Subject: schematic for 200 b-1
Posted by OldSchool1 on Fri, 04 Sep 2015 15:22:32 GMT
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hello, new member here and glad to be member of your great site. i recently purchased very cheap a kustom 200 b-1 head (2 channel/4 controls each side/no reverb or trem model/blue pilot) that is blowing fuses. i need the schematics for it in order to repair it. also, any tips on where to start would be much appreciated. fyi, when i install a new fuse and turn on, the trans starts to hum up then cuts out blowing the fuse and i think the pilot light. also, prior owner converted the plug end to a 3 prong but didn't change anything inside. thank you in advance.

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Fri, 04 Sep 2015 16:15:18 GMT
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Welcome to the place.

If you go over to the technical section of the site, you will find the schematics that you need for your amp. They will be listed by model or by pc board number.

When one of these amps blows fuses like that, the usual suspects are the transistors in the power amp stage. Sometimes it's just one or two, but sometimes it's a lot more than that.

What sort of skill set do you have regarding electronics and what sorts of test stuff do you have? While it is not impossible for a complete novice to fix one of these, some people are better at it than others. You will need to open the amp and turn it on to measure voltages, etc. Do you feel comfortable in doing that?

If you want to save some future headaches, you might consider building some sort of light bulb limiter. At least having one of those will save you from replacing multiple fuses.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Fri, 04 Sep 2015 17:37:07 GMT
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hi, i have general electronics knowledge but will be doing this repair with a friend at work who is knowledgeable soup to nuts. he jumped the fuse and took a read across both of the large blue can like caps (read 38.7 each) to see if there was a pulse. said it was definitely alive and worth fixing. i will look for the schematics where you mentioned and get started over the weekend. i work at an engineering firm that has accounts with places like newark/element. they seem like the place for parts. question, when the fuse blows does it knock the pilot lamp out also? regards.....

Subject: Re: schematic for 200 b-1

Posted by OldSchool1 on Fri, 04 Sep 2015 17:51:31 GMT
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i'm trying to find the tech section for schematics and don't see a forum section. how do you get there?

Subject: Re: schematic for 200 b-1
Posted by pleat on Fri, 04 Sep 2015 20:47:36 GMT
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Left side of this site there are 6 tabs that look like a kustom amp head. Main, literature, webboard, classifieds, Technical, and email. Click on the Technical and that will open up a new page and I'd select Amp by model number then scroll down to the K200B-1 model and it will list the three boards your amp uses. PC105 and PC203 are your pre amp or channels. PC703 is the power amp and regulator schematic. I'm not a tech, but bi-passing the fuse isn't something I'd do. The fuse is there for a reason and running the amp without a fuse may take out more parts that maybe weren't bad. I'm not a tech, but have been around Kustom amps for over 40 years.
pleat

Subject: Re: schematic for 200 b-1
Posted by pleat on Fri, 04 Sep 2015 20:52:46 GMT
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Forgot to mention when the fuse blows, the light will not work since the blown fuse is cutting AC power to the amp.
On the tech page, if you click on the K200B-1 it will open up a block diagram, clicking on the PC numbers will open up the actual schematic.
pleat

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Fri, 04 Sep 2015 22:30:33 GMT
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thanks for the info. will start my project this weekend. love this stuff.....!

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Sat, 05 Sep 2015 04:50:46 GMT
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hello, for some reason my display didnt load the tab col. on the left so i never saw the tech section. when i access the site a different way the tabs load.....weird. found schematics...to bad cant print. question, member above said need to test voltages with amp turned on but if fuse

always blows how can i test voltage? seems like from what ive read here that best place to start is rectifier and power amp transisters. they are the ones on back board with the funky heat sinks? and the triangle like ones on bottom below? seems very clean open design for working on and removing parts. i like the slip on wire ends connectors. no unsoldering just pull off and unscrew. seems do-able.....thanks again. btw heavyist job i did was recapping my 68 bassman. soldering is sort of a art ive learned....not as easy as it seems.

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Sat, 05 Sep 2015 05:42:53 GMT
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Yes, if the fuse blows you can't read voltages. But once you have found the shorted components and removed or replaced them, you will need to read voltages. And if you have a light bulb limiter, the amp will power up enough to read some voltages.

