Arrow Shark

2011 Onboard E-Starter III

OWNER MANUAL

PACKAGE INCLUED

E-starter III gear assembly
580 high torque motor
Servo switch assembly
CNC flywheel adaptor
500mm servo extension wire

ADDITIONAL ITEMS REQUIRED:

Three channel RC system
14.8volt LiPo battery of 2200Mah+
Lipo battery charger
Loctite
Installation tools

INTRODUCTION

Arrow Shark 2011 E-Starter III

The second version of our Arrow Shark E-Starter has been very successful around the world, but we are never satisfied and have invested considerable time and effort in developing further improvements which we are now proud to announce as Version III.

The cast flywheel adapter in our Version II has been replaced by a CNC-machined billet adapter which will be even stronger and more durable for long term use. Additionally, we are now including with the E-Starter two spare pawls and springs for the billet adaptor to make sure you'll be all set for years to come.

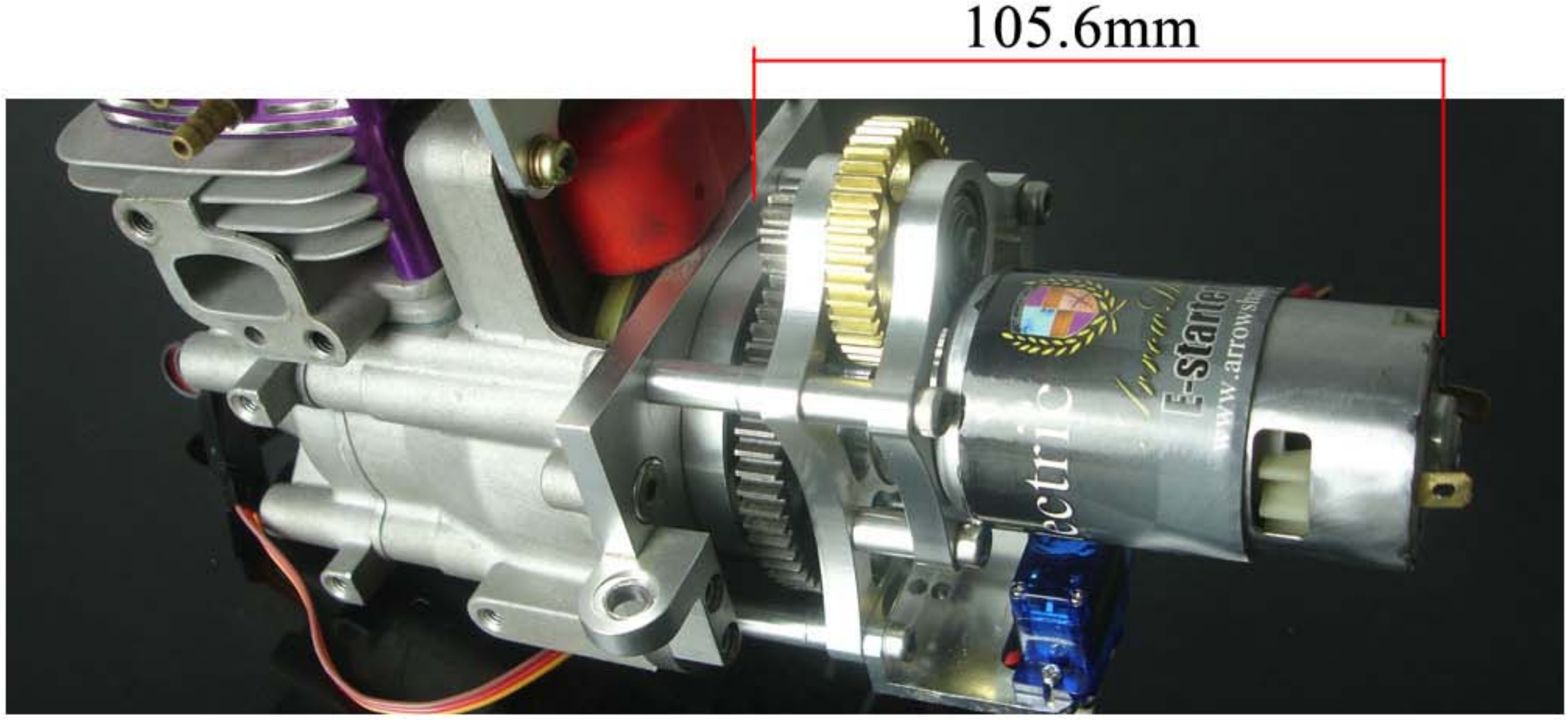
For this new 2011 version E-starter III, the front spinner has been re-designed with four pawls instead of two. This will make the contact timing even shorter for faster engine starts, and the gears will fully disengage as soon as your engine is running. The result is that the E-Starter has no impact on performance and will work well with either stock or modified high-rpm engines.

Along with the above upgrades, we have re-designed the main gear which is now detachable for easier maintenance and servicing – for example, if the CNC four-pawl spinner needs to be replaced, although actually that should not be needed for many years. Previously, with the E-Starter II, if the spinner was damaged the whole main gear had to be replaced.

