

# Thunderstruck Gear Reduction

## Parts List

Mounting Plate with 4 sets of nuts and bolts

2 Support Angle Arms

Motor pulley and hub

Shaft Coupler

Hardware bag with top tensioner,  
motor bolts (one longer for top),

machine keys

Belt



Hello, and congratulations on your purchase of a Thunderstruck Motors gear reduction. There are several things you need to know in order to make installation as easy as possible.

For starters, it is important that the reduction shaft is correctly aligned with your existing prop shaft. **Before** removing the old engine it is a good idea to take note of where the shaft is, either by taking precise measurements, or by making an armature to hold the prop shaft in it's current position. When initially positioning the motor plate, note that the angle it tilts to match the angle of the prop shaft is not necessarily vertical. It is advisable to replace your stuffing box and cutlass bearing at this time. If your cutlass bearing is worn out, your shaft may not be properly aligned, potentially causing noise and/or vibration while running.

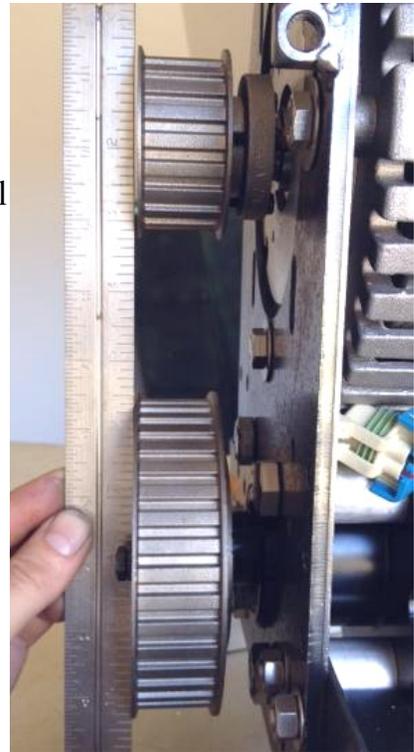
At the bottom of the plate are two sets of holes for attaching the 1 1/2" angle. These pieces of angle will also be mounted to your boat. There are multiple holes to make it easier to get the plate at the right height, although you'll likely need to use some shims or washers to get both shafts aligned. You can use a straightedge along the two shafts to confirm alignment. Check it along the top and side of the two shafts. Check again after mounting the motor as it may pull the plate to one side.

How you choose to mount the angle to the boat is up to you, but we've had success drilling a hole in the bottom of the angle and using lag bolts directly into the old wooden engine blocks, or by bolting to engine mounts that have dampers on them to isolate any vibration. When drilling into the stainless steel arms, go slow, use lubricant, and start with a small bit to get accurate hole placement. A step drill can make this easier. You may choose to cut off any unused remaining length of the angle.

At the top of the plate are two square nuts with 3/8" mounting holes. These are used to attach an additional support if necessary (not supplied) and to help get the proper angle of the plate. A simple piece of 1" wide, 1/8" thick flat steel or aluminum will likely suffice. If you can drill a hole in one end of the flar bar and a slot in the other, it will be easier to properly adjust the angle of the plate to match your drill points. After you're comfortable with how your setup looks and after any drilling or chopping has taken place, you will need to either paint the steel shaft, coupler and other steel components with a good marine grade paint to prevent rust, or lube them with a corrosion inhibitor (don't get anything on the pulley grooves that may make the belt slip). The motor plate itself and all larger nuts and bolts that we've included are stainless steel or black oxide.

Check that **your** prop shaft can be turned by hand. To connect our shaft to your prop shaft, use the double chain sprocket coupler. This style allows for slight shaft misalignments. We've included a longer set screw that sits in the pre-drilled well on our shaft to prevent it from sliding fore and aft. It's advisable to do something similar on your prop shaft. If your shaft does not have a keyway for a machine key you may choose instead to drill a hole through the shaft and install a roll pin through both the coupler and shaft. In this case you'd remove the coupler set screw and drill through the set screw hole into the shaft, all the way through. This option is less ideal as it can be difficult to drill through stainless steel.

After you've got the plate mounted and supported, installing the motor, pulley and belts should be pretty easy. Install the smaller hub then the pulley onto your motor shaft, making sure that it will be lined up with the lower pulley as in the photo. If your hub is difficult to fit onto the shaft, try cleaning just the inside edge of the hub with a round file. It won't go on if you've already attached it to the pulley. **Do Not** hammer the hub on. The 3 bolts will go through the **non-threaded** holes on the hub, into the pulley. The hub and bolt heads need to be pretty close to the motor face; you'll need a small open ended wrench to access the bolt heads. Note that the pulley will move a bit on the hub as it is tightened up, but does not need to compress all the way onto the hub. Tighten each bolt several times as they will loosen up as the others are tightened around it. If the 3 bolts are not tightened down enough they may shear off from the twisting force on the pulley to the hub. Once tightened the hub and pulley act as one and there is no twisting force on the screws. The most common cause of belt slippage is misaligned pulleys.



There's usually enough room in the plate's mounting slots to allow you to first loosely bolt the motor and pulley in place and then slide the belt on and pull the motor and belt tight by hand or by wedging a shim underneath it. We've included a motor locating bolt on the top to help prevent the motor from shifting over time. This does **not** need to be very tight. Pushing on

the belt half way between the two pulleys about as much as you'd push on a postage stamp, expect to see about 3/16" of belt deflection. Next, snug down those motor bolts.

If you need to take off the lower pulley for a ratio change, **be sure** to reinstall it correctly. To remove the lower pulley, the three black screws can be removed and threaded into the other set of three holes to force the pulley off the hub. If the hub is also getting replaced you'll need to remove the 5/16" end bolt and the set screw along the hubs circumference. To reinstall, the hub should first be held on the shaft by the single 5/16" end bolt and don't forget the rectangular machine key that's between the hub and shaft. Before installing the plate or motor, confirm that the lower bearing and shaft assembly is free spinning. A little resistance is ok, but over-tightening the bolt on the end of the shaft can cause too much pressure on the bearings. **Do not** over-tighten the end bolt to the point of compressing the bearings, but there should be no wiggle in the shaft after the end bolt is snugged. Next tighten the set screw on this hub, then you can install the pulley and tighten the 3 taper lock screws. The taper lock will tightly compress the hub onto the shaft.

When it's time to try out your system, take note of any excess noise, heat, vibration, or current draw. These can be signs of a misaligned or mispositioned shaft(s) or pulleys or over-tightened bearings. Hopefully all you hear is a quiet hum of the motor. The lower bearing assembly comes pre-filled with grease, but there is a grease fitting which may need to be topped off periodically with NLGI #2 lithium complex grease if you notice any leaking over time. Be careful as over filling will cause grease to come out of the hub near the pulley. It's a good idea to take a look at the belt every once in a while to make sure there's no tears or fraying.

We appreciate any feedback you have that will help us to improve our products or make your installation easier. Have fun and send us a photo of your boat kit!

-Thunderstruck Motors

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