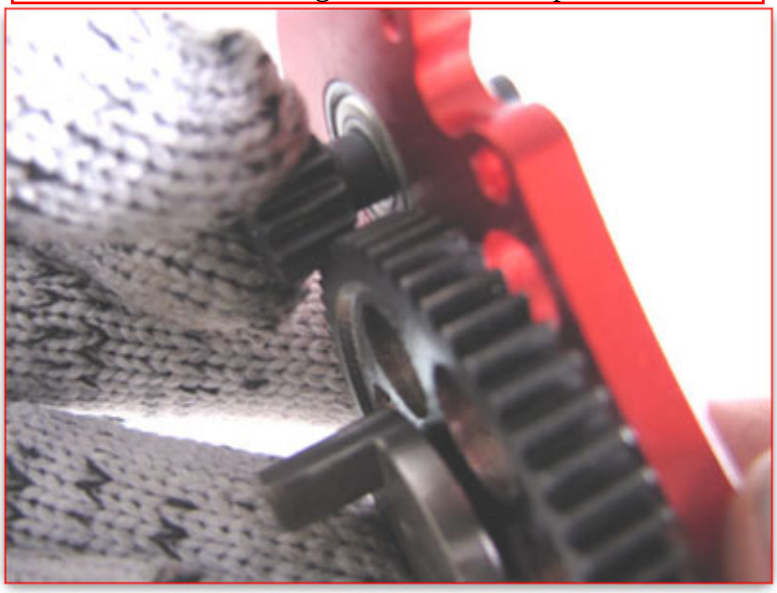
Install bearings to the CNC plate and gear box as shown above; apply some loctite around the edge of the bearings when installing them.

Install the electric motor onto the gear box by using two of M3x20 bolts - make sure to apply some loctite on the bolts as well.



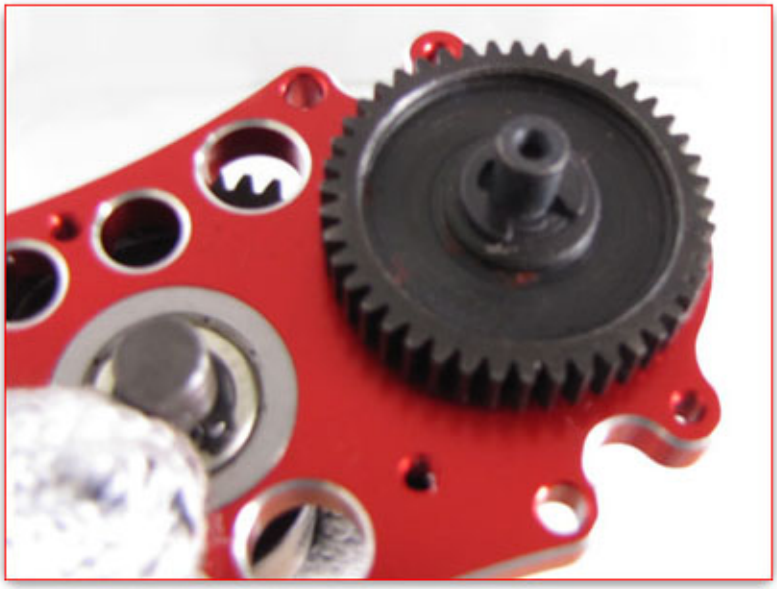
Insert the upper plum coupling through the 57T gear, and use two C-clips to hold it in place. Make sure they are two 8mm C-clips here in order to make out the proper space between the gear and the CNC plate.

Insert the coupling shaft through the lower bearing on the CNC plate as shown above, and use a C-clip to hold the shaft in place.
Note: When doing this, the Logo side should be facing you.

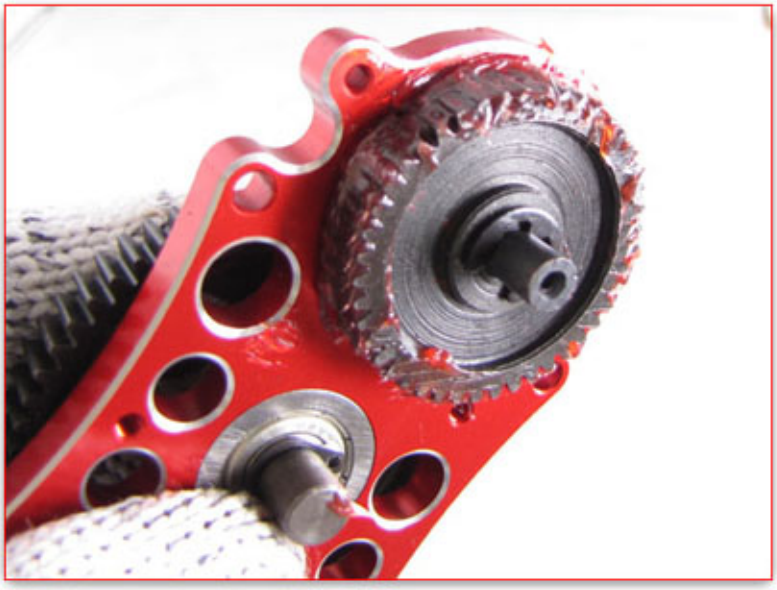


Install the 13T shaft gear through the upper bearing on the CNC plate.

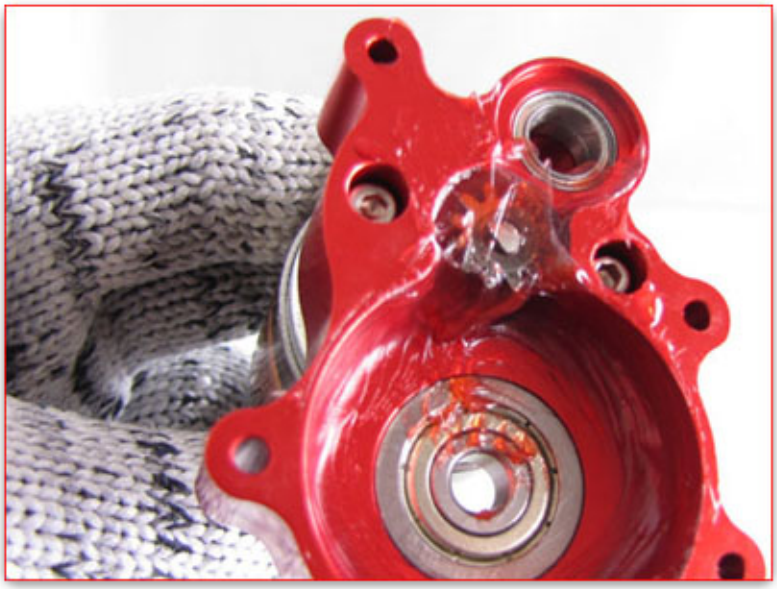
Use the C-clip to hold the gear shaft in place.



Insert the 35T gear onto the shaft on 13T gear shaft and use a C-clip to hold it in place.



Apply some grease in the gap of each tooth on 35T gear as shown above.