You said that your friend read 38.7 on both filter caps. How did he do that with a blown fuse?

The power transistors are the 4 metal cased TO-3 transistors that are mounted on the aluminum channel that is mounted to the bottom of the chassis. The collectors are the metal cases, the emitter and base pins are connected by the small black plugs.

The 4 transistors with the square heatsinks on the pc board are the drivers. There are 2 large transistors just like the power outputs that are mounted to the power amp pc board. These are part of the low voltage power supply regulators.

The first test that you can do is to disconnect the black plug connectors from the 4 power transistors. Now try and power up the amp. Does the fuse still blow? If it does, then disconnect the red and green wires that connect the power amp pc board to the two large filter caps. You can unscrew them from the top of the caps. Leave the other wires connected to the caps. Now will the amp power up?

If it does power up, then the problem is in the power amp section. If the fuse still blows, then there is a problem with the power supply.

If you need any help with this please feel free to ask. There is a lot of accumulated knowledge available from the members here.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Sat, 05 Sep 2015 16:53:14 GMT
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hello, thank you chicagobill and other members. can i buy a light bulb limiter at radio shack or some place? do you recommend newark/element 4 or some other place for replacement parts? what i will do is start today with your recommendations. i think i have to spray each push on connector with a little WD or liquid wrench. they are sticking. i was thinking of stripping the chassis

down to clean everything. i read here that mild warm water and dish detergent and toothbrush can be used on the boards. its ok to get the boards a little wet and air dry from cleaning? the whole thing looks very easy to disassemble with few desoldering points. will try to get some pixs going. btw, i have never played one of these with guitar. this is my first big chassis SS amp. i have all tube gear except for a little ampeg from the 70's.
regards.....

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Sat, 05 Sep 2015 17:01:57 GMT
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forgot, my friend measured the filter cap volts with the amp plugged in and jumping lead across fuse. it was real quick with all knobs on zero.

Subject: Re: schematic for 200 b-1
Posted by pleat on Sun, 06 Sep 2015 02:12:29 GMT
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You can google how to make a light bulb limiter. Really easy to make.
pleat

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Sun, 06 Sep 2015 04:29:18 GMT
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If he bypassed the fuse and got those readings, then you already know that the power supply is working.

Explain what you mean that it blows fuses. Was the fuse blown when you bought it? Did it blow when you first turned on the amp?

The light bulb limiter is just a old fashioned incandescent light bulb wired in series with the amp's ac power wiring. If the amp has a short in it, the light bulb will light up and will limit the current available to the amp. The higher the current draw from the amp, the brighter the bulb will light up.

Using one will keep the amp from blowing the fuse and will protect most new parts that you install if there still are problems with the circuits.

The parts that you need can be ordered from any of the major supply houses, Newark, Mouser, Allied, etc. I order parts from all of them depending upon what I need.

Subject: Re: schematic for 200 b-1

Posted by OldSchool1 on Sun, 06 Sep 2015 23:43:39 GMT
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hi, ok i tried to power up with the 4 black triangular power amp transistors disconnected and the red and green wires off the big filter caps and both times the fuse blew. it was correct to leave the 4 transistors disconnected at the same time the red and green wires were disconnected for the second test? i bought the parts for the bulb limiter and will build tonight. when i got the amp the owner said he was playing guitar with the amp plugged into a power conditioner that had another amp plugged in that was also on. while playing the conditioner got accidentally kicked and pulled out from the wall socket. the amp went silent and would not turn back on. when i got the amp home i had my friend look at it and he ran a wire with 2 gator clips across the fuse leads. we plugged in and turned on for about 30 seconds with all knobs turned down to zero and thats when he measured across the 2 large filter caps and got almost same readings on both of like 38.5.

with slow-blow fuses the trans starts to hum up then blows the fuse. with regular fuse the trans doesn't hum up just blows fuse immediately. there is a 3 prong plug that has been put on the end of the original cord. opened it up and the black wire is connected to the long lug and the white wire is connected to the shorter lug. i wonder if the 3 prong has anything to do with this. i sprayed wd on all push/pull connectors and knob screws to get ready for removal. i will clean all parts at some point. regards to all.....

