

Servo Motor Disassembly and Reassembly

1. Remove the knob from the motor shaft by loosening the 2 mm allen screw in the side of the knob.
2. To completely separate the motor from the bracket and resistor you may want to cut the tyrap around the plastic corrugated cover on the wires.
3. Remove the four bolts mounting the servo motor to the motor bracket.
4. Scratch several marks on both the motor endplates and motor body to ensure the motor is reassembled with the endplates mounted in the same position they were originally manufactured.
5. Remove the four Philips head screws in the front endplate, these screws hold the motor together. You may want to hold the motor in a bench vice as it may require a strong downward force on the screwdriver bit in order to loosen these four screws.
6. The front square endplate can be removed by lightly tapping on its corners and it will slide off of the shaft.
7. Remove the sticker from the back of the motor to expose the end of the motor shaft. Tapping lightly using a soft pin punch will push the rotor out of the motor body. Eventually you will be able to pull the rotor completely out of the motor body. There is only the one part to the rotor with small sealed ball bearings pressed on each end of the shaft. No further disassembly is required.
8. Two small spring washers may stick to the rotor and come out when the rotor is removed or may remain in the back endplate bearing cup after the rotor has been removed. Do not lose these washers as they must be inserted when the motor is ready for reassembly.
9. Using a soft non-metallic brush and a solvent such as WD-40 clean the rust from the outside of the rotor, similarly remove the rust on the inside bore of the motor body.
10. After the parts are cleaned a small amount of WD-40 may be sprayed on then to prevent further rusting.
11. The back endplate can only be placed in one location to accommodate the grommet and motor wires.
12. Placing the motor upright with the opening in a vertical position and resting on the back plate will allow for the easiest reassembly. Place the two spring washers in the bearing cup inside the back endplate inside the bottom of the motor.

13. Slide the rotor into the motor body and press the back ball bearing into its bearing cup. You may feel the spring washers now located under this bearing, the rotor will be in its normal position but will not rotate because the rotor magnets are holding the rotor against the side of the motor body.
14. Place the front endplate in its correct position indicated by your alignment scratch marks. Press the front endplate into the motor body.
15. Install each motor screw and lightly tighten each screw, after all of the screws are installed evenly and then tighten each screw slightly by moving from screw to screw to distribute the clamping forces evenly between all of the screws. Perform a final check that all screws are properly tightened.
16. You should now be able to turn the motor shaft with your fingers and not feel any tightness or contact between the rotor and the motor body. The motor should rotate smoothly without any binding.
17. The servo motor can now be remounted on the bracket and tyrapS reapplied to the plastic jacket to protect the wires.
18. You could test the electrical operation of the motor by plugging in the connectors and turning the boat key to on and the motor should rotate $\frac{3}{4}$ of a turn clockwise each time the PerfectPass system is powered up with the key. With the knob reinstalled and the cord tightened by turning the knob clockwise the system should be ready to use.
19. Servo motors become seized most commonly because drops of water have been jettted at the servo motor by the fan belt, you may be able to move the servo motor to a location where is will not get hit by this water. Operating the bilge pump before you use the boat will help reduce the amount of water available to contact the fan belt. Servo motors can be cleaned many times if water continues to be a problem.