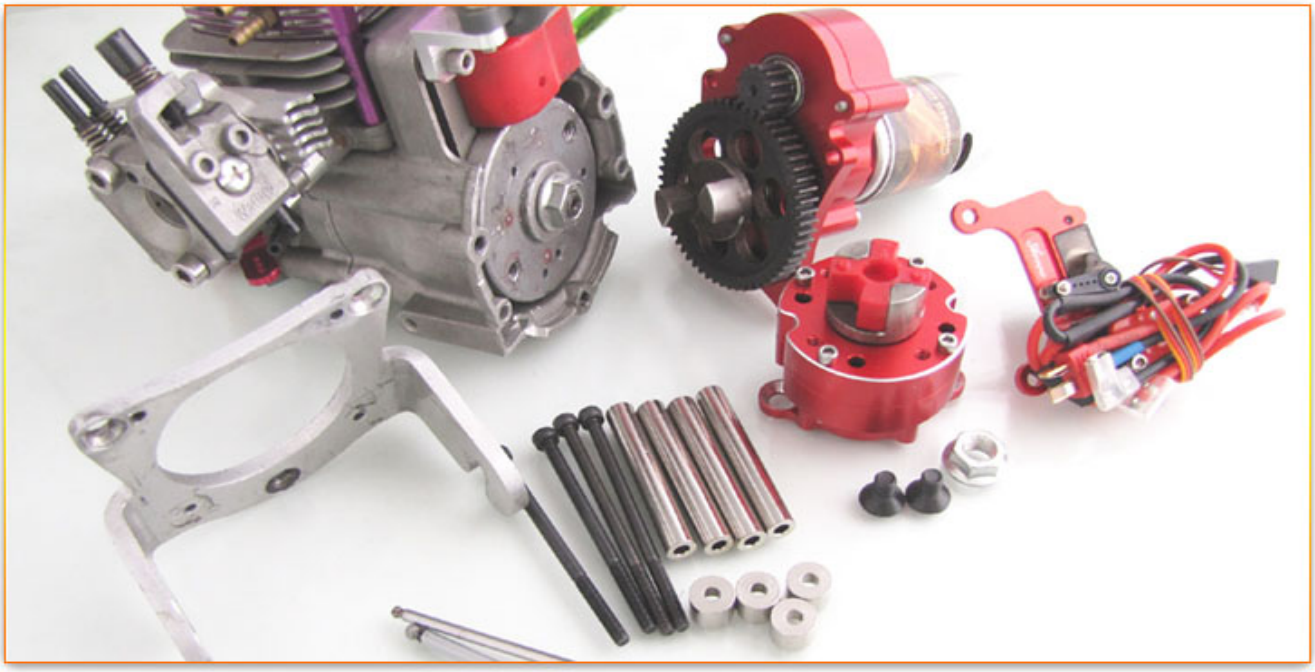
Apply some grease on the side of the gear box and electric motor gear.

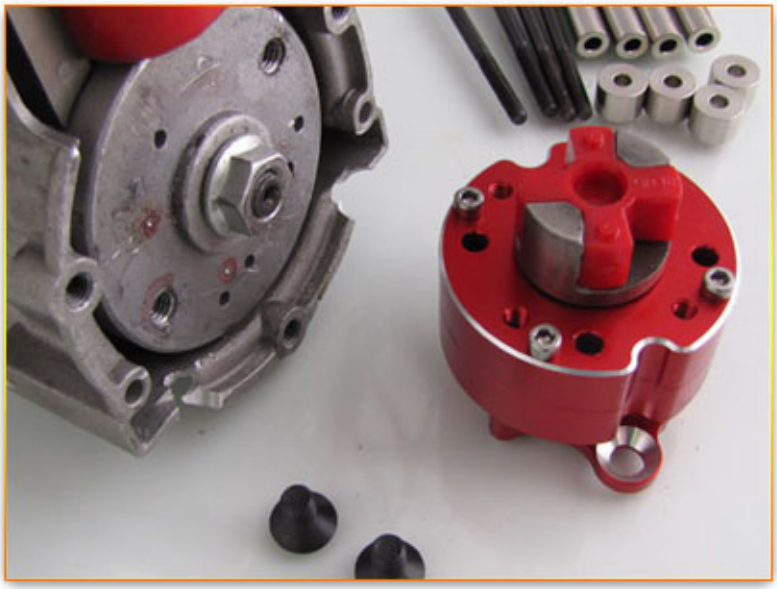
Match together the CNC plate and the gear box as shown above.

Use M3x25 bolts to hold the gear box firmly on the top of the CNC plate.

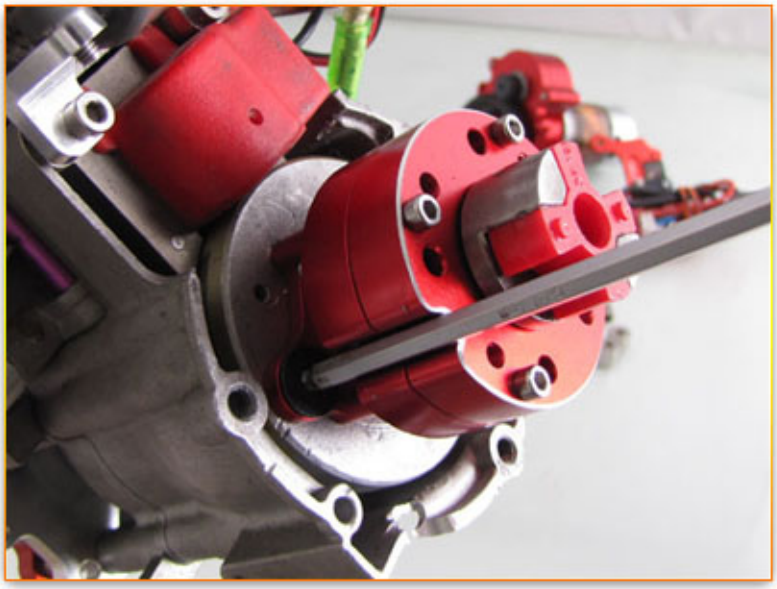
Gear box assembly complete!

Installing the E-Starter V4 on to Gas Engine

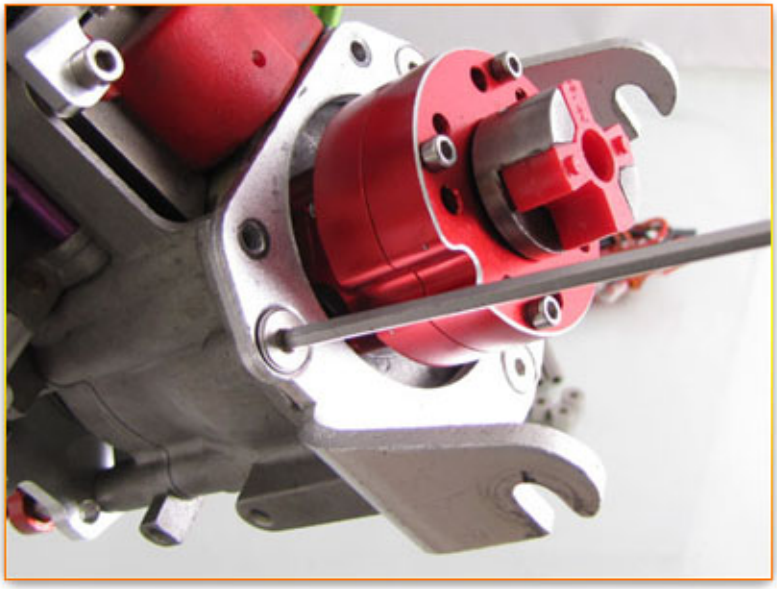




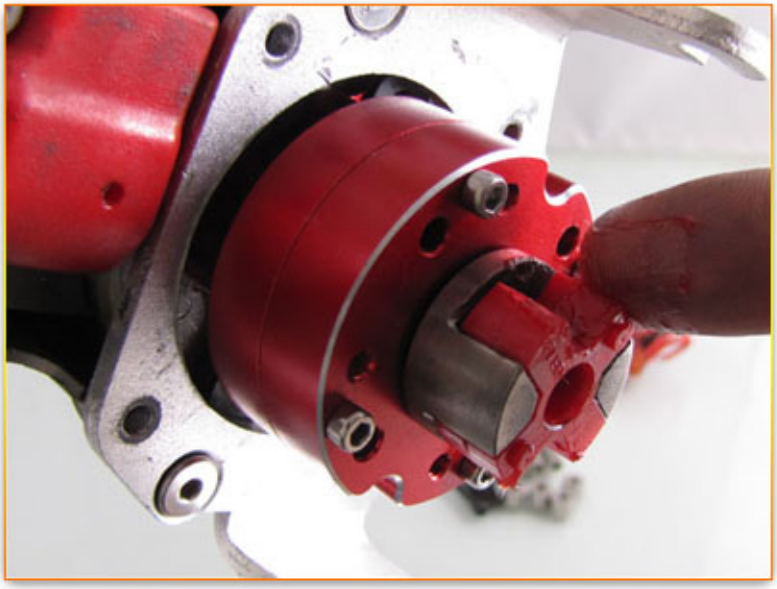
Insert the piston stopper to your engine - take out the stock pulley and install the crankshaft nut from the package.