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Mon, 07 Sep 2015 02:25:10 GMT
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When you disconnected the wires from the filter caps did you just remove the two that connect to the power amp board?

If it is still blowing fuses with the wires disconnected from the filter caps, then there is a chance that the bridge rectifier may be shorted. Do you have a multimeter?

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Mon, 07 Sep 2015 05:03:15 GMT
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yes, removed just 2 wires from filter caps....1 red off cap closest to trans, 1 green off the other cap both going to power amp board. 4 power transistors also disconnected at this same time. i have a multimeter ready to go. also bought a 6/12 volt circuit tester. next step rectifier? btw the blue pilot lamp bulb blew so have had that out.

also, is it ok to wash the boards, resisters and all with warm water, dish detergent, and toothbrush? thanks

Subject: Re: schematic for 200 b-1

Posted by stevem on Mon, 07 Sep 2015 10:57:30 GMT
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If you have not made the light bulb limiter then now that those wires are dissconnected install a fuse of 1/2 the normal value and turn the amp on.
If that fuse blows then pull the two wires off of the round recto bridge that come out from the power transformer and make that same test.
If the fuse holds then you have good news and bad news.1) you have found a shorted recto bridge, and 2) these rectos are 99% of the time taken out by a blown output stage in the amp, so more testing out is in your and your friends future!

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Mon, 07 Sep 2015 17:50:18 GMT
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question, is it ok to clean everything with warm water/dish detergent/toothbrush? will get 1/2 value fuses today and test recto. thank you for all advise so far. i am learning.....

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Mon, 07 Sep 2015 21:58:42 GMT
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hi, just did test with 1.5 amp fuse as stevem advised. fuse blew....then removed 2 brownish black wires from recto bridge. plugged in and new 1.5 amp fuse held. tried again with 3 amp fuse and fuse held.

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Mon, 07 Sep 2015 23:52:02 GMT
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If you look at the bridge rectifier (at least if it is the original one), there are 4 terminals. There are two across from each other that are marked with yellow dots. Then there are two more terminal one of which is marked with a red dot.

The two yellow terminals are the ac inputs and the other two terminals are the positive (red) and negative dc voltage outputs. I assume that you pulled off the two wires that connect the power transformer to the rectifier ac terminals.

Because the fuse held, you have shown that the power transformer is okay.

Does your meter have a diode test function?

As for washing the boards, you can use water with a little dish soap to clean off the boards, but you must be certain to dry off the boards before you power up the amp again. Some of these parts

will absorb moisture so I don't think that you should soak them. I use cotton swabs moistened with a little cleaner. I wipe down all of the parts and the boards until they are clean.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Tue, 08 Sep 2015 04:42:11 GMT
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yes, my multimeter has a diode test function. the rectifier in the amp now is a round black westinghouse. doesn't have the yellow or red dots but has 4 terminal lugs: + and - symbols and two "AC" symbols on the top. i have the 2 wires that go to the 2 "AC" lugs disconnected, and the two (red and green) wires connected to the lugs with the + and - symbols. i'm starting to see how the wires all run around....progress!

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Tue, 08 Sep 2015 06:04:56 GMT
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Okay, set your meter to the diode test function. Connect the black meter lead to the + terminal of the rectifier bridge. Now touch the red meter lead to each of the ac terminals of the rectifier and note the readings on the meter. It should read somewhere around 0.6 or 0.7 volts.

Now reverse the meter leads by connecting the red lead to the + terminal and the black lead to the two ac terminals and note the meter readings. You should get a reading that is the same as when the meter leads are not touching anything.

Repeat the same tests by connecting the meter to the - terminal and the ac terminals.

In any case you should never have low or zero readings across any of the terminals.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Tue, 08 Sep 2015 06:23:04 GMT
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will do, is the amp plugged in and switched on for this test?

Subject: Re: schematic for 200 b-1
Posted by stevem on Tue, 08 Sep 2015 10:19:13 GMT
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No the amp is not on or plugged in.