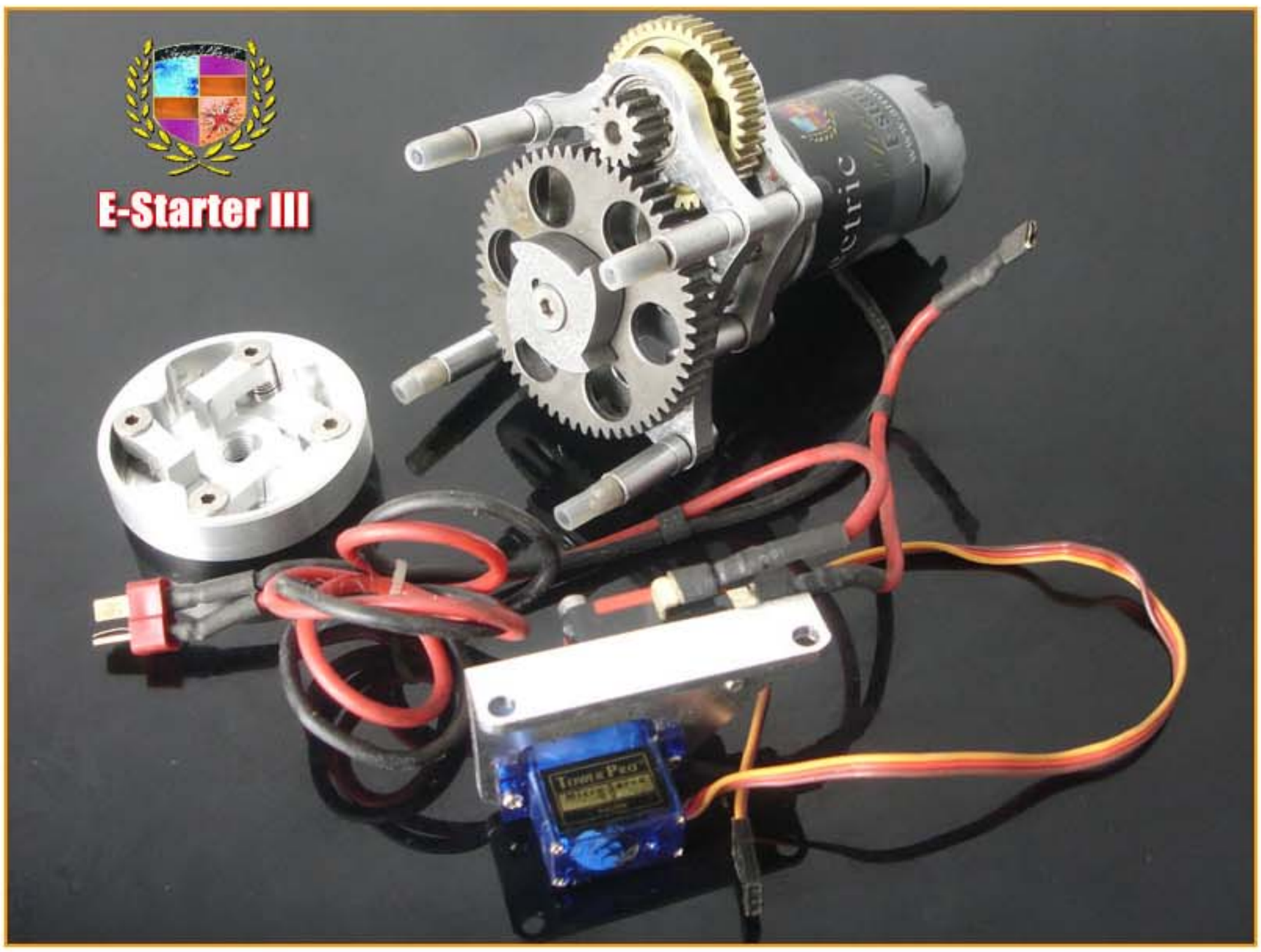
The 2011 version E-Starter III comes to you completely assembled (as did the E-Starter II) and installation is very straightforward. It can be fitted to most brands of 26cc or 29cc marine engines currently in the market such as Zenoah, RCMK and QuickDraw, and can start both single cylinder and twin inline engines. In order to fit the E-Starter to those engines all that is required is to simply replace the Zenoah pulley with the CNC billet flywheel adaptor that comes with the E-Starter kit, and then just bolt on the E-Starter III.

The power source of the 2011 version E-Starter is our OEM 580 series high torque electric motor; this has more power and torque compared with other 540 or 550 motors and makes servo-controlled onboard and on-the-water starting easier than ever. The new motor is equipped with a built-in fan for better cooling and more efficient temperatures during operation. In order to run the 580 motor properly, you will need a 14.8volt LiPo battery of 2200Mah or higher capacity, and a suitable charger for it.

Dimensions of the E-Starter III



What is in the package?



The package contains:

* E-Starter gear assembly
* Servo switch assembly
* 500mm servo extension wire
* 580 high torque motor
* CNC billet flywheel adaptor

Additional items required:

* Three channel RC system
* LiPo battery charger
* Installation tools
* 14.8volt LiPo battery of 2200Mah+
* Loctite