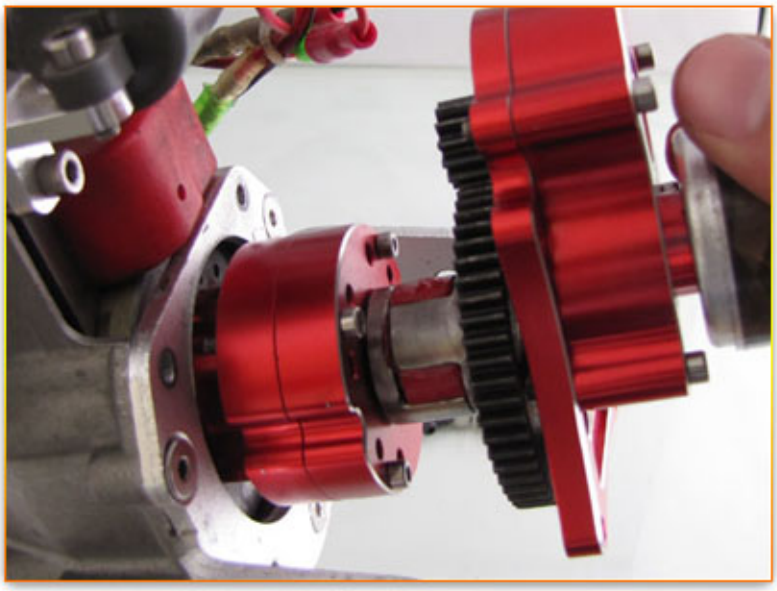
Install the flywheel adaptor along with clutch box onto the flywheel of your engine; tighten it with the M6 bolts with Loctite applied.



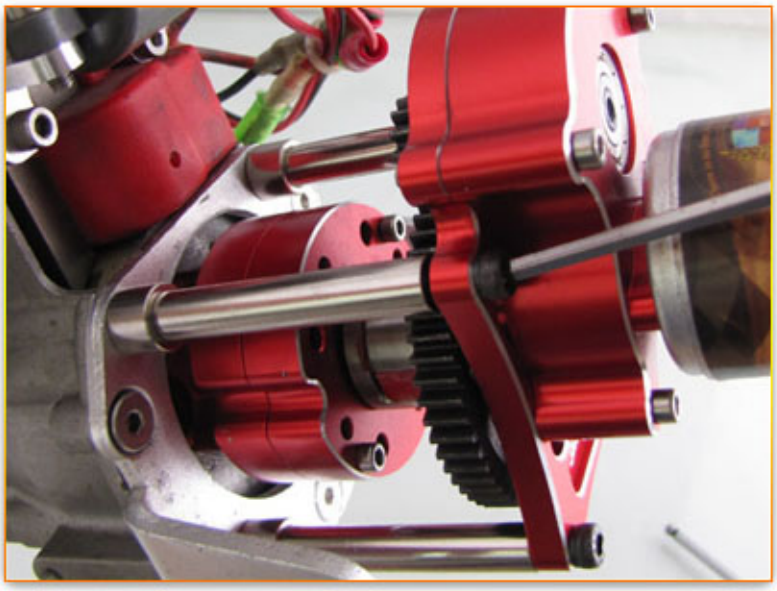
Install your engine mount back to engine and tighten it with original bolts that came with the engine.



Apply some grease on the softer adaptor.



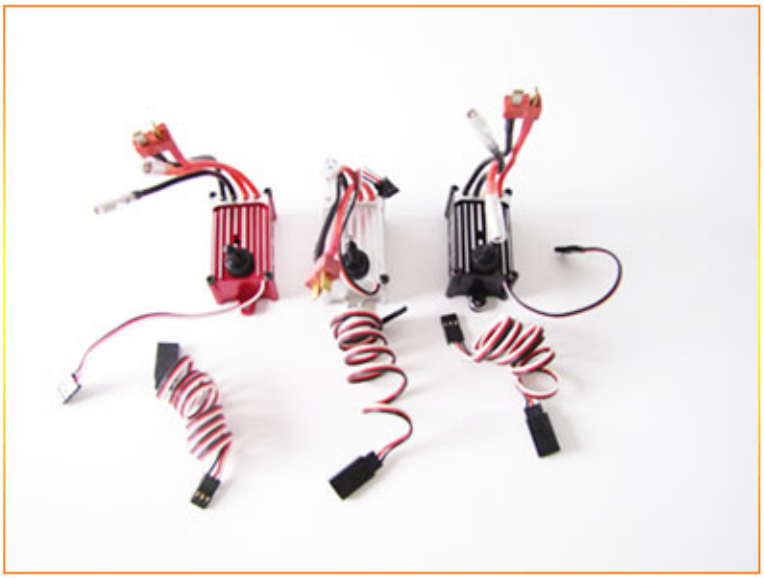
Match the gear box side plum couple onto the softer adaptor on clutch box side – you'll need to use some force to push them into place.



Put the spacers between the engine mount and the CNC mounting plate and tighten with the bolts.

