Subject: Need to replace a sensor on a K100C-8
Posted by RickBlacker on Wed, 15 Sep 2010 04:14:31 GMT
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Hi all... Long time since I've been here. Need a little assistance.
I broke a sensor on my amp while trying to remove a lead.

It came from here

And here is the schematic for this particular part and section of the amp

Does anyone know a replacement part number? I tried to find this part and was not able to find it.
Also, do sensors have a particular way they are supposed to be hooked up?

Thanks for any help!

Subject: Re: Need to replace a sensor on a K100C-8
Posted by chicagobill on Wed, 15 Sep 2010 15:46:04 GMT
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I haven't really searched for a replacement sensor, but here's the basic story of what they are there for.

This is a normally closed thermo-switch, meaning that it is a switch that opens and closes based upon temperature. The 185 is the temperature rating of the sensor. It will remain as a closed circuit until it reaches 185 degrees F.

It has be mounted on the heatsink of the output transistors in your amp so that if the amp ever runs hot enough to do damage to the output amp, it will open the circuit to the ac line and shut down the entire amp. Think of it as a thermal fuse. Once the amp has cooled down enough, the switch will close again and turn the power back on.

Until you find a replacement you can slip the two push on connectors of the ends of the wire together and tape over them to make the amp work.

I noticed from the photo that you have also replaced the heat sensing diode that normally fits into the metal clip on the heatsink. If possible, you should redo this and mount the diode body in

contact with the heatsink so that it will again be able to react to the temperature of the output devices. This will keep the output stage from running too hot and possibly damaging the amp.

I will try and find a replacement part number for the thermostat for you. Or maybe one of the guys here may have one that they can sell you.

Subject: Re: Need to replace a sensor on a K100C-8
Posted by RickBlacker on Wed, 15 Sep 2010 16:02:31 GMT
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Hi Bill

Thanks for the feedback. If you notice, I did take those two wires and tape them off together. Been running it like this for a while. Didn't really like doing it but, amp seems to operate fine. Plus, I never play it for more than 30 minutes at a time, nor very loud. Mostly moderate levels because the family is home.

As far as the heat sink diode, I did replace it, only because the leads on the original snapped off at the head of the diode. I got this normal diode as a replacement. However, if you think it would be best to get an original heat sink diode back in, then I'll look into replacing that as well.

Do you by chance know any of the details on that diode itself? What values I need to look for?

Also, I happen to come across an old thread here. Happens to be in the form of a PDF file, in there user jbreher states that he found a replacement sensor at mouser. Part# 802-STO-190
http://www.mouser.com/ProductDetail/Stancor/3L11-190/?qs=070
3g%252bcHv%2f516TldM4mHCw%3d%3d

Subject: Re: Need to replace a sensor on a K100C-8
Posted by chicagobill on Wed, 15 Sep 2010 16:20:52 GMT
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Yes, that sensor should work just fine. And it looks like it will bolt right down in place of the original.

As for the diode, the original one was a 1N3754 made by RCA. These haven't been made for quite some time. Any basic diode, like the one that you have in place will replace the original, but I suggest that you leave the leads long enough to let the body of the diode extend over to the heatsink and if possible rest on the aluminum surface. Insulate the exposed leads with some heatshrink or plastic tubing.

That diode is part of the bias circuit for the power amp. It senses how hot the output transistors

are running. If it senses that the outputs are getting too warm, it reduces the drive to the outputs to keep them from overheating. So this diode should be thermally connected to the heatsink.

Subject: Re: Need to replace a sensor on a K100C-8
Posted by RickBlacker on Wed, 15 Sep 2010 16:58:40 GMT
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So I can reuse this same diode.
Prevent the diode leads from touching the chassis
Mount diode such that the body rests on the chassis.

I was thinking something along the lines of this.

Extend the leads
Drill two very small holes into the heat sync that are just big enough for some small wire to attach the diode.

Subject: Re: Need to replace a sensor on a K100C-8
Posted by chicagobill on Wed, 15 Sep 2010 19:28:07 GMT
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You lost me at the drilling the two small holes.

I'd get some solid core insulated wire. Solder in two lengths of this wire into the pc board where the diode is now located. The wires should be long enough that the ends are maybe 1/4" over the heatsink channel (right next to the small component clip where the original diode was mounted). Then solder the diode to the ends of the solid core wires so that the body of the diode extends down to the surface of the heatsink channel. If you have any silicon heatsink grease, add a dab between the diode and the surface of the heatsink. Or you could glue it down with a small dab of RTV or silicon caulk.

