“MOTORGUIDE” ELECTRIC MOTORS

CARE AND MAINTENANCE GUIDE

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Recently I worked with the manufacturer of the Motorguide trolling motors, adapted to the Harbor 20, to find solutions to what seemed like an unusually high number of problems. Below is the report prepared by them and a summary by me of the issues and what we should be doing to reduce the problems.

Firstly, these Motorguide motors were adapted by W. D. Schock to the Harbor 20 by removing the motor from the factory supplied shaft and screwing it to a stainless steel arm bracket that hinges into the aft compartment on the Harbor 20. They were not designed to drive a boat like a Harbor 20 at max throttle for extended periods, it was for slow speed trolling at low rev’s. This adaption is the root of many of the problems but they can be managed.

The majority of breakdowns are due to water intrusion into the motor. There are several ways this appears to be occurring.

1) **Through the screw joint of the motor to the stainless steel arm bracket. Either this is not being sealed correctly when assembled or when paint on the motor portion breaks down, allowing corrosion to occur. Water wicks its way down the thread into the motor.**

2) **For some boats, through a hole in the top of the stainless steel arm bracket that feeds the electrical leads down to the motor. At some point, a rubber bushing was added to this hole to reduce the likely hood of this occurring. Many older boats are wide open. Extensive hosing in this compartment might have led to water intrusion. Also, possibly salt air.**

3) **Through either of two potential parts of the “T” intersection of the stainless steel arm bracket. 1) On some boats, where the electrical wires feed into the end of the short stainless steel cross arm that the long Stainless Steel motor arm rotates around or 2) Through either end of the coupler fitting on the end of the long arm for boats where the electrical wires enter at the top of the long arm. For # 1, water wicks along inside the tube until reaching the “T” joint and open end of the long arm and runs down inside the long arm. For #2, the water wicks into either side of the coupler until it enters the open end of the long arm and runs down it.**

4) **Through either of the two joints between where the three parts of the motor body are bolted together. Both joints have rubber “o”ring seals. Most motors I see have corrosion to the motor body. This either occurs with time or due to the external paint being chipped off while rotating the motor into the harbor. The corrosion eventually gets to the rubber “o” ring seals and breaks down the waterproof joint.**

5) **These motors are designed to run al low throttle to move a boat slowly while fishing. It is believed that running them at full throttle for an extended period (20 – 30 minutes) pushing a Harbor 20 may overheat the motor. If this occurs, the rubber seals may breakdown allowing water to enter.**

With these areas of concern now identified, I will be working to find solutions or better solutions to eliminate or reduce this occurring. In the meantime, here are some recommendations.

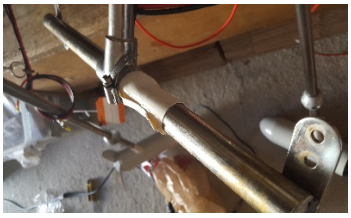
a) **Take great care to prevent paint chipping off the motor or external corrosion occurring. If chipping occurs, repair the chip by repainting as quickly as possible. Often, when the motor is being rotated over into the water, the leading nose cone of the motor connects with the fiberglass compartment edge. This chips the paint. The newer "digital" motors are slightly longer than the original analog motors. Some people have made small cut outs in the compartment edge to allow the motor to rotate more clearly. Padding this connection point would be advisable.**

b) **Always wash saltwater off the external body of the motor after use. If a hose is not available, carrying a small bottle of freshwater on the boat and rinse with that.**

c) **Do your best to seal the joint between the motor body and the stainless steel arm bracket. Some external sealants such as silicon or similar might aid this. (Newly repaired motors I plan to add a sealer to the joint and then slide down heat shrink tubing over that and shrink onto it for protection.)**

d) **Seal off the hole feeding the electrical leads into the stainless steel arm bracket. Again, silicon sealant or similar product will be a great help.**

e) **Seal the ends of the short stainless steel cross arm (see rubber plugs in photo) and add "boot" devices to the "T" coupler to prevent water entering either end of the "T" coupler.**



f) **Try to run you motor at around 75% throttle or less most of the time and 100% only for short periods. 15 – 20 minutes. Avoid excess hosing of the top hinge end of the stainless steel arm bracket where the electrical leads enter it.**

g) **Attach an anode to the stainless steel arm bracket to reduce the likelihood of corrosion.**

h) **Wrap tape or a thin bead of silicon around the two joints between the three parts of the motor body to protect the internal "O" rings from damage and breakdown.**

The newer Torqeedo motor is also an adaption to the Harbor 20 as well. I will build up a list of common issues with them as they occur and will report that over time. Issues I have seen so far .....

a) **The collapse of the regular 12 volt battery that feeds to the Lithium battery. This the root of many non operating issues. Just because the battery charger is feeding the 12 volt battery doesn't mean the power is feeding to the Lithium battery.**

b) **The failure of the coupling and plug where the 12 volts feed from the regular battery enters the Lithium battery.**

c) **I have heard the propeller shear pin can shear off very easily so it may pay to have a spare shear pin on board as backup.**

Motorguide Inspection of Shock sail boat trolling motor installation

I inspected these trolling motors on 1-5-2018. They are installed as an auxiliary drive unit used to move the boat from the slip out to open water. The extreme corrosion issue is causing the customer some grief. In this report are some suggestions that may help.

In this picture, we see extreme corrsion under the paint. This is classic electrolysis that occurred from the inside out.

One possibility is the entry of salt water through the motor tube itself. This example has a grommet in place. However, other examples did not. If salt water is able to travel down this tube, it will in time cause a short to the system. Salt water is an excellent conductor.

Here we see evidence that water is traveling down the tube. I feel the likely entry point is around these wires in the tube.

The water then shorts out this circuit board. Since there is 24 volts of DC power here, electroylsis occurs as voltage is put into the water. This is blowing the paint off of the motor casing.

One other point to check is this joint. However, it is possible that the paint in this area is coming off. This “could” cause water to wick down the threads.

The entry point of the wire harness is different in some of these applications. It appears that the designer changed how he was fishing the wires down the tube. These points have to be properly sealed.

All applications need this anode installed. It will help. Make sure it is grounded to the casing tested with a meter.

One item that could help is not running the motor at full throttle during operation. There is a possibility that at high speed, the motor is overheating. It is a distant possibility but perhaps the customer could consider to not use the high speed selection to help reduce this as a failure possibility.

This damage needs to be repaired. Wherever there is a break in the paint, it needs to be properly sanded and re-painted. Corrosion is already starting on this unit as you can see. If it goes unattended, salt water may enter the motor casing though the O-ring seals. I did not see evidence of this, but I would have to inspect more to be sure.