Power Switch Options

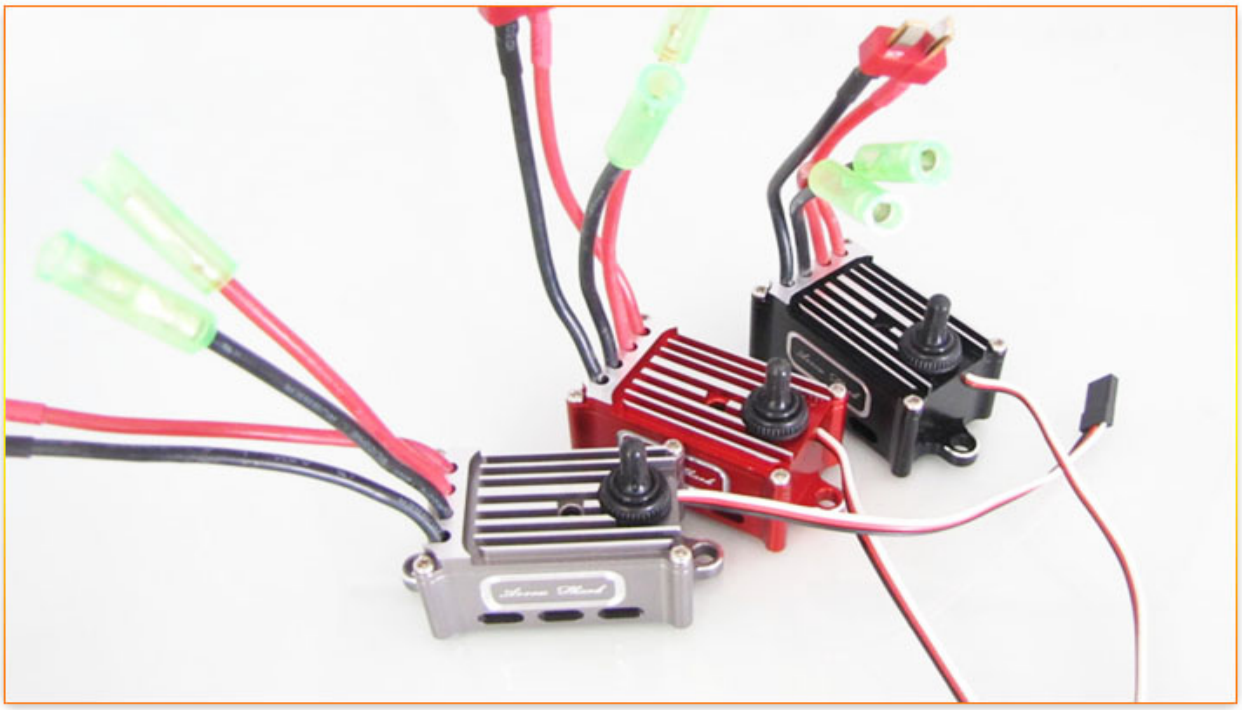
R-One Remote Device



Servo Remote Control Switch

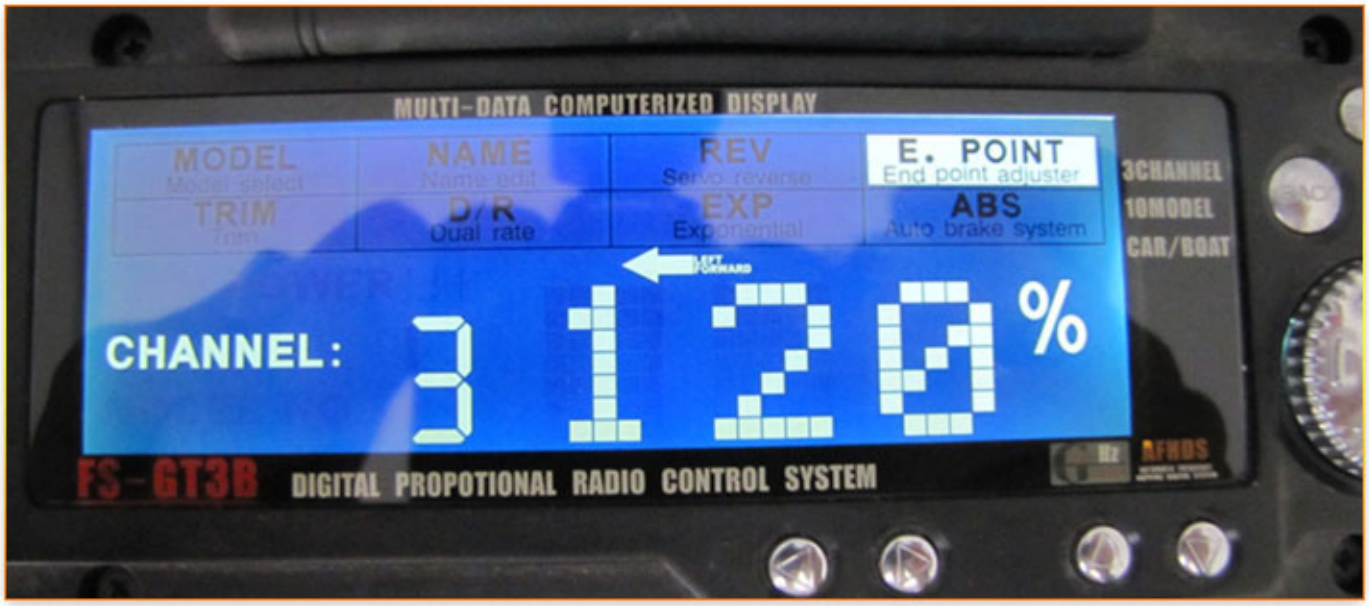
The E-Starter V4 comes with optional power switch of R-One control device or Servo remote switch which allows you to start your gas engine with a single click on the third channel of your transmitter. The R-One will supply 5.2V power from the E-Starter LIPO for your radio system. You do not need a separate battery for that. Simply turn on the power switch of the R-One and your receiver and servos will be powered from the LIPO battery.
The Servo remote switch allow you to use up to 5S LIPO battery for the higher compression engine while the R-one Device only accept the LIPO batter up to 3S, however, we recommend to use E-starter V4 on single cylinder engine up to 30cc with 2S up to 35C LIPO battery, if you need a starter for a over 30cc engine or twin inline engine, please check our other starter series-TS760-Marine starter.

Transmitter Set Up



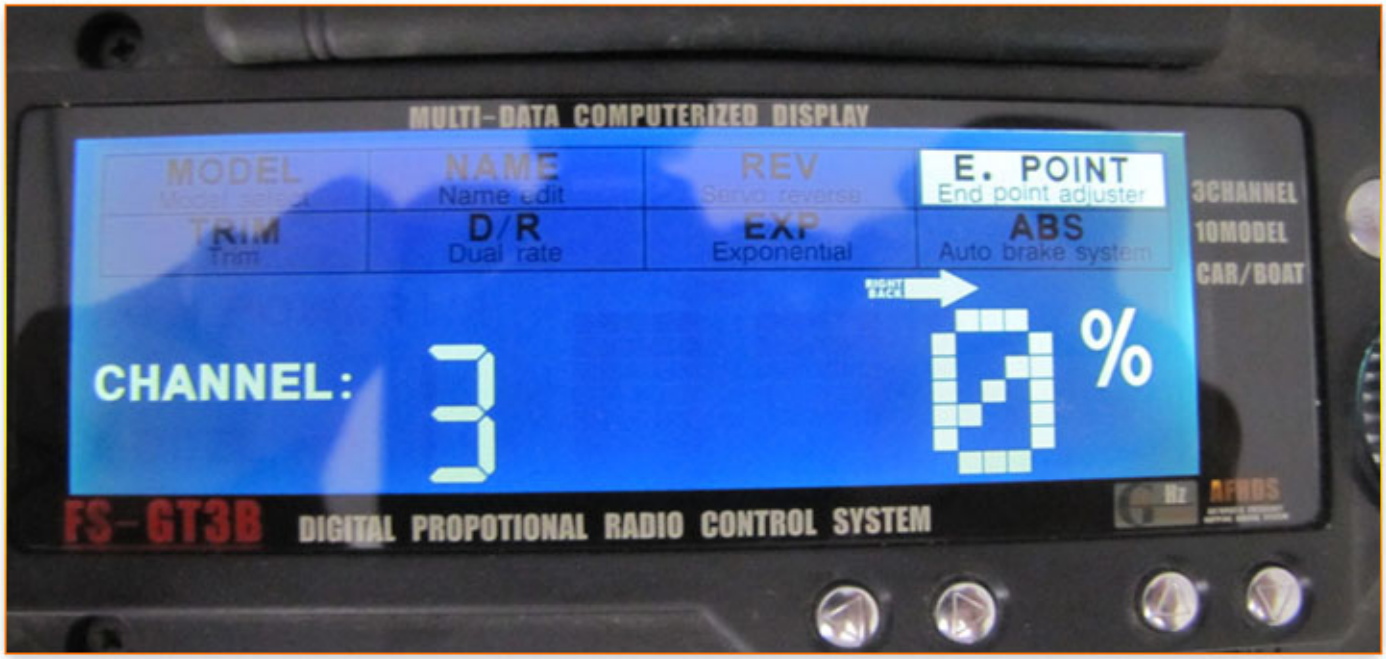
In order to use the R-One remote device correctly for your E-Starter V4, you will first need to set up the third channel on your transmitter correctly. Please follow the instructions below for the correct setting.

