
Subject: Electric Shock from Charger

Posted by [GmcGmc](#) on Mon, 01 Dec 2014 14:23:15 GMT

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Hello Kustom experts. I've got an old Kustom Charger that I have been using for about a year. When I use a particular (passive) bass, I get shocked if I touch anything metal or electric, e.g., laptop, metal door lock. I posted something on TalkBass first, and the concensus is that the amp has issues, mostly from a 2 prong plug and the polarity switch in the back, referred to as a "death cap".

I have been advised to stop using the amp until these issues are dealt with. Apparently, I dodged a bullet on this one. Can anyone further elaborate on what needs to be done, what the problem could be, etc.? I love the amp, great sound with my bass but I sure don't want to get fried. Is this a legitimate concern?

Subject: Re: Electric Shock from Charger

Posted by [stevem](#) on Mon, 01 Dec 2014 16:06:59 GMT

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You need to have a 3-prong AC cord installed on the amp, or blocking caps on both the hot and shield installed in that bass.

Subject: Re: Electric Shock from Charger

Posted by [chicagobill](#) on Mon, 01 Dec 2014 20:03:02 GMT

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The problems with old amp ac wiring are well known and should be understood and dealt with to prevent any possible injury. If you don't have the technical skills to do this work safely, have the amp serviced by a trained technician.

In olden days in order to get quieter operation from ac appliances like amplifiers and radios, engineers would connect the neutral (zero volts) side of the ac line to the metal chassis of the appliance with a small value capacitor. Because of the lack of grounded outlets, polarized plugs and sockets and the variability of common house wiring, when you plugged something into the wall, you never knew for sure what side of the ac line was actually being connected to the chassis via the ground capacitor.

The normal procedure was to plug in your amp and listen to see if there was a lot of hum and noise. If there was you pulled out the plug from the outlet and twisted the plug 180 degrees and plugged it back into the outlet. When the chassis was connected to the hot side of the ac line you would feel a slight shock from the voltage that would leak through the capacitor when you touched both the metal guitar strings and any grounded metal surface like a metal water supply pipe or stood on a concrete floor in you bare feet. When the amp chassis was connected to the neutral side of the ac line there was less noise and no shock from the leakage voltage when you touched a grounded object.

To make things easier amps started to add a second switch that did the same thing as turning the ac plug 180 degrees. This was called a ground switch or a line reverse switch. Some Kustom amps have a three way power switch that combines the functions of the power and the ground switch into one unit.

If you have access to an ac voltmeter, you can test your amp to see if and what the problem is with the wiring. This assumes that your amp has the original two wire ac cord and three position power switch with ground cap and that the wall outlet is correctly wired and grounded.

Set the meter to read 200-300 ac volts. Connect one lead to the metal amp chassis and then connect the second lead to a grounded contact like the screw on the outlet cover plate or a cold water pipe. Turn the amp on by flipping the switch to one side or the other. Read the meter and record the voltage reading that you get. Now switch the power switch in the other direction and read the meter. If the system is working as expected, there will be no voltage with the switch set in one direction and depending upon the meter maybe as much as 80-90 ac volts in the other direction.

If the switch is working correctly, you can choose to leave it as is and just be certain to switch the power switch so that the chassis is not connected to the hot side of the ac line or you can opt to add a grounded three wire ac cord or you can opt to add a three wire ac cord and remove the ground cap, Modern standards would require the 3 wire cord, no ground cap and a 2 position power switch.

If you get odd readings or voltage readings in all positions of the switch, then there could be serious problems with the amp and it should be checked before using it again.

Subject: Re: Electric Shock from Charger
Posted by [GmcGmc](#) on Tue, 02 Dec 2014 12:06:14 GMT
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Thanks for those responses. I am taking the chassis in to a shop this week. He seems to think it definitely needs a 3 prong plug but believes the polarity switch is a good thing to leave in, since the amp will hum too much without it. Does that sound right?

Subject: Re: Electric Shock from Charger
Posted by [chicagobill](#) on Tue, 02 Dec 2014 17:03:23 GMT
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Yes, that will work. He should be certain to test the ground cap, etc.
