WESMAR

THRUSTER

12 & 24 VDC Motors

12V

24V

Motor Installation Manual

WESMAR 12&24 VDC Motors
Thruster
Installation Manual

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Introduction

This manual has been created as an aid to understanding WESMAR bow thrusters, and to provide some helpful tips. Use it only as a guide. Installations should be performed by a professional boat yard or a competent marine service yard.

One feature that distinguishes our bow thrusters from the competition is that all WESMAR drive legs are stainless steel, and a sacrificial zinc nut is installed on the propeller shaft to reduce electrolytic corrosion.

When you receive your WESMAR bow thruster motor, you should find the following equipment:

- Electric motor assembly with solenoids (Fig.1)
- Control station, with switch assembly and faceplate
- Owner's manual

Figure 1: 24V Motor

Installation

1. Place an 8D battery within 25 feet or closer to the relay assembly to ensure sufficient latching current for the relay solenoid. 1 or 2 batteries depending on 12 or 24 VDC. This battery must be capable of handling the full current draw of the motor.

2. Use the vessel's system to charge the battery. Run the wiring from the motor through a breaker or fuse large enough to handle the maximum expected current (Fig. 2).

3. Fuses are customer supplied. Examples: 24 VDC fuse NLN500 amp slow blow; 12 VDC fuse NLN400 amp slow blow.

4. Bolt the plastic motor isolator plate to the top of the tunnel.

5. Tape around the motor's two end caps to keep them in place during installation.

6. Carefully remove the nuts and washers that keep the motor together and set them aside, the tape should prevent the motor from coming apart.

7. Insert the motor into the thruster mount and adjust until the coupler aligns and allows you to push it together (make sure that the motor couple insert is in place).

8. Rotate the motor until the bolts align with the isolator plate and then bolt the motor back together through the plate with the nuts and washers, attaching the motor to the housing.

Figure 2: Fuse holder, 400 A slow blow fuse, and 4/0 cable.

Model	Power Source	Power Input	Fuse	Motor Rating
V2-7	Electric/12VDC	330 A	400 A	5 hp
V2-8	Electric/12VDC	330 A	400 A	5 hp
V2-8	Electric/24VDC	475A	500A	13.5 hp
V2-10	Electric/24VDC	475 A	500 A	13.5 hp
V2-12	Electric/24VDC	475 A	500 A	13.5 hp

Table 3: Power requirements and fuse size.

Operation and Maintenance

WESMAR bow thrusters are hard working, powerful units. Please keep in mind the following cautions when operating your unit.

Electric WESMAR thrusters have a thermal cutoff switch that will cause shut down when the motor reaches approximately 170 degrees fahrenheit (Fig. 3, 4). Once this happens, there will be a 15 - 20 minute cool off period during which the system is not operational.

Apply no more than 40 seconds of continuous thrust. This is a recommended duty cycle, however most systems can be run for longer periods before the thermal cut-off switch activates. If you require longer run cycles, please consider hydraulic or DC Pro thrusters.

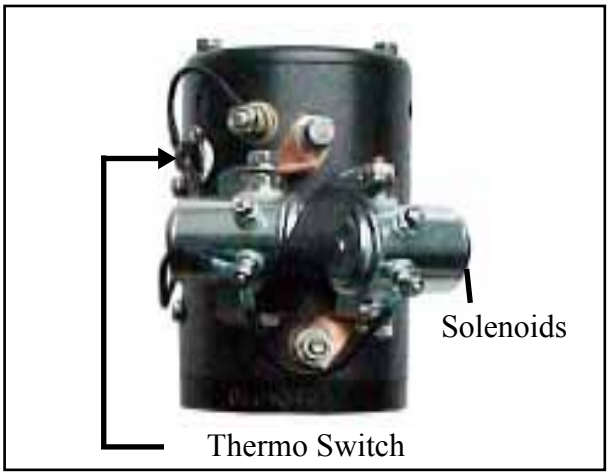


Figure 3: Thermo switch and solenoid location on 5HP 12 VDC Motor.

Maintenance

The WESMAR bow thrusters are low-maintenance systems that require only occasional routine servicing. When looking over your thruster, check the following:

- Examine the oil level in the bottom gear pod. If low, fill with SAE 90W gear oil.
- Check the zinc bolt and nut on the end of the propeller shaft for electrolytic corrosion.
- Examine breakers and/or fusing system.
- Keep battery supply fully charged.
- Oil reservoir: fill 3/4 full with 90 wt gear oil.

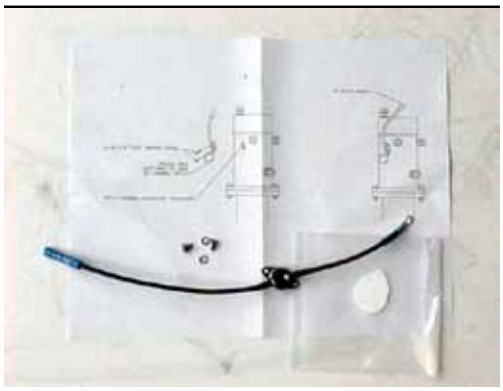


Figure 4: 24 VDC thermal switch shipped with V2-8, V2-10, and V2-12 products - customer installed on 13.5 HP motor.

Couplings

V6, V7 and V8 series couplings are custom made at WESMAR with Lovejoy L-75 inserts. V10 and V12 series thrusters use Reuland R3 series couplings (Fig. 5). Before ordering couplings, recheck shaft diameters and measure key ways.