"Left Forward" Setting



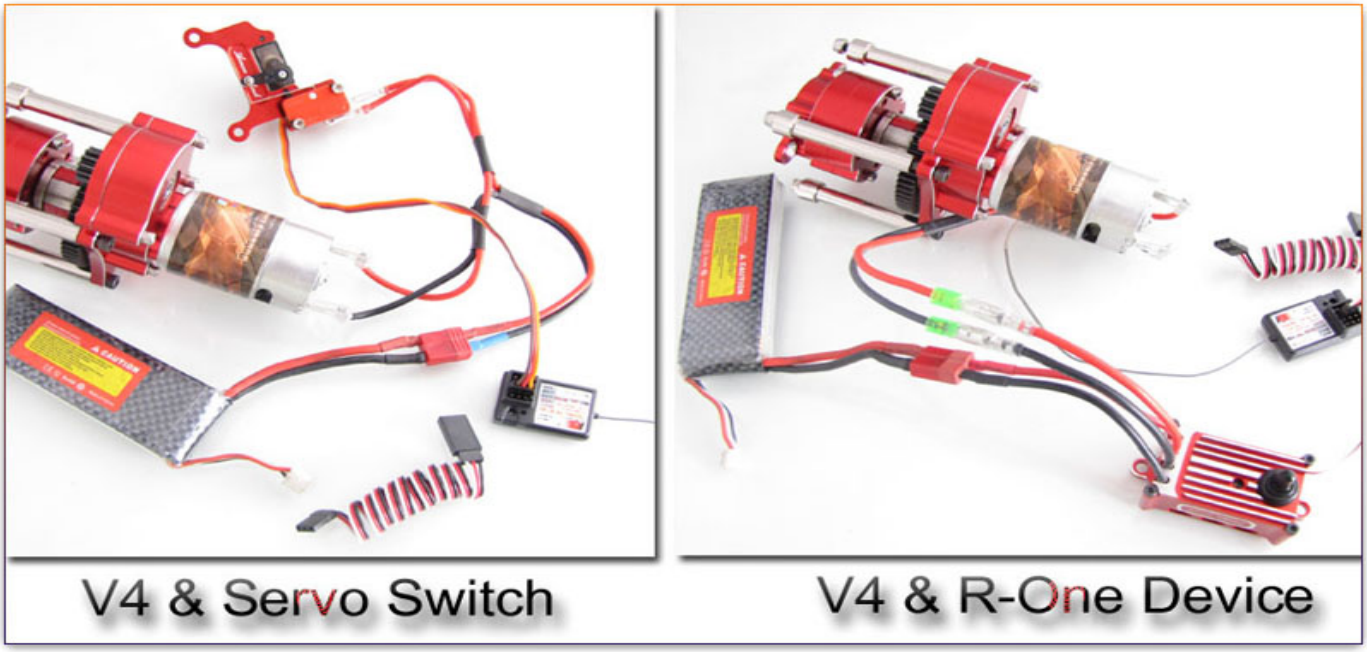
Go to the "End Point Adjustment" (EPA) in your transmitter, and select the Third Channel. Adjust the "Left Forward" to the top percentage available in your transmitter - usually 100% or 120%. This will determine the RPM for the electric motor in the E-Starter kit when you click on the third channel switch to start your engine. If you feel the RPM is too high, you can set it at lower percentage such as 80% or 90% to obtain the optimum RPM to start your engine.

"Right Forward" Setting



After you set the "Left Forward" correctly for the Third Channel on the "End Point Adjustment", then click on the third channel switch to move the radio to the "Right Forward" setting. Adjust that to 0% which will enable you to turn off the R-One device when your gas engine is started. If this rate is set at any higher than 0%, when you turn off the third channel switch the electric motor will spin counter-rotation which is not needed for your starter system.

Battery Connection Guide



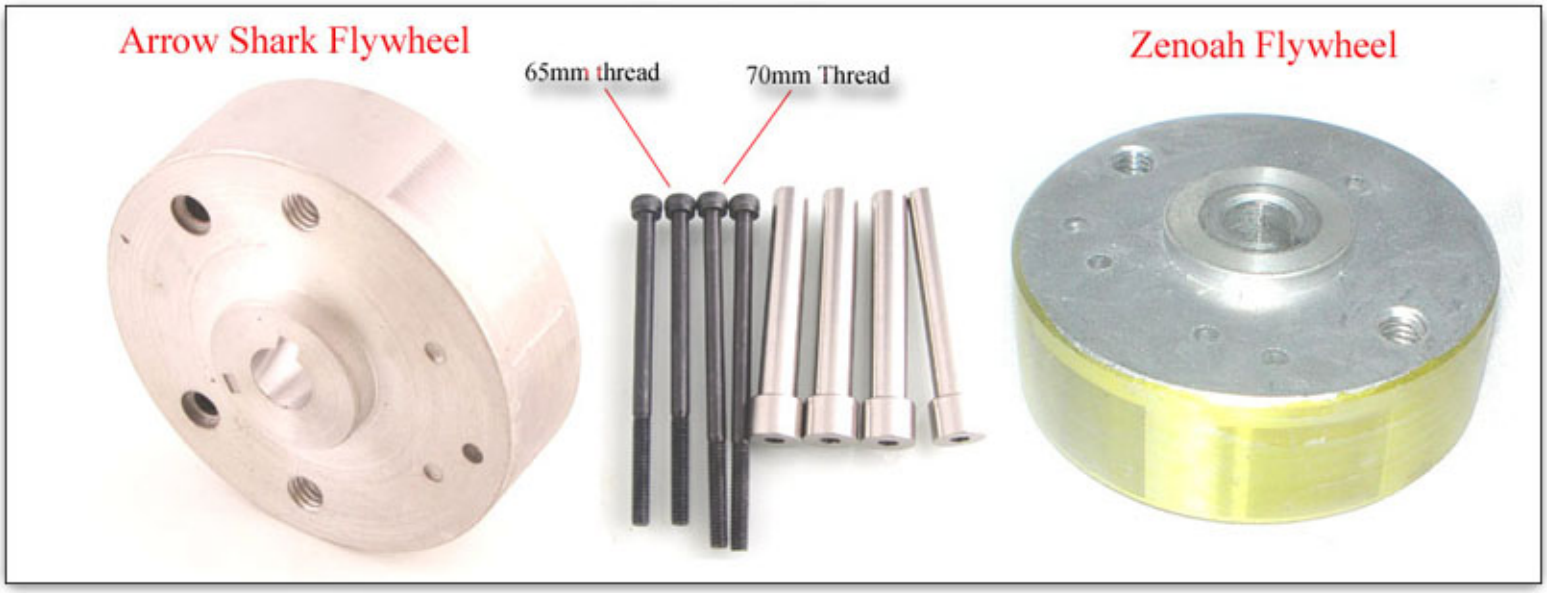
You need to provide a Three Channel Transmitter and a Three Channel Receiver for the R-One remote device or servo remote control switch to work properly, any FM or 2.4GHz radio will work. Connect the receiver wire from the R-One device or servo control switch extension cord into the third channel slot in your receiver. please make sure DO NOT use any LIPO battery over 3S on R-one device, it might burn it! and only use the LIPO batteries with dean connection only!

