

Kart and Motorcycle Conversion Tips and Tricks

Thanks for purchasing a kit from us! If you're converting a motorcycle, you may want to start by checking out our videos online for some tips to make your conversion easier:



Be sure to consult the manual for your speed controller before applying voltage to your system! We have manuals and diagrams available on our website in the *Motorcycle & Kart Kits* and *Product Manuals & Data Sheets* categories. If you have any doubts about your wiring, feel free to send us a request with photos to our email: Connect@Thunderstruck-ev.com

For Kart Conversions

The most common question we get is how to mount the motor to the frame. We offer several solutions for this. The first is our "Kart Plate" that is made of 1/4" steel. This is designed to bolt to a 50mm kart axle bearing holder. If you don't have this type of kart axle you can drill new holes in this plate that line up with your axle bearing holder bolts to make it work. A different approach is to try mounting the motor near where the gas engine used to live. To do this you can use our generic "Motor Plate." This would have to be welded to the frame, or have another plate welded to the bottom at 90 degrees that you then can bolt to the old engine mounts. Be sure your two sprockets are aligned. See our motorcycle conversion video to see how to align sprockets.

Motorcycles and Karts

Motorcycle and kart kits have motors with 7/8" keyed shafts, except for the ME1507, which has a 1 1/8" shaft. For karts we recommend using the largest wheel axle sprocket you can get. Use a motor sprocket that matches the axle sprocket pitch and chain size. We commonly use #35 for lower power and #40 for medium and high power karts and motorcycles. If you have a different size like #420 or #428 you should google search your size to confirm its compatibility.

Rules of Thumb for gearing:

Gearing your vehicle for a lower top speed will give you a quicker acceleration off the line (more torque), will generally keep your components cooler, and give you a longer run time due to lower overall power consumption. You can also lower the max current output in your controller to help keep things cool and prolong your run time. Using a larger axle or wheel sprocket and/or a smaller motor sprocket gives a lower top speed. Using too small of a sprocket on the motor will make a noisy chain. If you decide you want a higher top speed, then use a larger motor sprocket if there is clearance for it and the chain path. You may need to change your chain length after any gearing changes. We have a gear ratio calculator on our site if you want help predicting your top speed:

<http://www.thunderstruck-ev.com/gear-ratio-calculator.html>

Battery Packs:

If you want to use a lithium battery pack on your first conversion, that is fine, but there is nothing wrong with starting out with a simpler, cheaper, safer lead acid battery pack. If you are considering using lithium, a Battery Management System (BMS) is required. A good place to start is to look at our BMS section to determine your equipment and skills requirements. Regardless of the pack

chemistry, install a meter to monitor pack voltage while using the system to prevent over-discharge and damage to your batteries.

Follow balancing and installation instructions provided by your battery vendor. A well-constructed pack is essential for reliability and safety. Research and planning will pay off here.

Keep cable lengths as short as possible. Use a properly rated fuse at your battery pack most positive terminal for the controller circuit. Charger connections should be fused at the pack. Fuses are sized based on the wire current capacity in each circuit.

When mounting your controller, note that the 4Q, AXE and some Curtis controllers should be mounted on a heatsink with access to fresh air. Use thermal transfer grease between the controller and heatsink for better heat transfer.

If you're using a brushed motor you need to allow the brushes to properly seat on the rotor, so you can get the most life out of them. Do this by initially giving the motor low, fluctuating power. You will be able to hear the difference between a new motor and one that has been running on the bench for a while. Start by applying a bit of throttle and letting it run for 20-30 minutes, then give it a bit more throttle and repeat. A brushed motor should have brush dust blown out and brushes inspected after many hours of use.



Safety Considerations

These are do-it-yourself kits so we cannot assure that you won't be making something very dangerous. We have been in the industry for a long time and have seen some crazy inventions, and some epic fails. Here are some things to keep in mind:

- Wear insulating gloves and eye protection when connecting electrical circuits.
- Try to have no exposed electrical connections. That metal wrench can weld itself to your batteries and cause a fire. If you think something may be dangerous to connect or touch, put a voltmeter on it and check! If there is voltage, there is a possibility of sparks!
- Cables should be routed so they don't wiggle or rub against neighboring objects.
- Test your system first with nothing connected to the motor shaft.
- Make sure your throttle resets to zero once released.
- Have an easy to reach main kill switch or pack disconnect in case you didn't follow the above recommendation.
- Your brakes should be strong enough to override a full throttle input.
- Test little by little and pay attention to any noises, heat buildup, etc.
- If your components are getting warm that is ok, if they are getting hot then consider cooling them, upgrading, gearing it lower, or lowering the max current output in the controller.
- Cables getting hot and loose connections are a waste of energy and can cause a fire. If you can hold your hand on the surface of the motor it is not overheating.
- Use a chain guard.
- Check that your wheels, bearings, steering, tire pressure, etc. are safe.
- Wear a helmet and your fancy racing leathers when you ride.
- If you take care of your components you may end up using them in other vehicles down the road, so show some respect for your gear and you should have a lot of fun with your project.