

REMOTE ELECTRIC STEERING for TROLLING MOTORS

The purpose of this switch actuated Trolling Motor steering setup is to provide a remote steering mechanism that does not require the trolling motor be modified in any way, other than bolting-on the new steering parts. The process will be described in a series of photos, and the plans will, although minimal, provide the fabrication and assembly details.

This is a do-it-yourself project. There is a drawing and a parts list, but the most important part of the plan is the idea. Study it, and then make any changes that will best suite your application.

This remote steering set-up is ideally used when a remote speed control is also being applied, but it is not mandatory.

I have found that steering takes up most of the operators attention, compared to the speed control, because the top speed of a trolling motor is usually slower than the slow speed of a larger gas powered boat.

Also, as most applications for trolling motors are in small boats, remote steering allows the operator more freedom of movement from the motor, which is primarily on the transom of the boat.

My applications are in small, home built, custom boats that utilize a sitting position, not necessarily in the back of the boat.

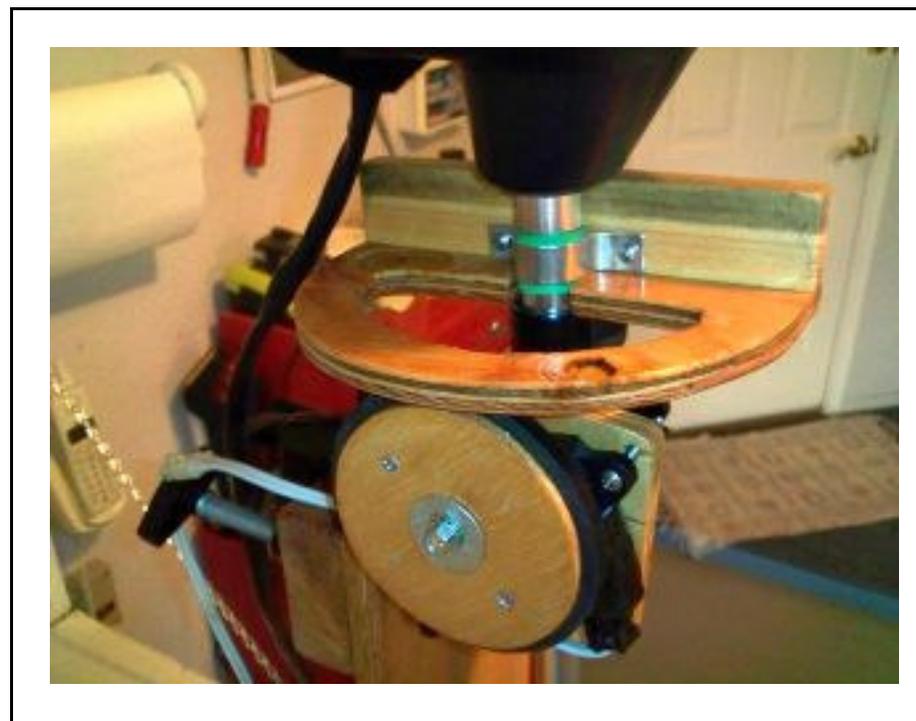


Photo of Completed Assembly

KenSimpsonDesigns

DESIGN

The design concept is a simple one. Use a small 12 volt, high torque, low speed gear motor to turn the Trolling Motor shaft, without adversely modifying the Trolling Motor. There are a number of issues that have to be overcome to achieve a working design, and they are:

In case of steering motor failure the Trolling Motor can still be steered.

The steering motor must be disengaged when raising the Trolling Motor (beaching).

The steering motor assembly cannot restrict, in any way, the use of the Trolling Motor.

The parts must be easy to make, and/or readily available.

The assembly must be easy to remove, for possible Trolling Motor use on another boat.

