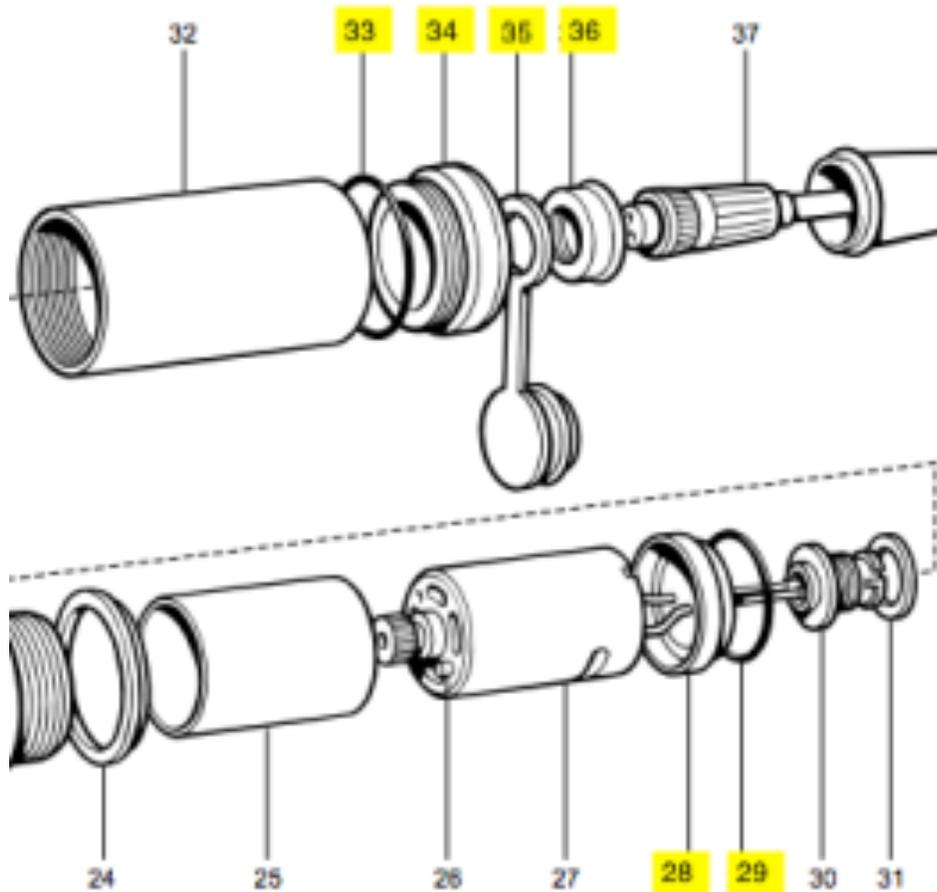




i3D Gear Marine

Autohelm 4000 Motor Assembly

Refer to the parts diagram below for this procedure:

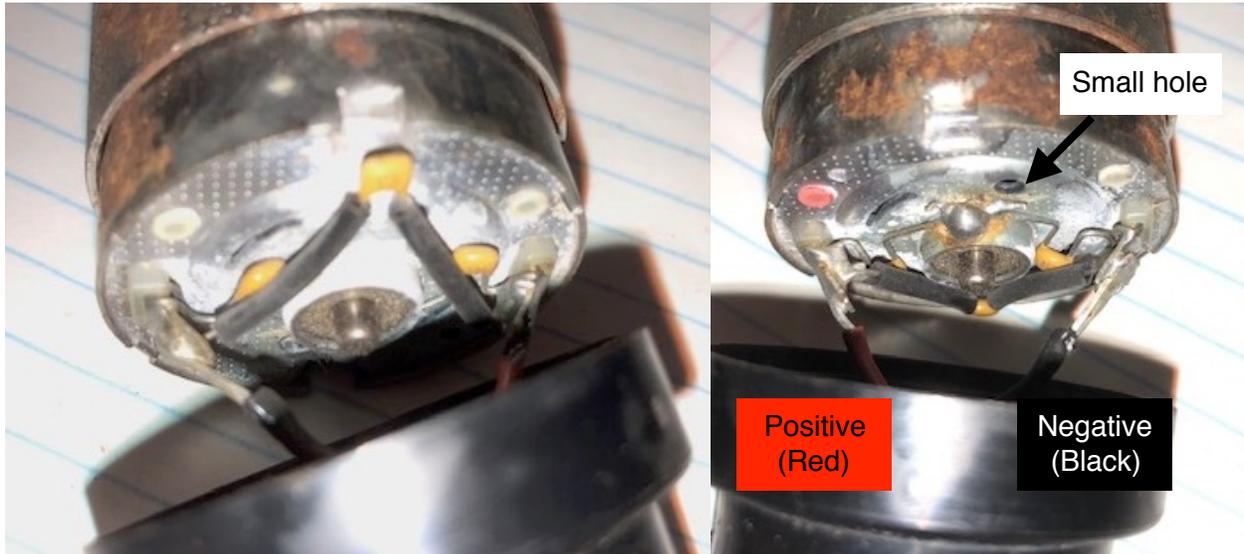


To disassemble the motor from the gearbox.