When I wash off boards I use warm water with a drop or two of dish detergent along with a

modeling type 3/4" wide paint brush, and or a tooth brush.
Line the bottom of the amp with paper towels and when clean blow dry the boards on the low setting or let it evaporate off over night or out in the Sun for a few hours.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Tue, 08 Sep 2015 16:45:02 GMT
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also, when i next perform the multimeter diode test described by chicagobill on the recto leads, i still will have the 4 power transistors/2 filter cap wires/2 recto wires all disconnected?

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Tue, 08 Sep 2015 19:03:15 GMT
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Unless you want to re-assemble stuff just to remember where it all goes, just leave things unhooked for now. In fact when testing the rectifier, having the caps connected to it will influence your readings.

When I do this test I leave as much connected as possible, because I don't want to spend the time to remove and then replace wires if I don't need to. But I have done it so many times, I understand what the readings that I get mean.

When you test a diode junction with your meter, you should get a "low" reading with the meter leads connected in one way and a "high" reading with the meter leads connected in the opposite way. With any typical silicon diode the forward voltage (low reading) will be somewhere around 0.5 to 0.7 volts. The reverse reading should be the same as not having the meter leads touching anything. Not zero, but infinite, no reading.

When the filter caps are connected to the diode that you are testing, they will cause your meter to read the voltage across the diode differently, as your meter will charge and discharge the caps as they try and read the diode turn on voltage.

I will usually only remove wires after I suspect that some part is bad. The final test should always be with the part removed from the circuit.

Let us know what you find out.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Tue, 08 Sep 2015 19:12:33 GMT
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10-4.....the wiring is pretty simple to follow after looking at everything several times through as compared to looking at a fender bassman head. is WD spray ok to use on the wires push/pull

connector ends to loosen up?

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Tue, 08 Sep 2015 19:38:52 GMT
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WD-40 can be used, but you will need to clean it up afterwards. I prefer an electronics cleaner/lubricant like Caig DeoxIt. There are other brands out there and I must have tried them all, but the DeoxIt D5 works the best for me.

If you still have an open Radio Shack near you, you can get it there.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Wed, 09 Sep 2015 04:43:11 GMT
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ok, recto bridge test results using multimeter in diode test mode:

black meter lead to + terminal/red meter lead to ac terminal: ac terminal a = .499 and ac terminal b = .500. second test red meter lead on + terminal/black meter lead on ac terminals: both ac terminals read 1 (no reading) which is what the digital meter displays when not touching anything.

next i put the black meter lead on the - terminal/red meter lead to the two ac terminals: no reading (1). second test red meter lead to - terminal/black meter lead to the two ac terminals: ac terminal a = .499 and ac terminal b = .499.

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Wed, 09 Sep 2015 06:43:27 GMT
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Those readings show that the rectifier is okay. Next test is to see if the filter caps are shorted.

Does your meter have a capacitance mode?

Begin by setting your meter to read resistance. Take the two meter leads and touch them to the two terminals on top of one of the filter caps. For the time being disconnect the red and green wires. You can leave the ground connections.

The meter reading should start at a low level and slowly rise as the cap charges up. It may take a few seconds for the meter to start to change readings. It should eventually rise to 1 (no reading). If you then reverse the meter leads the meter again read a low value and slowly rise to 1.

See what readings you get.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Thu, 10 Sep 2015 00:23:06 GMT
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next test results: with multimeter set at 200 ohms resistance and only the black ground wires connected to the large filter caps, the meter started in the negative and then climbed to positive then went to 1 (which is what it shows when not measuring anything). results were same when i reversed the leads and for both filter caps.

the meter does have capacitance mode.

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Thu, 10 Sep 2015 01:28:53 GMT
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Good, just as a second test do the same test with the meter set to a higher resistance scale like 2K or 20K.

Next test each cap with the capacitance setting. I don't know how large of a value your meter will read but try it anyway. Touch the black lead to the negative cap terminal and then touch the red lead to the positive terminal of the cap. See what value your meter reads.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Thu, 10 Sep 2015 04:13:33 GMT
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ok, bumped the meter up to 2000 and 20k settings and performed same tests on filter caps. no reading, display stayed on 1. next test, meter set to capacitance read, (friend said the setting even though it says "battery charge measurement" in manual its the same as a capacitance setting). tested black lead to black (-) cap terminal and red lead to positive (+) cap terminal. both caps started at .90 and dropped to no reading (1).

