

Modding a silverface amp to blackface specs.

Silverface amps all sound better when modded back to blackface specs in my opinion. I will outline the mods below. However, some of the changes that Fender did in the silverface years are not easily changed back to blackface specs.

Don't go into the amp unless you know how to not get shocked! These amps will even shock you when unplugged. They store extremely harmful voltages that will jump out and grab you if you put your paws in the wrong place. I know this from experience! It hurts!

Suppressor caps: Fender added .002uf (or sometimes 1200pf) capacitors to the grids of the power tubes (pin 5). These bleed off frequencies that they thought were too high to be heard with guitar. The effect of these is to bleed off any frequencies that the amp will oscillate at. Oscillation is like feedback with a microphone. It feeds itself and runs away from you if you don't do something about it. Amps can do this internally, and it's a big problem. For you tech types, somebody emailed me and said that the effect of these caps is -18 dB at 6 kHz! Ouch! The caps are actually a good idea, but they tend to bleed off high end "sparkle" from the amp. These caps were added because of problems with the lead dress that was causing the amps to oscillate. It's unfortunate that Fender needed these. The best way to control oscillation is to design the amp not to oscillate in the first place! But for cost cutting's sake, it was cheaper to put these caps in than spend the extra labor to make the amp more stable. These caps can usually be removed and the amp will run fine. **I haven't run across an amp yet that started oscillating without them. But, I have heard from some techs that have seen many amps that can't live without these caps.** Oscillation suppression is nothing new in Fenders. Tweed bassmans had a cap across the plates of the phase inverter to help with this (47pf). If your amp plays fine after the mod and then all of a sudden acts like it loses most of its power, it is probably oscillating. Try the 47pf cap like the tweed Bassman and see if that fixes it (look in [schematics](#) to see how it is done). There is also a much rarer oscillation suppression method Fender had, it involved a .02 cap and a 220k resistor going from one leg of the power section then held 100 ohms above ground via the feedback loop. This is rare and only occurred in the early 70's.

Phase inverter: Fender changed the phase inverter in a few ways. Starting from one end and going to the other: The coupling cap increased from .001 to .01. This has the effect of letting more bass through to the power section. This sounds like a good idea, but to my ear makes the bass get overbearing. The .001 cap sounds tighter with more defined bass to me. After that, Fender used 330k resistors on the grids of the phase inverter instead of 1 meg. The cathode resistor on the phase inverter was made smaller which ran this tube a little hotter. The plate load resistors were decreased from 82 and 100k to 47k. This reduces gain. Overall, the changes to the phase inverter look like they were designed to tame the amp and change the way the amp sounds to what Fender wanted at the time.

Reverb circuit: Fender tended to run the reverb driver tube very hot in the silverface years. Blackface amps came with 2.2k resistors bypassed with a 25uf-25v electrolytic cap. Sometime in the 70's, they started to change this value. I've seen 1.5k, 820 and 680 ohm resistors here without a bypass cap. Fender also added a cap from the plates of the reverb driver to the cathode. They added a cap to ground after the reverb tank as well. I've found that I sometimes like the silverface method for reverb better than blackface, but I do take out the added caps to ground. I will leave the amp otherwise stock if the reverb sounds good to the owner.

Bias supply: Fender changed the bias supply from a level to a balance control. The balance control allows the tech to match the tubes, but not set the bias level which is what can determine tone. Also, some extra filtering was added to the circuit (two 70uf-100v's? Don't remember exactly). **I always change the bias supply to blackface specs because we use matched tubes these days!** When replacing the bias supply filter caps, I usually just use one 100uf-100v.

There are a few other changes that I don't mod back to blackface specs because I don't feel they change tone all that much. The main ones have to do with the power supply.

Changes in the silverface years that can't easily be changed back to blackface specs: Sometime when Fender went to the 5U4 rectifier tube, they increased voltages on the high voltage secondary of the power transformer. The 5U4 has a higher loss, so the increase makes the voltage after the rectifier tube similar to what it was in the blackface years with a GZ34. When installing the GZ34 in these silverface amps, the voltages will be higher than those in a blackface amp sometimes. **The only way this can be changed back to blackface is to change the power transformer. This is expensive.** In the late silverface years, Fender changed the power supply and power section of the amp quite extensively. They do not look like the earlier blackface and silverface amps at all. These changes included new power and output transformers and solid state rectifiers for all of the larger amps. Voltage was greatly increased on the plates of the power tubes. These changes are not easily reversed. The way to tell if you have one of these amps is to look under the speaker jacks. If it says 70 or 135 watts, you have the later model that cannot be easily or cheaply modded back to blackface specs. **I'd recommend selling this amp if you are not happy with the tone before trying to do extensive and expensive mods to it.** They actually do sound pretty good clean though. And they are extremely loud!

*Disclaimer - My lack of electrical engineering knowledge means I don't fully understand what Fender was trying to accomplish with some of the changes in the silverface years. If you have something to add or a correction to make, please let me know! I'm always happy to hear from someone that knows more about this than I do.

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