- 1) Remove the Connector Nut (36) while holding the Connector(30).
- 2) Remove the Seal Cap (35) over the threads.
- 3) Unscrew the Motor End Cap (34) and push the Connector (30) through it to remove the cap.
- 4) Unscrew the Motor Sleeve (32) and pull it off the motor.
- 5) The motor may now be pulled out of the gearbox.

Replacing the motor

Motors may be ordered off eBay. Search for 'Autohelm motor N012'. You will have to install the 3 capacitors shown below on a new motor. These help make the motor brushes last longer and are important. They are 6 nF capacitors - three of them - anything close to 6 nF is fine - they could even be double that.



One capacitor goes from positive-negative across the terminals of the motor - this is the most important one - you should put heat shrink of the leads of the capacitor so it can't short to the case of the motor. The other two go from each terminal to the case of the motor (these are not as important). You will need a very hot soldering iron to solder to the case of the motor - be careful not to let any solder drop inside the motor. It's a good idea to put some tape over the holes in the motor while you are soldering to prevent this. Twist the leads of the capacitors through the motor connectors to hold them securely. This will be important in the next step when you try to solder the power wires to the motor.

Next, you will need to solder the electrical connector to the motor. To get the polarity correct, note the small hole in the end of the motor seen in the capacitor picture on the right above. Use about 3 inches (8cm) of 16-18 gauge wire, you will need to have about 2" of wire sticking out above the Motor Clamp (28) (the conical black plastic piece with the rectangular hole in the top).

Bend the motor terminals in towards the centre as shown above so they don't interfere with the Motor Clamp (28).

Stick the wires through the top of the Motor Clamp and solder the electrical connector on. The electrical connector has a small dot of plastic beside one of the pins. That is pin 1 and is Positive (Red). When you are finished soldering the 2 wires on, coil the wire a bit above the motor so it can be pushed in easily when the final assembly is done.



Assembling the Motor

If you are installing a new motor, unscrew the Motor Location Peg (26) from the old motor and put it in the new motor. If you do not have a Locating Peg, you can make one from a #4-40 stainless steel bolt. Cut a .35" piece of the bolt with a hacksaw. Put a small crimp mark in it with a pair of crimpers leaving .15" below. This stops it from going too far into the motor. The other .2" will go into either of the locating holes in the gearbox. Put a small drop of Loctite or glue on the threads and screw the short end into the motor locating hole. Even though there are 2 locating holes, you only need one Locating Peg. It is very important as it stops the motor from just spinning in the sleeve and ripping all the wires off.

Slide the Flux Ring (25) over the motor - the brass or metal sleeve that was on your old motor. Carefully insert the motor gear into the gearbox allowing it to mesh with the planetary gears inside and then rotate the motor until the Motor Location Peg (26) fits into one of the 2 holes in the top of the planetary gearbox.

Now slide the Motor Sleeve (32) (with the logo on it) over the motor (both ends of the Motor Sleeve are the same). Screw the Motor Sleeve (32) tightly onto the gearbox.

Put the large o-ring on the Motor End Cap (34) above the threads. It's a good idea to lubricate this gasket with a bit of oil so it will go together easier in the next step.

Put the flat rubber gasket (31) on the Electrical Connector (30) and insert the connector through the Motor End Cap (34). Put the Motor End Cap over the Motor Clamp (28) and screw the End Cap tightly onto the top of the Motor Sleeve (32) while allowing the electrical connector to rotate freely in the End Cap (you don't want it to twist the wires up). The pins underneath the connector will fit nicely into the rectangular hole in the top of the Motor Clamp.

While holding the top of the Electrical Connector (30), put the rubber Sealing Cap (35) over it as shown in the picture. Then, while still holding the Electrical Connector, screw the Connector Nut (36) onto the end of the Electrical Connector, and firmly tighten it down onto the rubber Sealing Cap.

If you have any problems, please contact me.

Rick.

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