



HV MOTOR/WIRING SHEET PRECAUTIONS #55-3410-1 12-2004

- WATER & ELECTRONICS DON'T MIX Never allow water, moisture, or other foreign materials to get inside motor, or on PC boards.
- CHECK MOTOR SCREWS Check all motor screws for loosening. The 3 main 4-40 socket screws on the shaft end of motor may become loose after a few runs of motor & will need to be tightened NOVAK MOTORS WITH NOVAK ESCs ONLY The HV series of
- motors have been specially designed for use with the sensor-based HV-Maxx Brushless ESC Only! Use Novak sensor-based motors with Novak brushless ESCs with higher wattage rating than the motor.
- ALWAYS INSULATE EXPOSED WIRING to prevent short circuits.
- NO SOLVENTS Exposing the motor to any type of solvents can damage the exposed material.

HV-SERIES MOTOR SPECS

Motor Diameter	1.41" [35.8 mm]
Motor Length	2.84" [72.1 mm]
Motor Weight (w/o heat sink)	8.4 ounce [295 grams]
Motor Commutation	. Sensor-Based Electronic
Motor Magnet Material Neo	dymium [1pc/multi-pole]
HV4400 SPECIFICATIONS	#3410
Motor Power Rating	375 watts (@14.4VDC)
Motor Ky	4400 RPM/volt DC



(Important) GEAR SELECTION

HV4400 Motor @ 12 cells (14.4VDC)

With the HV4400 motor start with 2 teeth lower pinion gear than the "stock" gearing for most 1/10th scale monster trucks like the Traxxas E-Maxx & Kyosho Twin Force.

Because of the broader power band of brushless motors, you can go with 1-3 tooth higher pinions than the above recommendation for more top speed, but remember that going with 3 or more teeth higher will produce excessive ESC & motor heating. Be sure to check the ESC operating temperature after making any gearing adjustments--the HV-Maxx ESC is designed to operate comfortably between 160°F and 180°F (warmer than typical brush-type ESC).

You will want the final drive ratio in the vehicle to be:

for Monster Trucks @ 12 cells 22:1 9:1 for Off-Road Buggies @ 6-7 cells 12.3:1 for Off-Road Stadium Trucks @ 6-7 cells

Higher final drive ratios give longer run time at the expense of top speed. Lower ratios result in higher ESC temperatures--too low may result in thermal shut-down.

	VEHICLE	SPUR	HV4400 PINION
	Traxxas E-Maxx	70*	14-16
	Kyosho Twin-Force	50 st	15-16
	Tamiya TXT-1	40 st	15 st
	st = stock gear siz	ze *=	bigger than stock
Not	te: The above chart shows b	asic starting	points for gearing vehicles with

standard size tires--See our website for extended gearing information.



MOTOR & ESC WIRING

REPLACEMENT POWER CAPACITOR INSTALLATION

- Insulate capacitor leads with heat shrink tubing.
- Solder capacitor's **NEGATIVE(-)** lead {shorter lead on capacitor} to the HV-Maxx's **BLACK PowerCap wire** that comes from the smaller hole on ESC's BAT.2(-) tab.
- Solder capacitor's POSITIVE(+) lead to RED PowerCap wire coming from smaller hole on ESC's **BAT.1(+)** tab.

HARD WIRING ESC TO BATTERY PACK

- DOUBLE CHECK polarity & battery number of each connection before soldering to packs--INCORRECT WIRING WILL DAMAGE ESC (check tab i.D. on ESC labels).
- **I**Put a tie-wrap or tape around each set of battery wires coming from ESC to avoid possible incorrect wiring.
- Cut ESC's BLACK BAT.1(-) power wire to the desired length & strip 1/8-1/4" of insulation off the end. Solder to NEGATIVE(-) of battery #1 (6-7 cell pack). Repeat for BLACK BAT.2(-) power wire going to NEGATIVE(-) of battery #2.
- Cut RED BAT.1(+) power wire to length & strip 1/8-1/4" of insulation off end. Solder to battery #1 POSITIVE(+). Repeat for RED BAT.2(+) wire going to battery #2 POSITIVE(+).

