
Subject: Replacing Kustom Filter Caps

Posted by [Dism2000](#) on Sat, 03 Nov 2012 21:57:20 GMT

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Hi, I have a Kustom 200b1 amp. I recently got the amp totally Serviced. The amp sounds fine at low volumes. The moment I crank it up passed 2 it starts to get muddy. Can the problem be the Filter caps. If it is , where can I buy the same caps. It reads GE 4500 Mfd and 65 volts surge. Also what would the correct MFD / Voltage value be for this amp.

Can anybody steer me in the right direction.

Subject: Re: Replacing Kustom Filter Caps

Posted by [chicagobill](#) on Sun, 04 Nov 2012 04:12:58 GMT

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Welcome to the place. What do you mean by "muddy"?

Bad filter caps will cause a constant low frequency hum or may cause the an amp to distort or lose headroom when really pushed hard, but I don't think muddy would be a good description.

Subject: Re: Replacing Kustom Filter Caps

Posted by [stevem](#) on Sun, 04 Nov 2012 11:54:26 GMT

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Please discribe muddy more?

If you are playing bass thru the amp and have really hot active pickups you can drive these amps into clipping very easy as they where never made to handle hot pickup outputs, infact a input drive signal level of 180mv is all that is needed to drive these amps to max output and this is with a channel volume set level of all of 5 out of 10 if you will.

An active bass with two 9 volt batteries can pump out near twice that 180 mv!

Also these amps pack alot of punch as the volume is brought up, it could be just your speakers farting out, so what are you driving the amp through?

A tech with a load bench sould in a 5 minute set up and test out session confirm that the amp is outputting its normal full RMS wattage of 90 plus watts.

I use a signal input level of all of 120 mv which is more than enough to drive any model circa 60 or 70s Kustom to full peak output!

Those filters you have in your amps at least spec wise are fine, these filters have a round 1/4" black spot, or a round red spot on top that is not to stick up off of the rest of the filters black top end seal.

If the black or red spot is popping up more than 1/32 of a inch then it may be time to change out those filters as they have dried up and if not letting 120 hz hum enter the amps output than they will impead the amps power output to one degree or another.

If you find they need replacing stepping up to 10,000 uf filters at 75 volts would be the way I would

go, just be prepared for the price if you stay with the same size computer grade filters!
It also needs to be confirmed that the check out/repair tech who had the amp did not change any preamp transistors with the wrong type, as there are many that will work but give the wrong gain structure in the preamp section.

Hope some of this stuff might help, and let us know how things progress.

Subject: Re: Replacing Kustom Filter Caps
Posted by [Dism2000](#) on Sun, 04 Nov 2012 18:25:23 GMT
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Subject: Re: Replacing Kustom Filter Caps
Posted by [Dism2000](#) on Sun, 04 Nov 2012 18:59:40 GMT
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Hi William & Steven,
Sorry I wasn't clear... I meant to say the sound distorts rather quickly as I raise the volume between 2 - 3 on the volume pot. The 2 filter caps seem to be original and each has a value of 4500uF/60volts as marked on the cans. I don't have an active bass. Here's what was changed in the amp: some of the small transistors in the preamp were changed with equivalent ones and they were tested. The 4 power transistors & the 2 drivers were also replaced with equivalent ones from Toshiba. Once all the work was done the amp sounded tighter and no noise issues. After playing with the amp a few times at home the amp started to distort at low volume settings and I hear what sounds like the amp is clipping early on with a loud hum. Also if I tap the amp with my hand on the top, side or front the hum goes away but it also comes back when I tap the amp. Does this sound like the filter caps need replacing? Strange issue.
Steven, you mention replacing the filter caps with 10,000uF/75volts.....is this 2 caps x 10,000uF/75volts = 20,000uF/150volts total. What is the benefit of upgrading to this level...and is there a downside? What else needs to be adjusted in this scenario.
I appreciate your replies William and Steven.
Regards,
Michael

Subject: Re: Replacing Kustom Filter Caps
Posted by [chicagobill](#) on Sun, 04 Nov 2012 23:52:13 GMT
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If hitting the amp causes the problem to come and go, there is something loose inside the amp that needs to be resoldered or tightened up.