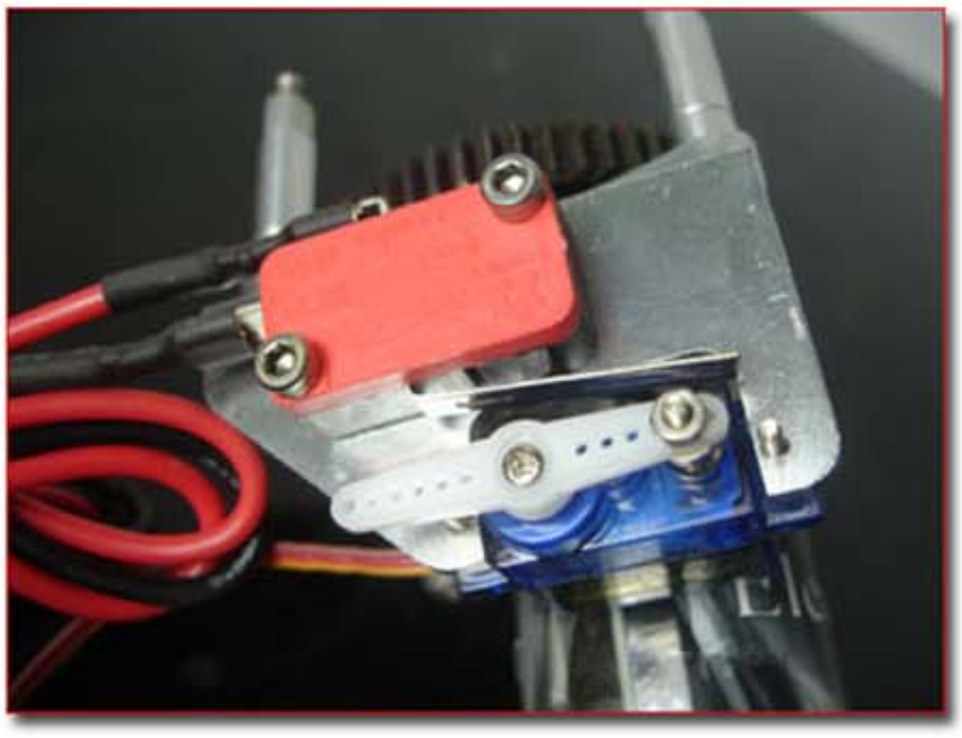
NOTE: for installation on engines with thinned (lightened) flywheels;
Four by 4mm diameter by 1mm thick spring washers are needed.

The Features of Arrow Shark E-Starter III

The 2011 E-Starter III comes with a CNC billet flywheel adaptor along with two extra pawls and spare springs.

The main gear from E-Starter III is fully detachable with a new design of a four-pawl front spinner for faster engaging.

Precision-made gears for smoother than ever performance.



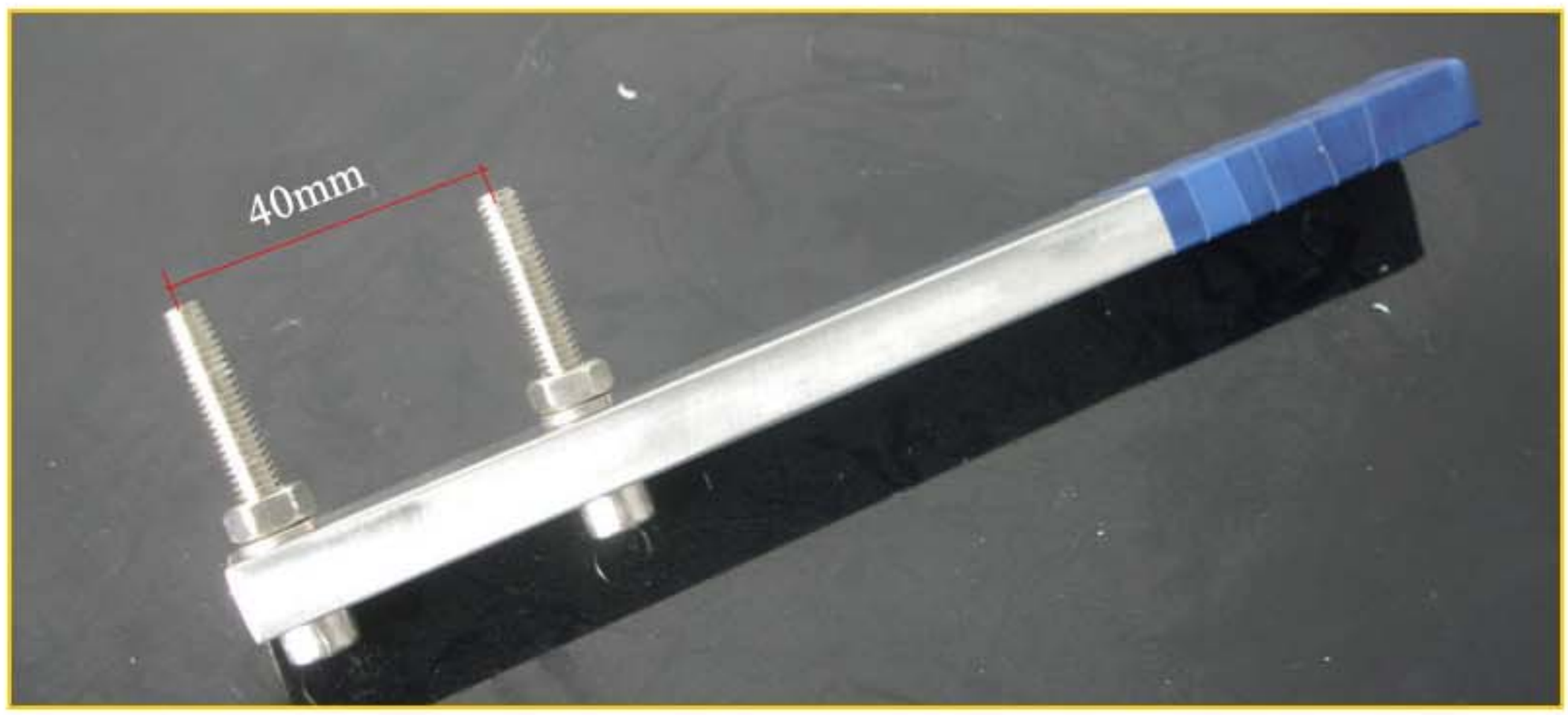
All-in-one servo switch control allows compact installation and easy starting.

OEM 580 high torque motor to deliver one-click starting of your gas engine when either on the stand or in the water.

Easy installation with direct bolt on to any brand motor that could accept standard Zenoah motor mount.

