Subject: Repair
Posted by stevem on Fri, 25 Sep 2015 10:42:45 GMT
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The output stage will see no load without the / a speaker hooked up.

I wonder if the amp is oscillating at full tilt power when the issue takes place, that would / could make the light glow brite and also block the amp from passing input signal!

Osscilation can take place above the frequency that the speaker you have the amp hooked up thru can reproduce and make for the ntermitant issue you have.

One way to prove this out is to keep your voltmeter that is set for AC volts hooked up across the speaker, when the brite bulb issue takes place if you read any voltage on that meter than the amp is indeed osscilating and we need to help you pin down where that is originating from in the amp.

Subject: Re: Repair
Posted by OldSchool1 on Fri, 25 Sep 2015 13:16:53 GMT
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the bassman speaker cab is a closed back. to hook up the meter across the speaker do you mean i have to open up the back of the cab and get at the back of the speaker itself and hook the meter leads to the speaker wire connectors? there are 2 speakers....so i would be measuring voltage across only one speaker?

any thoughts why the amp works after first turning it on and then plugging in the speaker cable and guitar? if the amp is oscillating at a high level wouldn't there always be the problem of no sound and the limiter bulb glowing bright? it just happens when the amp is turned on with the speaker cable plugged in. amp works fine if turned on first, and then speaker cable is plugged in after.

Subject: Re: Repair
Posted by stevem on Fri, 25 Sep 2015 15:26:54 GMT
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It's best to hook the meter up across the speaker output Jack on the amp, just use, or get some clip leads or another set of hands, or even solder some wire on for now. Polarity of the meter leads does not matter since its AC voltage.

If your speaker cable has ends the unscrew you can hook up the meter there.

Oscilations are strange things, it could just be getting triggered by the action plugging in the speaker cable yes!

Subject: Re: Repair
Posted by chicagobill on Fri, 25 Sep 2015 16:52:03 GMT
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Oscillation could be the cause, but it could be any number things.

Without the speaker connected and therefore no load on the power amp there is little current draw through the circuit. It doesn't matter if the cable is plugged into the amp or not as long as the speakers are not loading the amp.

The basic principle of any push pull circuit like the power amp is balance. The top and bottom half of the circuit move evenly together in sync. As long as that balance is kept steady, then everything works the way it should and we have a happy amp. But when the circuit becomes unstable and gets out of balance, one half of the circuit takes over and forces the other side into submission and the circuit draws too much current causing failure of transistors, resistors, etc.

You haven't mentioned seeing any burned components on the board and I don't know if the board has been repaired before or not, so we need to run a few tests to see if we can figure this out.

The first one is the loose, cold solder, broken lead test that I asked you to do in the earlier posts. Because this problem is intermittent, this is a good possibility.

The next step will be to read the dc supply voltages and the voltage if any at the speaker terminal when it is in failure mode. This could help us to find out which circuit is failing.

Subject: Re: Repair
Posted by OldSchool1 on Fri, 25 Sep 2015 17:47:27 GMT
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i will investigate for loose/broken/cold solder leads tonight and measure voltage at speaker terminal.

i'm confused however as to why the amp will work/play/sound when first powered on (guitar and speaker not plugged in) and then i plug in the speaker cable and guitar. i understand powering up without the speaker plugged in draws little current but wouldn't it fail (not work no sound and the limiter bulb stay bright) as soon as i start to play because now it is drawing power as evidenced by the bulb going bright then dimming when chords are hit? that's the part i don't get, if the speaker is plugged in before i turn on the amp it fails, however if i plug in the speaker after amp powers up it will work all night as long as i don't turn off and back on. and then like i'm resetting it it will work again if i unplug the speaker, power up, then plug speaker cable back in. interesting brain teaser.....

Subject: Re: Repair
Posted by chicagobill on Fri, 25 Sep 2015 18:17:36 GMT
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You'd think it was that simple wouldn't you. When the amp first powers up a number of things start to happen. First the two power supplies start to rise up to their rated plus and minus 40 volts. While this happens the slowly rising voltages are applied to the power amp circuit.

As the power amp circuit starts to wake up, each of its' transistors and capacitors start to see slowly rising voltage levels as the two power supplies get up to full voltage.

As I described before, the two halves of the power amp circuit are trying to keep themselves balanced against each other until the voltages all stabilize. If there is any difference between the plus and minus voltages as they rise up, it could cause one half of the power amp to power up before the other half. This startup imbalance is usually what causes the familiar turn on thump that we hear when turning on the amp.

With no load and little current draw during power up the two halves don't get a chance to get locked into that imbalance while the voltages get up to normal level. But with the speaker load connected one part of the circuit could draw so much current during startup that the other side gets shut down so hard that it can't pull itself up enough to rebalance the circuit.