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Thu, 10 Sep 2015 07:00:07 GMT
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I don't know about the battery charge test, but the resistance tests of the caps seem to be okay.

Reconnect the two wires from the power transformer to the ac terminals of the rectifier bridge. Connect the red wire from the positive terminal of the rectifier to the positive terminal of the positive filter cap and the green negative wire from the rectifier negative terminal to the negative terminal of the negative filter cap. Leave the wires that connect the filter caps to the rest of the amp disconnected for now.

So you should have the transformer connected to the rectifier and the rectifier connected to the two filter caps. If you have built a light bulb limiter, plug the amp into it. If you haven't built one yet, you will have to risk another fuse for the next test.

Carefully plug in the amp, turn it on and see if the fuse holds. If the fuse holds, you will next read the dc voltage on the two filter caps, that is if you feel safe in doing so. Set your meter to read dc voltage. You will be measuring about 40 volts dc so set the meter to the appropriate scale. Either touch the black meter lead to the metal chassis or connect it to the chassis with a clip wire. Now touch the red lead to the screw terminals where the red and green wires connect to the filter caps.

At the red terminal you should get around +40 vdc and at the green terminal about -40 vdc.

Please remember that working on an amp that is plugged in and turned on can be dangerous and if you don't feel qualified, please defer servicing to a tech. Let us know what happens.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Fri, 11 Sep 2015 04:17:00 GMT
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did test with trans connected to recto and recto connected to filter caps. wires off from power amp. plugged in turned on and blew 1.5 size fuse. i now understand how these tests are isolating each part of the power section. i don't know if i correctly measured in capacitance mode the leads on the filter caps. what symbol/number setting should i be set on the meter for capacitance mode?

also, i'm was wondering if my new cheapo harbor freight meter is giving results that may be off. it seemed to read within ballpark measures advised here. my friend loaned me his old big simson 260 analog meter. it just has ohms and volt settings. if i am advised here to do the tests again with that meter i have to familiarize myself with how to set it. thanks

---

Subject: Re: schematic for 200 b-1
Posted by stevem on Fri, 11 Sep 2015 09:54:26 GMT
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Ok, let's go back a few steps here and let me ask something so I do not have to go back and read thru all of the post.
I assume that you did this last test with the output transistors connectors still unplugged, but did you also have the red lugged wire unbolted from each output transistor?
Under each of these wires when bolted down you should find a nylon washer that keeps that red wire supplyed 40 volts from shorting out.
Also if you totally unbolt / take out one of the transistors you will find a thin mica washer under each, once again if one is missing, torn or out of place enough that 40 volts will short out and of course take out the fuse!

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Fri, 11 Sep 2015 17:00:45 GMT
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Steve: The entire power amp has been disconnected from the power supply for right now. We will get to testing the transistors later as we move forward.

OldSchool1:Your meter is probably fine for these test, so don't worry about it for now.

The only other thing that I haven't mentioned before is the pilot lamp. The pilot lamp is connected to the negative voltage power supply with a green wire. In the last test, did you unhook this wire as well as the two wires that connect to the power amp board? If not, then do so now.

We know that the transformer alone did not blow the fuse, and that the bridge rectifier passed static testing, as did the filter caps. So unless the pilot lamp or wiring is shorted or some other wires are shorted the fuse should not blow. That is something to check, the red and green wires that connect the filter caps to the bridge rectifier. Sometimes they are tied to the filter caps with a cable tie. Check to see if either of them is shorting to any metal clamps, etc.

You mentioned using a 1.5 amp fuse for the last power up. What type of fuse was it fast blow or slow blow? I personally do not use under-rated fuses for testing, so I don't know if that is a factor here or not. It may be that the smaller fuse can't handle the turn on surge when the filter caps start charging up.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Fri, 11 Sep 2015 17:31:26 GMT
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I will check on the pilot lamp wire tonight. also, the the red/green wires connecting filter caps to bridge rectifier are definitely tied/clamped to the filters caps so will check things out there. will also test a 3 amp fuse. i have the light bulb limiter built and ready to go. TGIF.....

