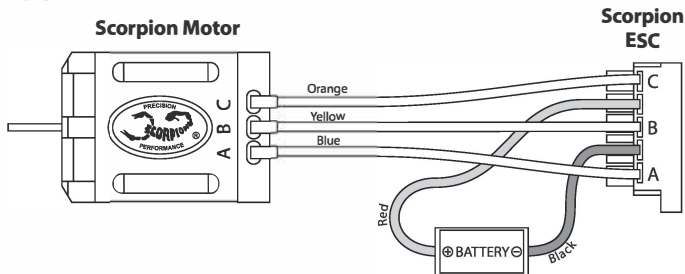


Motor Installation

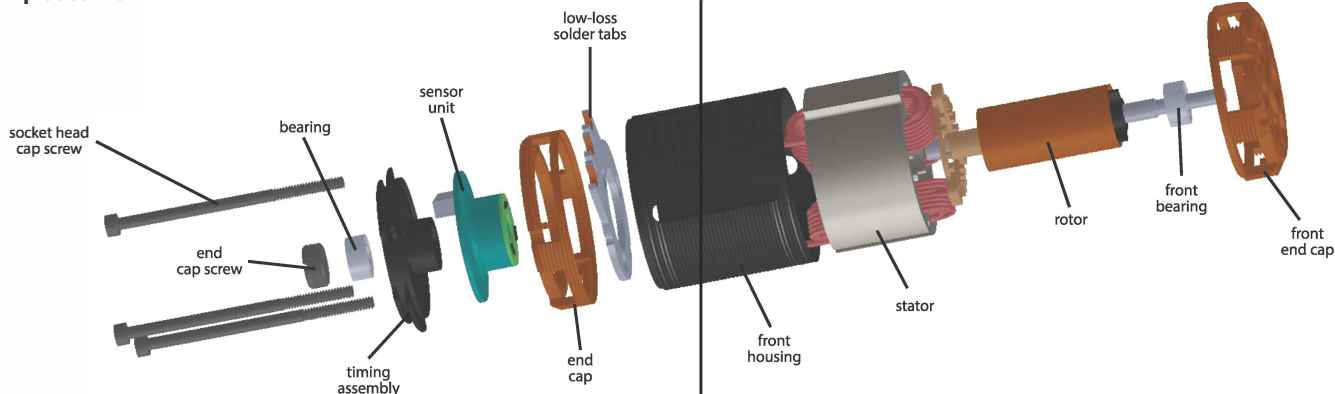
When installing the motor into the car chassis, be sure to use proper length screws. If screws are used that are too long, they can hit internal parts of the motor and cause damage. When installing the pinion gear, make sure that the gear mesh between the pinion and main gear is set up correctly. If the mesh is set too tight, it can cause premature wear of the motor bearings, and in extreme cases, it can cause the motor shaft to break. When setting the gear mesh, always find the high spot on the main gear first, and set the gear mesh at that point.

When installing the Scorpion RS-3420 series motor into your car or truck, ensure that the motor phases are soldered correctly. The ESC Phase "A" wire should go to the motor phase "A" terminal. Likewise, the ESC phase "B" and "C" should go to the motor phase "B" and "C". When soldering the ESC leads to the motor, take care that there are no solder bridges from one terminal to the other or that there are no loose strands of wire sticking out that could later cause a short circuit. A short circuit between two phase leads can cause permanent and irreversible damage to the ESC and/or motor. Take care not to overheat the solder tabs on the motor during the soldering process.

Once the main power leads are soldered in place, plug the sensor control lead into the motor and ESC. Pay special attention to the polarity of these connections. Make sure that the pins and alignment keys are pointing the right way. Do not force the sensor lead into either connector if it does not seem to fit properly. Once the sensor lead is in place, it is a good idea to secure it to chassis with a zip tie or sensor clip bracket. This will insure that nothing pulls on the wire and accidentally unplugs it from the motor or ESC.



Exploded View



Scorpion Power System

www.scorpionsystem.com

Scorpion User Guide for RS-3420

V3.0

Thank you for purchasing a Scorpion Power Systems RS-3420 Series Brushless DC Car Motor. These motors are designed to meet and comply with all standards set forth by IFMAR for use in 1/10th and 1/12th scale electric powered RC racing cars. Scorpion motors are designed from the ground up to meet the demanding needs of racing enthusiasts, and are built with efficient, high-temperature components that allow them to produce the maximum power and speed that is possible. Years of research and development by top engineers and hands on testing by professional drivers has allowed us to make the RS-3420 series the best motors available on the market today!