Installation Tips

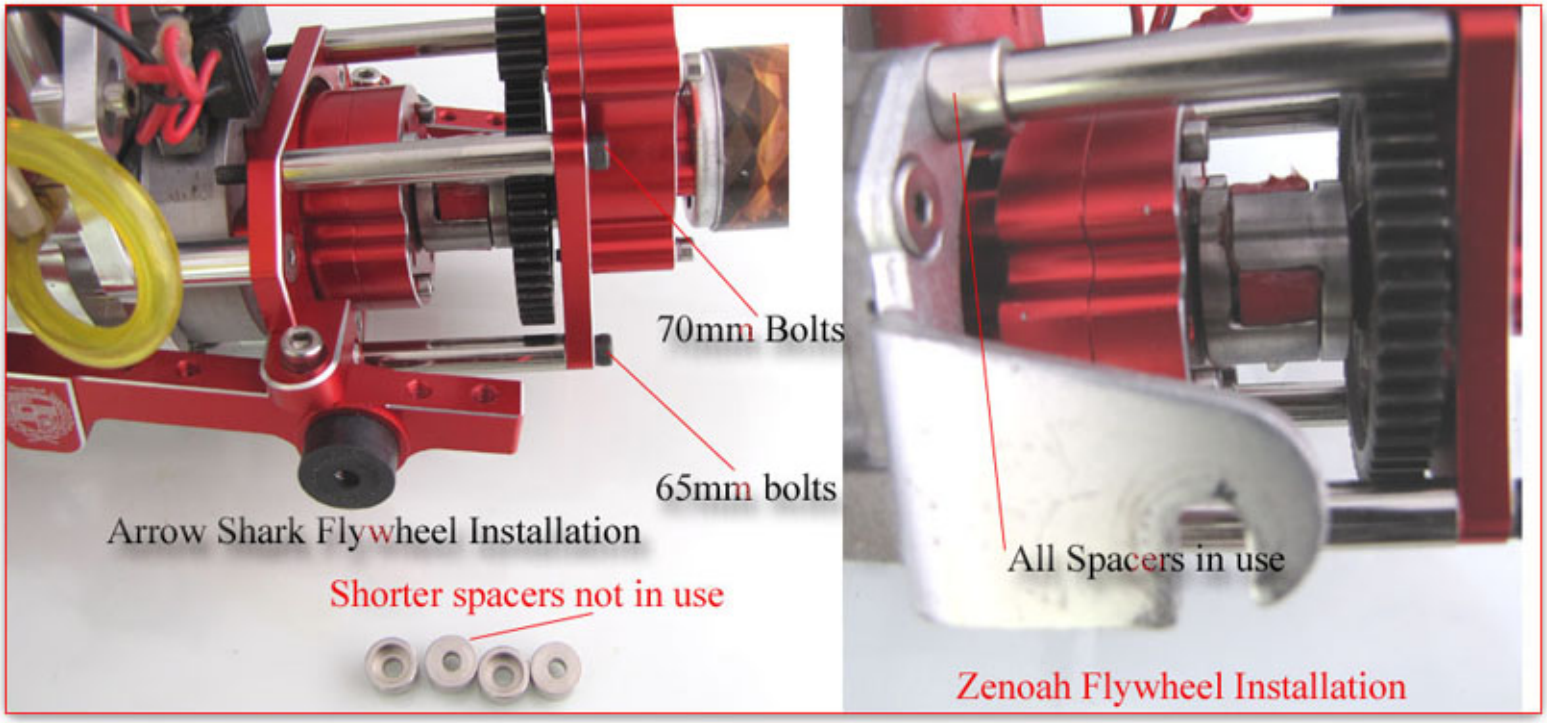
Engine Mount

There are many brands of engine mounts in the market; most but not all will fit directly with the E-Starter V4. To fit, the mounts need to meet these requirements:
#1: The diameter of the clutch box is 49 mm; therefore, the center hole on the back engine mount should be no less than 51mm in order to have proper clearance space for its operation.
#2: The thickness of the engine mounts in the market is different as well. In order to have a deep enough thread on the engine mount to properly hold the E-Starter V4, we recommend at least 5mm thickness on the material of the engine mount.

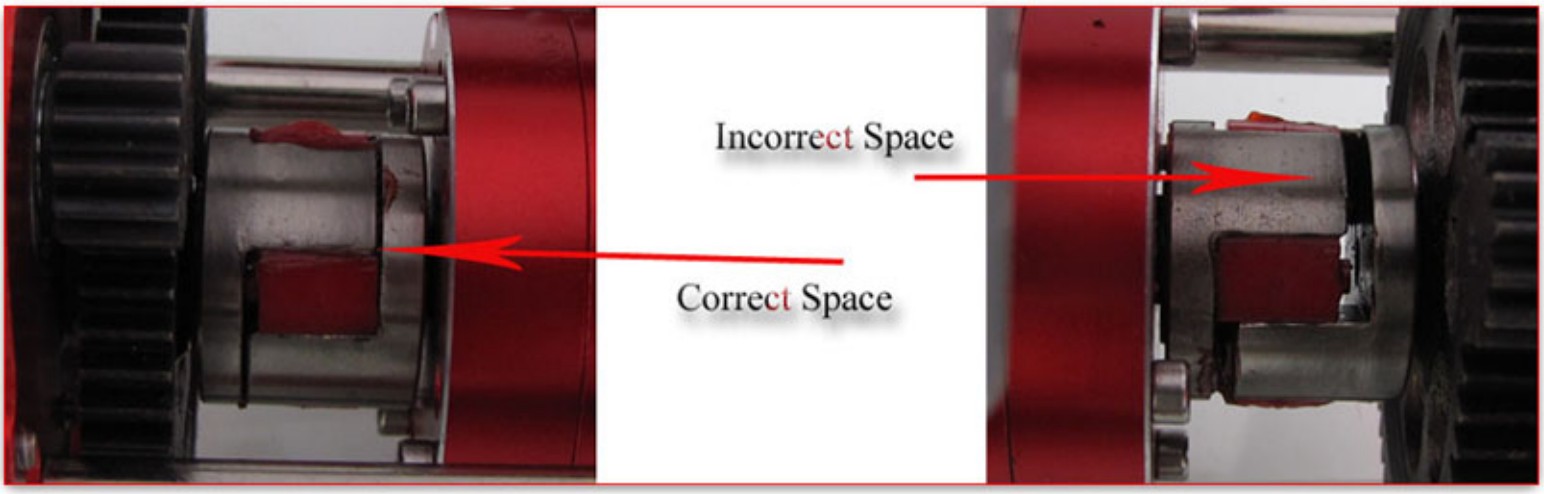
Engine Flywheel & Installation Bolts



There are many types of flywheel available in the market as well. Here we introduce only two versions - the one from a stock Zenoah and one from Arrow Shark. The one from Arrow Shark is thinner than the one from Zenoah, so we have two sizes of the installation stands that come with E-Starter V4. When you install the E-Starter V4 to a stock Zenoah Engine, use both stands together. When you install the E-Starter V4 to an Arrow Shark engine (or a similar size flywheel engine to Arrow Shark), then you will only need to use longer size stands and leave the shorter one aside (not to use it) as the picture shows below. Also, there are two size of installation bolts that come with the E-Starter V4, please use the longer two (70mm thread part) on the top and the shorter two (65mm thread part) on the bottom two; this is because the Zenoah crankcase bottom space is limited for longer size bolts.