Some amps don't like being limited with a light bulb and will never startup while using one. I know from personal experience that all basic Kustom amps will work with them.

Your amp was blowing fuses before we started testing. So far there has been no smoking gun discovery so the problem is still in there. We just need to find it.

Subject: Re: Repair
Posted by pleat on Fri, 25 Sep 2015 21:49:11 GMT
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Not being a tech, but the schematic calls for all voltage reading with no load to the speakers, all controls full on and no input. Another thing, when your doing your testing is the circuit board fastened to the back wall of the chassis? These needs be done to insure all the grounding points are made. May be one reason why the amp will work once powered up and the speakers are making a partial ground to the board.

Just thinking as a novice.
pleat

Subject: Re: Repair
Posted by OldSchool1 on Sat, 26 Sep 2015 00:25:43 GMT
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guys, bear with (or humor) me on this. i tested solder joints with a wood probe while amp was on, speaker plugged in and limiter bulb on full bright. nothing seemed loose or made the bulb flicker. so i then thought let me test the cab because it is almost 50 years old. so i plugged the bassman head in and fired it up and everything worked fine. so then i thought ok, let me go back and test

the kustom without the limiter. i said this is not a proper way to go about this but i can live with burning a fuse so i plugged the kustom straight in to the wall outlet, disconnected the amp lamp green wire to the filter cap so i could save the bulb and plugged speaker and guitar in. turned on the amp expecting anything and she fired up. waited and then turned volume up and played a note and everything worked. tested on/off several times and then each of the 4 high/low input jacks on each channel and all worked. the amp has been running now for 30 minutes. i think i did something to my limiter when i put it away last week after my initial tests.

i now think that either 1) there was a bad/dirty connector on one of the wires that were disconnected and then reconnected step by step as advised here taking measurements along the way which was causing the fuse to blow or 2) the lamp bulb was bad and caused a short or 3) i had replaced the original fuse (with the 2 leads at the ends) which was soldered directly to the on/off switch and replaced with a car fuse holder or 4) all of the above.

there were a lot of disconnect/reconnect things going on through my testing and each connection i shot with deoxit. would you guys agree with this? could a dirty oxadated lead connector on the rectifier or filters or transistors cause the fuse to blow?

Subject: Re: Repair
Posted by chicagobill on Sat, 26 Sep 2015 02:34:30 GMT
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Anything is possible. If it is working then you may be right.

Have you checked the speaker cable for shorted ends or cuts in the wire?

Subject: Re: Repair
Posted by OldSchool1 on Sat, 26 Sep 2015 03:26:41 GMT
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evening, i will check the bassman cable. as a matter of fact, i remember it has one end with the back cover of the plug missing exposing the soldered wires.

the tests that you have recommended seemed pretty thorough. separating each stage and starting from the transformer on up to the 4 power transistors was a task i never could have gotten through. all the measurements i took seemed close to what was expected from you guys.i know there is probably more testing to be thorough but do you think i can noodle playing the amp now and see how it goes? i don't intend to put any pedals in front yet, just hear what this baby can sound like with a couple different guitars. i'm curious how it will sound next to the bassman.

also, compared to the bassman the kustom is designed so "repair friendly". really simple and neat, just pull/push any lead connector to separate a component, except for that main fuse set up and orange cap above the switch. with the bassman, everything is soldered and runs in all directions, nothing is easy! i will clean the boards this weekend and then the tuck and roll covering.

Subject: Re: Repair
Posted by stevem on Sat, 26 Sep 2015 10:27:04 GMT
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Pleat , the notation on the schematics about having all the controls up full is in regards to signal level testing and will really have no effect on the driver / power amp test out voltages with no speaker plugged in!

The question now and still with his amp is why was it doing what it was at first before he pulled it apart as Bill walked him thru the check out session?
My guess is that a poor connection was not allowing the needed current flow to take place to fully power up one side of the 40 volt supply or one of the slip on on the connectors was bad.

Old school one thing I would still do would be to drop that driver board off of the rear wall of the amp and check all the solder connections very very close.
Once again be carefull with that diode on the output heat sink strip and where the output transistor connector wires go thru the board as many times some of the strands will break off and they all need to be there to carry the current load!

Subject: Re: Repair
Posted by OldSchool1 on Tue, 29 Sep 2015 23:01:12 GMT
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greetings, just wanted to update. i cleaned the boards and took a look behind the driver board and didn't see any bad connections. also, cleaned the tuck and roll. so i guess i'm going put it back together and start playing. i want to thank chicagobill and stevem for so much help. not only did i get the amp running but learned a heck of a lot. forums like this are the good of the internet and guys like you who freely share your wisdom make the world go round! thank you gentleman.....cheers!

Subject: Re: Repair
Posted by chicagobill on Wed, 30 Sep 2015 00:43:44 GMT
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Glad to hear that it's working for you. Have fun with it.