

D&D Motor Systems, Inc.

"Actual Motor Manufacturer" (NOT A Distributor)

Basic GEM Motor & Controller Installation Instructions

Along with these written instructions we also provide instructional videos to assist with installation at our website online at <http://ddmotorsystems.com/NEVMotors.php>.

Installation of your new motor is a 3-part process

1. First you have to take the existing motor out.
2. Step two is the actual motor installation, which includes making sure the new motor is functioning correctly. This is important because if there are any unknown issues we want to be able to isolate them **prior** to introducing any controller reprogramming.
3. The last potential step is the controller reprogramming which will happen once the motor is installed and running correctly. This is completely dependent on what the end customer is looking for with regards to performance. D&D Motor Systems relies on its over 2000 golf and Gem car dealers and distributors worldwide to assist all customers with that reprogramming service if required.

Step 1 – Uninstall Existing Motor

1. **Turn off the main power switch.** On pre 2005 models the switch is located under the seat, while on newer models it is located under the dashboard. On 2005 and newer models you should remove one of any of the battery cables. Failure to disconnect the batteries may result in damaging the controller.
2. Removing the front tire makes it easier to access the old motor and install the new one.
3. From the passenger side, disconnect the speedometer by opening the male/female 3 pin connector. This procedure can be viewed in the NEV videos section from the D&D Motor Systems online installation page at <http://ddmotorsystems.com/NEVMotors.php>
4. From the passenger side, on 2003 or later models, disconnect the overheat sensor which is flat 2-pin plug. This procedure can also be viewed in the NEV videos section from the D&D Motor Systems online installation page at <http://ddmotorsystems.com/NEVMotors.php>
5. From the passenger side, remove all electrical connections from the old motor. We suggest taking a quick photo of what all your connections looked like before you start disconnecting, just in case you may want to reference later. The connections you will be disconnecting will include the two to the commutator end head (grey colored casting) and the two to the frame & field, which are the ones coming out of the Blue housing.
6. From the driver's side of the car, remove the 3 bolts (7/16") that hold the motor to the trans-axel. Be sure to take notice of the position of the terminals, as the new motor will need to be installed in the similar position.
7. Slide the motor back approximately an inch and it can be removed from the vehicle - **Use caution, as the motor is heavy and can cause injury if not handle with care. The standard 11 HP motor weighs 48 lbs and the motor part #'s which start with ES are even more!**

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Step 2 –Motor Installation

1. With old motor now out of the vehicle, go ahead and remove the black rubber bushing, which is located at the bottom of the female splined shaft.
2. Apply Loctite to the 3 motor bolts which are used to mount the motor thru the transaxle and let it cure for 10 minutes.
3. Seat the bushing that was removed from old motor into the same location on the new motor.
4. Line-up the motor and position it the same as before on the transaxle. Once again, the motor should be positioned so the terminals are in a similar position as the old motor was. The body of the motor can be twisted from left to right to allow for alignment with the mounting holes.
5. Install the 3 bolts that attach the motor to the transaxle. When installing the bolts you only need a snug wrist tightening. The Loctite will harden and provide a secure fit.
6. Review the picture you took of your wire connections prior to uninstalling the old motor and reconnect the wire connections all the same way. **BEWARE** - do not over tighten the 4 brass posts otherwise the field wire connections on the inside can break.
7. On 2004 and older GEM cars, reconnect the 3 wire speedometer connector and continue to step 8. On 2005 and newer; the speedometer magnet needs to be changed. This is accomplished by taking out the 2 #10 torque screws on the side of the speed sensor cap. This will remove the small black cap that the speedometer wires are attached to. Once the cap is off there will be a circular magnet held in by a 4 mm allen bolt. The magnet is about an inch in diameter and is a black/dark brown in color. In your motor package, you will have a white envelope, which contains the required replacement magnet. Simply remove the 4 MM allen bolt in the center of the circular magnet and switch the magnet with the new one provided. **There is no in or out side to the magnet, there also is no difference in the appearance between the 2 magnets so be sure they don't get confused.** Apply a drop or two of Loctite to the allen bolt and install the new magnet hand tight. This procedure can also be viewed in the NEV videos section from the D&D Motor Systems online installation page at <http://ddmotorsystems.com/NEVMotors.php>.
8. **Important note** - on the original motor there was a wire holder holding the 3 wires and connector tight to the side of the motor. The reason it is there is to hold the wire close to the motor and avoid it being hit by the tire. This wire holder must be put back onto the new motor. If it was missing you can just pull the wires tight on the side and use a zip tie on the top of the motor attaching them to anything solid.
9. On 2003 and newer models, the 2-pin plug will need to be "shorted out". The overheat sensor is no longer required with the use of the D&D Motor Systems motors. This can be done by using a jumper wire between the two wires or simply cutting off the plug and connecting the 2 wires together and taping them. Do not short the wires out to the frame of the car as it can cause controller damage. Failure to jump the wires on 2003 or newer models will cause the vehicle to operate in slow mode only.
10. Lastly, you should reinstall the tires, turn on battery switch and reconnect any disconnected battery cable.
11. At this point and time you are ready to run your GEM car. It should run as strong as or stronger than it did before without doing anything to the controller. If you are happy with the performance then you are all done. If you are looking for a different overall performance out of your GEM car then it's time to move on to the third step – controller reprogramming. Since D&D Motor Systems, Inc. has thousands of golf and GEM car distributors and dealers around the world, we will direct you to the closest ones to your location.

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We want you to be 100% satisfied so if after working with one of our dealers and distributors, you are not happy with your performance, be sure to contact D&D Motor Systems, Inc..

Step 3 –Controller Reprogramming (if required)

If the customer is not equipped, willing or able to handle the controller un-installation or installation process, then we will search for a source from our extensive golf and GEM car network over 2000 strong worldwide to help you out.

Often a quick video can be much more helpful than written installation instructions. There are many additional videos out on the internet which help with regards to un-installing and reinstalling the controllers from GEM cars. Several of these videos can also be viewed in the NEV videos section from the D&D Motor Systems online installation page at <http://ddmotorsystems.com/NEVMotors.php>. Just look for the heading of what you are interested in learning. They are often listed in chronological order. Before going to that link, please complete reading the entire installation manual below.

BEWARE – Do not be fooled by middleman sources which do not offer a complete line of GEM car motors to handle the many different customer GEM car setups, applications, and performance requirements. Also, there are many Black & Grey motors which are made in China & Mexico. ONLY the BLUE motor is the one which has thousands in the field all over the world since 2001 and is completely US Made.

There are 2 different controllers used in GEM cars. Therefore, there are 2 different sets of removal & installation video instructions. The one controller is for models that are 2005 and newer (Figure A below) and the other for versions that are for models that are 2004 and older (Figure B below).

FIGURE A



FIGURE B



If you have any questions and are not getting the response you would like, let us know and we will be sure to find you the right help.

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