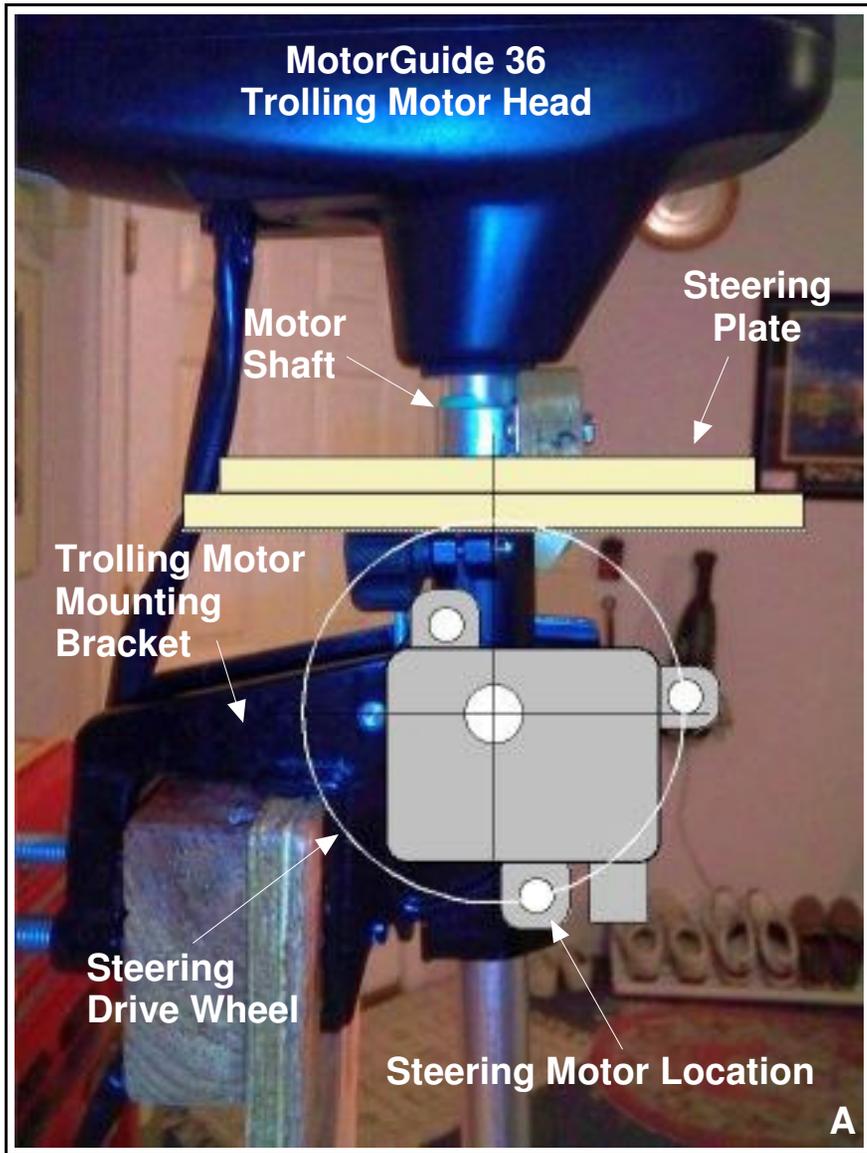
Once all these parameters are met, the design can move forward. Selecting the Steering Motor can be difficult. Size, cost and power needs must all be considered. The motor I selected is a surplus one from a minivan. It was used in the interior heating/cooling system to redirect vanes in the ductwork. I will provide the source on the parts list, but cannot guarantee the motor is still available there. You may have to hunt the Internet to find it, or a similar one, for your specific application.

The motor spec's are : 12 volt operation, small size (fit on motor bracket), high torque - 5 RPM output shaft, all plastic (non-rust), and low cost (under \$10).

The next hurdle is how to mate the steering motor to the trolling motor in such a way that the motor torque can be applied to the trolling motor shaft. In engineering terms, a moment-arm had to be developed. This took shape in the form of a 4 inch radius semi-circle of plywood, on which a 3 inch diameter rubber wheel would turn. And remember, it had to be out of the way of normal trolling motor operation. It should also be noted that the vertical position of the Trolling Motor Shaft must be controlled by the Motor Shaft Stop Collar, so as not to put undue force or stress on the steering plate and rubber ring. Only slight compression of the ring is required.

The following sketch shows the developed position of each component, and relative size. It must be noted that this was done on a MOTORGUIDE 36, and if you are using another manufacturer's motor or one of a different size, the design will have to change accordingly.

EXECUTION



Concept sketch of the Steering Motor assembly.

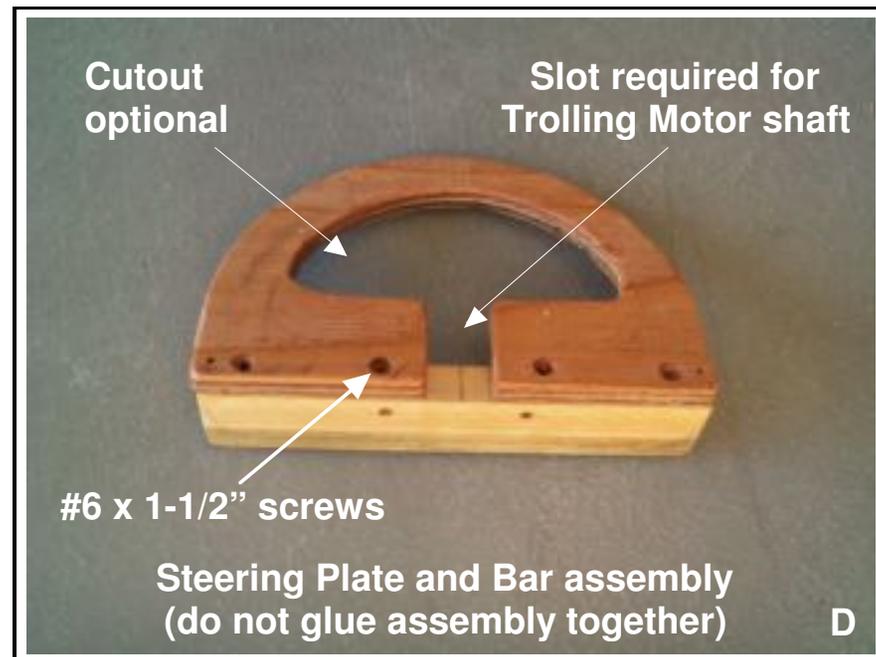
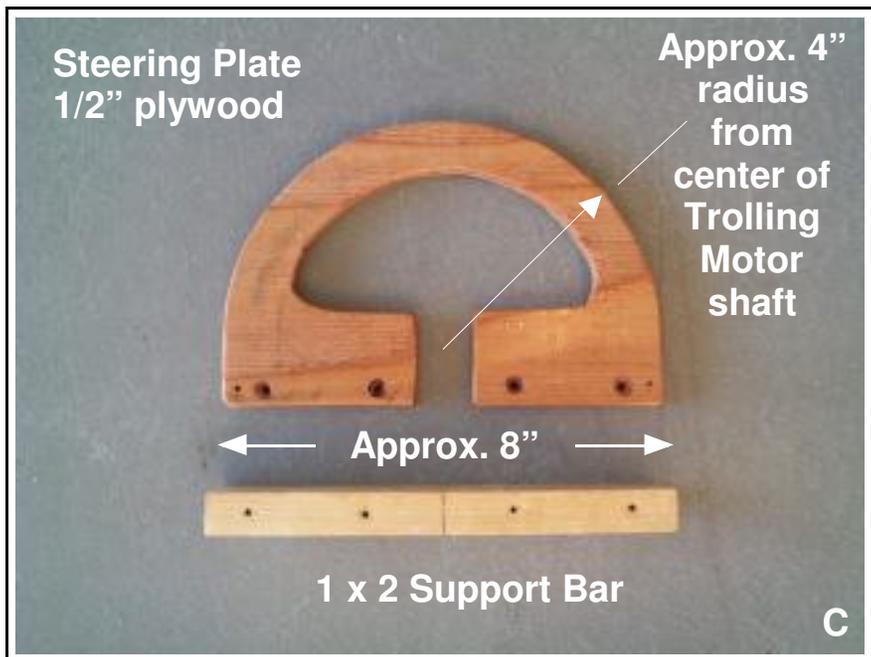
The following photos will provide visual relevance to the design concept.