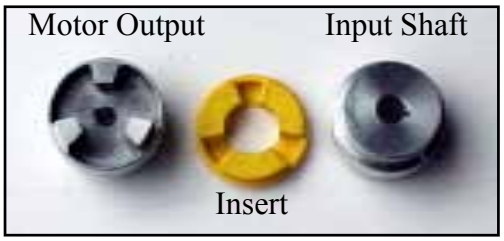


Figure 5: Motor Couplings

Couplers have two set screws in each threaded hole. The inner set screw must be tight against the key, and

the outer set screw must be tight against the inner set screw to prevent the inner set screw from backing out. Use LocTite to help secure the set screws.

Replacement of Seals

Replace the thruster output shaft seals every 3 - 5 years under normal conditions of operation. Seals are housed within the seal retainer cap. Place seals back to back: one to hold the gear oil in and one to keep the sea water out (Fig. 8).

Extending the Life of a Solenoid

Once you start experiencing trouble with solenoids, you are encouraged to replace the bad solenoid as soon as possible (Fig. 9). To extend the life of the solenoid, follow these procedures:

1. Disconnect battery.
2. Remove 3 top nuts and top of bad solenoid
3. Remove locking nut.
4. Take washer and flip over.
5. Put locking nut back on.
6. Replace and rescrew or rotate washer 45 degree.

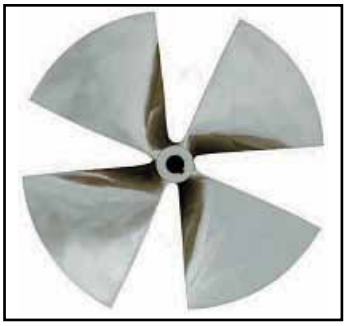


Figure 6: Kaplan Propeller

Figure 7: 5/8 zinc nut size B fits all 12/24 VDC thrusters.

Figure 8: Lip seals and seal retainer

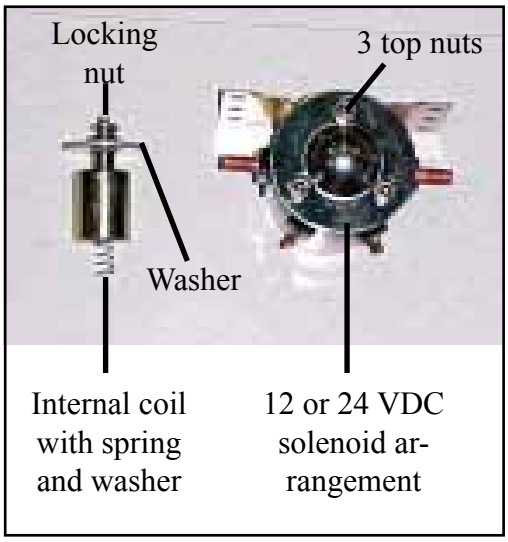


Figure 9: Solenoids

Flexible Coupling Alignment

The provided shaft couplings have two setscrews in them each. One of these is aligned with the bore keyway. This setscrew must be tightened down against the key of the given shaft. Align the coupler halves such that both shafts have setscrews set against their respective keys and that the coupler halves firmly together about the hytrel insert. If a setscrew cannot be driven into its appropriate shaft key then the shaft and coupler alignments must be adjusted to correct this (Fig 10, 11).

Note: all setscrews must be tightened down prior to thruster operation.

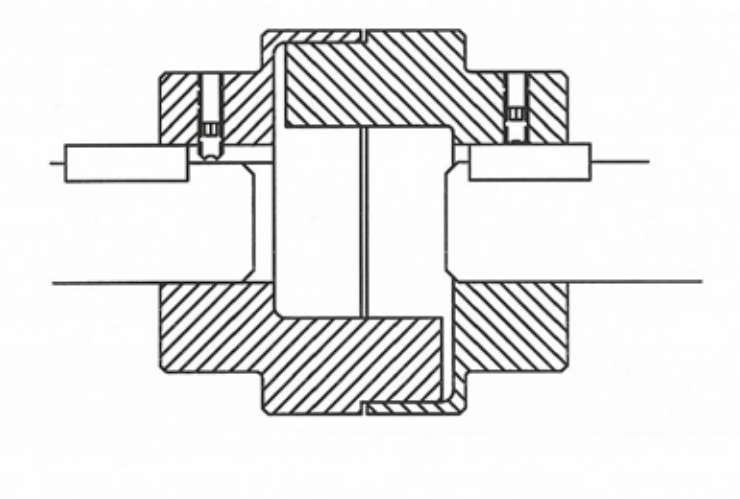


Figure 10: Improper shaft alignment prevents proper setting of setscrew against shaft key.

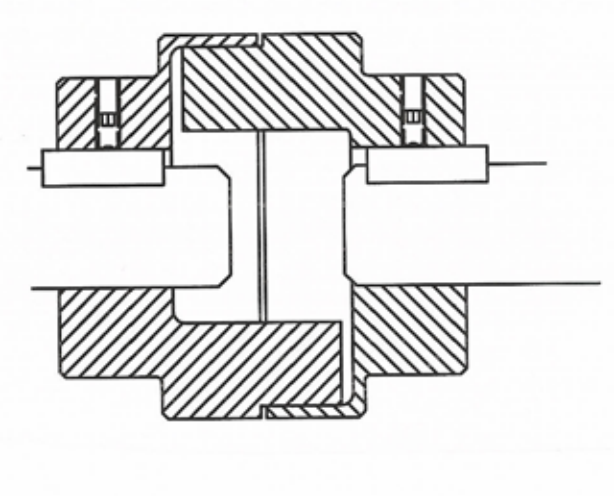


Figure 11: Shaft re-aligned to facilitate proper setting of setscrew against shaft key.