Increasing the value of the filter caps will allow the power supply to hold up better when you really drive the amp hard. The stiffer power supply will tighten up the response of the amp a little bit.

Subject: Re: Replacing Kustom Filter Caps
Posted by [stevem](#) on Mon, 05 Nov 2012 12:01:55 GMT
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Yes, two caps each rated at 10,000uf at a minimum of 50 volts, a 75 volt cap will last longer.

Subject: Re: Replacing Kustom Filter Caps
Posted by [Dism2000](#) on Tue, 06 Nov 2012 01:42:18 GMT
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Hi William & Steven,
Thanks for the reply, If I do upgrade to a higher voltage from 4500uf/50 volts to 10,000uf/75 volts, is there anything else that needs to be done, for example does the bridge rectifier need to be upgraded or anything else need to be done.
Also, has anyone else on this forum have this upgrade done with complete success.
Regards
Michael

Subject: Re: Replacing Kustom Filter Caps
Posted by [Kustom_Bart](#) on Tue, 06 Nov 2012 02:49:48 GMT
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You are safe doing this, it isn't going to hurt anything. Think of what a cap is, it is nothing more than storage. It is going to store a little bit more power so when you really hit it hard it isn't going to deplete it. The caps you have now are dumping and cannot catch back up fast enough. This how I look at it.

I have it in a few of my amps that needed caps. But honestly not many of my amps have had to have the caps or anything else replaced.

Subject: Re: Replacing Kustom Filter Caps
Posted by [Dism2000](#) on Tue, 06 Nov 2012 04:06:56 GMT
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Hy Bart, thanks for your feedback on this.
Well what I'm not clear on, is if I need to do any other modifications.
It can't be just changing the caps to 10,000uf. The voltage will be increased with this upgrade to.

Don't I have to do anything to the bridge rectifier. That's what I'm not clear about.

Regards
Michael

Subject: Re: Replacing Kustom Filter Caps
Posted by [Kustom_Bart](#) on Tue, 06 Nov 2012 04:25:31 GMT
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No, you don't have to do anything else. The voltage doesn't increase it is just a larger tank to hold more of the same voltage.

Subject: Re: Replacing Kustom Filter Caps
Posted by [steven](#) on Tue, 06 Nov 2012 12:15:32 GMT
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It would not be a bad idea that while replacing the filters to also step up to a 25 amp bridge recto which can be had from most radio shack stores as the the bigger caps will pull a good amount more starting current thru the power supply section at start up, and this will place more stress on the factory bridge.

Also while you are getting the bridge recto, pick up 4 .001uf at least 100 volt ceramic disc type caps and install them across each diode in the bridge, these help to block out the switching noise that all rectos other than the fast switching(FREDS) make and in turn get introduced into the idle back ground noise of an amp.

If you are up for something better in regards to rectos than get(qt) 4 UF5408 fast rectos and then make up a new bridge with a small circuit board, or terminal strips and the amp will sound better on the top end, have a bit more punch and you can do away with the .001uf caps.

The main filter voltage rating of the caps does not matter, as long as the filters are rated for more than the 40 volts that the amp runs at.

Subject: Re: Replacing Kustom Filter Caps
Posted by [Dism2000](#) on Wed, 07 Nov 2012 06:44:25 GMT
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Thanks Steven for the info.

I will start looking for the 10,000uf/75volt caps and the UF5408 recto and as soon as I upgraded the amp I will let you know how it turns out.

many thanks
Michael

Subject: Re: Replacing Kustom Filter Caps

Posted by [stevem](#) on Fri, 09 Nov 2012 12:16:29 GMT

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Just be aware that the UF5408`s are sperate diodes, so you will need four of them and as I posted before you will need to mount them on something like two solder type terminal strips, or on a small section of circuit board, and them they have to be hooked up in such a way to form a bridge recto.

