



# TECH NOTES

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**TECH NOTE # TN 02-4**

**ISSUE DATE:** July, 2002  
**ISSUED BY:** S. Bankhead  
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**PRODUCT(S) AFFECTED:**

"Pro-Tube Series" Twin Amp, Pro Reverb, & Concert Reverb

**SYMPTOMS:**

Low frequency oscillation ("motorboating") with the tremolo engaged, or at extreme gain settings.

**CONDITIONS:**

Oscillation, or "motorboating", may occur with the Tremolo on, and the INTENSITY control at a high setting. Symptoms may be affected by the SPEED control as well.

Symptoms also may occur if the amp controls are set to high gain levels. Gain related oscillation is most likely to occur while in channel 2, with high GAIN & VOLUME settings, or with gain added in the effects loop.

This modification should only be done on revisions A thru D of the main PCB. These modifications are permanently incorporated into the design at revision E. The easiest way to identify revisions A thru D, without removing the PCB, is to note the date above V1 on the main PCB. Revisions A thru D will be dated 2000 or 2001. Subsequent revisions will be dated 2002 or later.

**PARTS REQUIRED:**

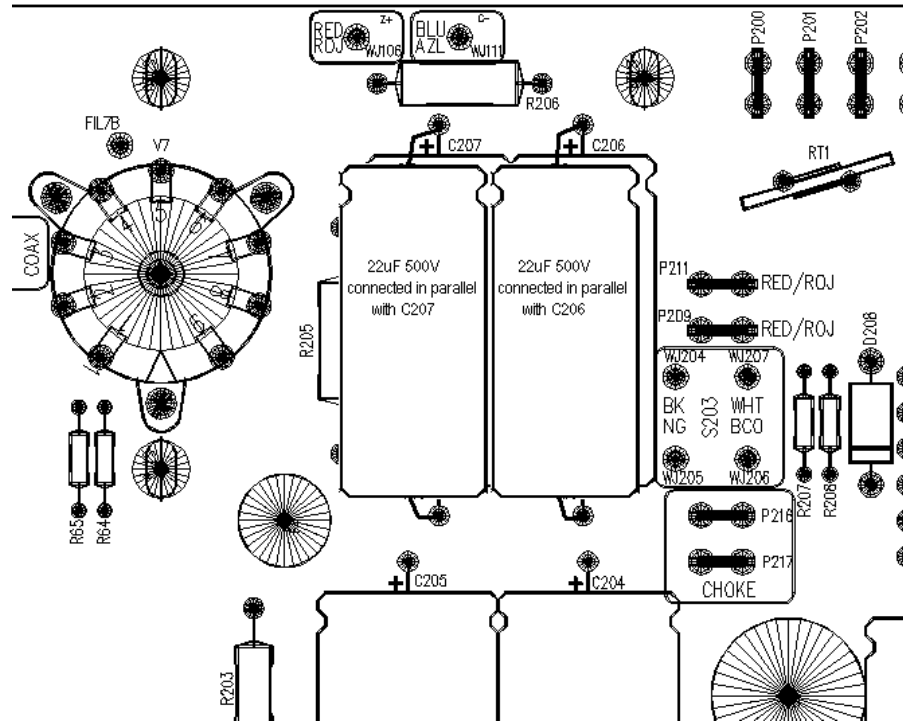
QTY	DESCRIPTION
2	Capacitor, Aluminum Electrolytic Axial 22uF 500V (Fender P/N 0024819000)
1	Insulated wire jumper, approx. 2"

**REQUIRED ACTION:**

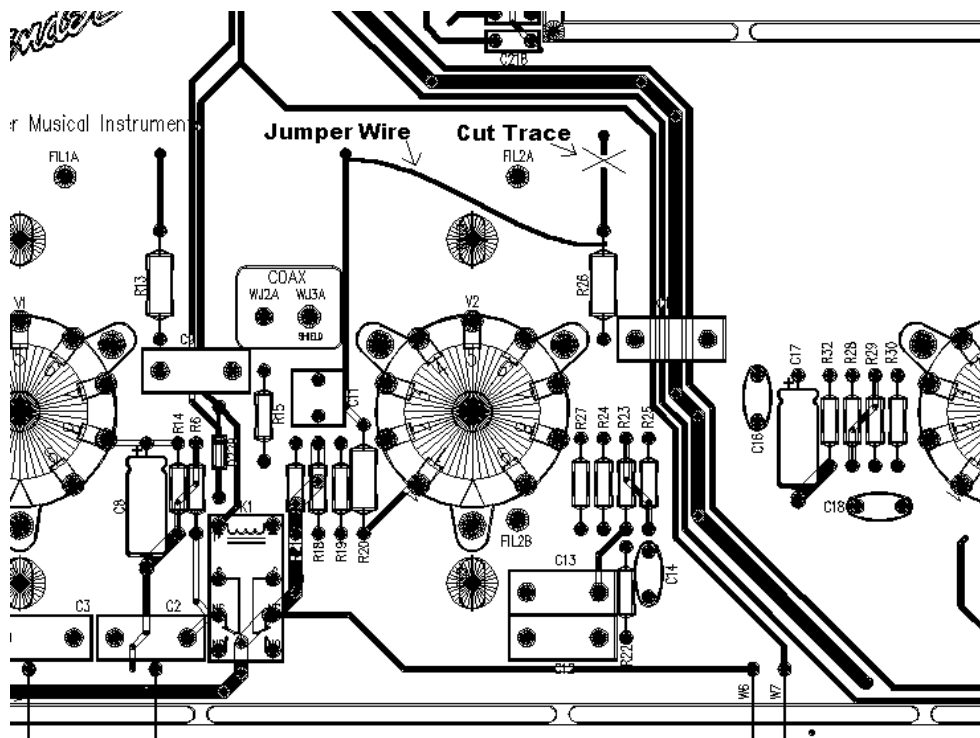
This modification is to be performed on all applicable units that are either in or out of warranty. For proper labor reimbursement, indicate tech note number TN02-4 in box # 12 of the Fender Warranty Claim form. Labor reimbursement =1 hour, U.S. & Canada only.

Note that these modifications can be performed while the circuit board is still mounted in the chassis.

1. Remove chassis: Remove upper back board by removing 4 screws. Disconnect power cord, speaker cable, and reverb cable. Remove 10 chassis mounting screws- 8 on top of unit, and 2 on the sides. Slide chassis towards the rear of the cabinet, being careful not to tear the foil shielding on the cabinet.
2. Add extra filter capacitance by "piggybacking" 22uF 500V capacitors across C206 & C207 (X & Y supply filter caps). Trim the leads of one capacitor to approx. 1", bend, and solder to the leads of C206, matching polarity. It may be necessary to cut the wire ties from nearby wires and dress the wires away from the area in order to reach the capacitor leads with a soldering iron. Repeat for C207. When finished, replace any wire ties that were cut while installing the capacitors.



3. Change the supply at V2-B and V-3A from "Y+" to "X+". This can be done by cutting the trace between R26 and the via above it (This is the Y+ supply voltage). Then locate the via that is about 1.5" to the left of the trace you just cut (It is connected to R20, and carries the X+ supply voltage). Carefully scratch the solder mask from the top of the via and nearby trace so a good solder connection can be made. Solder an insulated wire jumper from this via to the top of R26. The jumper wire can be inserted into the via while it is being soldered.



4. Replace chassis: Slide chassis into cabinet from the back, being careful not to tear the foil shielding in the cabinet. Install 10 chassis mounting screws. Connect reverb cables and speaker cable to their proper positions. Attach upper back board with 4 screws. Attach power cord, and turn unit on to verify proper operation.