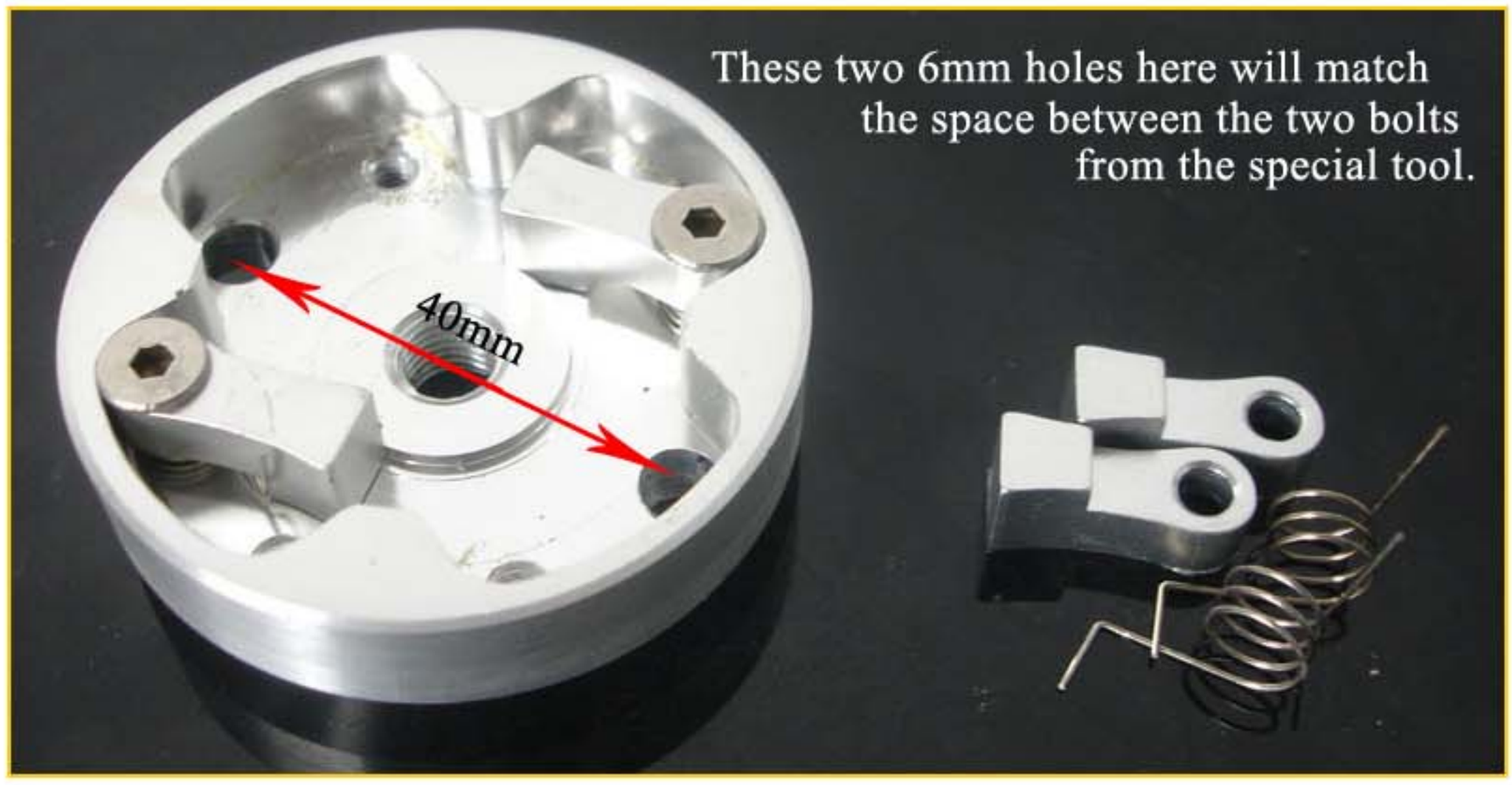
Installation Tips

* Special Tool



In order to install or disassemble your E-Starter III correctly, a special tool is needed and this can be easily made. Find a square metal tube with at least 2mm thickness on the tube wall, drill two 6mm holes on the tube 40mm apart (see the picture above). Then install two 6mm bolts and tighten them with nuts. This tool is to tighten or loosen the CNC billet adaptor to the engine.

* CNC Flywheel Adaptor



The E-Starter III is equipped with a CNC billet flywheel adaptor for more durable performance, and it also comes with two spare CNC pawls and springs.