Try to leave the leads as long as you can, as they can be used as part of the diodes heat sink, also in regards to mounting these on a circuit board make note that the leads themselves are thicker than common recto leads and as such you will need to drill out the holes that come in place on circuit boards.

Subject: Re: Replacing Kustom Filter Caps

Posted by [Dism2000](#) on Thu, 06 Dec 2012 17:08:34 GMT

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Hi, Steven and chicagobill,

This is the results of the upgrade that you suggested.
I first changed the Bridge Rectifier from the orginal 15amp and I replaced it with 25amp (600v). I replaced the old orginal filter caps which were 50v/4500uf and upgrade to 75v/10,000uf. I also replaced all the old small radial elecrolyptic caps with new ones.

Before I tell you the results, my technician warned me not to do this upgrade.

When we turned on the switch it worked. There was no noise, tested the voltage and it stayed stable with no voltage drop.

we plugged in a bass and the sound was clean, tight with punch.

From volume levels of 1, 2, 3, 4, 5, 6, it remained clean with no distortion, compared to the old caps it would start to distort after 2.

closed the amp for 10 minutes, re-opens the amp and tested the voltage again for an hour, no voltage drop again. Put the amp aside till the next day.

Day 2, Technician turns on the amp and tested the voltage for an hour, again no voltage drops. Again put the amp aside for the next day.

Day 3, Technician turns on amp, after about 20 seconds we notice there a small hum and we notice some smoke coming from the power amp board (703).

Shut the amp again to check where its coming from, it seem to come from one of the ceramic resisters. Turned the amp on again and the same thing there was smoke coming from the same spot. Closed the amp.

The tech then discharged the filtercaps and checked the amp.

This the results...

1 Power Transister (2n3055) blown,
1 driver transister (2n3053) Blown,
1 square cermaic resister blown,
1 Diode RCA (61087) blown

and the fuse did not blow.

And the the technician turn to me and said, I told you so!

My question here is, what went wrong?

The mod was done by a Professional Technician.

Put the right parts into it. Very expensive computer grade caps.

Is there something thats missing in this mod.

My question is, is this upgrade that you suggested, is it a mod that you have done personally, or anyone on this website have personally done and had complete success .

If there is any member that has has done this upgrade I would like to know if you had any problems with this and how you solved the problem.

I have checked all over this website and there is some members who talked about doing this upgrade but now one mentioned if they had results.

There must be more to this mod then just changing a Bridge rectifier and higher value Filtercaps.

I have spent alot of money restoring this amp and I can't go back putting my old caps now.

Desperately looking for a Solution.

regards

Mike

Subject: Re: Replacing Kustom Filter Caps

Posted by [chicagobill](#) on Thu, 06 Dec 2012 20:24:49 GMT

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Dism2000 wrote on Thu, 06 December 2012 11:08

This the results...

1 Power Transister (2n3055) blown,

1 driver transistor (2n3053) Blown,

1 square cermaic resister blown,

1 Diode RCA (61087) blown

and the fuse did not blow.

And the(n) the technician turn(ed) to me and said, I told you so!

Mike, sorry to hear that you had a problem. I believe that the new caps and rectifier were not the real cause of your problem, although they did make the problem show itself to you.

The above list of parts if it is accurate, is more likely the real cause of your problem. The driver transistor that you have listed as a 2N3053 is not rated high enough to work as a replacement for the original transistor. I looked up the datasheet and it is rated at 40 volts. I'm going to guess that

the voltage in your amp is somewhere around plus and minus 45-47vdc, which will stress a 40 volt part.

Changing the caps and rectifier only made your amp work more efficiently. You proved this yourself, when you said that the amp had more clean headroom and more power than it did before the caps were changed.

Unfortunately, when the earlier repair was performed the wrong parts were used. It might have been able to survive when the power supply was weak, but once you brought it back to spec, it couldn't take the stress. The original driver transistors were rated for 80 volts.

Do you know the history of this amp in terms of the earlier repairs? I guess that I'd suggest that your tech double check the earlier repairs to make sure that there are no other underrated parts installed.

