

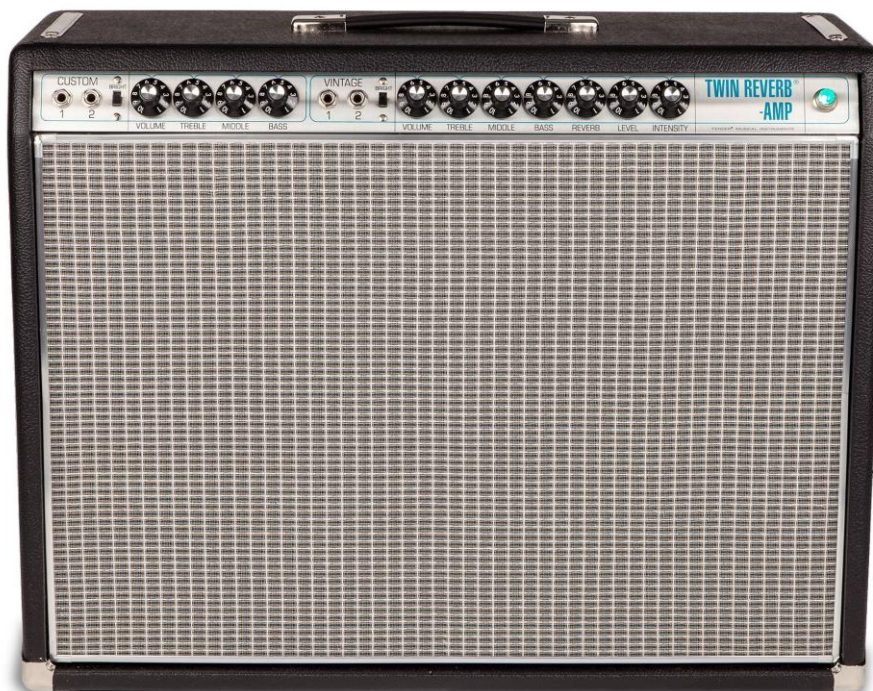


'68 Custom Twin[®] Reverb

(This is the model name for warranty claims)

p/n 277-3000-000 (120V)

SERVICE MANUAL



ATTENTION:

WARRANTY SERVICE PROCEDURES

The "68 Custom Twin[®] Reverb Amplifier is considered to be field serviceable to the component level. As such stuffed PCB Assemblies are not readily available. Any Fender Authorized Service Center in need of a warranty replacement PCB Assembly for this unit should contact the Fender Customer Service Call Center, and ask to speak to an Electronic Technician. You will be given instructions on how to proceed with the repair at that time. Contact the Call Center by phone at (866) 345-3642 or by email at service@fender.com.



IMPORTANT NOTICE

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specifications are subject to change without notice. This information and any copies produced electronically or otherwise must be surrendered upon demand of Fender[®] Musical Instruments Corporation.

• Parts marked with two asterisks (**) indicate the required use of that specific part. This is necessary for RELIABILITY and SAFETY requirements. **DO NOT USE A SUBSTITUTE!**

PARTS LIST CODES

The description codes used in the itemized Parts Lists are defined below:

CAPACITOR CODES

CAP AE = Aluminum Electrolytic
CAP CA = Ceramic Axial
CAP CD = Ceramic Disk
CAP CR = Ceramic Radial
CAP MPF = Metalized Polyester Film
CAP MY = Mylar
CAP PFF = Polyester Film/Foil

RESISTOR CODES

RES CC = Carbon Comp
RES CF = Carbon Film
RES FP = Flame Proof
RES MF = Metal Film
RES MOX = Metal Oxide
RES WW = Wire Wound

HARDWARE CODES

BLX = Black Oxide
CR = Chrome Plated
HWH = Hex Washer Head
M = Machine Screw
NI = Nickel Plated
OHP = Oval Head Phillips
PB = Particle Board
PHP = Pan Head Phillips
PHPS = Pan Head Phillips Sems
SMA = Sheet Metal "A" Point
SMB = Sheet Metal "B" Point
SS = Stainless Steel
TF = Thread Forming
ZI = Zinc Plated



