



TECH NOTES

FENDER MUSICAL INSTRUMENTS CORP.
7975 N. HAYDEN ROAD
SCOTTSDALE, ARIZONA 85258

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OVERHEATING SOLID STATE GUITAR AMPLIFIERS

We have received several calls concerning solid state guitar amplifiers which appear to be overheating. In most cases the thermal switch will shut down the unit. After cooling, the unit will turn back on. The problem is caused by poor heat transfer from the output transistors through the mounting bar to the Bias Diodes. This will cause poor thermal tracking of the Bias circuit. In turn this will allow excessive Bias (Idle) current to flow through the output transistors. In most cases the output transistors are not properly seated down flat onto the mounting bar.

Inspect the Insulator used between the output transistors and the mounting bar. The overheating units all appear to be using Silicone insulators (Sill Pads). Sill Pads are soft and flexible.

A simple test will verify the overheating condition. Using a DC Volt Meter, attach the leads across one of the Emitter Resistors (.47 Ω 5watt). Turn the power on and let the unit idle (NO signal applied and NO load on the output). Observe the DC voltage drop across the Emitter Resistor. The measurement will climb up to a certain level and stabilize. This usually takes about 3-5 minutes. An overheating unit will measure 80mVDC - 250mVDC.

Modification procedure:

Desolder and remove the transistor (TIP142/147). Remove the Sill Pad (Insulator).

Install a Mica Pad (P/N 040903 or in packages of 12 P/N 040903-049) using a liberal amount of Thermal Grease to Both sides.

Remount the transistor. Tighten securely (6-8 inch lbs.). Solder the leads.

Repeat the above test. A properly operating unit should measure about 40mVDC - 80mVDC. Verify this on ALL Emitter resistors.

NOTE: The TIP142/147 Darlington transistors have a wide gain range. In some cases, the transistors may need to be replaced in order to lower the Idle (Bias) current.

The models that may exhibit this problem are: The "M-80", "M-80 Chorus", "Studio 85", "Eighty Five", "Deluxe 85", and the "Power Chorus".

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