Subject: Re: Replacing Kustom Filter Caps
Posted by [Dism2000](#) on Fri, 07 Dec 2012 05:36:29 GMT
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Hi Chicagobill and Steven,

Thanks for the quick reply.

Yes I know the history of this amp.

I bought this head on ebay about 2 years ago. It cost me \$100.00.

When I opened it up it had pretty much all the original parts.

It worked but had a lot of cracking and hissing sounds and sounded lifeless. So I decided to bring it back to life.

A good portion of the small transistors were changed on both pre amp boards and power amp board. some resistors on all 3 boards were changed. I changed all the other caps on the pre-amp and power amp boards to orange drops caps and I recently changed all the radial caps to ELNA Caps (24) to be exact. I changed all 6 power Transistor 2n3055 and all 4 driver transistors (2n3053) which you mention caused the amp to malfunction.

And now I have recently did the mod you suggested which was up grading the rectifier to 25 amp and the filter caps to 75v 10,000uf.

Which leads me to my next question.

I keep on asking you and anyone on this forum. Has anyone else done this upgrade and had success. why does anyone who has done this mention it. Can you please respond on this.

I will speak to my Technician and explain to him what you feel the problem is concerning the Transistor 2n3053 being 40v instead of the 2n3053 80v transistor. I don't know where I'm going to find this transistor. Maybe you can suggest a place where I can get them.

Is there anything else I need to do to this before I continue on repairing the blown parts.

Thanks for the reply...Mike

Subject: Re: Replacing Kustom Filter Caps
Posted by [stevem](#) on Fri, 07 Dec 2012 12:04:52 GMT
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I have done this filter up grade to at least 35 Kustoms over the years, on of those being my main K250 that I use for Bass when giging.

I installed 20,000 uf worth of filtering on each leg for the 40 volt supply some 30 years ago, and have played hundreds of gigs with the amp at loud volumes driving 4 15" driver with no issues. The first semiconductor that would blow due to the turn on current suge would be the rectifier bridge in the amp, the transistor that Bill posted about was the weak link in your amps output stage and would have likly have blown on you at some point in time even if you used stock value replacement filters.

Some big buck high end stereo amps use 30,000 uf of filtering per power supply leg and just like you did the rectos are high amperage ones.

Its good that the amp went south at the techs shop cause it suck when it happens at a gig, and some times dependant on the speakers you are playing thru when the output stage pops the full DC power supply voltage it places on the speakers can take them out!!

Subject: Re: Replacing Kustom Filter Caps
Posted by [Kustom_Bart](#) on Fri, 07 Dec 2012 16:59:22 GMT
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I am not a tech, but these are normal weak links that go bad in a kustom when you buy it and it doesn't work. So it is normal for 2 or 3 of these parts to be bad or at least weak, just because of time. Replace them Like Chicagobill said and you will be golden and it will perform better than new for the rest of your life.

Just my .02

Subject: Re: Replacing Kustom Filter Caps
Posted by [chicagobill](#) on Fri, 07 Dec 2012 19:17:03 GMT
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Dism2000 wrote on Thu, 06 December 2012 23:36I changed all 6 power Transister 2n3055 and all 4 driver transisters (2n3053) which you mention caused the amp to malfuntion.

I will speak to my Technician and explain to him what you feel the problem is concerning the Transistor 2n3053 being 40v instead of the 2n3053 80v transistor. I don't know where I'm going to find this transistor. Maybe you can suggest a place where I can get them.

There is some mis-information here regarding the driver transistors that you had replaced. The 2N3053 is an NPN device, the amp has two types of driver transistors NPN and PNP, so there must be another number transistor as well as the 2N3053. While there is a 2N3053A that is rated higher in voltage I don't recommend these parts. If you or your tech need recommendations for replacement transistors, I can give you the part numbers that I use.

As for the filter caps and rectifier replacements, what you did is a very common upgrade to many

amps that were made in the 60s and 70s. Back then when these amps were designed, high value filter caps were very expensive and physically very large. Amp designers had to make part decisions based on cost and chassis space. Modern caps are smaller and cheaper so upgrades are easy to do and you can now easily fit double or triple the capacitance value in the same space as the original ones.