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SPECIFICATIONS

Model Name:	68 Custom Twin Reverb	
Release Number:	PR 186	
Part Numbers	68 CUSTOM TWIN REVERB 120V	227-3000-000
	68 CUSTOM TWIN REVERB 110V TW	227-3001-000
	68 CUSTOM TWIN REVERB 240V AUS	227-3003-000
	68 CUSTOM TWIN REVERB 230V UK	227-3004-000
	68 CUSTOM TWIN REVERB 230V ARG	227-3005-000
	68 CUSTOM TWIN REVERB 230V EUR	227-3006-000
	68 CUSTOM TWIN REVERB 100V JP	227-3007-000
	68 CUSTOM TWIN REVERB 220V ROK	227-3009-000
Power Requirement:	360 W	
Fuses:	T4A, 250V for 100V versions T4A, 250V for 120V versions T2A, 250V for 230V versions T2A, 250V for 240V versions	
Input Sensitivity:		
Input 1 High Level	10 mV – volume at maximum for 85 watts power. Tone controls centered.	
Input 2 Low Level	20 mV – volume at maximum for 85 watts power. Tone controls centered.	
Power Output:	85W RMS into 4 ohms @ < 5%THD, 1000Hz	
Input Impedances	>1M Ohms	
Speaker Complement:	Two 12" , 8 ohm	
Dimensions	Height: 19.87 in	(50.5 cm)
	Width: 26.5 in	(67.3 cm)
	Depth: 10.5 in	(26.7 cm)
Weight:	64 lbs (19.05 kg)	

Product specifications are subject to change without notice



SERVICE NOTES

CHASSIS REMOVAL is accomplished by first removing the upper rear panel (remove the four (4) screws securing the rear upper panel to the cabinet). Unplug the white and red plugs from the Reverb cable/jack connections under the chassis. Next unplug the speaker cable from the rear panel. Remove the wood screw from the plastic clamp that secures the power cord to the side of the cabinet. Then remove the three wood screws that secure

the rear lip of the chassis to the cabinet. Now remove the two screws (4 total) screws on the left and right nickel plated chassis straps on the cabinet top. Pull the screws completely out of the cabinet. The chassis can now slide out to the rear, giving access to the electronics. This chassis is heavy, so make sure it is well supported during its removal from the cabinet.

PCB EXCHANGE POLICY

Parts marked with a single asterisk (*) in the Part Lists are not field replaceable. If a failure due to one of these components is detected, please con-

tact the FMIC Customer Service Department to order the complete PCB Assembly.

CIRCUIT DESCRIPTION

This section provides concise information about new or unusual circuitry designs incorporated into this amplifier model. The purpose is to aid the service technician by providing insight into the design areas most likely to become obstacles in troubleshooting. Information is focused for its effective use while maintaining the security of Fender[®] proprietary information wherever possible.

PRE-AMPLIFIER/REVERB

The preamplifier is configured in two parallel sections – the Custom channel preamp & the Vintage channel preamp.

For the Custom channel, the guitar signal is input to J1 for high gain and J2 for lower gain. When both inputs are used in a single channel, both signals receive low gain. V1-A provides a single gain stage that drives the tone stack. The Vintage channel tone stack is composed of R7, R8, and R9 and associated components to provide the treble, bass, and mid tone controls respectively. R10 provides volume control. V1-B recovers gain lost in the tone stack.

For the Vintage channel, the guitar signal is input to J3 for high gain and J4 for lower gain. When both

inputs are used in a single channel, both signals receive low gain. V2-A provides a single gain stage that drives the tone stack. The tone stack composed of R18, R19 and R20 and associated components provide treble, bass, and mid tone controls respectively. R21 provides volume control. V2-B recovers gain lost in the tone stack.

The plates of V1-B and V2-B are tied in common. This configuration allows both channels to utilize the Reverb effect.