RS-3420

All Scorpion RS-3420 motors have the following features:

- Patented Screw-type rotor surface to increase flux density and maximize cooling
- Built-in Cooling Fan on the rotor to increase airflow and decrease internal temperatures
- No plastic inserts are used to achieve maximum copper fill for the motor windings
- Rotor magnets are protected by a metal sleeve for maximum durability
- Built-in temperature sensors allow for on-track monitoring when used with Scorpion ESC
- 200% more cooling surface than other comparable motors for better heat dissipation
- The largest glued surface for the rotor, shaft and magnets of any motor in its class
- High grade Silicon Steel is used in the stator assembly for maximum flux density
- High purity copper wire is used for minimum internal resistance
- High temperature magnets are used to take the heat of competition
- Motor parts CNC machined from 7075 aerospace grade aluminum alloy

Warranty

Scorpion Power Systems warrants this motor to be free of defects in materials and workmanship at the date of purchase. To validate any warranty claims, the purchaser will be required to provide proof of the date of purchase, either by receipt or invoice, from an authorized Scorpion dealer or distributor. This warranty does not cover any components that are worn due to normal use, Crash, overload, improper installation, ingestion of foreign objects or unauthorized repairs. This warranty will be null and void if the motor is subjected to voltages exceeding the maximum value recommended in the operating instructions, water or other moisture enters the motor or if the motor is modified, tampered with or any repairs have been made by the end user.

Under no circumstances will the purchaser be entitled to any compensation for consequential or incidental to other components such as batteries and speed controllers that are used in conjunction with this motor. It is the end users sole responsibility to ensure that all components used in the power system are designed to work together properly.

| Model | kv | IOA | Weight (g) |
|---------------------|------|------------|------------|
| RS-3420-3.5T | 9390 | 11.8(7.8V) | 164.4 |
| RS-3420-4.5T | 7170 | 6.7A(7.8V) | 167.2 |
| RS-3420-5.5T | 6000 | 5.4A(7.8V) | 154.8 |
| RS-3420-6.5T | 4970 | 3.8A(8.0V) | 161.4 |
| RS-3420-7.5T | 4300 | 3.1A(8.0V) | 164.8 |
| RS-3420-8.5T | 3860 | 2.5A(8.0V) | 163.7 |
| RS-3420-10.5T | 3130 | 1.8A(8.0V) | 167.4 |
| RS-3420-13.5T | 2445 | 1.2A(8.1V) | 146.3 |
| RS-3420-17.5T | 1865 | 0.7A(8.1V) | 187.6 |
| RS-3420-21.5T | 1470 | 0.5A(8.1V) | 163.1 |
| RS-3420-21.5T (ETS) | 1470 | 0.5A(8.1V) | 163.1 |

General Maintenance

As with all mechanical products, electric motors need periodical maintenance to ensure long life and trouble free operation. After each days racing, the motor should be inspected for any signs of damage. The solder joints on the power leads should be checked to insure they are solid and no cracks are forming. The sensor lead should be checked to insure it is firmly plugged into the motor and speed controller. Any accumulation of dust and dirt should be brushed off the motor. A blow gun or can of compressed air can be used to remove dust and dirt from small crevices in the motor and car frame. Take care not to blow high pressure air directly on the motor bearings, as this can force dust and dirt inside the bearings and cause them to wear prematurely.

Motors that are old enough to be out of warranty can be disassembled for a thorough internal cleaning if necessary. Remember that disassembly of the motor during the warranty period will void the warranty!

Mechanical Timing

The RS-3420 series motors are equipped with user adjustable timing. The timing angle is set at 30 degrees at the factory, but this can be adjusted as needed by the user. Advancing the timing will provide more top end speed at the expense of starting torque. Retarding the timing will increase starting torque, but at the expense of lower top end speed. We recommend that the timing angle be changed only 5 degrees at a time and test run on the track to see how the motor performs. Be very careful about motor temperature during timing tests. After making a timing adjustment, run the motor on the track for 1 minute and then come in and measure the motor temperature. If the motor temperature exceeds 180°F (83°C) you need to reduce the timing or use a smaller pinion gear.

Pinion Gear Selection

The best way to see if you are running the correct gearing is to measure the temperature of the motor after a run. When the gearing is set up properly, the temperature of the motor should not exceed 180°F (83°C). Continued operation above 210°F (100°C) can damage the motor windings and magnets. At the end of a race, if the motor temperature exceeds 180°F (83°C) reduce the size of the pinion gear by 1 tooth and try it again.