At left is the initial drawing, indicating the position of the steering motor on the trolling motor mounting bracket. Also shown is the drive wheel and the steering plate.

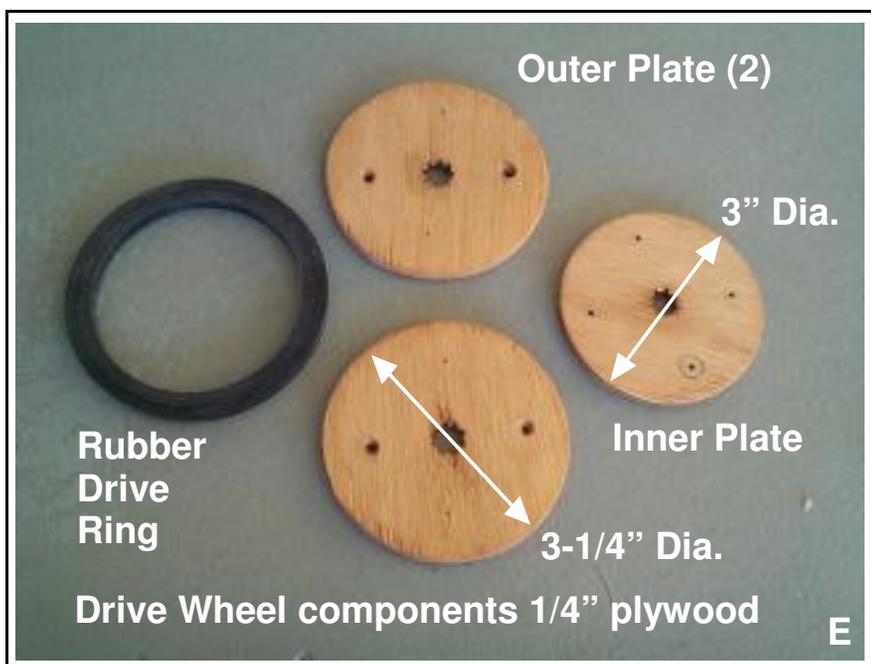
The photo below is of the motor chosen for this project. Note the splined output shaft. The drive wheel hole will have to match this shape. Also, the white power cord was soldered to the internal terminals of the motor connector. No mating connector was readily available.

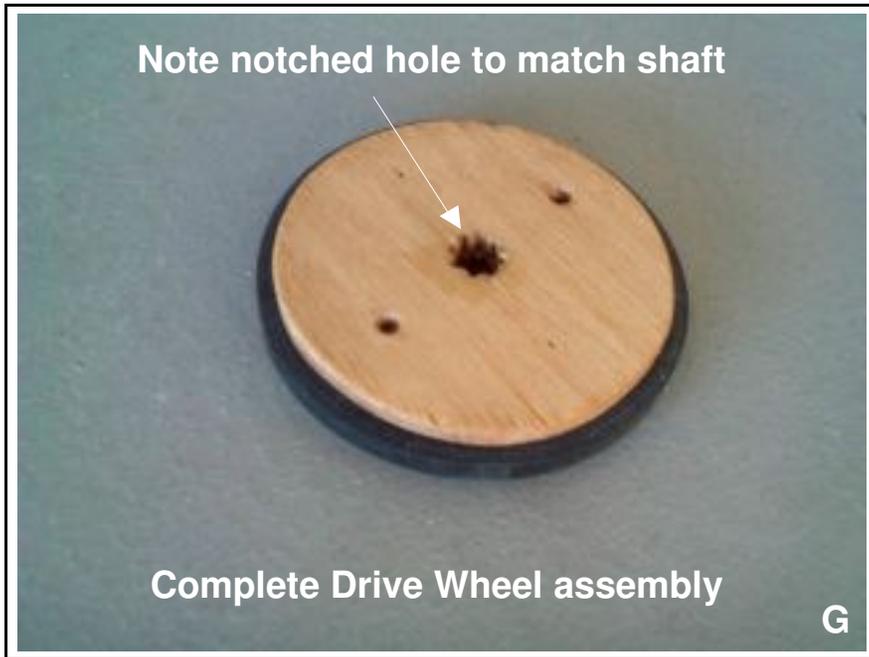


Typical photos of fabricated parts and subassemblies.