The output from V1-B & V2-B are fed via C12, to the REVERB drive amplifier V3, thereby creating a high pass response. The REVERB pan is driven by impedance matching transformer T1. The output of the spring reverb signal is recovered and amplified by V4-A. The V1-B's & V2-B's output signal also couples to the V4-B intermediate gain stage. This is the dry signal which mixes with the wet Reverb signal at the grid of V4-B.

TREMELO

V5-A is an R-C phase shift oscillator configured in a classic vintage tube configuration. The oscillator rate is controlled by SPEED control R56 in the first



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leg of the phase shift feedback network. The rate varies from approximately 0.5 Hz to 5 Hz. V5-B isolates & amplifies the oscillator output. V5-B drives either 1) the OP1 LDR opto-coupler assembly (for all non-European models), or 2) the RoHS-approved LDR replacement PCB Assy (for European models). This circuit modulates the input impedance of the non-inverting input of the tube power amp. The modulating level is adjusted with the INTENSITY control R64. This impedance modulation effectively varies the input level that drives the power amplifier.

POWER AMPLIFIER

Phase splitter V6-A&B is configured in a differential long tailed pair topology with V4-B driving the non-inverting input and the feedback from the speaker output attached to the inverting input for sensing. Output from the V6-A drives the upper pair of 6L6 power amp tubes: V7 & V8. Output from the V6-B drives the lower pair of 6L6 power amp tubes: V9 & V10. The upper and lower pair of 6L6s act as a push-pull quartet in the '68 Custom Twin's tube

class A-B power amplifier. T2 matches the 6L6 plate impedances to the 4 Ohm speaker load

POWER SUPPLY

The line voltage is fed to T3's primary through the line fuse, F1, and the inrush current limiter, TH1. The red secondary output is full-wave rectified by dual vacuum tube diode V9 and filtered to produce the 415V (B+), 406V (Z), 324V (Y), and 270V (X) DC supply voltages for the power and preamp tubes.

A 6.3VAC secondary (green) powers the power indicator lamp and the preamp & power amp tubes' heaters.

The rectifier diode filament is supplied by a separate 5.4 VAC secondary winding (yellow).

Negative bias for the output tubes is supplied by the solid state half-wave rectifier CR1, a resistive divider circuit (R69, R58 and R59), and two filter capacitors (C36 & C29). R58 are used to adjust the output tube stage bias voltage to nominally set the V7 & V8 idle currents at 24 mA for each.



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PARTS LIST:		PCB ASSEMBLY	
QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
3	0027413000	HEADER 6 CKT.	P1-3
2	0037596000	CONTROL 1M 30A	R10,21
2	0037597000	CONTROL 250K 30A	R7,18
2	0037598000	CONTROL 10K 10A	R9,20
2	0037599000	CONTROL 250K 10A	R8,19
1	0037600000	CONTROL 100KB	R29
1	0037601000	CONTROL 3M 10C	R56
1	0037602000	CONTROL 50K 30C	R64
1	0025933000	JACK PHONO DUAL	J8
4	0037117000	JACK PHONO MONO	J1-4
1	0037836000	OPTOISOLATOR ASSY.	OP1 – FOR NON-EUR & UK UNITS
1	0028503000	**THERMISTOR	TH1
2	REF	JUMPER WIRE 22GA (.800)	JP1 (@ C29), JP2
16	REF	JUMPER WIRE 22GA (.500)	W1, W3-W17
4	0026730000	DIODE 800PRV 1A	CR1-4
1	0064089000	DIODE 200PRV 1A	CR5
1	0037664000	RES FP 1K 1W 5%	R67
1	0036469000	RES FP 4.7K 1W 5%	R68
1	0027350000	RES CF 22K 1W 5%	R36
1	0037619000	RES CF 82K 1W 5%	R42
1	0027353000	RES CF 100K 1W 5%	R43
1	0027347000	RES CF 2.2K 1W 5%	R25
1	0037665000	RES CF 27K 1/2W 5%	R72
8	0025116000	RES CF 100K 1/2W 5%	R4,11,15,22,28,33,61,62
3	0025117000	RES CF 220K 1/2W 5%	R54,65,66
1	0024996000	RES CF 82K 1/4W 5%	R74
1	0024981000	RES CF 10K 1/4W 5%	R75
1	0025060000	RES CF 270K 1/4W 5%	R76
7	0025069000	RES CF 1M 1/4W 5%	R3,14,24,37,38,57,58
1	0024937000	RES CF 10W 1/4W 5%	R73
4	0024995000	RES CF 68K 1/4W 5%	R1,2,12,13
1	0029613000	RES CF 91K 1/4W 5%	R55
2	0024969000	RES CF 1.5K 1/4W 5%	R5,16
2	0024997000	RES CF 100K 1/4W 5%	R6,17
1	0025957000	RES CF 47W 1/4W 5%	R40
1	0025074001	RES CF 1.8M 1/4W 5%	R59
1	0024972000	RES CF 2.7K 1/4W 5%	R60
5	0025059000	RES CF 220K 1/4W 5%	R26,31,35,44,45
1	0025077000	RES CF 3.3M 1/4W 5%	R32
1	0025063000	RES CF 390K 1/4W 5%	R30
1	0024961000	RES CF 470W 1/4W 5%	R41
3	0024964000	RES CF 820W 1/4W 5%	R23,27,39
1	0025084000	RES CF 10M 1/4W 5%	R63