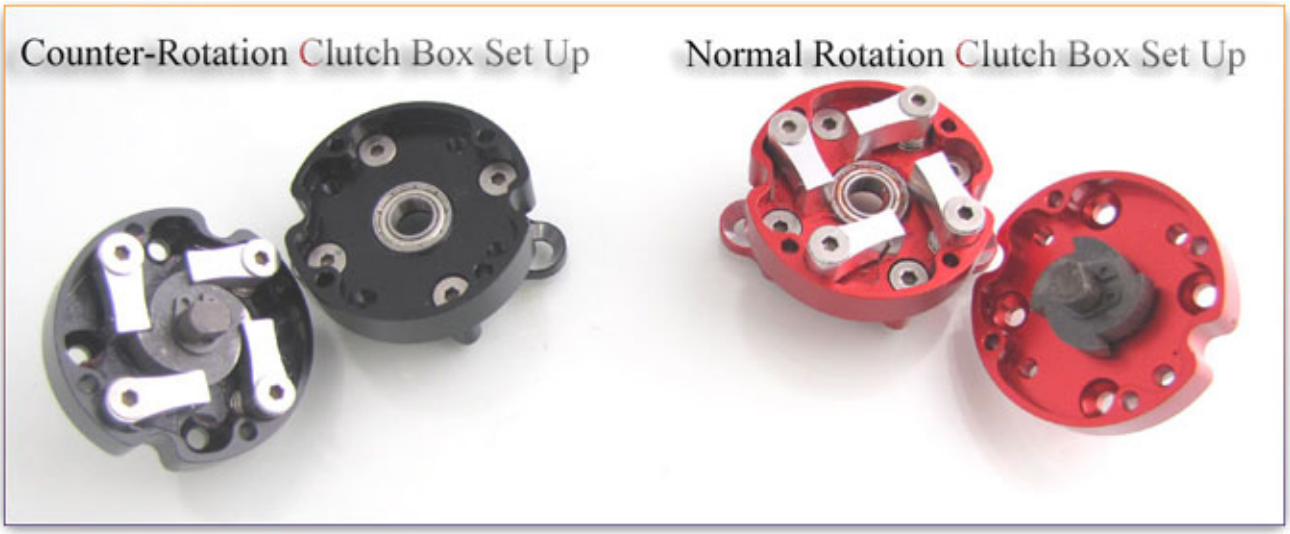


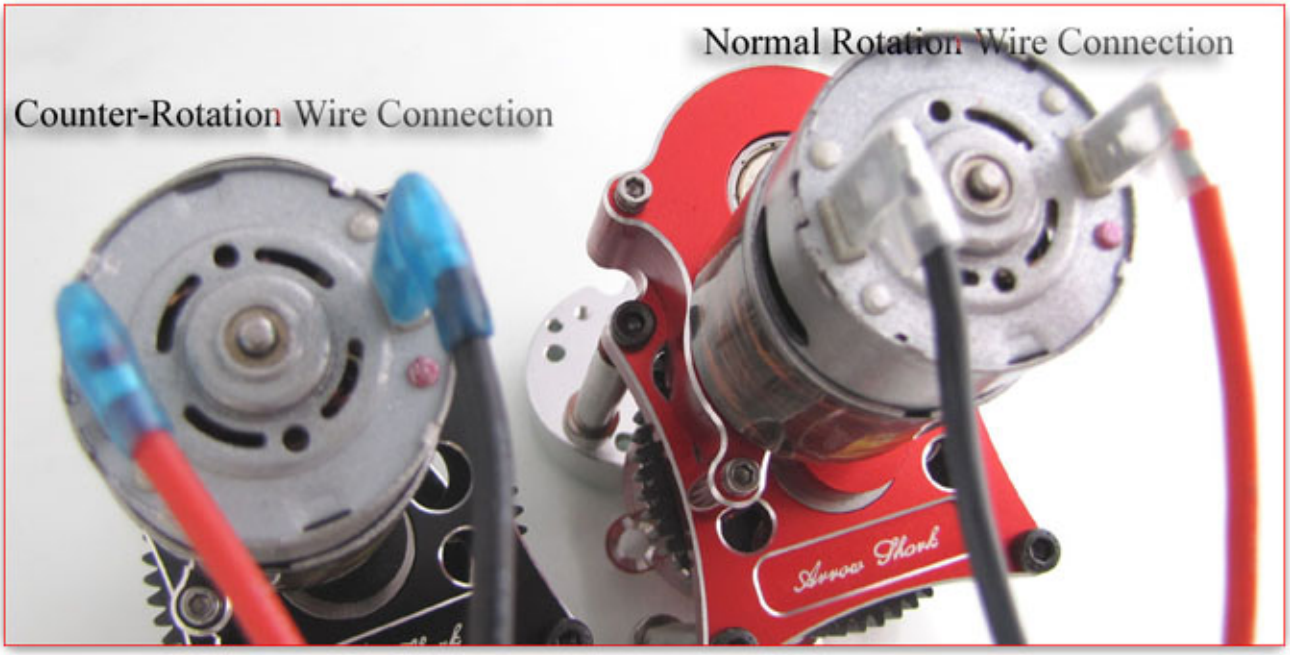
Plum Coupling Correct Installation



No matter what brand engine mount or flywheel you use on your gas engine, after you complete the installation make sure the gap between the plum coupling is no larger than 1mm. (you can use additional spacers if the gap is not reach requirement), They should be a tight fit in order to protect the softer adaptor from damage. The softer adaptor could be the part you need to replace once in a while, and you can purchase this part from our website. When you install the new softer adaptor to the coupling, make sure you apply some grease or oil on both the softer adaptor and the metal couplings in order to help you push them together easier.

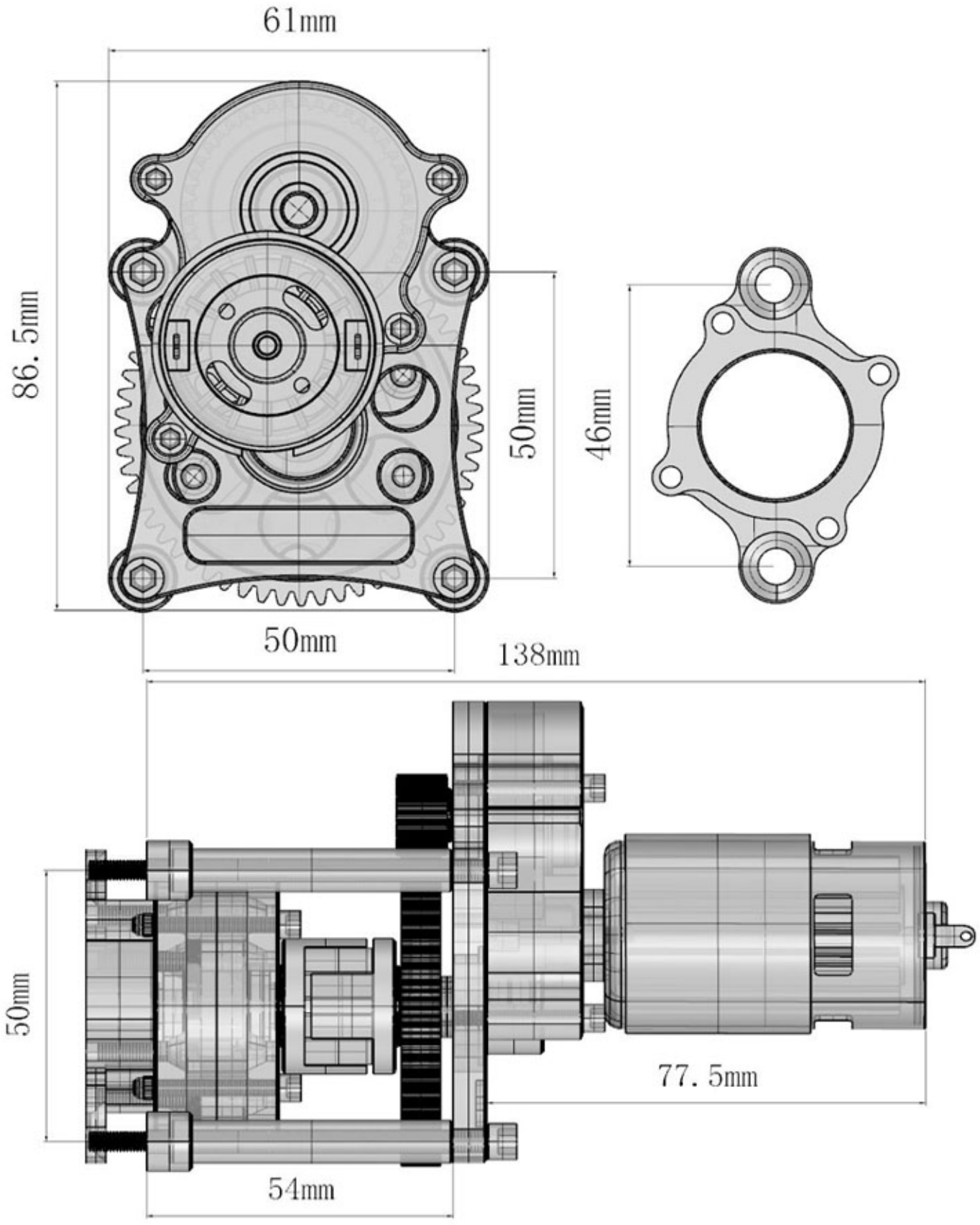
Counter-Rotation E-Starter V4 Set up





There are only two simple steps to turn the E-Starter V kit from normal rotation version into counter-rotation version:
#1: Install the clutch box upside down to the flywheel adaptor, see the above first picture.
#2: Connect the wire reversed as the normal rotation as shown at above second picture.
#3: You will need a reversed thread nut for your counter-rotation crankshaft which you could find from any hardware store.