REPLACING POWER WIRES AT ESC & MOTOR

The HV-Maxx ESC comes factory wired to the brushless motor & battery connectors. For custom installation or for replacement of the Silicone power wires:

- Remove power wires from PCB solder tabs (remove ESC from model to get access to bottom side of solder tabs). Use a soldering iron to apply heat to the power wire's solder joint on bottom side of solder tab, while gently pulling up on the wire to remove it from the hole in the PCB.
- **Replace power wires** by stripping 1/8-1/4" of insulation from end of the new wire. Tightly twist strands of wire & insert into proper solder tab's hole (*tabs are identified on the* ESC case labels & on the end cap of the motor--see below). Use soldering iron to apply heat to exposed wire that extends past bottom of PCB, and begin adding solder to tip of soldering iron and to wire. Add just enough solder to form a clean & continuous joint from the plated area of solder tab up onto the wire. Use side cutters to trim remaining (now soldered) wire from below solder tab (about 1/16''above PCB)--make sure no wire strands have strayed to an adjacent solder tab as this can result in short-circuiting & damage to the electronics, which will void the product's warranty.

•Be sure to solder phase wires to appropriate tabs on Motor (A/B/C)•



A = BLUEB = YELLOWC = ORANGE

• Note: Power wires can also be soldered flat on the solder tabs. Strip 3/16-1/4" of insulation off end of the new wire. Tightly twist strands of wire & tin with solder. Lay end of wire flat on solder tab & use soldering iron to heat the end of the wire. Add solder to form a clean solder joint between wire & tab.

IMPORTANT NOTE: DO NOT OVERHEAT SOLDER TABS Prolonged/excessive heating of solder tabs will damage PCB.

CHANGING BATTERY CONNECTORS

If you want to change Tamiya-style battery connectors on the ESC, we recommend using high-quality/low-resistance connectors, such as Dean's Ultra Plug. Use female connectors on battery packs to avoid shorting. Change one connector at a time to avoid incorrect wiring (check tab I.D. on ESC labels). Always use a connector that can not be connected backwards!

HOOK-UP INSTRUCTIONS

- 1. MOTOR CAPACITORS & SCHOTTKY NOT NEEDED Novak brushless motors have built-in motor capacitors, and like all reversible ESCs, do not use external Schottky diodes. Schottky diodes damage reversible ESCs & void warranty.
- 2. CHECK MOTOR SCREW LENGTH

Insert the M3 motor mounting screws that came with your vehicle through the motor mounting plate in vehicle. You need to have no more than 1/8" of screw extending past the vehicle's mounting plate (2-4mm). Too little can strip the threads in the end bell, and any more will cause short-circuiting/damage inside the motor & will void warranty.

- **3. INSTALL PINION GEAR** (*see GEAR SELECTION on back*) Install pinion gear on motor and position set-screw over flat on end of shaft. Test fit motor in vehicle to align pinion and spur gears, then tighten pinion gear on shaft.
- 4. INSTALL MOTOR IN VEHICLE
- Determine the best routing for sensor harness & motor power wire. Some off-road cars may require unsoldering motor to route wires through the shock tower--refer to the "WIRING MOTOR TO ESC" section.
- Using the M3 motor screws that came with your vehicle, attach motor to vehicle's motor mount using one of the three sets of threaded mounting holes--select a mounting position that will avoid short-circuiting of solder tabs on conductive surfaces such as aluminum or graphite.
- Check gear mesh for proper amount of play. You want to have a small amount of free play between the pinion and spur gears (about the thickness of piece of paper)--check free play at several positions around the spur gear.
- Avoid using excessive force when tightening motor screws, as the threaded holes could become stripped.