Control Stations

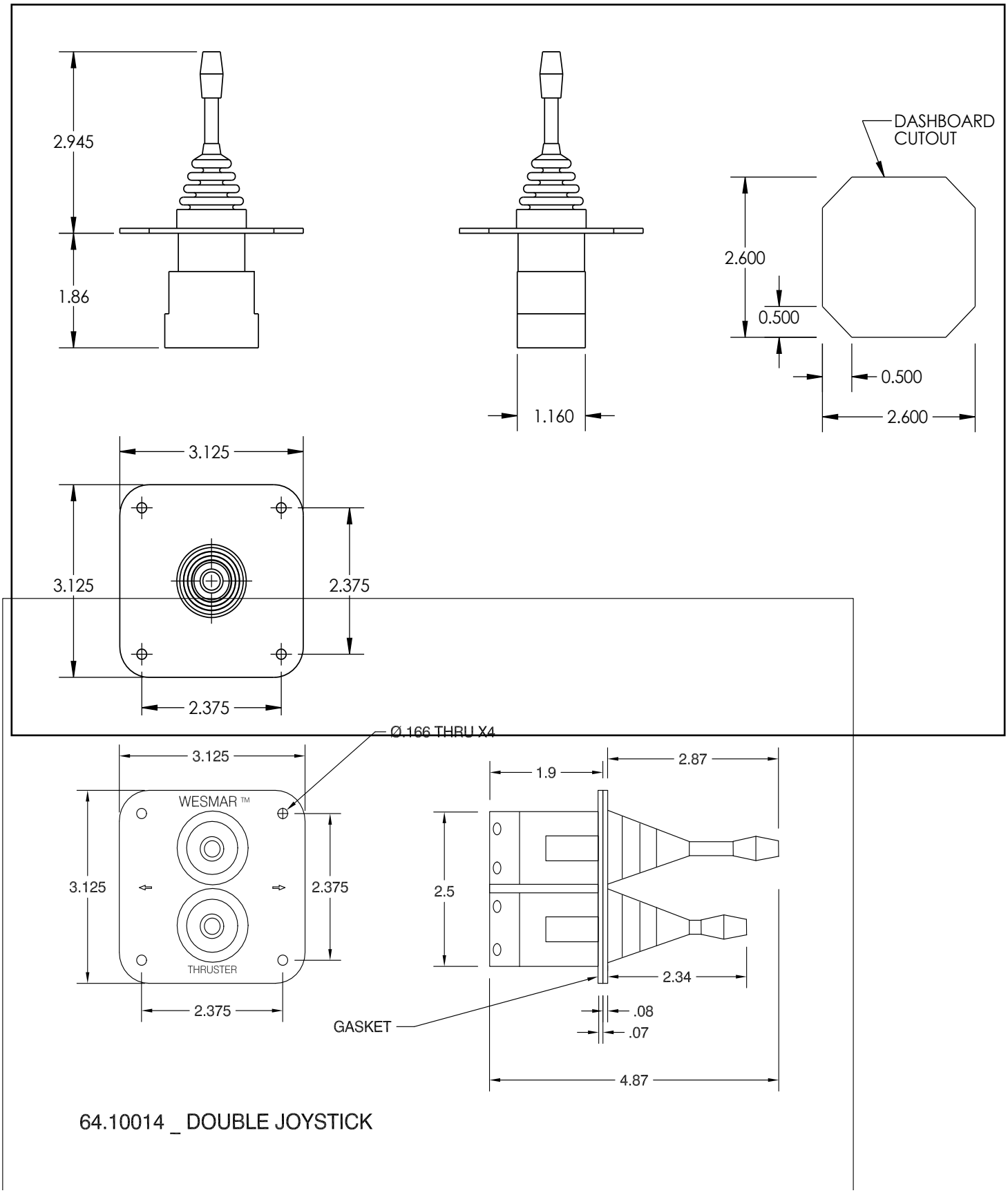


Figure 12: Joystick Switch Dimensions

12 VDC 5 HP Motor Solenoid and Control Station Wiring Diagram