* Mounting Spacers

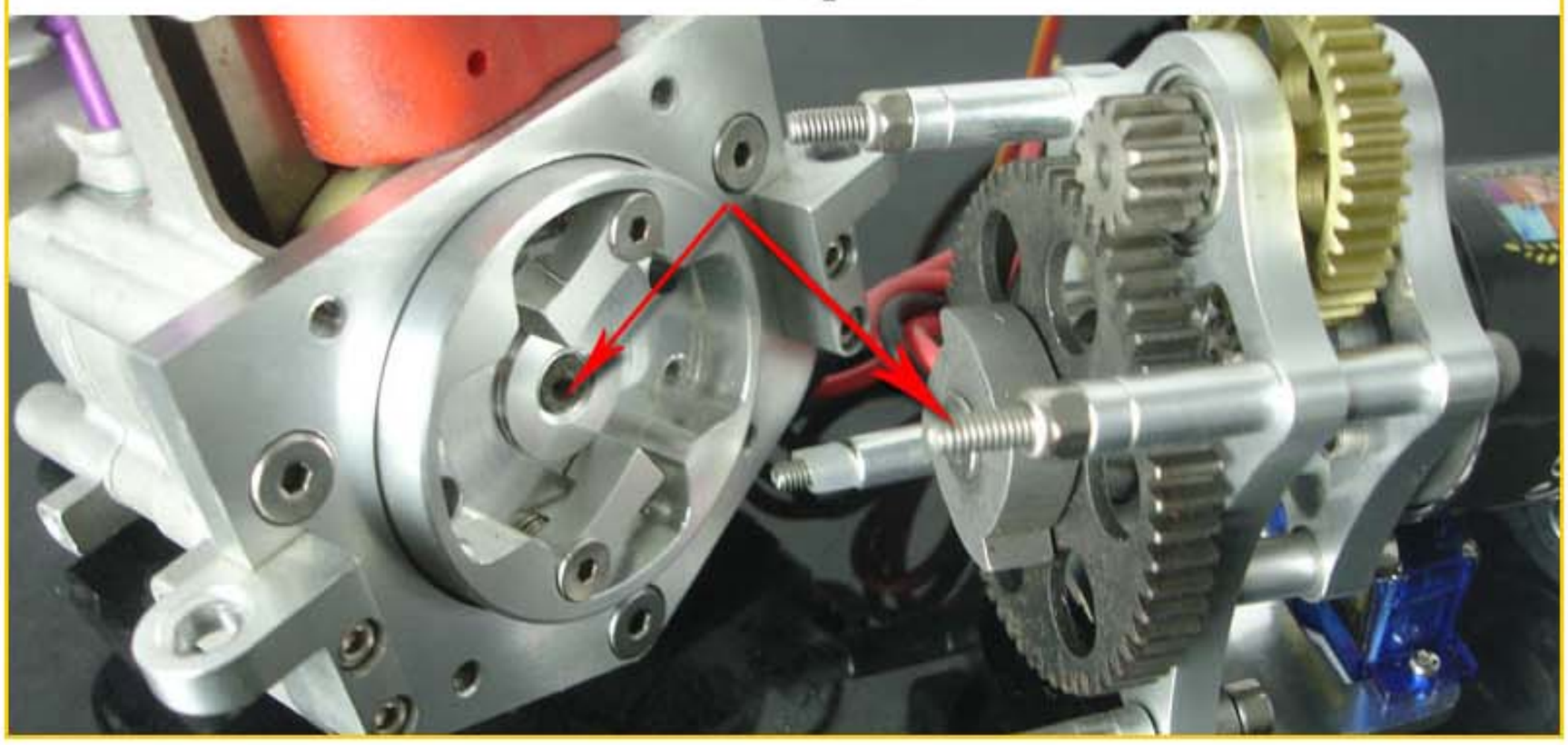
The E-Starter III comes with two sizes of mounting spacers. In Combo#1 (see above left picture), the length of the longer spacer is 15mm and shorter one is 4mm. The E-Starter kit comes with the "Spacer Combo#1" and you need to put both spacers together when you install the E-starter on to a Zenoah using a stock Zenoah flywheel. This will retain the correct free space between the surface of the four-pawl spinner and the inside surface of the flywheel adaptor.

However, if you are going to install the E-Starter III on to a modified engine with a thinned (lightened) flywheel - such as the flywheel in Arrow Shark XP254M, you need to use "Spacer Combo#2". To do this, replace the 4mm length spacers from the Combo#1 with 4mm diameter, 1mm thick spring washers which you can obtain from your local hardware store (these are not included with the E-Starter kit).

* Correct Free Space

Very Importatnt

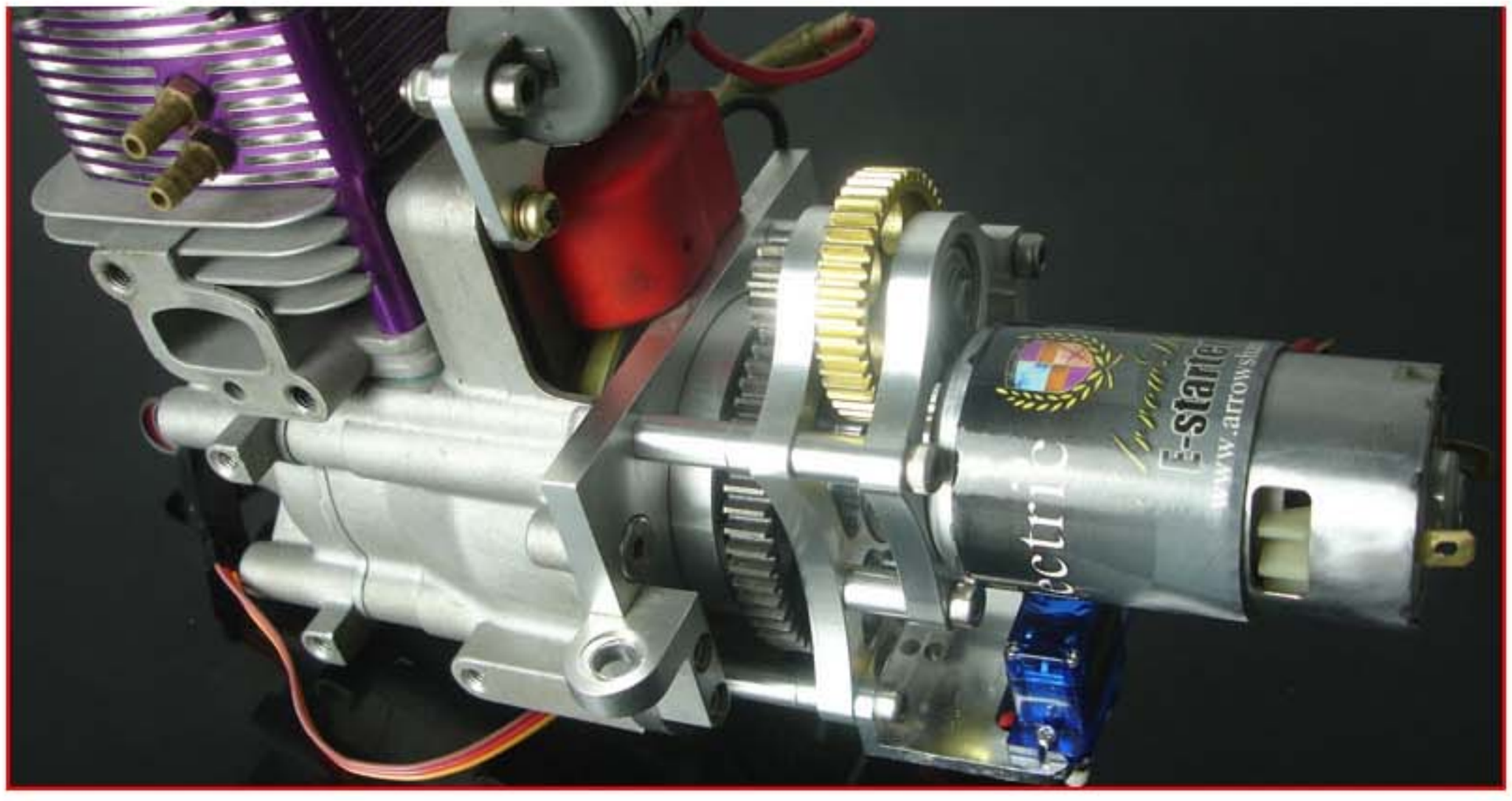
There must be at least 2mm free space between these two surfaces