The above dimensions will vary depending on the Trolling Motor used. For each Motor, the Shaft diameter varies as does the distance from the side of the Trolling Motor Mounting Bracket to the center of the Shaft.

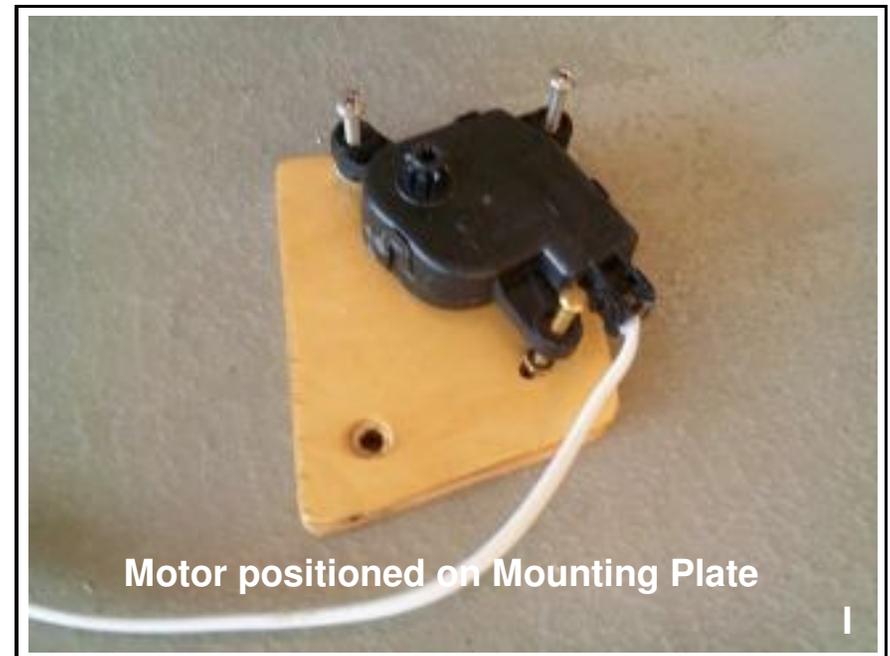
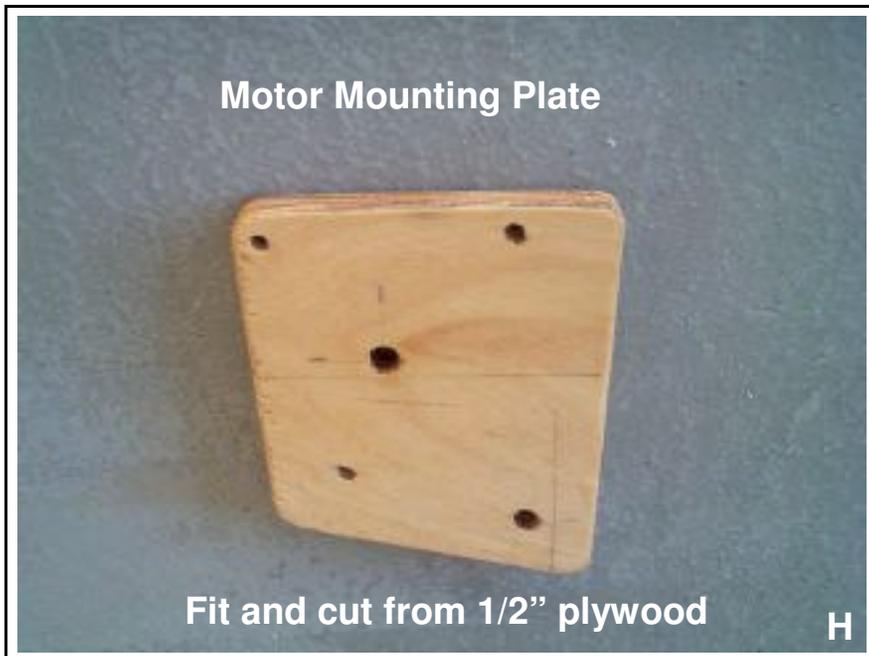




