

Ampeg Back Line.

(The amps that never need mic-ing up on stage!)

First: Read carefully. There are three parts to this page. The first deals with 7027 and 7027A (hereafter referred to as just 7027) in general. The second deals specifically with Ampeg guitar amplifiers. The third deals with amplifiers */other than Ampegs/* that use 7027's. The notes for Ampegs should *not* be read as applying to other amplifiers with 7027's.

Q. So what is a 7027, anyway?

A. It's a US (possibly Japanese) 6L6-GC, sometimes with a taller bulb, with two extra pins. (pins 5 & 6 are connected together, as are pins 1 & 4). That's it. The published RCA specs claim higher ratings: but in practice this is not the case, at best it was a case of juggling numbers to claim more "horsepower" for sales purposes. (Remember those were the days when some amp makers were claiming 1000 watts peak power for 300 watt amps, too) . Some 7027's had gold-plated grid wires, but that does not affect the actual tube ratings (other than maximum DC grid resistance, pretty much a non-issue when replacing 7027's with 6L6's) or power output...actually, the Tesla/JJ 6L6-GC has gold plated grids, too, if you're into gold plated grids.

OK: I have a Sylvania 7027, 6L6-GC, and 6L6-WGB and a GE 7027 (made by GE, not an RCA re-label) and a GE 6L6-GC. The internal parts of the Sylvania 7027, the 6L6-GC, and the 6L6-WGB are exactly the same, except the 7027A and the 6L6-WGB have a grid cooling fin on the top. GE 7027 and 6L6-GC look exactly the same. IOW: all of them have the same effective plate dissipation. I put them in my nifty Avo valve checker, and with 400 plate volts, 300 screen volts, -30 grid volts. Guess what, they all check out within 5 ma of average plate current for 6L6-GC. I pick up my handy RCA tube manual and look up the plate curves for 7027 and 6L6-GC: Guess what, they're identical! Put a pair of 7027 and a pair of 6L6-GC of the same make that test the same, in the same amp: you'll get about the same watts out.

Here's the *plate curves for 6L6-GC and 7027*, from RCA Receiving Tube Manual RC-26. See any difference?

Q. What about the Tesla and Sovtek 7027's?

All these are, are Tesla & Sovtek 6L6's with two extra pins connected on the base.

If you really just *have to have *tubes in there that say "7027" on them, we do stock Tesla/JJ 7027A, which are a very well made tube and will work in any amp that uses 7027's.

In nearly all cases the Tesla, Svetlana and Philips 6L6 (or 7581) will work in amps that use 7027, without any socket rewiring at all, and it'll save you some money to boot. The only issue is the socket wiring, there may be a few amps out there (but not many, and definitely not Ampegs) that use the extra pins that 7027 has, but not the ones 6L6 does. Scroll down to the bottom of the page for instructions on how simple it is to rewire 7027 sockets for 6L6-GC or 7581. *7027 will still

work if you make these socket wiring changes.*

Now, about those Ampegs...

Most likely you ran across this page after picking up an old Ampeg PortaFlex or V-series head or combo in a flea market or pawnshop. You liked the tone, in the case of the V amps, loved the cool tone controls, in the case of the Portaflex they look way cool, too. Then you looked under the hood, and ACCKKKK! The output tubes were 7027's! You called every guitar store & electronic shop in town: nobody has any. Someone said you might use 6550's, but they weren't sure..

Fear not, gentle reader, for the kind folks at Ampeg not only foresaw the problem and provided a simple solution, they made your Ampeg one of the most versatile amplifiers on Earth in regards to adapting to different output tubes! Years before Mesa & Crate even thought about it. You can pop in *any* good matched pair of 6L6-GC, (except skinny Chinese & Russian ones), 7581, 5881, 6L6-WGB, or KT66 without any modifications, because the socket is actually wired for 6L6's. 6550, KT88, or KT90 may be used without modification, in most cases...(biggest problem is that the base clips usually won't fit KT88 or 6550) and by installing a simple jumper, both 6CA7 (fat bulb) & EL34 (skinny bulb) tubes, too!

IMPORTANT *NOTE REF 6550 & KT88: *Ampeg as far as we've ever seen, did not use the extra two pins on the 7027, on the V-series (V4, VT40, V2, VT22) amps.. *BUT we *have seen at least *one B-18* that did have pin one connected to screen voltage...and on KT88 and 6550, that's connected to the metal base shell, which means if you'd plugged a 6550 into *that* B-18, you'd get a *500+ volt shock* if you grabbed the metal base! So if you aren't sure that pin one is grounded or unconnected, **don't* *use 6550 or KT88!)