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Sat, 12 Sep 2015 00:30:30 GMT
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ok guys.....progress! i put in a 3 amp fast fuse, up from a 1.5 which blew. hooked power trans to bridge recto, bridge recto to 2 filter caps. only the 2 red and green wires from recto connected to filter caps. plugged in and flipped switch on. trans started very quite hum and fuse held. flipped switch off, then switched on the other channel and fuse held. i then used friends big old analog meter set on 50v. alligator clipped black meter lead to chassis and touched red lead to positive cap screw.....meter read 40v....love analog needles! flipped meter setting to -dc and read 40v off negative filter cap screw. chicago bill your prediction was spot on! chicagobill and stevem, you guys know your amp.....

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Sat, 12 Sep 2015 02:09:31 GMT
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Glad to hear the good news. The next tests will be of the pilot lamp circuit and then the output transistors.

Take either meter and set it to read resistance. Read the resistance from the chassis to the green wire that was connected to the negative filter cap. You should read a minimum of about 200 ohms. If you get no reading, then the bulb might be burned out. If you get the correct reading, you can reconnect the wire to the filter cap, that way when you turn on the power the lamp will light up.

There are three terminals on the transistors the Base (blue wire), the Emitter (yellow wire) and the Collector (red wire/metal case). You will test the transistors just like you tested the diodes in the rectifier bridge. Touch the red meter lead to the Base and then touch the black lead to the Emitter and note the reading. Then keeping the red lead on the base, touch the black lead to the Collector and note the reading. Then like before, reverse the meter leads and retest. Just like the diodes, you should get a low reading in one direction and a no reading in the other. The last test is to read between the Emitter (yellow) and the Collector (red). Test all 4 transistors with the amp off and unplugged and pull the black connector off the transistor during the tests.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Sat, 12 Sep 2015 05:16:27 GMT
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tested green lamp wire. read 200 ohms. when i went to replace the lamp with a new bulb, somehow the old one was jammed in the socket. of course it shattered and i had to extract it with needle nose pliers. thought i ruined the socket. vacuumed out the glass and was lucky the new bulb and blue lamp cover went in. connected to negative cap, plugged in turned on and blue lamp glowed beautiful!

next tested 4 output transistors. all 4 trannys read exactly same: red wire/base - blck wire/emitter read 10, red/base - blck/collector read 10, blck/base - red/emitter no read 0, blck/base - red/collector no read 0, emitter/collector no read 0. i should say tranny 4 farthest right read slightly lower at 9 than first 3 trannys which read 10.

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Sat, 12 Sep 2015 05:36:24 GMT
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I'm not understanding your readings on the transistors. Are you using the same meter that you used to test the bridge rectifier?

Subject: Re: schematic for 200 b-1

Posted by OldSchool1 on Sat, 12 Sep 2015 21:16:43 GMT
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hi, did test again on 4 power trannys. i used same meter as used on bridge recto. all 4 power trannys measured very close to each other. with multimeter set on diode mode, test results were .499 - .566 with red meter lead touching base and black meter lead touching first the emitter and then collector tranny posts. then when i switched/reversed the meter leads to black lead touching the base and red meter lead touching the emitter and then collector posts i got no reading (1). no read also when i touched meter leads to emitter and collector.

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Sun, 13 Sep 2015 00:10:36 GMT
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Good, then the transistors test okay. Next test the insulation that Steve had asked about by setting the meter to read ohms. Touch one lead to the chassis and the other lead to the red Collector case of each power transistor. In all cases the reading should not be zero.

The next thing to test will be the transistors on the power amp board. Maybe the better test would be to test your light bulb limiter.

Plug the amp into the limiter and the plug the limiter into the wall. Turn on the amp and watch the light bulb. If all is well, the lamp should pulse on and and then dim down to a faint glow. How bright and how dim will depend upon what wattage lamp you have used and how much power the amp is drawing.