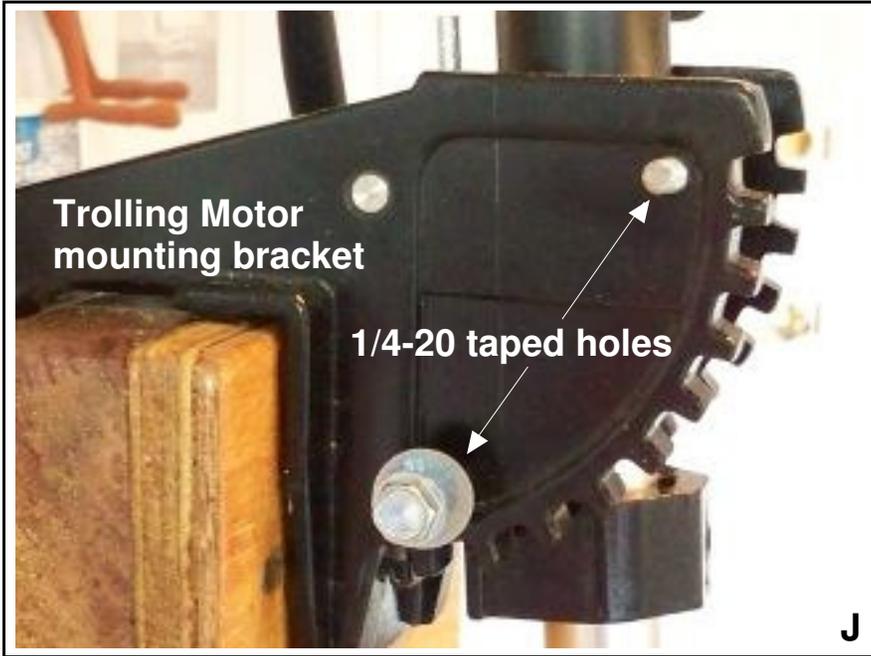
When cutting the drive wheel parts with a jigsaw from the 1/4" plywood, precision is paramount. The hole must be on the exact center of the wheel. To duplicate the spline of the shaft, mark the outline of the spline on the hole, and using a triangular file, cut the slots carefully and evenly.

Sandwich the rubber washer between the outer plates and the inner plate. Hold the assembly together using 3/4" screws, 2 on each side, as shown.

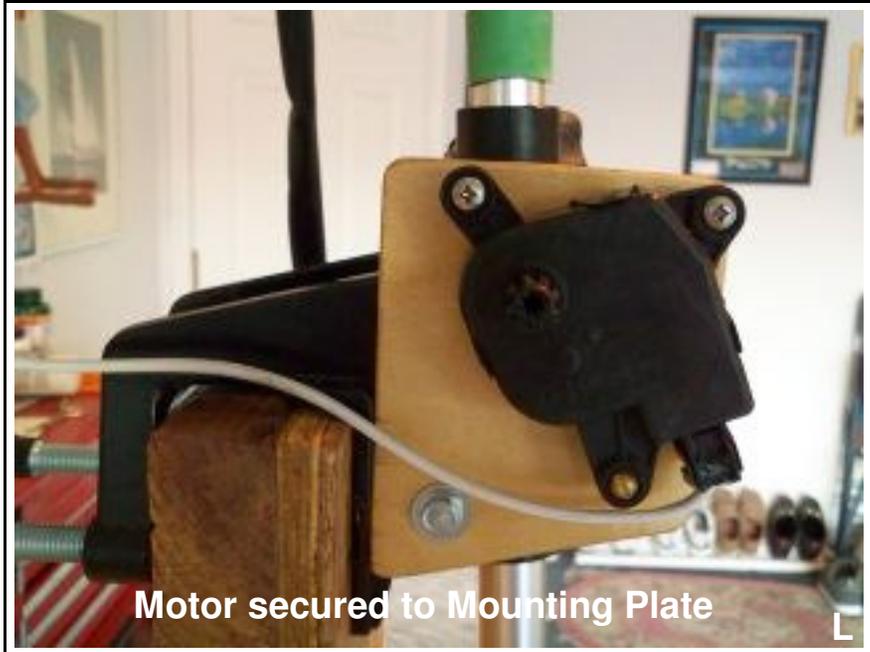
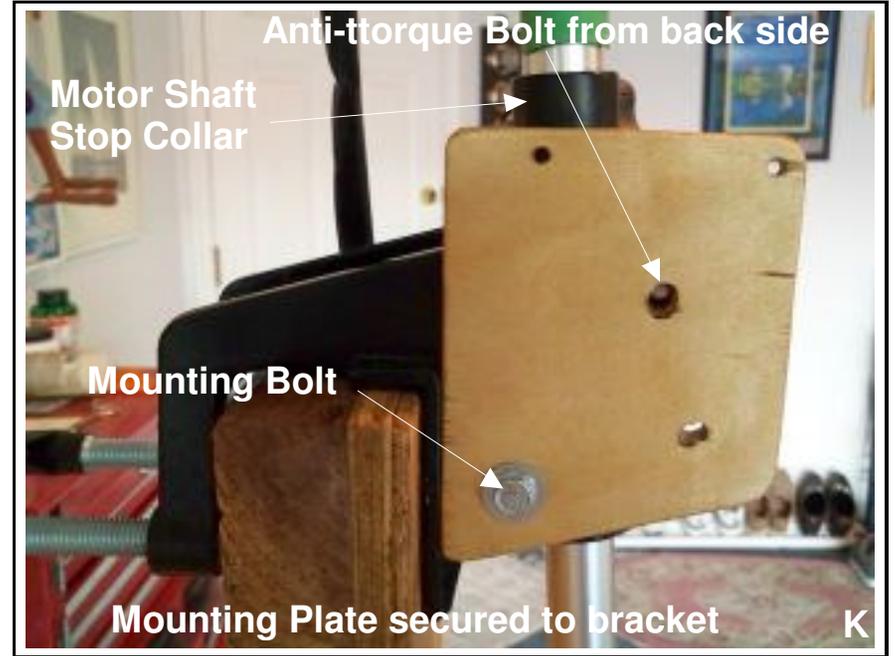
The medium-hard rubber washer is 1/4" wide x 1/4" thick., approximately. The one used is a kitchen sink drain seal, available at any Home Improvement Store.