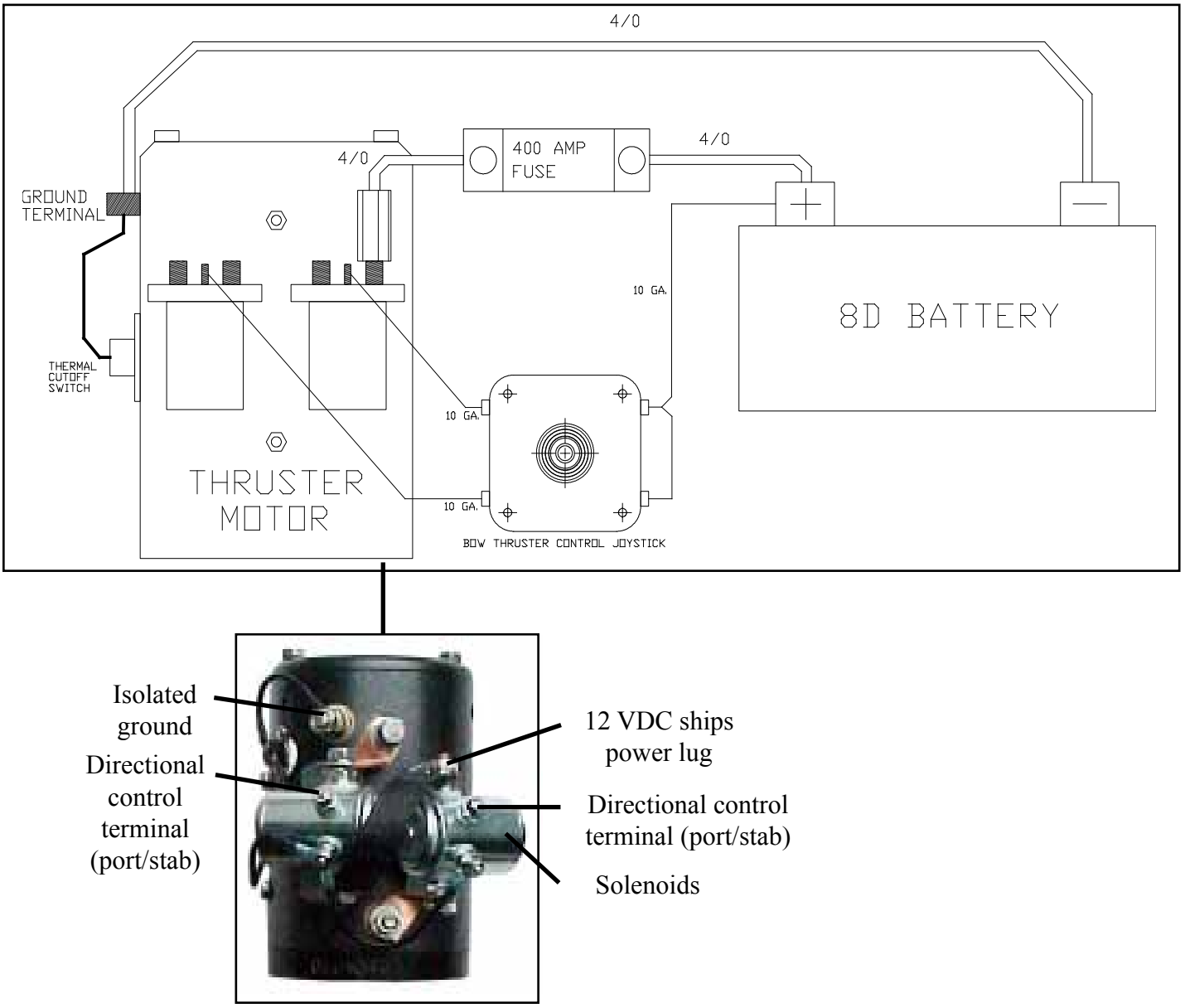
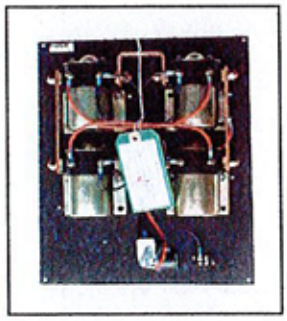
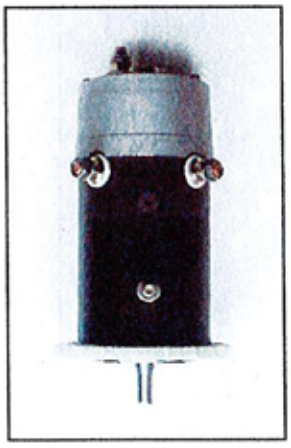


Figure 13: 12 VDC motor and solendoid control station diagram.