Try it out and see what happens.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Sun, 13 Sep 2015 04:11:05 GMT
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not sure what the red Collector case of each power transistor. could you explain what it looks like? i see the screw with 2 nuts and nylon washer at bottom that the red wire attaches to. it is also the trans case mounting screw.....there are two per tranny case.

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Sun, 13 Sep 2015 05:35:53 GMT
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How did you test the power transistors before without knowing what the Collector terminal is? The case of the large metal power transistors is the Collector terminal. Because the case is connected to the circuit, they must be isolated from the chassis.

There are two sets of screws that hold the transistor to the chassis. One of these screws also connects the red wire that goes to the circuit board. There is a very thin Mica washer that sits between the bottom of the metal case and the chassis. There are also nylon shoulder washers that isolate the mounting screws from the chassis.

Just make sure that you don't have continuity from the metal transistor case and the chassis. Fastest test is to turn the chassis over and you will see the oval metal cases of the 4 output transistors. They are mounted to an aluminum extrusion that is riveted to the bottom of the chassis. Touch one meter lead to the chassis and the other lead to the metal case of the transistor.

Subject: Re: schematic for 200 b-1
Posted by stevem on Sun, 13 Sep 2015 10:27:48 GMT
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You might also test out the 4 rectangular 5 watt one ohm resistors on the 703/ driver board.

If any of them have gone open then that would prove out that it's related 36892 output transistor is toast!

Note that when testing with modern a ohm meter for low ohms readings like this you can only hold the metal portion of one of test leads to make a connection and get a proper reading.

If you hold the metal section of both test leads to make the connection then the meter will read thru you and provide a wrong reading.
A automotive contiuity tester is great for this type of test out.
Here's another question, are all the 4 output transistors still the original RCA brand # 36892?

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Sun, 13 Sep 2015 23:20:00 GMT
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ok.....tested continuity of 4 power transistors. touched black meter lead to chassis and red lead to connector case on bottom of chassis. no reading was observed. btw, they are all rca transistors. also tested 4 rectangular 5 watt one ohm resistors on 703 board. again, no reading observed. i then performed power up test on limiter. plugged amp in to limiter and limiter to wall outlet. turned on and 60w bulb lit then dimmed. amp bulb glowed blue and trans hummed.

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Mon, 14 Sep 2015 02:40:17 GMT
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Okay so your limiter is working the way that it should.

You say you get no reading across the four 1 ohm resistors? Retest with the meter set to the lowest resistance scale. You don't need to get exact 1 ohm readings, as the resistance of the meter leads will add some to the overall reading.

The next step will be to reconnect the two power supply wires from the power amp board to the filter caps. Keep the amp plugged into the limiter. Leave the four black connector for the power transistors off for now. And do not plug a speaker into the amp until we know that it is safe to do so.

Once you have the power amp reconnected turn on the amp and see what happens. If the bulb lights up and stays bright there is a problem on the power amp board. If the bulb dims like it did before, then we'll reconnect the power transistors and retest with the limiter.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Fri, 18 Sep 2015 04:33:14 GMT
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greetings.....i will pick up where i left off this weekend and post latest results. TGIF.....

Subject: Re: schematic for 200 b-1
Posted by stevem on Fri, 18 Sep 2015 10:27:47 GMT
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Ok!

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Thu, 24 Sep 2015 00:51:08 GMT
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greetings, finally found time to continue testing. i had left off testing continuity of the 4 power transistor base, emitter, and collectors and also the cases on the bottom. also tested 4 rectangular 5 watt 1 ohm resistors on the 703 board which read about 1.4 ohms each. then reconnected the red and green wires from the power amp board to the filter caps. left the 4 black triangular transistor connectors off as instructed. plugged amp into limiter and turned on. limiter bulb flashed bright then dimmed off. blue pilot lamp glowed and fuse held. let run for several minutes then shut off.

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Thu, 24 Sep 2015 01:53:00 GMT
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If you touch the leads of your meter together on the resistance setting what reading do you get,

maybe 0.4 ohms? If that's the case, the 1 ohm resistors would be much closer to the rated value.

