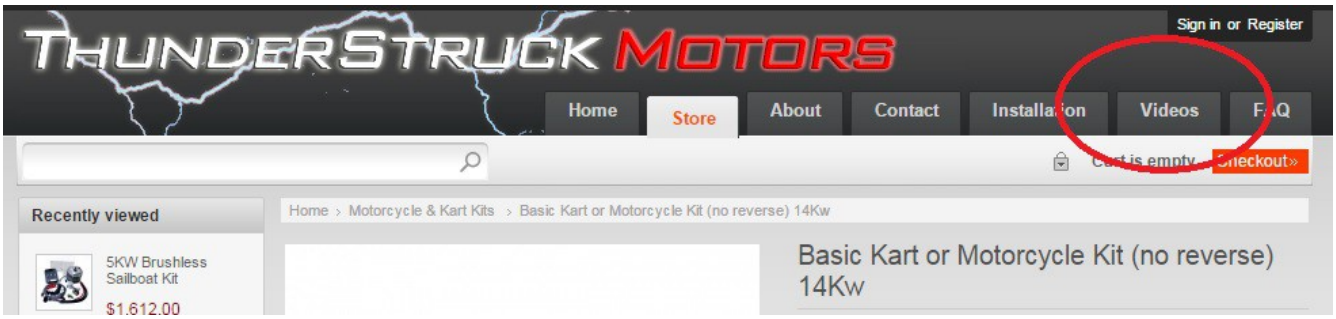
Kart/ Motorcycle Conversion Tips and Tricks

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 the manuals available on our site. http://www.thunderstruck-ev.com/product-manuals-and-data-sheets.html If you have any doubts about your wiring, feel free to send us a photo 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 one of our “Generic Mounting Plates.” 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 or your chain will stay aligned. See our motorcycle conversion video to see how to align sprockets.

Karts and Motorcycles

Your motor has a 7/8” keyed motor shaft. For karts we recommend using the largest axle sprocket you can get. Use a motor sprocket that matches the axle sprocket pitch and chain size. We commonly use #35 for lower powered vehicles and #40 for medium and higher powered 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. Going too small of a sprocket on the motor will make a noisy chain. If you decide you want a higher top speed it is easy to use a larger motor sprocket as long as 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

Many people want to use a lithium battery pack on their first conversion which is great but there is nothing wrong with starting out with a simpler, cheaper, safer lead acid battery pack. If you are considering using lithium, a good place to start is to look at our BMS to see if you are up to the task of

wiring in a bms. Whatever your chemistry, you should monitor your voltage while using the system to prevent over-discharging them. It is tempting to keep driving til your pack is dead but this is an easy way to shorten the life of your batteries. The quick and dirty way to monitor voltage is to use a cheap voltmeter, mounted where you can see it while driving. Keep in mind your batteries may not all discharge and charge exactly the same, so keep a safety cushion in mind when deciding when to call it quits.

Be sure when building your project to have your batteries contained in a way that is still rigid even in the event of a spill. Take note of their weight and how this may affect the ride. The best way to install your 48v (for instance) lead acid battery pack is to charge all four of your 12v batteries in parallel, at 12v (actually most 12v chargers will charge to about 14.5v). This way you know they all are at the same state of charge. Then, take them out of parallel, install in the vehicle and wire them in series to get your 48v for the controller. Keep cable lengths as short as possible. Use a high-current fuse on your battery pack most positive terminal. You will likely also have a connection to your pack for your charger; this should have it's own lower current fuse for safety.

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 a difference in a brand new motor and one that has been running on the bench for a while. I usually 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 after many hours of use should have brush dust blown out and brushes inspected.

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:

Try to have no exposed electrical connections. That metal wrench can weld itself to your batteries and cause a fire. If you're curious if something is dangerous to connect or touch, put a voltmeter on it and check! If there is voltage, there is possibility of a spark!
Cables should be mounted 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.
Ideally your brakes will 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 are a waste of energy. Loose connections can cause a fire. If you can hold your hand on the surface of the motor it is not overheating.
Use a chain guard.
Wear a helmet and your fancy racing leathers.
Did you check that your wheels, bearings, steering etc is safe? Why don't you go ahead and check your tire pressure while you're at it.
Don't forget that if it's ON there won't be a telltale idle sound to remind you. Consider making the key in an obvious place and having an ON status light that you can't miss.
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.