13.5 HP 24 VOLT STANDARD 24VDC V1-10, V1-12, V2-8E, V2-10 & V2-12 WIRING TO SOLENOID BOX





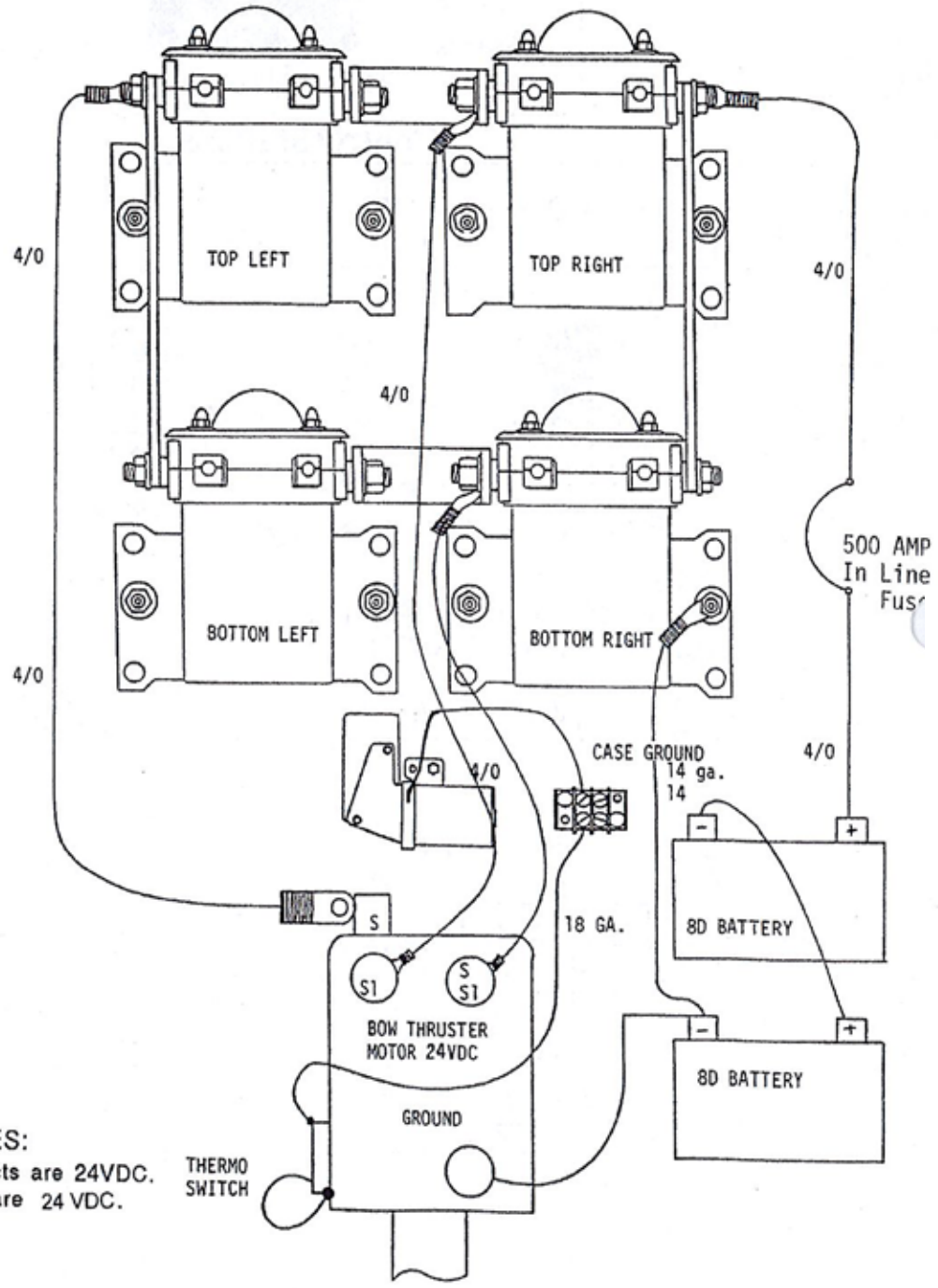


Figure 14: 24VDC Standard wiring to Solenoid Box

24V Solenoid Junction Box Wiring
V2-8, V2-10 & V2-12 Systems

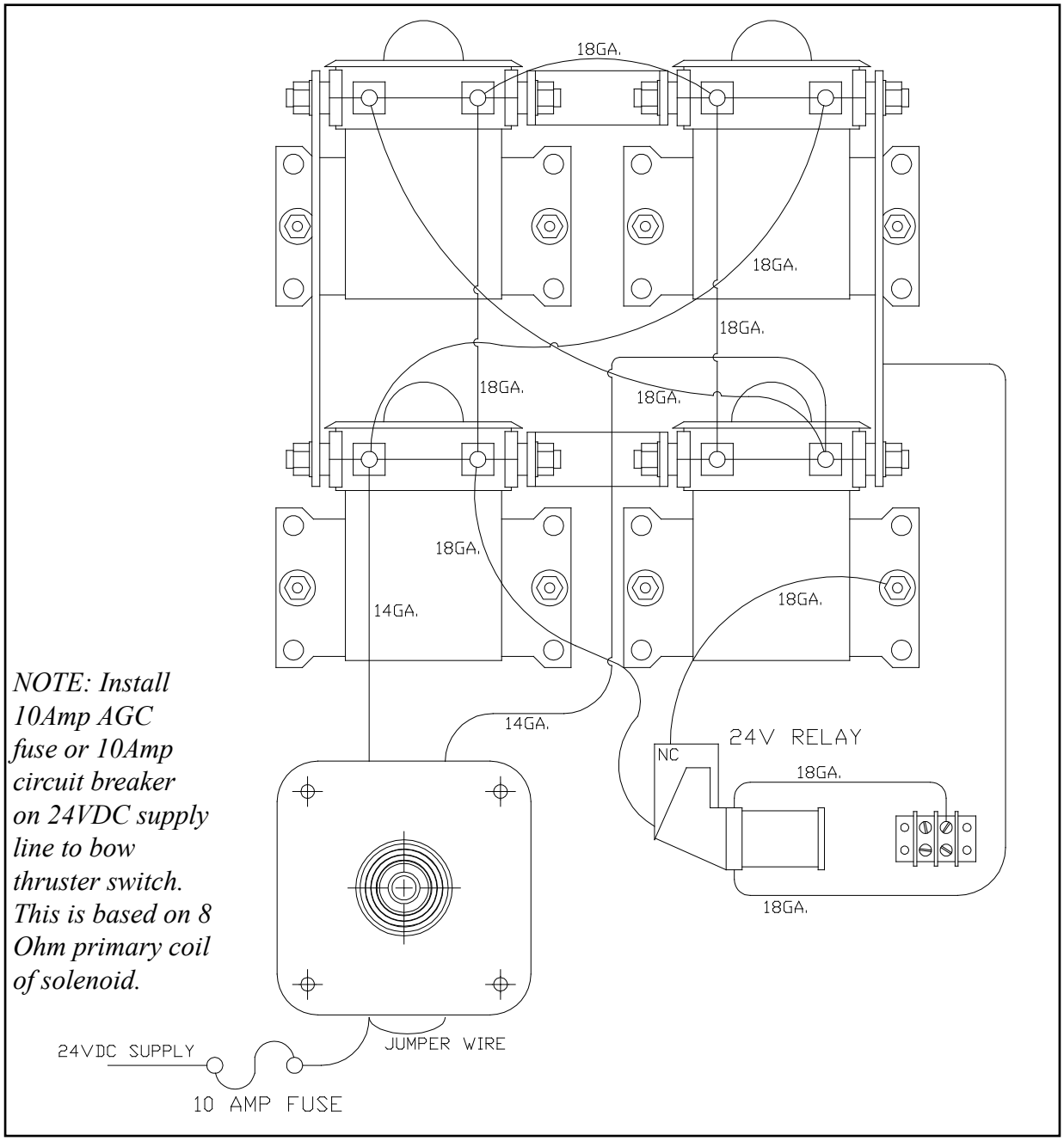


Figure 15: Solenoid Junction Box Wiring Diagram

Series Parallel Station

The series parallel switch requires a diode block kit. Contact WESMAR if supplying your own series parallel switch.

Figure 16: Relay

13.5 HP RELAY PANEL

- Available with 12 or 24 VDC relays.
- 12 volt relays and diode block for series parallel operation and 12 volt charging.
- 24 VDC relays for 24 volt charging systems.