Make sure that you wire the diode in with the correct polarity.

Subject: Re: Need to replace a sensor on a K100C-8
Posted by pleat on Wed, 15 Sep 2010 19:57:37 GMT
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I happen to have the sensor sitting in front of me. Taken out of a amp that was used as a donor amp for it's power transformer. 10.00 and I'll take care of mailing. djt@chartermi.net
pleat

Subject: Re: Need to replace a sensor on a K100C-8

Posted by RickBlacker on Wed, 15 Sep 2010 20:37:08 GMT
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chicagobill wrote on Wed, 15 September 2010 15:28You lost me at the drilling the two small holes.

I'd get some solid core insulated wire. Solder in two lengths of this wire into the pc board where the diode is now located. The wires should be long enough that the ends are maybe 1/4" over the heatsink channel (right next to the small component clip where the original diode was mounted). Then solder the diode to the ends of the solid core wires so that the body of the diode extends down to the surface of the heatsink channel. If you have any silicon heatsink grease, add a dab between the diode and the surface of the heatsink. Or you could glue it down with a small dab of RTV or silicon caulk.

Make sure that you wire the diode in with the correct polarity.

The drilling of the holes was simply a way to fasten the diode to the heatsink. But, if using some silicon caulk is good, then that's what I will do.

Subject: Re: Need to replace a sensor on a K100C-8
Posted by stevem on Thu, 16 Sep 2010 13:50:14 GMT
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Two things to note hear gang.
1) the sendor as spect by Kustom was rated to open at 175 degrees F if anyone needs to know to order one, an I have come across some in the K250 amps with a 185 rating.

2) The reason the leads so often break off of the factory diodes is due to intensional use of the small leads.

The use of such small leads was to not have them act like a heat sink which could lead to the output stage getting hotter then Kustom wanted the amp to get to before bias changes are made by the diode itself, the less these diodes sink heat the better they track the temp of the output stage.

We are pretty much stuck with using modern diodes that are designed to handle there max rated wattage when then are installed having most of there lead lenght left for heat sink use.
This is in part why the leads are so thick even for a 1 amp rated diode.

When I use a new type diode to replace the RCA type I shorten the new diodes leads as much as possible and then solder on 3 strands of bare brass wire from a section 18 GA wire. An I then cut the brass leads as long as I then need to get back to the board connections and insulate them with 3 layers of shrink tube.

In regards to mounting them I use a screw down type small transistor clip of the kind made to hold a small transistor down to a flat surface.
I re-bend the 150 degree portion back to near flat with just enough of a roll section left to it to hold

the diode down while contacting some 30% of the diodes body. If you care to you can even grind a small ditch in the output heat sink bar to give more contact area to the body of the diode. When I do this mod I also drill a 1/16" hole on each end of the ground ditch to help give more clearance for the leads to get by with out shorting out.

Subject: Re: Need to replace a sensor on a K100C-8
Posted by RickBlacker on Fri, 17 Sep 2010 02:38:40 GMT
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Hi steve... I understood everything you were saying, but having a hard time visualizing what you're referring to regarding the mounting process. By chance, do you have any images of this you would be able to share?

Subject: Re: Need to replace a sensor on a K100C-8
Posted by RickBlacker on Fri, 17 Sep 2010 02:42:07 GMT
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pleat wrote on Wed, 15 September 2010 15:57I happen to have the sensor sitting in front of me. Taken out of a amp that was used as a donor amp for it's power transformer. 10.00 and I'll take care of mailing. djt@chartermi.net[/email]
pleat

Hey pleat, did you get the money I sent you?

Subject: Re: Need to replace a sensor on a K100C-8
Posted by pleat on Fri, 17 Sep 2010 11:54:07 GMT
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Sure did. the sensor is in the mail.
pleat

Subject: Re: Need to replace a sensor on a K100C-8
Posted by stevem on Fri, 17 Sep 2010 13:36:41 GMT
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The clip type I am talking about can be made from a strip section cut from a sheet of .005 to .0015" sheet Brass or Aluminum sheet that can be had from a hardware or crafts/ hobbie store.

A strip cut as wide as your diode or a hair more, and 3/4 " long is all you need, then you just need to shape one end of it into a somewhat semicircle (something less than 180 dgrees to trap the diode) and the other end is left flat but with a mounting hole drilled in it.

