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MARINE INSTITUTE
MODEL BOAT RACE

PROPULSION KIT GUIDE 2016
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kit Contents</td>
<td>2</td>
</tr>
<tr>
<td>Things You Will Need</td>
<td>3</td>
</tr>
<tr>
<td>Propulsion Support System</td>
<td>4</td>
</tr>
<tr>
<td>Shaft Coupling Installation</td>
<td>5</td>
</tr>
<tr>
<td>Motor Cooling System</td>
<td>6</td>
</tr>
<tr>
<td>Propeller Clip</td>
<td>9</td>
</tr>
<tr>
<td>Receiver, Speed Controller and Wiring</td>
<td>10</td>
</tr>
<tr>
<td>Servo for Rudder/Tiller</td>
<td>11</td>
</tr>
</tbody>
</table>
KIT CONTENTS

The propulsion kit contains all components for the propulsion unit. These components consist of the following items:

- 4 x AA Batteries for Controller
- Battery
- Battery charger
- Cooling system with extra tubing
- Controller
- Electric motor
- Propeller
- Propeller shaft
- Receiver with antennae
- Shaft coupling (one flexible, one rigid)
- Speed controller
- Servo
- Washers
- Water inlet piping
- Misc. hardware
THINGS YOU WILL NEED

The Propulsion Kit is primarily a “plug and go” system. Some items that are recommended to assist with the assembly are as follows:

- Small screwdriver
- Allen key
- Small tweezers
- Small file

BATTERY NOTE:

For maximum run time (performance): The battery should be fully charged then used until fully discharged if possible. This will condition the battery making subsequent charging faster and longer lasting when operating the vessel.
PROPULSION SUPPORT SYSTEM

Please note that the propulsion system shown below is merely a sample to demonstrate one possible setup scenario. The motor support and shaft supports (circled below) are not supplied with the setup package. These items are to be created by the builders.

NOTE: Motor and Shaft must be aligned and support made to suit this arrangement

Motor support may be required to be angled to support this arrangement

Propulsion support system with motor support and shaft supports circled

Propulsion support system may be required to be angled as shaft and motor must be aligned on centreline
SHAFT COUPLING INSTALLATION

Two options are provided to attach the propeller shaft to the motor. Both a rigid coupling and a flexible or “universal” type coupling are included — see below. Only one coupling is required to attach the shaft. If using the Flexible (universal joint) type coupling, care must be taken to ensure that the propeller shaft will not move back and forth (whip) when the vessel is moving ahead or astern.

The hole in one end of the shaft coupler may be too small to fit over the propeller shaft or the motor shaft. This can be remedied by reaming out the hole in the shaft coupler with a 1/8” dia drill bit. An alternate solution would be to file down the threaded end of the propeller shaft until the diameter is small enough to fit into the shaft coupler. When installing the coupling, be sure to securely tighten the set screws onto the motor shaft and the propeller shaft.
MOTOR COOLING SYSTEM

It is important that motor is cooled to avoid overheating. The cooling system consists of a cooling water intake, cooling water outlet, tubing and cooling coil. The cooling water intake (shown below) must be fabricated from the aluminum pipe provided.

Cooling system water intake. Please note this needs to be forward facing.

Attach cooling water outlet to hull with a penetrating opening to ensure cooling water leaves the hull.

Cooling system water outlet
The cooling process will occur with the water entering the inlet, circulating through the tubing and the coil and exiting through the outlet.
The cooling coil is to be placed over the motor and should be done so prior to mounting the motor in place.
PROPELLER CLIP

The propeller clip and the propeller nut must both be attached on the shaft to avoid the propeller from coming off the shaft. The inside clip may be a little tedious to install but is required to stabilize the propeller in place.
RECEIVER, SPEED CONTROLLER AND WIRING

The receiver and antennae are the components that will be used to enable the remote control operation of the boat. The wiring of these pieces is shown:

NOTE: The speed controller and the receiver should be kept dry at all times. Measures should be taken to ensure the dryness of these components.

The Bind Plug is a part of the receiver that connects the Controller to the Receiver. It is located in the black box inside the controller box that contains the extra hand grips for the controller. The bind plug should be kept after the initial set up of the controller and brought on race day. Please see the Receiver instructions (included in packaging) for further details.
**SERVO FOR RUDDER/TILLER**

The servo should be mounted to the vessel and wired into the receiver. There are a variety of attachments that can be used to control the rudder that are included with the servo. The depicted attachment is shown as an example only. **The attachment of the rudder/tiller to the servo is something that should be designed by the team.** This attachment can be elaborated on in the design booklet.