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shaded Unique Fender® part. Order directly from the FMIC Parts Department.

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PARTS LIST:		PCB ASSEMBLY	
QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	0024986000	RES CF 18K 1/4W 5%	W2
1	009512000	CAP AE 22/25	C14
2	0013638000	CAP AE 220/285	C30,31
3	0024819000	CAP AE 22/500	C32-34
1	0031040000	CAP RE 100/100	C35
6	0028467000	CAP RE 22/50	C1,6,11,15,27,28
1	0036954000	CAP RE 22/63	C36
1	0031069000	CAP RE 10/100	C37
1	0024853000	CAP RF .1/250	C21
1	0037666000	CAP RF .001/400	C20
2	0024823000	CAP RF .01/400	C25,26
3	0024833000	CAP RF .022/400	C4,12,24
1	0024845000	CAP RF .047/400	C9
3	0024854000	CAP RF .1/400	C3,8,19
1	0037040000	CAP RF .0033/400	C16
2	0024855000	CAP RF .1/630	C22,23
1	0024835000	CAP RF .022/630	C40
1	0017620000	CAP CD 1500/1KV	C39
1	0020883000	CAP CD 10/1KV	C17
2	0020925000	CAP CD 120/1KV	C5,10
2	0020917000	CAP CD 250/1KV	C2,7
1	0020842000	CAP CD 500/1KV	C13
7	0051406003	CAP CD 220/500V	C38, C45-C50
4	0025995002	CAP CD 8200pF 1KV 20%	C41-44
2	0020775000	**FUSE CLIP PCB 5mm	XF2
15	0026000000	FASTON .187	CP17-31
18	0025802000	FASTON .250	CP1-4,7-16,33,34,36,37

PARTS LIST:		CHASSIS ASSEMBLY	
QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	0013688000	**FUSE TD 20x5mm 250v 10A	XF2 ON MAIN PCBA, FILAMENT FUSE
1	0013737000	**FUSE TD 1-1/4x1/4 250v 4A	MAINS FUSE - 100V & 120V
1	0013115000	**FUSE QA 20mmx5mm 250v 2A	MAINS FUSE - 220V - 240V
1	0036702000	**FUSE HOLDER 3AG FINGER GRIP	DOMESTIC MAINS FUSE HOLDER
1	0036703000	**FUSE HOLDER 5MM FINGER GRIP	EXPORT MAINS FUSE HOLDER
7	0016352000	NUT HEX 3/8-32x3/32 TK NI	@ FRONT & REAR JACKS
4	0016473000	SCRW M 8-32x1/2 PHP ZI)	SECURES OUTPUT XFMR
7	0018022000	BUSHING SNAP 5/16x17/32 BLK	PROTECTS WIRING EGRESS
1	0021550000	JACK PHONE TIP SHUNT 12A	INTERNAL SPKR JACK
1	0021956000	JACK PHONE OPEN CIRCT 11	EXTERNAL SPEAKER JACK
1	0055033000	JEWEL PILOT LITE BLUE #20	
1	0021642000	PILOT LIGHT #T47	
1	0032219000	COLLAR-PILOT LIGHT	