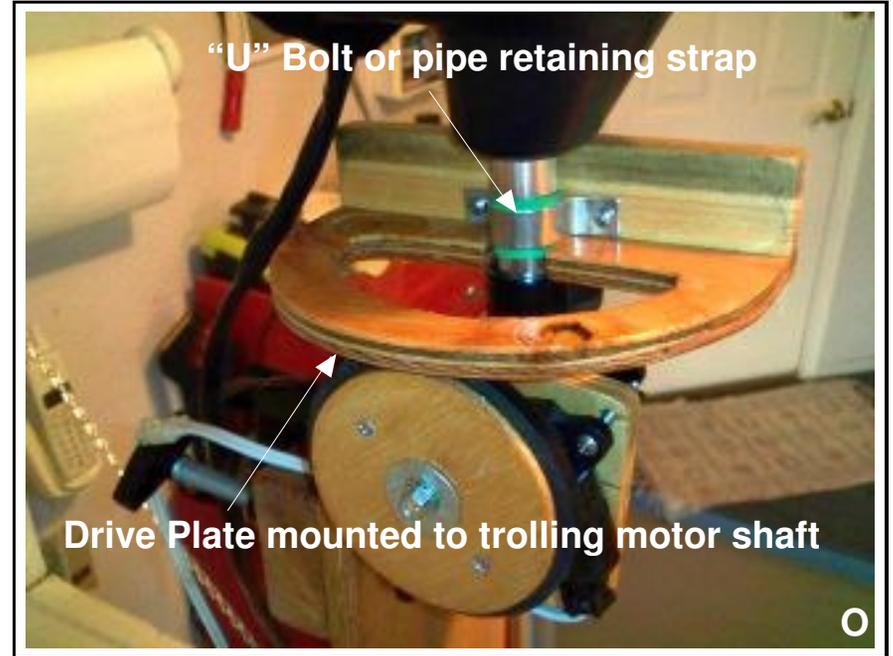
Assembly Photos



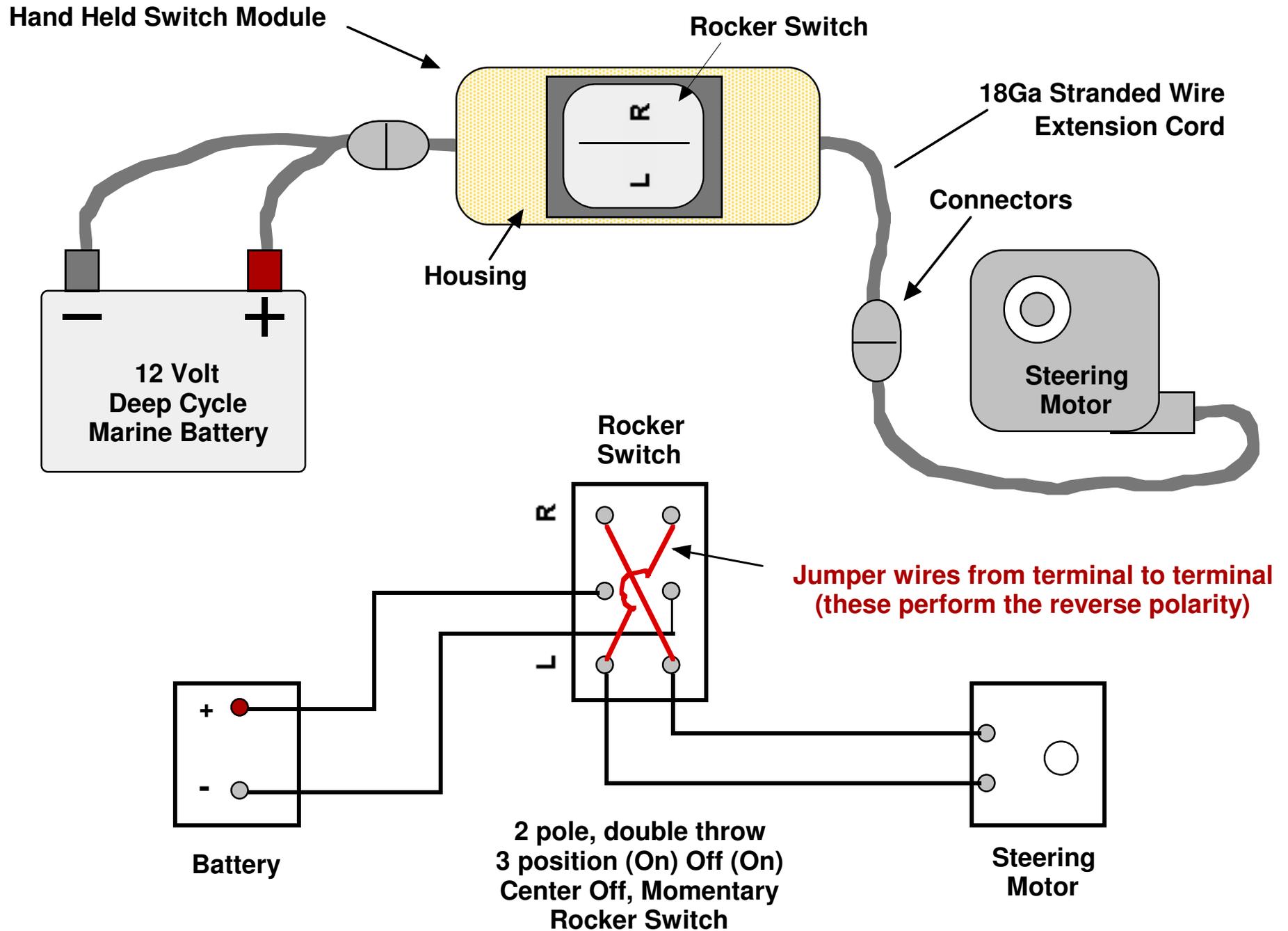
The only modification to the Trolling Motor