Q. But there's got to be a catch, right?

A. Yeah, a couple small but *important* ones. Most Ampegs used what's known as a "capacitive-divider" bias scheme that has a tendency to get out of whack, which un-biases the tubes and can fry them..*any of them*, not just 7027s. There's only a few parts involved, just a few resistors, a couple of caps, and a diode, so it's best to just replace those parts on general principle. After you do this, or even if you don't, find the diagramme. Check the voltage (with the amp standby switch off) on pin 5 of the 7027 socket. It should be close to or a bit more negative (since the standby is off) than what's on the diagram. If you don't know what I am referring to, please take it to an authorized engineer! There are high voltages (often much higher than typical Fenders, Boogies, Marshalls, etc) in Ampegs, and it is no place for a novice to get a beginner course in amp trouble shooting. I'd say best to get one of those three tube Champs, Danos, Airlines, or Gibsons (there's others) if you want to take the Hard Knock University's Amp Repair 101 course.

Some models of Ampeg V-series specifically say on the cabinet schematic that 6550 (or KT88 or KT90, they are all interchangeable) can be used directly in place of the 7027's. Others don't...there's *several* varieties of all these amplifiers, since changes were made through the years of production. There's probably a few odd variations floating around that even serious Ampeg experts haven't seen! At any rate, if you

want to make darn sure your 'Peg will handle the extra current draw of 6550's, plug them in and check the voltage across the filament lines (pins 2 & 7) of the output tube sockets. If you're getting much less than 6.3V *AC, then it's no go. *If that checks out OK, then let the amp run for awhile, and check how hot power transformer is getting. If it's getting too hot (it'll get *warm but shouldn't burn your fingers*), you've either got to go back to 6L6's or change the negative bias so the 6550's aren't drawing as much idle current.

Note that a lot of musicians have used 6550's in these model Ampegs for years but there's always that odd exception, and we don't want you blowing up a power transformer, so we strongly suggest checking this stuff out as noted above.

Q. So where's the bias adjustment?

A. There isn't any. Some engineers with the knowhow can install a bias control adjustment in an Ampeg and it's a neat idea, since some folks might like the sound of tubes biased hotter (higher than the 25-35 ma you'll typically see), and tubes like 6550 can certainly handle a bit more current. But I would note that because of the high (over max published ratings) screen voltages, I'd play safe and not bias tubes for more than 75% of rated dissipation (plate current X plate voltage): eg: for a 6550, not more than 30 watts, for EL34 or 6L6, not more than 18, though some 6L6 and large bulb 6CA7 might be able to handle 25.

Q. What about EL34's?

A. Simple. Install a jumper between pins 1 & 8 on the tube socket. However, do *NOT* attempt to use 7027 after you've installed that jumper! Some folks who've used EL34's in these amps say they get better tone out of them by installing a variable bias control (the stock bias voltage on most Ampegs that use 7027, is a bit lean for EL34's), and by changing the screen resistors to 1,000 ohms instead of 470 ohms. Note that a few of the early V-series Ampegs had no screen resistors at all! Unless you plan on going back to 7027's (which you can't with the pin 1 to 8 socket jumper, anyway), you could install these right on the socket like a Fender or Marshall.

If you're going to do either of the above, I'd suggest strongly *putting a label on the chassis to indicate that it's wired to use EL34's*, and that 7027 will NOT work.

If you've made the above changes, you can use 6L6 or 6550 as well, only caveat being that if you've installed an adjustable bias control, you'll want to adjust it when swapping between the various tube types. Installing a 1 ohm resistor between pin 8 and ground for bias metering (eg: 35 millivolts or .035V across the resistor will be 35 ma per tube) makes this procedure easier.

Q. I'm having a hard time swallowing this....these things are running 550V and up! Since when does 6L6 handle this?

Since Ampegs were around, remember there's really no substantive difference between US made 7027A and US made 6L6-GC from the same manufacturer, other than pin out & cosmetics and sometimes not cosmetics, either, look

at 7027A GE vs. 6L6-GC GE. Some folks claim they can hear a diff, but as of yet all of the ones I've met were comparing different vintages or makes of tubes, which would make a diff even if we were talking just 6L6-GC.. Note in an Ampeg (at least the ones I've seen) the tubes are biased at maybe 20W per tube or less...if tubes are de-rated for dissipation, they can indeed be run higher than published voltage rating, sometimes quite a bit more. In an Ampeg VT-40 which runs 585 nominal volts (our line voltage is a bit low, so it's really only about 570) on the plate, I recently had it cook away with a pair of Tesla 6L6-GC, which seem to be handle the strain quite well. The Teslas are quite beefy looking & have red bases like the old 7581A. I've also put US made 6L6-GC of various flavours, Philips ECG 6L6-WGB, GE 7581, Sovtek EL34, Tesla EL34, Russian & US 6550 in it successfully. I have not tried Russian 5881..I'm still a bit leery of the idea, but several folks as well as Lord Valve say they work, so I'll try to blow them up next..