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PARTS LIST: CHASSIS ASSEMBLY			
QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	0021741000	HOLDER IDAL LITE ASSY PILOT	
1	0031625000	NUT HOLDER PILOT LIGHT 11/16-27	
8	0022004000	NUT KEPS #8-32 ZINC	POWER & OUTPUT XFMRs
1	0022491000	CLAMP CABLE NYL SCRW MNT 5/16	WIRING FROM FILTER CAP CAN
4	0020424000	**TUBE RING UNIVERSAL (277H-2)	V7-V10
4	0023580000	TUBE SCKT 8 PN	V7-V10
6	0023598000	**TUBE SHIELD	V1-V6
6	0023606000	TUBE SOCKET 9 PIN	V1-V6
11	0024604000	Knob blk w/wht stamp 1-10	CONTROLS ON FRONT PANEL
4	0024969001	RES CF 1/4W 1.5k 5%	V7-V9 - @ CONTROL GRIDS
4	0036468001	RES MOX FP 1W 470 OHM LL	V7-V9 - @ SCREEN GRIDS
10	0025936000	STANDOFF NYL PCB SNAP 3/8	FOR MAIN PCB MOUNTING
1	0026038000	**BUSHING SR .625x.062x37/64 BLK	FOR DOMESTIC POWER CORD
1	0010401000	**BUSHING SR .625x.125x37/64	FOR EXPORT POWER CORD
1	0026541000	**CORD PWR ASSY W/.250 TAB 120V	DOMESTIC (US/MX/CDN) A CORD
1	0033331000	**CABLE ASSY PWR 220/240v	EUR POWER CORD
1	0038602000	**CABLE ASSY PWR AUST .250 TAB	AUS POWER CORD
1	0048463000	**CABLE ASSY PWR .250 100v	JPN POWER CORD
1	0040993000	**CABLE ASSY PWR 5A U.K.250 TAB	UK POWER CORD
4	0027979000	SCRW M 4-40x1/4 PH BH NI .23HD	
1	0028421000	CONTROL 100 OHM	HUM BALANCE CONTROL
1	0027887000	LUG SOLDER 3/8	GND FOR HUM BALANCE CONTROL
14	0028937000	SCRW TF 6-32x5/8 PHP ZI	
1	0032806000	SCRW TF 6-32x1/4 PHP BLX	
1	0036570000	**SWITCH TOGGLE DPST W/NUTS	POWER SWITCH
1	0037039000	**SWITCH TOGGLE SPST W/NUTS	STANDBY SWITCH
2	0057161000	**BOOT TOGGLE SWITCH GREY .844 H	COVERS PWR & STBY SWITCHES
1	0037610000	**XFMR PWR 65 TWIN 120V KANBAN	T3, UNDER CHASSIS, DOMESTIC
1	0049181000	**XFMR PWR 65 TWIN NEMKO KANBAN	T3, UNDER CHASSIS, EXPORT USE
1	0037612000	**XFMR OUTPUT 65 TWIN KANBAN	T2, INSTALLED UNDER CHASSIS
1	0037099000	**XFMR REVERB VIBROVERB/65 DLX	T1, INSTALLED UNDER CHASSIS
1	0036486000	**CHOKE RE-ISSUE TUBE AMPS	L1, INSTALLED UNDER CHASSIS
1	0037783000	STANDOFF NYL PCB SNAP 1/4" NAT	FILTER CAP SUBASSY
1	0098971000	*PANEL FRONT 68 TWIN	
1	0037854000	**COVER CAPACITOR 65 TWIN	INSTALLED UNDER CHASSIS
31	0038900000	SCRW TF 6-32X1/4 PHP ZI	
1	0099856000	*PCB ASSY 68 TWIN 100/120/240	ALL REGIONS EXCEPT EUR & UK
1	0099857000	*PCB ASSY 68 TWIN 230V EUR/UK	NO OP1 INSTALLED EUR & UK ONLY
1	0056934000	**FISH PAPER BARRIER SUPER RVRB	SURROUNDS REAR PANEL JACKS
1	9904101560	SCREW 6x3/8 HI-LO PHP BLX	SECURES REVERB JACK SUB ASSY
4	9904300100	WASHER LCK INTL 3/8x.681x.032	REAR PNL JACKS & BIAS CONTROL
1	0074184000	*PCB ASSY TREMOLO POWER SUPPLY	FOR EUR & UK UNITS ONLY
1	0073578000	*PCB ASSY SOLID STATE TREMOLO	FOR EUR & UK UNITS ONLY
1	0039367000	SCRW M6-32X3/8 PHP SS INTLWSHR	EU & UK ONLY TREMOLO PCB ASSY