Increasing the ratings of these parts just makes the amp more efficient, it doesn't change the supply voltages or in any way harm the amp. The power transformer steps down the wall voltage from 120 volts to 30/60 volts, and can only deliver a certain amount of current. The rectifier can only work with the power that the transformer delivers, so increasing the ratings of the rectifier does not increase either the available voltage or current.

The caps are there to remove the hum from the power supply and act as holding tanks. When the amp is driven hard, it draws on the power supply. If the power supply can't keep up with the demands of the amp, the voltages start to drop. Having a higher value filter cap will keep the power supply from sagging when the demands of the amp are increased. Thus the cleaner signal and increased headroom.

I'm sorry that you had a problem with your amp and if you didn't want to perform the upgrade, you should have opted not to. In general the information given here on the board is given as experience based information. Sometimes I personally do not agree with some of the things that are posted here, but unless it is suggesting something that can be dangerous, I don't post in because everybody has a right to their own opinion.

You've had a lot of work done on this amp. From your description, changing all of those parts fixed some problems and created some new ones. I suggest that you talk with your tech about next steps and work together to solve the problems.

Subject: Re: Replacing Kustom Filter Caps
Posted by [Dism2000](#) on Fri, 07 Dec 2012 19:36:54 GMT
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Hi Chicagobill,
Thanks for the recent reply.
Yes I would appreciate if you can give me the exact replacement transistors and where can I get these.

Appreciate the information,
Thanks...Mike

Subject: Re: Replacing Kustom Filter Caps
Posted by [chicagobill](#) on Fri, 07 Dec 2012 20:34:22 GMT
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The transistors that I currently use to replace the original driver transistors are NPN-2N3440 and

PNP-2N5415. I purchase them from Mouser in Texas.

They should be heatsinked, I remount these on the original transistor's heatsinks.

Hope this helps.

Subject: Re: Replacing Kustom Filter Caps
Posted by [Dism2000](#) on Sat, 08 Dec 2012 00:20:52 GMT
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Hi bill,
thanks for the your time and information.
I'll let you know how it turns out,once I get everything done.

...Mike

Subject: Re: Replacing Kustom Filter Caps
Posted by [Dism2000](#) on Tue, 11 Dec 2012 06:54:11 GMT
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Hi Bill,

question 1.

I was looking for transistors NPN-2N3440 and PNP-2N5415. Electronic stores don't seem to have these, the tech tells me that this must be old stock.
But we did find todays replacement.

these are the replacements...

NPN-2N3440(250v) = ecg396 (300v)
PNP-2N5415(200v) = ecg397 (300v)Matched set.

Are these correct as far your concerned.

question 2.

My amp originaly had RCA 2n3055 Power transitors. but since they were 40 years old I decided to change them.
I had replaced them with new Toshiba 2n3055.

I just read some where that 2n3055h is more like the original RCA 2n3055. Is this true.
Should I keep what I have now or is the 2n3055h a better match.

thanks...Mike

Subject: Re: Replacing Kustom Filter Caps
Posted by [Kustom_Bart](#) on Tue, 11 Dec 2012 16:32:11 GMT
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Go to mouser.com

http://www.mouser.com/_/?Keyword=2N3440&FS=True

http://www.mouser.com/Semiconductors/Transistors/_/N-2xpq5?Keyword=2N5415&FS=True

Those are the links to the pages for both parts.

Subject: Re: Replacing Kustom Filter Caps
Posted by [chicagobill](#) on Tue, 11 Dec 2012 17:02:13 GMT
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Dism2000 wrote on Tue, 11 December 2012 00:54question 1.
I was looking for transistors NPN-2N3440 and PNP-2N5415. Electronic stores don't seem to have these, the tech tells me that this must be old stock.
But we did find today's replacement.

these are the replacements...

NPN-2N3440(250v) = ecg396 (300v)
PNP-2N5415(200v) = ecg397 (300v)Matched set.

Are these correct as far as you're concerned.