Assembly Photos



WIRING DIAGRAM



PARTS LIST

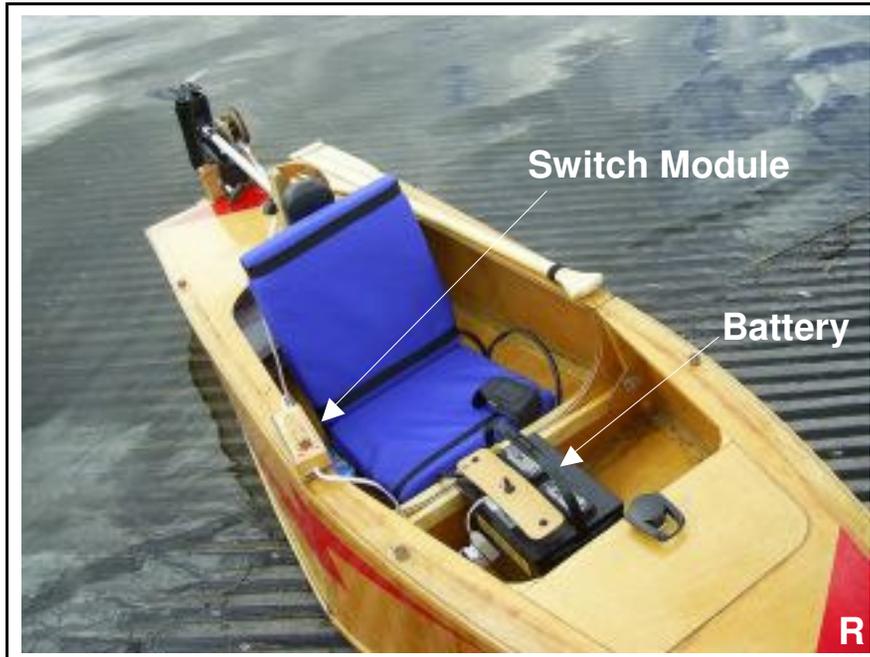
<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>PRICE EA.</u>
Drive Motor	Super Power 12 Volt DC Gearmotor Purchased from: www.goldmine-elec-products.com Item # G16034	1	\$8
Drive Ring	Kitchen Sink Drain Seal Ring, approx. 3"ID, (rubber) Purchased from: Any home improvement store	1	\$3
Rocker Switch	DPDT, 3POS, Momentary (On)-Off-(On) , 3 Amp Can be purchased at Radio Shack, Fry's Electronics or any electronics parts or hobby shop.	1	\$6
Line Cord	Cut up extension cord	1	\$3
Plywood, Nuts & Bolts purchased at local home improvement store.		a/r	\$5
		Total :	\$25

The design depicted has proven to be ideal for the 'Kayak+' boat for which it was intended. The combination of a 36 pound thrust Trolling Motor, an 8 foot Boat and medium steering sensitivity were well matched. This may be different, however, for your boat. Carefully review the initial design intent, make the necessary modifications for your motor and boat combination, and only then should you begin fabrication. Be precise in your cuts, and plan ahead for the next assembly steps. Test each assembly before going to the next. The fit of the drive wheel to the splined shaft is a good example. Check for out of round, wobble or loose fit, none of which are acceptable. With proper attention to detail your remote drive should last as long as your boat and motor.

Good luck with your project !

