

Brushless Motor Installation Guide

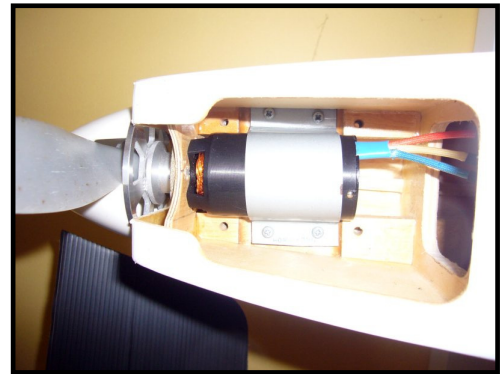
When fitting a brushless motor to a model aircraft there are three major factors to consider.

- Mechanical Mounting
- Cooling
- Wiring

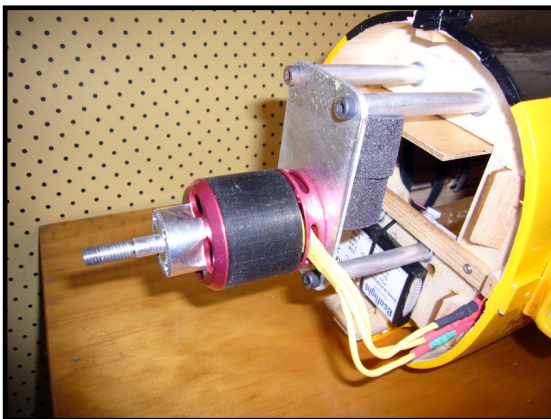
Mechanical Mounting

The method of physically mounting your motor will depend on the style of motor ie outrunner or in-runner and the type of model. For outrunners you often have the choice of front or reverse mounting the motor. There is no right or wrong way here, just what ever suits the model and your building skills best. If front mounting an outrunner be sure to have a nice strong mounting plate as these motors can sometimes produce a bit of vibration.

For some long inrunners swinging large props through gearboxes you may need to support the rear of the motor to prevent it flexing the front plate through the motor torque.



Mega ACn22/45/3e Front Mounted



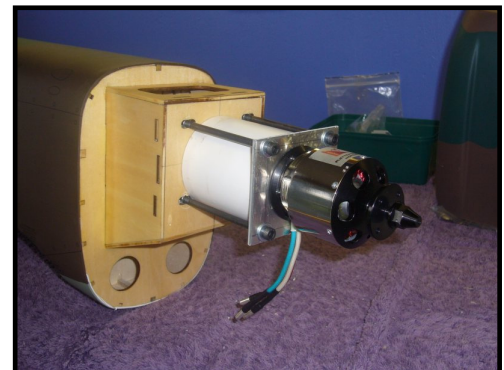
Outrunner Motor - Reverse Mounted

screws. Aluminum or carbon tube can be used as spacers. Another trick is to use a length of PVC pipe as a spacer.

For all motors be very careful to use the appropriate length mounting screws. Measure them to ensure they won't protrude too far into the motor and damage the windings.

There are a range of commercial motor mounts available for adapting Brushless motors to fit IC models but sometimes you may still have to "roll your own".

Sometimes this can be as simple as a plywood box or making standoffs from either threaded rod or long



65mm drainpipe as a spacer

Cooling

Good cooling cannot be stressed enough! All motors will dissipate a certain amount of heat under normal use. This needs to be got rid of to prevent the motor from over heating. The Neodymium

magnets used in brushless motors can lose their magnetism if they get too hot, thereby permanently damaging the motor.

The amount of cooling required will depend on the size of your motor and how much power is going through it. Generally you need some ventilation holes in the front of the cowl and then an exit hole somewhere rearward that is three times the size of the inlet holes. It may be necessary to fit some card or plastic baffles to direct the flow of air over the motor.

Do not run your motor on the ground for more than 30 seconds! When the model is stationary there is very little air flow over the motor. Most of the airflow is produced at the outer edges of



Inlet of a BF109 - Note Plastic spoon to redirect airflow

the prop, not the centre.

How hot is too hot? If you cannot hold your finger on the motor without pain then it's too hot. If it's hot enough to sizzle spit then you're in trouble!

Do a short test flight in your model and then check its temperature to see how things are going before trying longer flights.



Cooling Exit hole on BF109

Wiring

You can either use connectors or directly solder the motor wires to your Brushless Controller. If your motor spins the wrong way, just swap any two of the motor wires. Some speed controllers can reverse the motor direction in the controller's programming, very useful if you have soldered the connections.

Never shorten the motor wires! They are often the actual windings extended out and as such are a bundle of enamel wires that have been pre-tinned in the factory. If you cut these you will need to strip the enamel from every single strand to re-terminate.... A very labour intensive process as it means scrapping or sanding each strand.

If you need to extend the distance from the batteries to the motor, it is preferable to extend the motor wires rather than the battery leads. Overly long battery leads can cause damage to your speed controller due to voltage spikes. Make sure to use wire of an appropriate gauge if you do extend them. Ensure that the motor wires are not routed too close to the receiver or its antenna as interference may result.