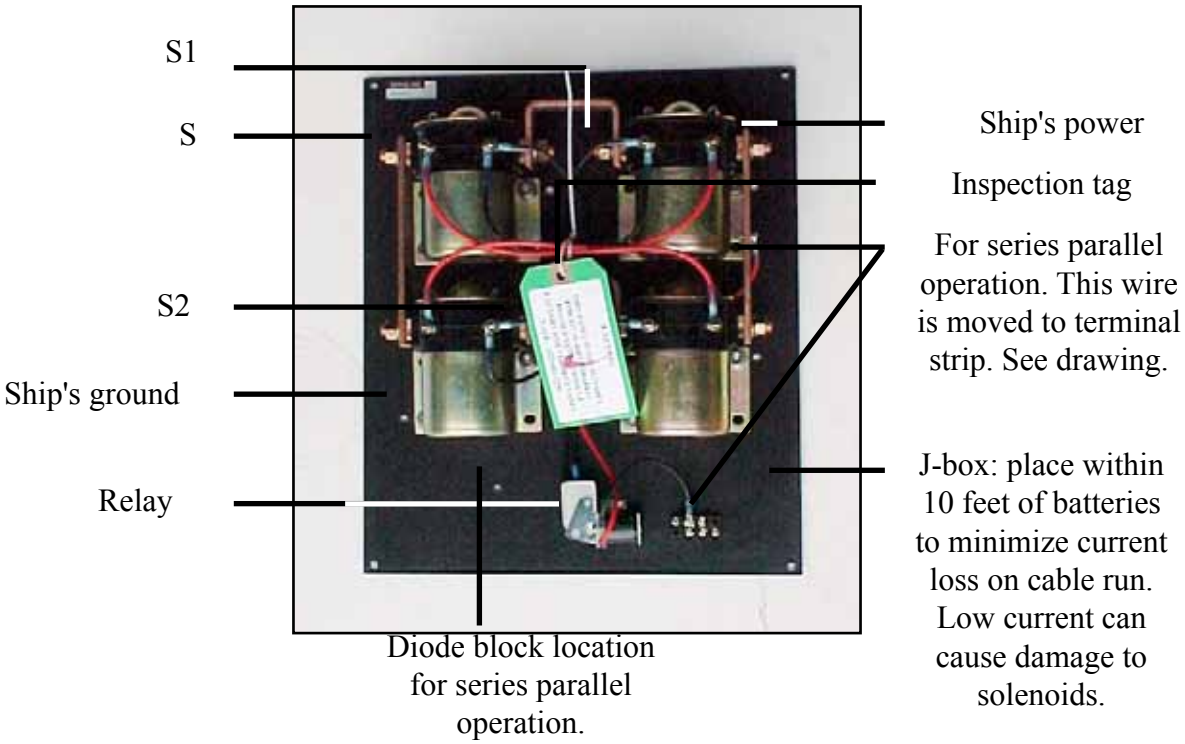
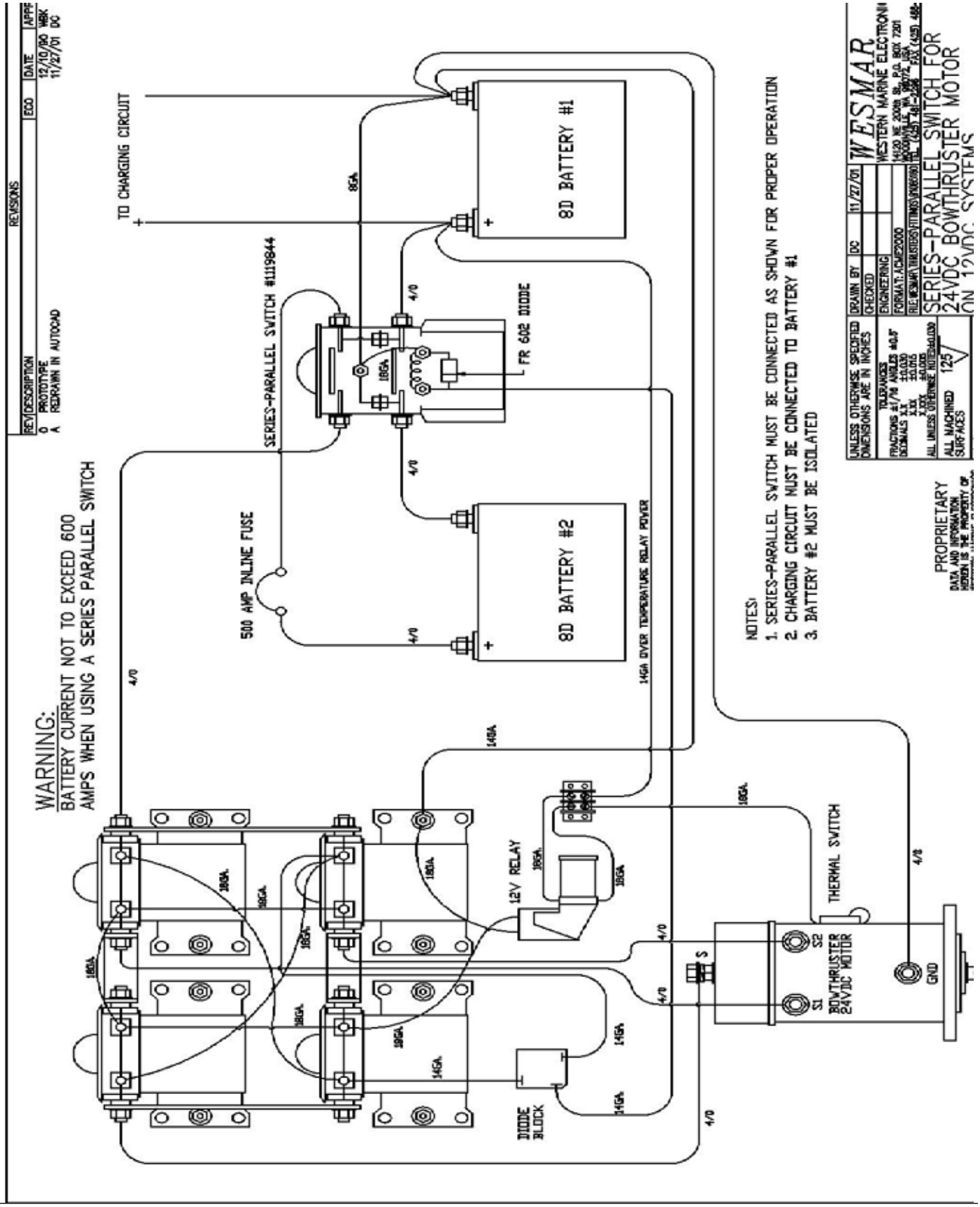