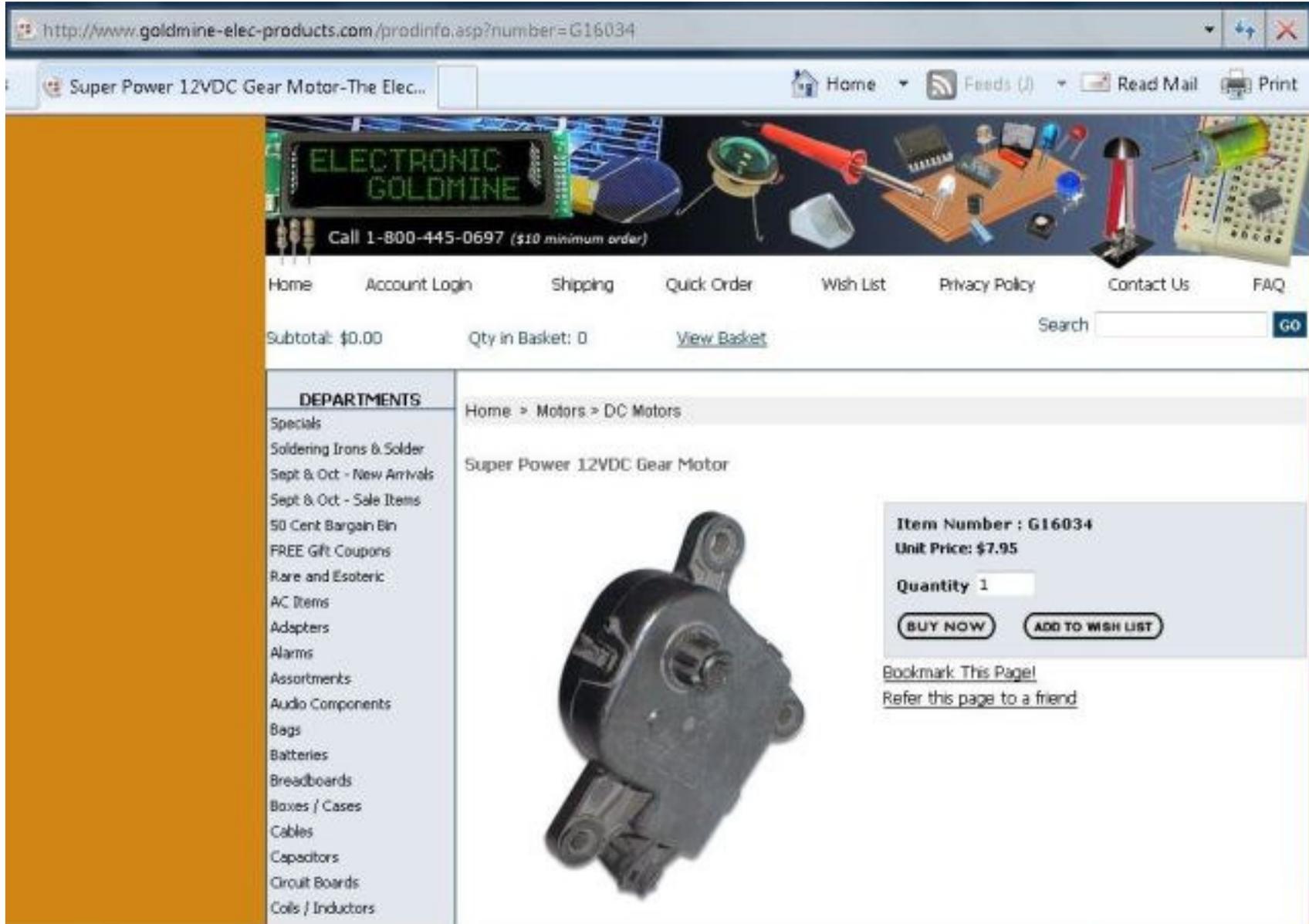
This is an experimental design drawn up by an untrained amateur. The Designer accepts no liability for any loss or damage sustained during construction or use. Builders may use these plans to construct small numbers of boats freely for their own use. Commercial manufacturers must ask the designer to negotiate permission.

Completed Assembly Photos



To test the Electric Steering fully, it was necessary to splash water on the drive wheel and drive plate while it was in operation. The water was easily displaced and the steering worked without hesitation. The motor draws very little power, so there should be no voltage concern. Also tested was steering the boat using the motor tiller, while still engaged to the drive wheel. This was easily accomplished, although the drive wheel did squeak in the process. The selection of the steering switch is critical for good feedback, as steering is not visible, until the boat actually turns.

As of 9/25/2009 the Motor was still available. Go to: www.goldmine-elec-products.com
Select Motors from the products list on the left, then DC Motors.



The screenshot shows a web browser window with the URL <http://www.goldmine-elec-products.com/prodinfo.asp?number=G16034>. The page title is "Super Power 12VDC Gear Motor-The Elec...". The website header features the "ELECTRONIC GOLDMINE" logo and a phone number: "Call 1-800-445-0697 (\$10 minimum order)". Navigation links include Home, Account Login, Shipping, Quick Order, Wish List, Privacy Policy, Contact Us, and FAQ. A search bar is present with a "GO" button. The main content area shows the breadcrumb "Home > Motors > DC Motors" and the product title "Super Power 12VDC Gear Motor". A large image of the motor is displayed. To the right of the image, the product details are listed: "Item Number : G16034", "Unit Price: \$7.95", and "Quantity 1". Below these details are two buttons: "BUY NOW" and "ADD TO WISH LIST". At the bottom of the product information, there are links for "Bookmark This Page!" and "Refer this page to a friend". On the left side of the page, there is a "DEPARTMENTS" menu with the following items: Specials, Soldering Irons & Solder, Sept & Oct - New Arrivals, Sept & Oct - Sale Items, 50 Cent Bargain Bin, FREE Gift Coupons, Rare and Esoteric, AC Items, Adapters, Alarms, Assortments, Audio Components, Bags, Batteries, Breadboards, Boxes / Cases, Cables, Capacitors, Circuit Boards, and Coils / Inductors.

As of 1/2/2010 the Switch was still available. Go to: www.goldmine-elec-products.com
Select Switches from the products list on the left, then Rocker Switch.