

Installing the brush card in your ESR motor.

For "McMillan" motor with silver outer housing.

First, you must remove the motor. Start this process by removing the rear axle, rear wheel, fender, front sprocket, chain and disconnecting the power leads.

Then remove the (2) mount bolts that attaches the motor to the frame. One of these bolts passes through chain adjuster. (Take note of their location for reassembly)

With the motor removed from the ESR. Remove the (2) nuts that hold the aluminum cap on the power output/sprocket side of the motor (opposite the finned side). Take note of the position of that circular cap in relation to the other finned side (it can easily be installed upside down). Be careful not to loose the (2) small nuts or locking washers.

Pull the outer magnetic shell off the motor to expose the inner Armature. Remove the Armature by pulling the outer housing of the motor straight out. A wavy looking washer sits in the recessed bearing location at the finned side of the motor so please note its location and be sure to put it back in place before reassembly. (This wavy washer will sometimes stick to the armature and may not be noticed and lost before reassembly)

With the armature removed, you can now clean up any plastic or debris found on it. With a Scotch bright pad, polish the brass contact points for where the brushes make contact.

Now, remove the (2) nuts on the power terminals on the finned side of the motor to remove the old brush card. Take note of the location for the (2) plastic bushings behind the nuts for reassembly.

For reassembly, make sure that the brushes on the brush card are held in place with the (2) paperclips and set the card in place. Install using the (2) plastic bushings and nuts removed from the old card. After carefully tightening the brush card nuts, remove the paper clip holders to check for full freedom of spring activated copper contact brushes. Only after the brushes are found to freely slide without binding, then reinstall the paper clip holders to accommodate the following final assembly steps

Now, place the wavy washer in the recess and then install the Armature. With the Armature in place, you can now remove the (2) paper clips. Again, check to make sure wires that attach to the brushes on the brush card are not going to hang up and prevent the brushes from moving freely this is very important.

Next, with alignment notch/detents aligned, carefully slide the outer shell of the motor back on. Be careful to hold the armature in place as the strong magnets in the outer housing have a tendency to pull the armature up out of position. If that happens, you will have to start over by putting the paperclips back in place and reinstalling the wavy washer and armature again as explained in the previous step.

Now reinstall the circular cap, making sure it is in the proper configuration so the motor cannot be installed upside down and tighten the nuts before installing back on the frame.

Once complete make sure to brake in the new brush cards by driving only in "Econo" mode until the next complete recharge.

Brush card



only remove paperclips during assembly

Note location of frame mounting holes to finned cap on other side of motor