Figure 17: 13.5 HP Relay Panel

Series Parallel Switch Wiring Diagram



Bow Thruster Motor Installation Alert & Warranty Disclaimer

Please follow this method on each motor stud.

WARNING: WHEN WIRING THE ELECTRIC BOW THRUSTER MOTOR INTO THE SHIP'S ELECTRICAL SYSTEM, THE FOLLOWING ACTIONS **MUST** BE TAKEN:

When tightening the hex nuts, hold the back nut with a separate wrench to make sure the back nut does not turn. If back nut turns, serious damage will occur, voiding WESMAR's warranty on the electric motor (Fig. 31).

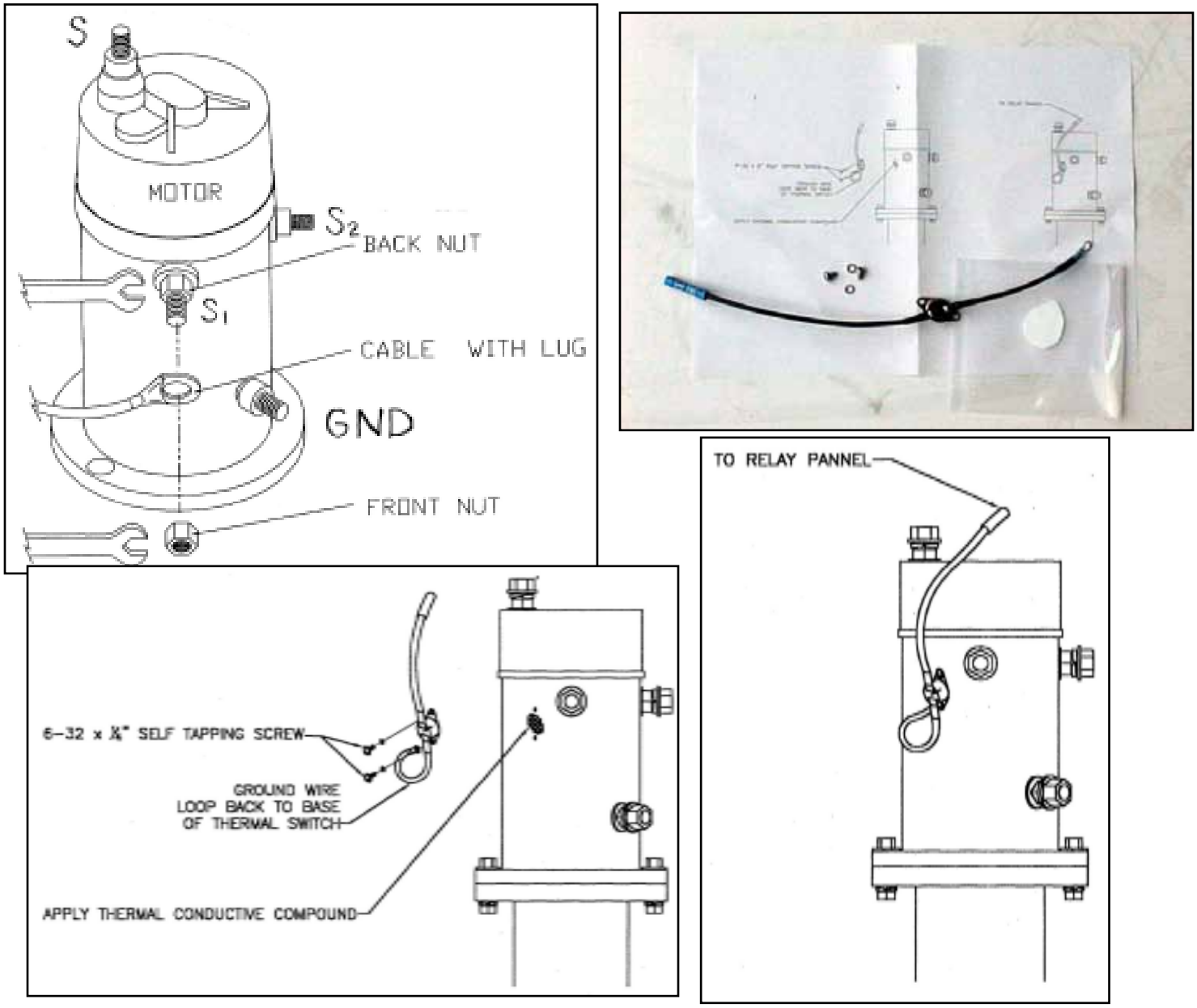


Figure 18: Bow Thruster Motor Installation Diagrams

Dimensional Information: Vortex Dual Prop Bow Thruster Specifications

Model	V2-7M	V2-8 (5HP)	V2-8 (13HP)	V2-10M	V2-12
A	15.21" (386mm)	11.96" (304mm)	14.41" (366mm)	15.21" (386mm)	16.92" (430mm)
B	15.90" (404mm)	16.12" (409mm)	16.12" (409mm)	15.92" (404mm)	16.58" (421mm)
C	6.25" (159mm)	8.51" (216mm)	8.51" (216mm)	7.79" (198mm)	7.13" (181mm)
Prop	7.07" (180mm)	7.75" (197mm)	7.75" (197mm)	9.50" (241mm)	12.25" (311mm)
Boat Size	20-35' (6-10m)	25-48' (7-15m)	40-55' (12-17m)	45-60' (14-18m)	50-78' (15-24m)

Table 4: Bow Thruster Dimensions

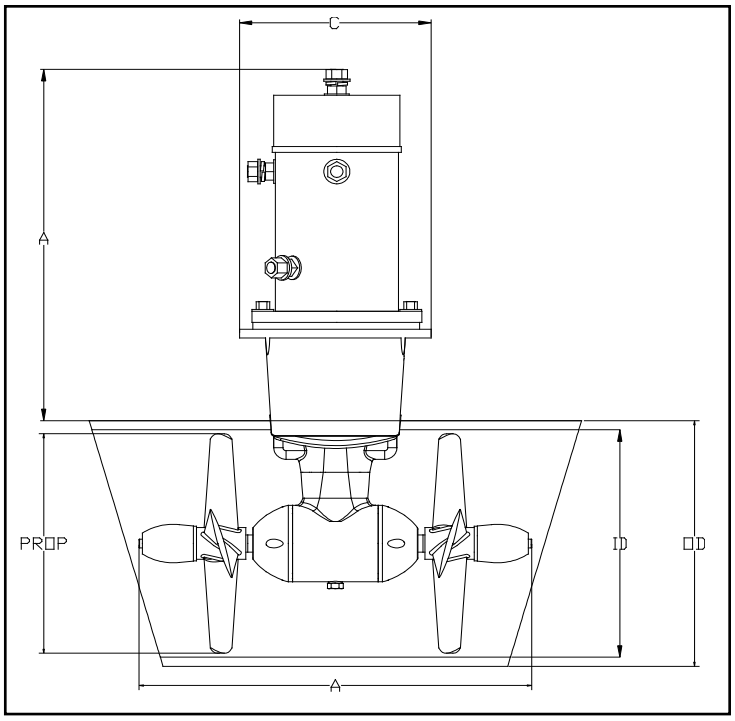


Figure 19: Bow Thruster Dimensions

Electric Bow Thruster Motor Parts List

Common 24 Volt Motor Replacement Part List

52.71017.0	End Terminal
95.07016.0	Brush
95.02601.0	Thrust Bearing
95.02664.0	Needle Bearing
95.00046.0	Oil Seal
57.00582.0	Brush Holder
95.10413.0	Wave Washer
95.31604.0	Ground Strap
61.08543.0	Armature
09.02007.0	Side Pole Insulator (Interior)
41.00009.0	Field Coil
49.02011.0	24v Solenoid
61.08166.0	Base Plate

SERVICE: PRIOR TO SERVICE, PLEASE REVIEW BELOW.

NEW INSTALL CHECKLIST FOR DC ELECTRIC BOW THRUSTER

FILL OUT THIS FORM AND FAX TO WESMAR SERVICE AT 425-486-0909 BEFORE ANY ITEMS WILL BE ACCEPTED FOR EXCHANGE.