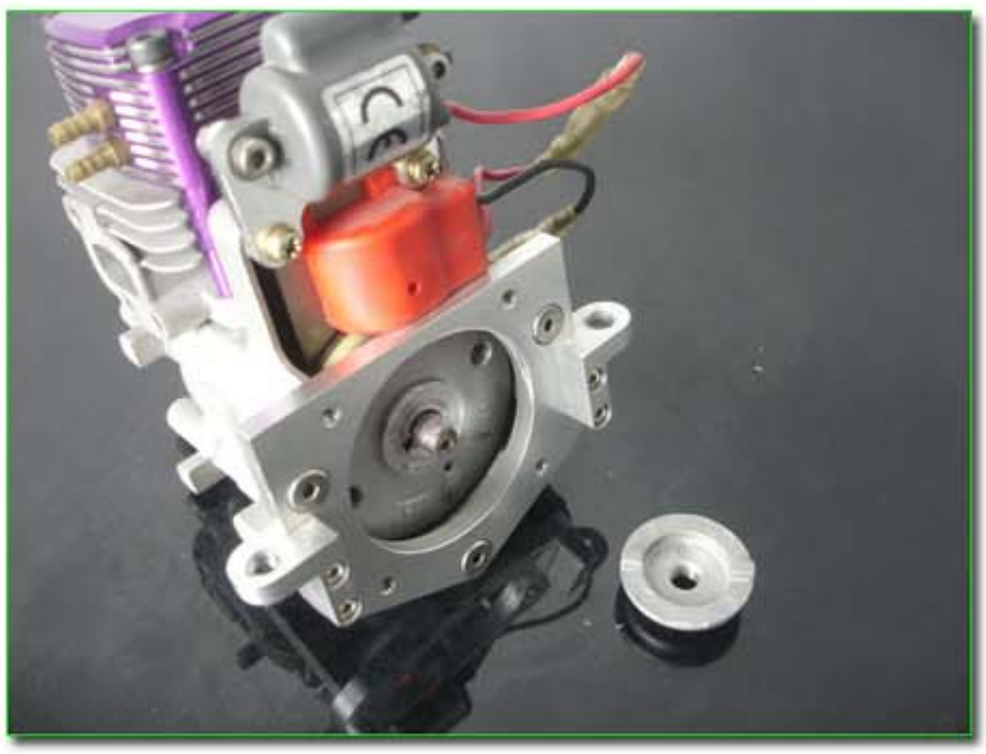


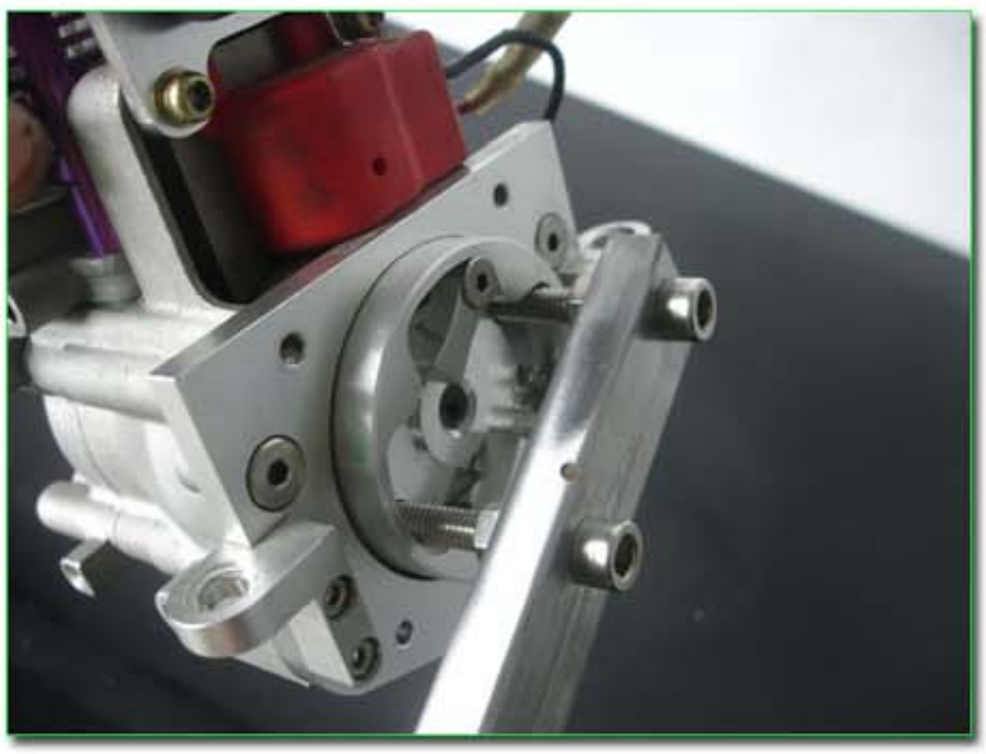
The correct free space between the surface of the four-pawl spinner and the inside surface of the flywheel adaptor is very critical in order to obtain proper performance from the E-Starter III. This free space will be affected by different thicknesses in the flywheel and the motor mount of your gas engine, so you need to make sure there is at least 2-3mm free space between the surfaces before you test your E-Starter III.