All this clip does is trap/clamp the diode down onto the output transistor mounting bar.

Subject: Re: Need to replace a sensor on a K100C-8
Posted by RickBlacker on Sun, 26 Sep 2010 00:17:54 GMT
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UGH!!!!!

I think I fried something, but not sure what it was. I didn't pay attention to the direction I put the heat sync diode back in place. I thought I had it right, but didn't go the extra step and confirm with a picture that I had.

Soldered everything back up, noticed smoke, turned the amp off. Flipped the diode around, no more smoke, but now my amp sounds ratted out.

Here is a pic of the diode I soldered in backwards (it's correct in this photo, took this AFTER, I put it back in correctly)

The smoke was coming from BEHIND the circuit board. I took it out and flipped it, but I've not been able to see any traces of smoke or burnt parts anywhere.

Subject: Re: Need to replace a sensor on a K100C-8
Posted by RickBlacker on Sun, 26 Sep 2010 03:11:00 GMT
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I was planning on using this http://www.mouser.com/ProductDetail/NTE/NTE5801/?qs=sGAEpiMZZMsagl7BRmp5TRbi3B9%2FYpOoy5rYtvXVi9c%3D as a replacement to the Diode I put in backwards. I'm not sure if this blew or not, but, thought I'd start there to see if that's why my amp sounds flubby now.

I'm worried that the part that went up in smoke is the transistor Q904. If it's burned out. I did a cross reference on NTE's website. This looks like the part. What do you guys think?
http://www.nteinc.com/specs/100to199/pdf/nte128.pdf

Subject: Re: Need to replace a sensor on a K100C-8
Posted by stevem on Sun, 26 Sep 2010 17:48:31 GMT

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A NTE128 is a replacement for that 38736 transistor.
The diode can be checked with a ohm meter test, it should only test out shorted in one direction. With the leads hooked up the other way it will test infinate in restance.

Subject: Re: Need to replace a sensor on a K100C-8
Posted by RickBlacker on Sun, 26 Sep 2010 20:26:07 GMT
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Hey Steve, thanks!!!!

What about the diode, did I get the right one?

Subject: Re: Need to replace a sensor on a K100C-8
Posted by stevem on Mon, 27 Sep 2010 13:15:10 GMT
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Hi.
Any 1N1004 or 1N1007 diode that can be had from any Radio Shack will work fine.
If they carry a higher rateded 3 amp diode the body will be much bigger and fit into the stock hold down clip very nice, but you must cut off its heavy leads to short stubs and then add thin gauge (24 ga, or 22ga wire with 3 strands removed)wire to make the connections as the thick leads act as too much of a heat sink.
Any diode rated at 200 volts or more and 1/2 amp is a good replacement.

Subject: Re: Need to replace a sensor on a K100C-8
Posted by chicagobill on Mon, 27 Sep 2010 16:28:54 GMT
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Man I hate when that happens.

That diode is in the bias string. When you installed it in reverse, the power amp tried to turn on full out, because the limiting bias was not present to keep it in check.

Check the diodes, the outputs and the driver transistors. Your photo shows a 100 ohm 1/2 watt resistor next to the driver transistor. The third color band is darkened from heat. Check its value with your meter.

If your meter has a diode check position, use it to test all of the diodes and the transistors. If you need help here, just ask and I can explain the procedure to you

Subject: Re: Need to replace a sensor on a K100C-8
Posted by RickBlacker on Mon, 27 Sep 2010 16:34:19 GMT
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Yeah I hate it too. I was too confident, thought I was correct in my placement. Oh well, live and learn I suppose. Wont be making that mistake again. Well, at least from not being overly confident in my memory.

Subject: Re: Need to replace a sensor on a K100C-8
Posted by chicagobill on Mon, 27 Sep 2010 17:54:55 GMT
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We all make mistakes, it's just a matter of whether or not we learn from them that makes the difference.

Subject: Re: Need to replace a sensor on a K100C-8
Posted by RickBlacker on Thu, 30 Sep 2010 16:26:57 GMT
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Hey all...

I replaced the diode, fired up the amp, and it seems to be running just fine again. I did buy a replacement transistor to replace the one I thought got fried but does not look like it's needed. Not yet anyway. I've not had much chance to really play the amp to fully test, but initial tests seems fine.