COMPANY NAME _____

1. **What voltage is the bow thruster?** _____
2. **Do you have a series-parallel switch?** _____
3. **What type of battery is used?** _____
4. **What is voltage at the battery?** _____
5. **What gauge cable is used from battery to relay panel?** _____
6. **What length is cable from battery to relay panel?** _____
7. **What gauge cable is used from relay panel to motor?** _____
8. **What length cable is used from relay panel to motor?** _____
9. **What is the voltage at the relay panel?** _____
10. **What is the voltage at the series-parallel switch?** _____
11. **What is the voltage at motor S1?** _____
12. **What is the voltage at motor S2?** _____
13. **What is the current draw at the motor?** _____
14. **What is the voltage at the control switch?** _____

Troubleshooting

Electric System

- Solenoid sticks operation one direction only:

  Flip internal washer on the solenoid or replace solenoids.

- Low battery:

  Charge or replace battery.

- Broken control or terminal:

  Check wiring on the control stations and solenoids.

- Bad series parallel switch:

  No charging to 12 volt batteries. Replace series parallel switch.

- Motor doesn't operate, no thrust:

  Reinstall prop, check zinc nut assembly. Be sure to pin the nut to the shaft. Low battery, motor brushes low, bad motor.

- Motor operates, no thrust:

  Coupling has slipped down shaft. Check inside the motor adapter and reset the set screws on the coupling. Broken output shaft on motor.

- Solenoids chatter:

  Insufficient latching current due to long cable run between batteries and junction box, or insufficiently charged battery.

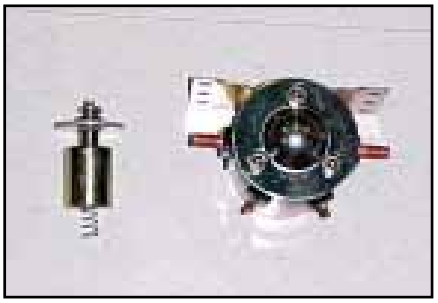


Figure 20: Solenoid

System Troubleshooting Notes

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