Installation of the E-Starter III

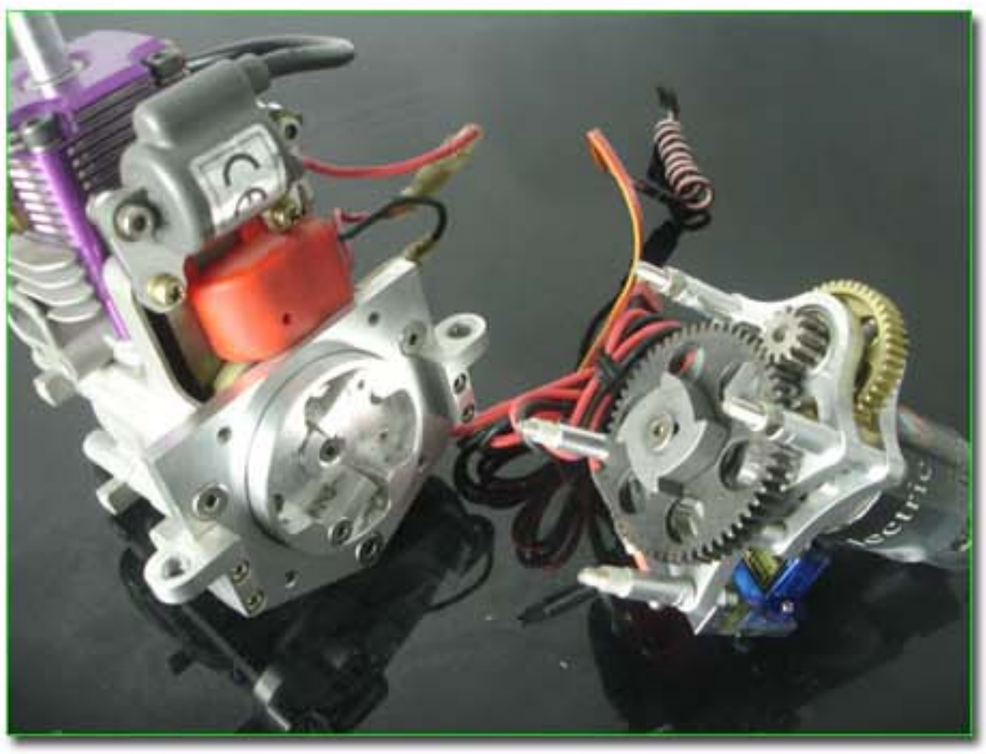
(To Stock Zenoah Engine)