Q. So what kind of tubes can't I use?

A. Anything rank. Ampegs need good power tubes, they'll smoke poor quality output tubes.

1. Anything Chinese...

2. Ei Yugo **skinny bulb* *EL34 (note the fat bulb ones, and KT90's, are fine) Those do not seem to have the 25W dissipation rating of good EL34. They can run away & glow red.

3. Sovtek EL34-G (skinny bulb). Same plate dissipation problem as Ei EL34 above. Be forewarned that some "Groove Tubes" EL 34 are actually EL34-G Sovtek, relabelled!

4. Old metal or "coke bottle bulb" 6L6-G or 6L6 (also 1614 or 1622). Those were designed for old 1950's/40's amps that ran less than 400V, and just weren't meant for Ampeg Madness.

5. Sovtek 5881 *will work*, but will produce considerably (20 to 30% less) max power than good Tesla, Sovet, or US 6L6 or equivalent. I suppose they are OK if you want distortion at lower volumes.

6. Don't try 6V6-GT/GTA, unless you are willing to sacrifice them for research. The voltages in Ampegs are way high and even at typical bias, will make way high plate dissipation in a 6V6-GT/GTA, likely smoke otherwise good & valuable NOS tubes.

Q. Any other suggestions ref output tubes?

A. If you can find Western Electric (or other US made) 350B, or real British KT66, those ought to work fine and have great tone, too. But those are expensive, if you can find any!

Q.I have a PortaFlex, any suggestions?

A. The V series amps have huge power transformers and will normally handle the extra load of 6550, EL34, KT90 or KT88, with little trouble. Lots of folks do use 6550 in place of 7027 in the B series (PortaFlex) amps with no problem, but I'd say you ought to check the filament

voltage (as noted above) and power transformer after it's been on a while, if it's getting way warm (like burns your fingers), you should check the bias voltage/current, and consider going back to 6L6-GC or equivalent (5881, 6L6-WGB, 7581) if the transformer heating worries you. Fortunately, unlike some lesser quality makes, Ampeg overrated most of their transformers, so it's a rare day when they smoke a power transformer.

It appears that the B-15-S (not an N, NF, or other) and B-18-S actually use the same transformers as a V-2, but potted in metal cans, at any rate, they're about the same size, and put out about the same voltage.

Q. Are you sure about that 6550 thing in the bigger Ampegs?

A. Yes. Here's a couple of pertinent comments...

Lord Valve Stateth:

Some of the later ones, the master-vol types made while Ampeg was still Ampeg, say right on the schematic that you can plug 6550s in with no mods at all. It's down in the really small print with the 'notes'. LV

Bluemuse wrote:

Ampeg literature from the mid-70s for the VT-22 and VT-40 at least, say there was a Performance Kit available consisting of four 6550 output tubes and tube retainers, yielding 130 watts from the normally 100-watt VT-22, and 80 watts from the normally 60-watt VT-40. I don't know if there is anything else besides the tubes that was included in the kit.

Q. Ok, ENOUGH ABOUT THOSE DAMN AMPEGS! I have a (Musak, Bogen, etc) amp with 7027! Now what?

A. Simple. Check the socket and:

1. Move any connections on Pin 6 to Pin 5.
2. Move any connections on Pin 1 to Pin 4. *7027 will still work if you make these socket wiring changes.*
3. Install, either Svetlana 6L6-GC, Tesla/JJ 6L6-GC or good US made 6L6-GC, 7581, or /late model /6L6-WGB/5881, and check idle current. Avoid using older 1950's style 5881, 6L6-GB, 6L6-GA, 6L6-G, or metal 6L6/1614/1622, those do not have the requisite plate dissipation rating. DO NOT INSTALL METAL 6L6 in any socket labelled 7027 until you have confirmed that there is NO B+ connection to pin 1! Otherwise B+ will show up on the metal case, ouch!

Q. Sob! 6550 or EL 34 can't be installed in my Bogen/Musak/whatever, like in an Ampeg??

A. (Maybe) We cannot confirm that power transformers in those units can handle the extra load. You can try installing the 6550, KT88, etc, in your amp, (remember for EL34, a jumper should be installed between pins 1 & 8) adjust bias for the same idle current (typically 40 or 50 ma) as a 7027, then checking B+/HT and filament voltage. If it's way down (say the meter is reading less than 6.2 volts)...no go. Put the 6L6-GC's back in before it destroys the mains transformer!