MOTOR MAINTENANCE

- CHECK MOTOR SCREWS Check all motor screws for loosening at regular intervals, just like other hardware on your vehicle. Note: The 3 main 4-40 socket head screws on the shaft end of the motor may become loose after a few runs of the motor and will need to be tightened. Also check the 3 flat head screws securing the end cap on the back of the motor.
- CHECK MOTOR BEARING WEAR After extensive use, the ball bearings in the end bells of your brushless motor may need to be replaced. While the design of the motor will keep the majority of debris out of the bearings, some debris may get in, and eventually wear will occur. If the shaft will not spin freely, you may need to replace the bearings (replacement bearing sets are available in Novak accessory kit #5910 and include bearing replacement instructions--If you do not feel comfortable changing the bearing on your own, please contact our Customer Service Dept. for assistance). A small drop of light oil on the bearings periodically can help extend bearing life--too much oil will cause problems, so apply sparingly.

ACCESSORIES

SUPER-FLEX SILICONE POWER WIRE

Novak Super-Flex wire for power wiring. 14 gauge silicone wire in kit #5500 (36"red/36"black), and 12 gauge silicone in kit #5530 (36"red/36"black).

H-SERIES MOTOR END BELL & BEARING SET

After extensive use, the ball bearings in the end bells of your brushless motor may need to be replaced. *Replacement front end bell with oversize bearing factory-installed & rear bearing are available in Novak kit #5910.*

SENSOR HARNESS WIRING

Should any of the 26G Teflon wires pull out of the connector on the motor's sensor harness, re-insert them in the appropriate slot in the connector as shown below. There is a small plastic tab that grabs a small raised barb on the back of the metal socket crimped to the Teflon wire's end. The plastic tab should be checked to make sure it has not deformed excessively before inserting the socket into the plastic connector housing.



SERVICE PROCEDURES

Review instructions before sending motor for service--motor may appear to have failed when other problems exist. After reviewing the instructions, if you feel the motor requires

service, please obtain the most current product service options and pricing by one of the following methods: **WEBSITE:** Print a copy of the product **SERVICE FORM** from the

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PHONE/FAX/E-MAIL: Contact our customer service department by phone, fax, or e-mail (see CUSTOMER SERVICE section below), and they will supply you with current service options.

WARRÁNTY SÉRVÍČE: For warranty work, you MUST CLAIM WARRANTY on the product SERVICE FORM and include a valid, itemized cash register receipt with purchase date and dealer name & phone number on it, or an invoice from previous service work. If warranty provisions have been voided, there will be service charges. ADDITIONAL NOTES:

- Brushless ESC & Motor should be returned together.
- Hobby dealers or distributors are not authorized to replace Novak products thought to be defective.
- If a hobby dealer returns your product for service, submit a completed product SERVICE FORM to the dealer and make sure it is included with the items.

PRODUCT WARRANTY

Novak brushless motors are guaranteed to be free from defects in materials or workmanship for a period of 120 days from the original date of purchase (verified by dated, itemized sales receipt). Warranty does not cover incorrect installation, components worn by use, cross-connection of battery/motor power wires, overheating PCB solder tabs, damage resulting from thermal overload, splices to sensor harness, damage from disassembling motor, over-tightening or using too long of motor mounting screws, tampering with internal electronics, allowing water, moisture, or any other foreign material to enter motor or get onto the PC board, allowing exposed wiring or solder tabs to short-circuit, or any damage caused by a crash, flooding, or act of God. In no case shall our liability exceed the product's original cost. We reserve the right to modify warranty provisions without notice. Because Novak Electronics, Inc. has no control over the connection and use of the motor or other related electronics, no liability may be assumed nor will be accepted for damage resulting from the use of this product. Every motor is thoroughly tested and cycled before leaving our facility and is, therefore, considered operational. By the act of connecting/operating speed control, the user accepts all resulting liability. ©2004 Novak Electronics, Inc. • All Rights Reserved • No part of these instructions may be reproduced without the written permission of Novak Electronics, Inc. • All Novak motors are designed & assembled in the U.S.A.

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