OK, I don't have any idea as to what the electronic supply system in Canada is like, but as Bart pointed out, these transistors are current types and are readily available here in the USA. The ECG or NTE replacements will probably work, but I do not use them because they will cost 2-3 times the cost of the other transistors. If you or your tech can't order from the US, then maybe there is some other source in Canada that you can get them from.

Dism2000 wrote on Tue, 11 December 2012 00:54question 2.
My amp originally had RCA 2n3055 Power transistors. but since they were 40 years old I decided to change them.
I had replaced them with new Toshiba 2n3055.

I just read somewhere that 2n3055h is more like the original RCA 2n3055. Is this true.
Should I keep what I have now or is the 2n3055h a better match.
Were the original transistors marked RCA 2N3055 or were they Kustom part number 36892?
There isn't really much difference, but the Kustom parts were "selected" versions of the generic 2N3055 transistors. This means that they were supposed to meet specific requirements that were specified by Kustom. So they may have been rated for a higher voltage just like the "H" versions that you mentioned. I have purchased some of the 2N3055H transistors in the past, but I could only find them manufactured by unknown Far East companies with no traceable history. I prefer to purchase transistors from sources that I trust and from makers that I know. So I prefer to buy ON

or ST brand transistors. In my experience, the standard 2N3055 replaces the Kustom part with no problems.

Subject: Re: Replacing Kustom Filter Caps
Posted by [stevem](#) on Wed, 12 Dec 2012 12:13:34 GMT
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Also the original RCA 36892 transistors used where put thru a matching process by Kustom. This gets them to all idle at the same current level in regards to each side of the power supply rails (the 40 volts + and -). Output signal wise this translates into less of the crappy sounding crossover distortion (sweeter sound with more sustain)more head room and less 120 hz idle hum as now the output stage is phase cancelling the 120 hz hum. If you or your tech has a big enough stock of transistors, and the time to incert them into the amp and check for the same amount of idle current draw from each power supply rail. Matched pairs for transistors can be had from most manufactures for a added cost.

Subject: Re: Replacing Kustom Filter Caps
Posted by [kasinoman](#) on Sat, 26 Jul 2014 14:32:01 GMT
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Just read the thread...So I suppose to be safe it is best to use a passive bass thru my old (1971) 250-1 bass head??

Subject: Re: Replacing Kustom Filter Caps
Posted by [kasinoman](#) on Sat, 26 Jul 2014 14:34:48 GMT
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Hmmm? I don't know why it posted here?

Subject: Re: Replacing Kustom Filter Caps
Posted by [chicagobill](#) on Sat, 26 Jul 2014 15:27:58 GMT
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The preamp circuits of the K200B amps are completely different from the metal front K250 series amps.

Subject: Re: Replacing Kustom Filter Caps
Posted by [stevem](#) on Sat, 26 Jul 2014 15:41:13 GMT

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Just set the volume on your active bass to give the same volume as the passive one, and make note of that knob position on the active bass, from that point on just work the volume controls on the amp.

The metal face amps like to the 250 can handle more input signal level than the earlier amps, but they have good gain so doing what I posted when I use my active bass still give good touch and feel without clipping the preamp section.

Subject: Re: Replacing Kustom Filter Caps
Posted by [pleat](#) on Sat, 26 Jul 2014 18:30:32 GMT

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You will also notice the lower input jack on each channel has more gain than upper input jack on each channel. Kustom did this to help with instruments with single coil vs. humbucking pickups. Kustom sent out a dealer memo late 1971.

pleat

Subject: Re: Replacing Kustom Filter Caps
Posted by [daveobergoenner@gmail.com](#) on Fri, 08 Aug 2014 01:52:37 GMT

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Back to the topic of filter cap replacement....

I just upgraded my K200 to 15,000uf at 75 volts. No problems at all (but I also changed the rectifier to a 25 amp).

Wow, what an improvement in performance from the amp though!

Dave O.

Subject: Re: Replacing Kustom Filter Caps
Posted by [steven](#) on Fri, 08 Aug 2014 10:44:46 GMT

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Yup, it makes for a nice improvement and when done to a amp that has not been band aided back to working will not make for any issues!