If the limiter didn't stay lit up bright, then the amp isn't drawing too much current, at least with the output transistors still disconnected. Now connect two of the black plugs on the output transistors. Do either the two outer ones or the two inner ones. Using the limiter turn on the amp and see if the bulb stays lit up.

If it does light up bright, pull the plugs and try it with the other two transistors connected. If it doesn't connect the other two and test again. If all is good you will be able to have all 4 transistors connected with the bulb dim.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Thu, 24 Sep 2015 04:17:01 GMT
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ok, connected 2 inner transistor connectors and powered up with limiter. bulb flashed on then dimmed off. then connected 2 outer transistor covers, now all 4 covers were connected. powered up and bulb flashed on then dimmed off(doesn't fully turn off just dims to where the bulb filament is just an orange color). let amp run for several minutes and turned off. btw, i retested the 4 rectangular 5w 1 ohm resistors with the analog meter and all 4 tested slightly below 1 ohm, maybe .9 ohms. i really learning here (and enjoying!) and can't thank everyone enough.

Subject: Re: schematic for 200 b-1
Posted by stevem on Thu, 24 Sep 2015 10:25:17 GMT
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Ok, those are good results !
Let me ask, where do you live on the east cost?

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Thu, 24 Sep 2015 16:18:43 GMT
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Yes, that is good news. The bulb will light up brighter as the amp draws more current, so the orange glow is quite normal. Let me ask you, what wattage bulb are you using in there?

The next step will be to reconnect the speaker and see what happens. Leave everything connected as it was in the last test and turn on the amp. Now with the amp still turned on, plug in the speaker and watch the light bulb.

If the bulb get a little brighter and settles down, plug a guitar in the front of the amp and see if you get any sound.

If the bulb glows full brightness, then there is something wrong in the power amp circuit.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Fri, 25 Sep 2015 00:22:18 GMT
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plugged amp into limiter, and then turned on. the bulb is a 40 watt. bulb flashed on then dimmed. plugged speaker in, then plugged guitar in front. bulb stayed dim. turned volume up and played some notes and cords. sound was good through my old 4ohm fender bassman 2 x 15 cab. when i hit a cord hard bulb got bright then dimmed each time i hit a cord hard.

but then i turned the amp off and back on. when i did this several times the bulb flashed on bright and stayed bright and there was no sound. with the amp off, i then unplugged the guitar and speaker and turned amp back on and the amp powered up and the bulb flashed then dimmed like normal. i then plugged speaker in, then guitar and everything worked. tested several times with same results. seems like something happens when the amp is turned off. if i don't unplug the guitar and speaker after i turn amp off and then on, the bulb flashes bright and stays bright and there is no sound?????

Subject: Re: schematic for 200 b-1
Posted by chicagobill on Fri, 25 Sep 2015 03:55:56 GMT
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Well there could be something that is loose on the power amp board or there is something just out of spec that will not let the amp handle the current draw when the speaker is connected.

Like I said before, the bulb will light up brighter as the amp draws more current from the wall, so having the lamp light up when you hit a power chord and then dimming down is normal.

Connect it all up as before and get a insulated tool or dowel rod. Use the stick to tap on the power amp pc board. You might try using the stick to push on some of the different components. One thing to be careful with is the small metal cased diode that is clipped to the heatsink, as its' leads are somewhat fragile. See if pushing on anything causes the lamp to light up or dim down.

Ideally you will find something that responds to the physical pressure of the stick. That will lead you to find a bad solder joint or a broken lead.

Subject: Re: schematic for 200 b-1
Posted by OldSchool1 on Fri, 25 Sep 2015 04:10:51 GMT
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10-4.....will test tomorrow. did a little more testing and found if speaker cable is plugged into amp but not cabinet no problem until i plug the speaker cable into cab.

weird how amp works fine when powered up without speaker cable plugged in, it doesn't like to have speaker plugged in before power up. then it will work and sound great! TGIF.....

Subject: Re: schematic for 200 b-1
Posted by stevem on Fri, 25 Sep 2015 10:33:29 GMT
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Hey gang / old school let's start a new string for discussing this amp as its getting to be a lot to scroll thru just to get to page two!
I will do that now with your old title .