

NetGain Motors, Inc.

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Special Update

Date: February 13, 2006

To: All **WarP Motors** Dealers

Subject: **WarP Motors** Heat and RPM Protection Bulletin

Throughout the year we have had inquiries about the effects of heat and RPM's on **WarP Motors**. This **Special Update** summarizes many of our conversations with individual dealers and shares the same knowledge across our entire dealership network. As in our other **Special Updates**, this information does not cover every aspect of the motor's usage. If you have a situation that you are unsure about, please call someone that has the expertise or seek more detailed information. Please act responsibly and protect yourself and your customer from personal harm or damage to the motor.

Motor Heat

1. All **WarP Motors** are rated over Class H, which is 180 degrees C, but one still needs to protect the motor from overheating
2. If you are using your motor for drag racing, with 10-20 seconds of high load, the brushes and comm will heat up faster than the other parts of the motor. To protect your motor in this case, measure temperature in the brushes and the comm surface area using an infrared device that can react quickly. Heat can build very fast, as you would expect and may already know!
3. If your motor is used for normal vehicle travel, the ends of the pole shoes and the motor case by the shoe bolts will generally be the area of greatest heat build up. To protect your motor in this area, the normal temperature snap switch is installed. Connect it to give the driver a warning light or to automatically open the circuit if it indicates overheating. Heating will build slower here, but fast action needs to be taken to protect the system.
4. Consider setting a temperature of 110-120 degrees C for your action starting point as a safe way to manage a potential overheating situation.
5. Lastly, always ensure that sufficient and proper air circulation through the motor is not impaired!

Motor RPM

1. All **WarP Motors** have comms that were tested to over 8,000 RPM, but that does not mean they can be run at that speed indefinitely!
2. Most motor comms built now are composite. Steel comms were used in the past, but are now made for custom orders and very expensive. Steel core comms are generally able to withstand higher RPM speeds.
3. We like to recommend safe speed ranges from 1500- 2500 RPM, even though we know some of our **WarP Motors** are peaked around 5,000 RPM for small intervals of time. When working with a customer, please be sure to design gearing so that the customer gets the speed he wants, but the motor will not be at a high RPM for long periods of time.
4. Lastly, utilize one of the many ways available to protect the motor from exceeding 8,000 RPM and make sure it is installed and working properly. It just needs to work once to pay for itself, save the motor and protect all the people around the vehicle!