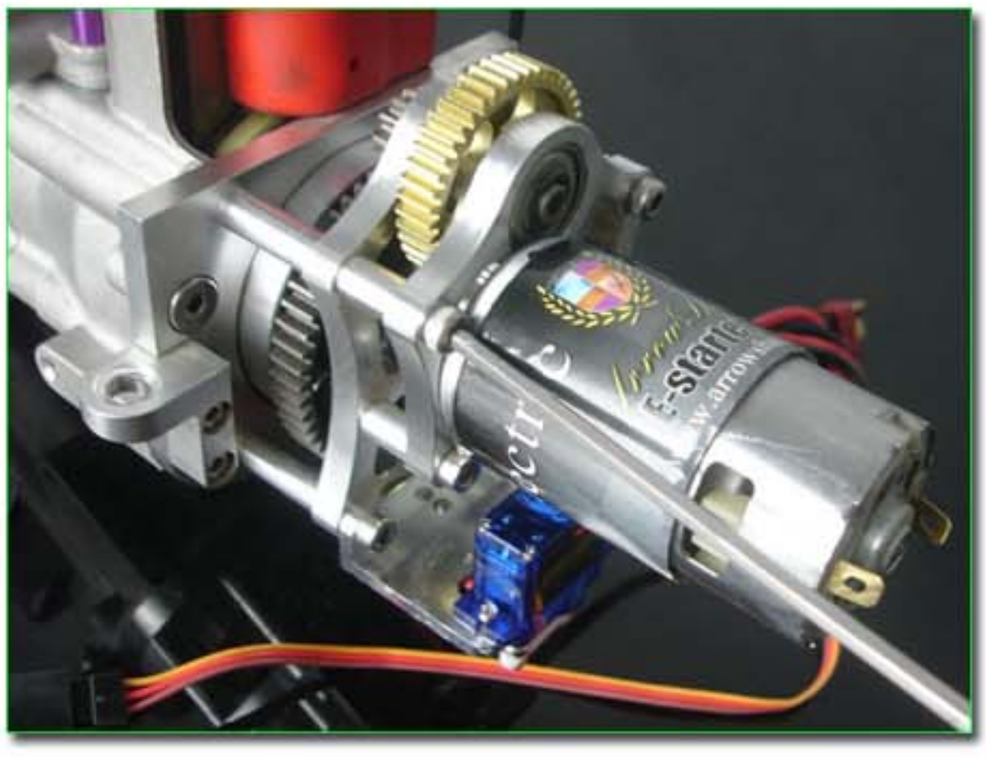


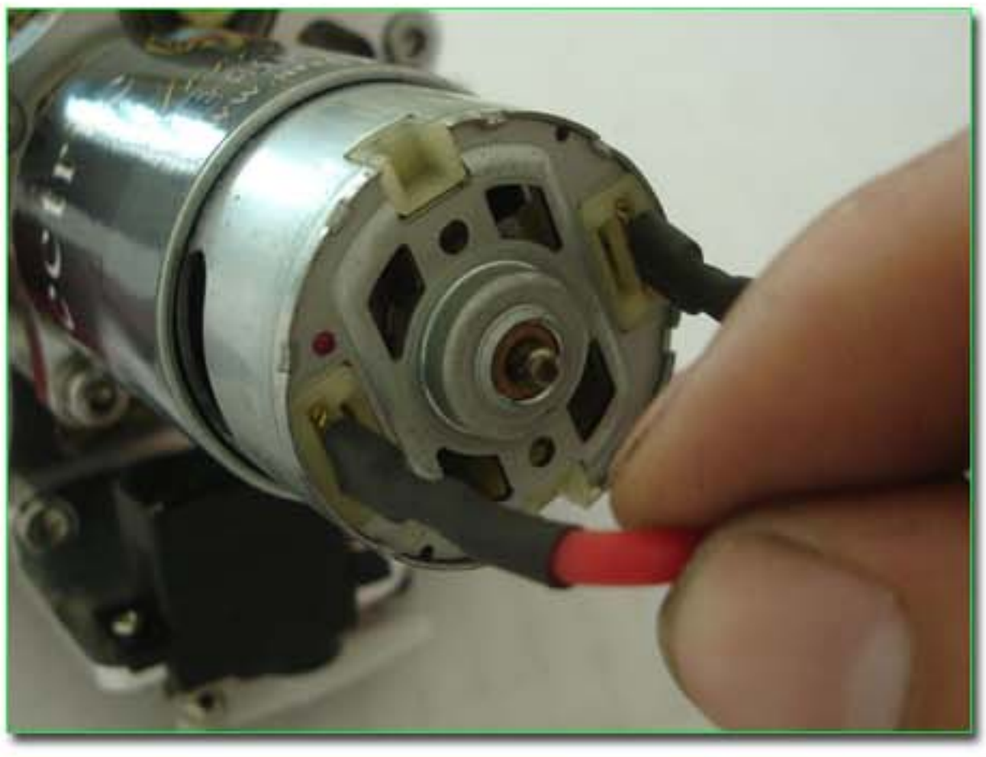


* Remove the spark plug and insert the piston stopper into the plug hole. Remove the standard pull starter and unscrew the pulley from the engine.
* Screw in the CNC billet flywheel adaptor and tighten it with the special tool you have made.



* Prepare your E-Starter III assembly kit for installation.
* Apply a small amount of loctite in the four thread holes, and align the four bolts on the E-Starter assembly kit to them.





* Tighten the four bolts with a 4mm hex spanner. Then connect the servo wire to your radio receiver.
* Plug in the red wire from the servo switch to the positive pole on the motor (the side with a red sign), and the black wire to the negative pole.

Final Step: Connect the 14.8v Lipo battery to the extent connector from the power switch; also, connect the servo extended wire to your receiver. Then, you are ready for the start testing.

OPERATION TIPS

1. The micro servo switch plugs into the third channel of your radio receiver. Follow the instructions in your radio manual to set the third channel for on-off operation (rather than proportional operation as is possible in some radios).
2. It's a good idea to mount the micro servo switch inside your servo box where it will be kept dry. Alternatively, a separate small water proof box near the motor could be made. In either case, if required, you can easily extend the length of the electric motor's wire.
3. Ensure that you use Loctite when bolting the E-starter to the engine mount. Without Loctite, normal engine vibration could cause the E-starter to come loose.
4. After each day of using the E-starter:
   a) Remove the spark plug and run the electric motor for about 30 seconds in order to dry out any moisture that may have accumulated.
   b) Spray some WD40 on all the gears and bearings to protect against corrosion.

STARTING PROCEDURE

1. A cold engine needs to be started with the boat on its stand.
2. If your carb has a primer bulb, use that to fill the fuel line.
3. If your carb does not have a primer bulb, cover the air intake and turn on the third channel of your transmitter. The starter motor will spin your engine and suck fuel through the line into the carb.
4. If your carb has a choke, close that and operate the third channel on your transmitter until the engine fires, then release the third channel (so the starter motor stops) and open the choke.
5. Open the throttle a small amount and turn on your third channel to spin the starter motor till the engine is started.
6. Turn off the third channel as soon as the engine starts – which is usually within a few seconds.
7. Once the engine has been run and warmed up, it can be re-started on the water which will often save the need to retrieve a stalled boat. Or you can simply put your boat on the water, push it out from the shore, and amaze those watching by starting the engine from your transmitter.