How To Test a Diode:

Tools Needed: a selection of screwdrivers and small open-end or box-end wrenches, a VoltOhmMeter (a VOM multimeter can be found at Radio Shack, K-Mart or Wal-Mart for about $15.00US. Be sure it has a diode test function if you need to go out and buy one). These meters are available with a digital readout or analog (needle) readout. While the digital is more accurate and easier to read, the analog gives a different readout when testing diodes. With an analog meter set the meter to ohms and generally speaking the needle will read about half way up the meter when the diode is good. If the diode is bad the meter will register no reading at all or a full deflection of the needle.

Cautions: Remove all jewelry from fingers and wrists, and any dangling necklaces. Unplug the charger from the AC wall outlet and from the golf car before removing the cover. There is a capacitor inside the charger box (usually a round or oval shaped cylinder with two thin wires running to the two terminals on top of it), which stores a small amount of electricity. Don’t mess with this. It does have the potential of discharging if a metal tool is accidentally touched between the two terminals. While it is not dangerous it may pop loudly and spark, startling you.

Pay attention!

Background: Diodes are devices that conduct electrical current in one direction but also block the current from going back the other way. Diodes get hot when they are working so they are generally found on the surface of or inserted into an aluminum plate, called a ‘heat sink’. The plate absorbs the heat and dissipates it thereby keeping the diode cool. Being electrical devices several wires are associated with the diodes depending on the particular design. In order to test each diode the wire(s) to at least one of them must be removed so current does not back up through the circuit and give a false reading.

Remove the cover from the charger and look around inside for an aluminum plate with the two diodes that will have one or more wires attached to them. (There are some exceptions to the two diode design; MAC (Yamaha) chargers and some Club Car chargers use a square diode with four slide-on terminals. This is a different style of diode and it can be tested as well but this is not the type we are referring to here.) Generally the diodes are in close proximity to each other. Go ahead and remove the wires to one of the diodes. Turn ‘ON’ the VOM and set the function to the diode test symbol (a small triangle (arrowhead) with short vertical line blocking the direction of the arrow).

Testing: You now are ready to test the diodes. Be sure the tester is set to the proper function. Touch the red probe of the tester to the terminal end where you removed the wire(s) and touch the black probe to the heat sink. Note the reading on the display. Now simply reverse the probes. You should get a reading in one direction (like, .454) and no reading at all in the other direction. Now test the other diode. You should get the exact same reading. If the diode is open you will get a reading in both directions, sometimes it may not work in either direction; both results indicate a bad diode.
What to do now: Some diodes come as an array; two diodes that are attached (glued) to a common plate. Others are individual diodes pressed into the heat sink or attached by a threaded stud that passes through the heat sink and is secured with a nut. If the diode is an array you have to replace the array even if one diode is OK. If it is a stand alone part then you may replace just the bad one. If you have the press-in style it can be replaced with the stud type but you will have to drill a ¼” hole to insert the stud through the heat sink. All golf car charger diodes have the same rating and may be used interchangeably except the square ones referred to earlier. The press-in diode is not very hard to get out but banging in the new one with a hammer is not recommended. A small press is suggested. The stud-type diode is easier to install than the press-in version. Clean the burrs after drilling through the aluminum and make sure all connections are tight.

Once the new diode(s) is installed and wired then install the new fuse (if removing several wires is required be sure to mark them clearly before removing them…DO NOT rely on your sharp memory to reconnect later!). Before closing up the charger case test your work. Plug in the charger to the wall and then into the golf car. If the meter jumps up above ½ way then the repair has been successful. Disconnect the AC and the DC plugs, and then reinstall the charger cover.

How To Test a Square Diode:

These oddball diodes are found in newer Club Car PowerWise 2 chargers and some MAC chargers as well. This diode incorporates the two diodes into a single part so it doesn’t look like the more common diodes described above. It is about an inch square, ½” thick and there is a hole right through the center to attach it to the heat sink. The bottom and sides are metal and it has 4 slide-on terminals protruding from the hard epoxy (potted) surface. While this diode looks different it functions the same; it allows current to flow in one direction but not the other.

This diode has three slide-on terminals aligned in the same plane and the fourth terminal is positioned 90* from the others. This is how to test it:

1. Set the rotary selector switch on the VOM to the diode test position.
2. Place the Black probe on the one terminal that is 90* different than the other three. (Terminal #1 in the picture) Leave it on #1 for the rest of this test.
3. Place the Red probe on the #2 terminal. It should read 525 or thereabouts. One of the two thick transformer leads connects to this terminal.
4. Next touch the Red probe to the #3 terminal. It should read1150 to 1160. This terminal goes to the main charger fuse.
5. Finally touch the Red probe to the #4 terminal. The reading should be around 500 to 510. This terminal is for the other thick transformer lead.

If the probes are reversed the readings should all be open, meaning no connection at all. No other readings than the ones described above should be observed. If so then the diode is bad and needs to be replaced before installing a new fuse.