Dimension Guide



Starting Procedure

After all the wire connections have been correctly set up, you are ready to start your engine. Before doing so, ensure the low and high speed mixture needles are adjusted to the factory recommendation from your engine manufacturer. Then you will need to take out the spark plug first from the engine (from easier pumping the gas up), and then close the choke on your carburetor and press the primer bulb to pump the gas up from the tank. Once you see the gas flowing into the carburetor, install the spark plug back to engine and press on the third channel switch on your transmitter for no more than three seconds. If you then hear the engine starting to fire, open the choke and press the power switch one more time – your engine should start.

When starting a warm engine, you don't need to close the choke; just simply press on the power switch for less than three seconds and the engine will start.

Note: If you feel your engine is flooded with gas, DO NOT try forcing the engine to start. Doing so might cause damage to the gears or the electric motor when they try to work against the much higher compression of a flooded engine. If the engine is flooded, remove the spark plug and turn on the switch on the E-Starter. Let it run for 30 seconds to pump the extra gas out of engine, then put the spark plug back and redo the starting procedure.

Performance Tips

#1: Never play the E-starter as fun by click starter on and off continually, because the peak electric current from the battery to the motor is achieved in only first few seconds of operation. That delivers the maximum torque and rpm of the motor. After these few seconds, the motor's power reduces slightly, as the compression from the engine is high, so, you only use the peak LiPO power to start your engine, if you keep doing the "on" and "off" on the starter, it might cause the electric motor overheated, and wearing on the gear by the reduced RPM. So, the best way to use the starter is when you need to use it.

#2: If you feel your engine is flooded with gas, DO NOT try forcing the engine to start. Doing so might cause damage to the gears or the electric motor when they try to work against the much higher compression of a flooded engine. If the engine is flooded, remove the spark plug and turn on the switch on the E-Starter. Let it run for 30 seconds to pump the extra gas out of engine, then put the spark plug back and redo the starting procedure.

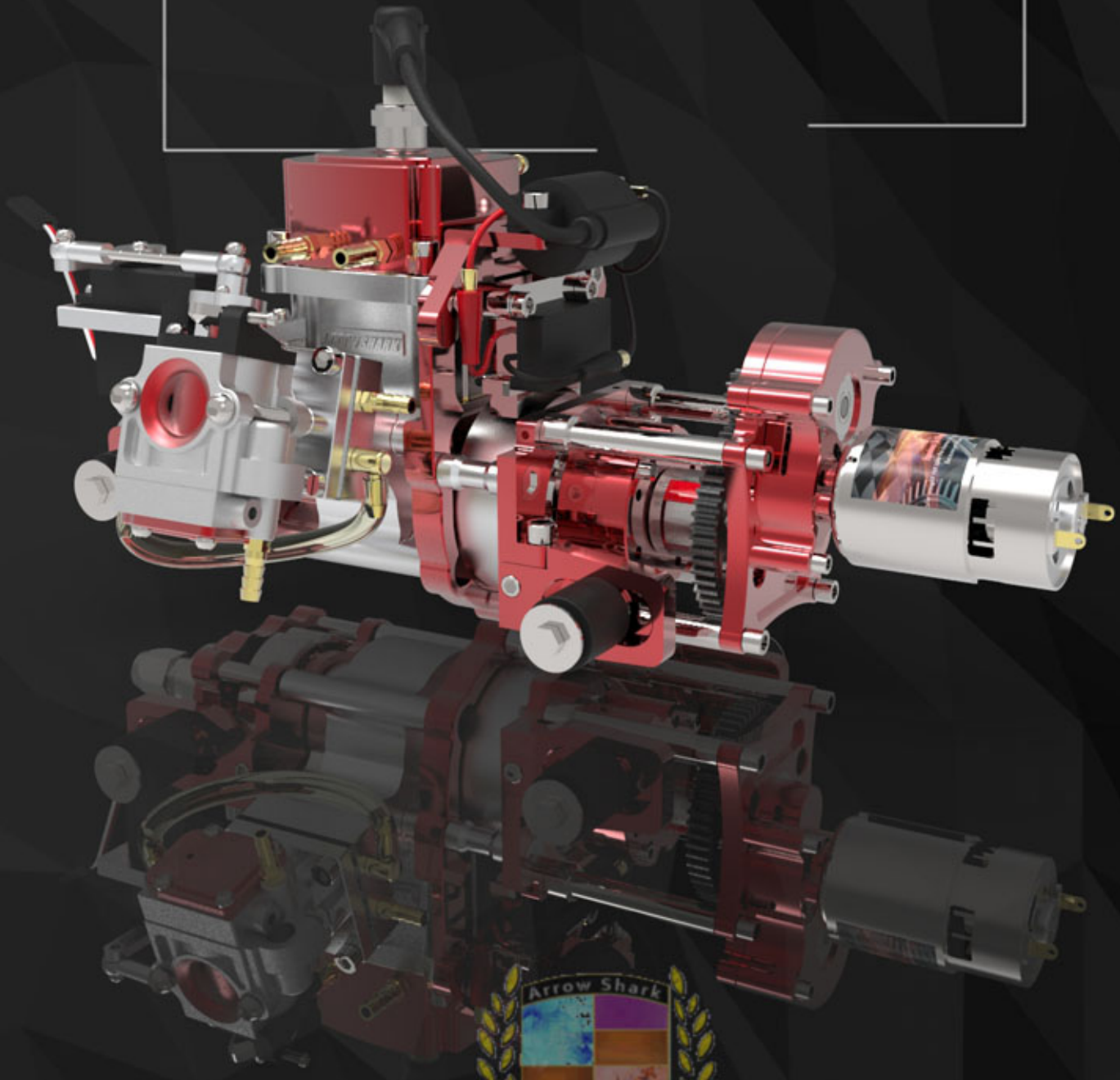
#3: The Electric motor on the E-starter V4 is High RPM custom made 560 series motor, therefore, we only recommend to use 2S 7.4V up to 35c LIPO battery with Dean connection for the gas engine below 30cc, to use 3S 11.1V LIPO battery only if the 7.4V is not create enough RPM to start your engine. Because to use 3S 11.1V LIPO on a 26cc engine would cause the RPM too high which is not good for the gears.

#4: Never suddenly stop your engine at high speed, this will definitely hurt the red soften adaptor by the suddenly impact, as well as gears, we recommend install E-starter V4 starter kit on a engine with clutch installed, when you ready to stop your engine, close the throttle gently to engine idle speed, then, use the kill switch to shut off the engine.

#5: When start a cold engine, first take out the spark plug to pump the gas into the carburetor, when start a warm engine which has been run, then, you can start it within spark plug installed.

Thanks for choosing an Arrow Shark Product; we hope the ease and convenience of our Arrow Shark E-Starter V4 kit will bring a higher level of enjoyment to your experience of RC gas boats!

There is no Best, only Better!



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