* Non-serviceable part. Replace complete parent assembly. See PCB EXCHANGE POLICY section above.

shaded Unique Fender® part. Order directly from the FMIC Parts Department.

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PARTS LIST: CHASSIS ASSEMBLY			
QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
6	0024981001	RES CF 1/4W 10k 5%	V1, V2, V4, - AT GRIDS

PARTS LIST: CABINET ASSEMBLY			
QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	0098988000	*CAB ASSY 68 TWIN	
1	0098988001	*CAB ASSY 68 TWIN GRILLE/BAFFLE ASSY	
1	0098988002	*CAB ASSY 68 TWIN UPPER BACK	
1	0098988003	*CAB ASSY 68 TWIN LOWER BACK	
1	0011678000	SCRW SMA 8x1-1/2 OHP BLX	SECURES GRILLE ASSY TO CLEATS
1	0021972000	NUT T 10-32x3/4 STR 3 PRNG BLX	SECURES HANDLE
2	0022244000	SCRW M 10-32x1-1/8 OHP NI	SECURES HANDLE
4	0022483000	GLIDE CUSHION RUBBER BLACK	
4	0024653000	GLIDE CABINET NICKEL PLATED	
4	0026566000	CORNER 2 HOLE W/TAB NI	
1	0037790000	HANDLE BLACK RIBBED 9.25"	
1	0032524000	HANDLE REINFORCEMENT STEEL	
1	0025395000	HANDLE CAP 1 HOLE NI (DWG17420)	
1	0026570000	TOLEX "BRAVURA BLACK" BRONCO	
4	0026625000	SCRW WOOD 8x1 FH	
5	0029527000	WSHR FNSH 8-5/8 FLNGD BLX WX	SECURES GRILLE ASSY TO CLEATS
8	0037543000	SCRW SMAB 8x3/4 OHPNI	
.6	0098990000	*CLOTH GRILLE BLACK/SILVER/BLUE	
1	0098988001	*GRILLE BAFFLE ASSY, 68 TWIN	
8	0021972000	NUT T 10-32x3/4 STR 3 PRNG BLX	SECURES SPEAKER

PARTS LIST: END ITEM ASSEMBLY			
QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	0012582000	CLAMP CABLE NYL SCRW MNT 1/4	FOR REVERB CABLE
2	0021998000	NUT FLEX LOCK 10-32 W/NYLON IN	FOR TILT-BACK LEGS
8	0047821000	SCRW M 10-32 3/4 THP STL BLX	SECURES SPEAKER
2	0022277000	SCRW M 10-32x1-1/2 OHP NI	SECURES TILT BACK LEG
2	0022285000	WSHR SP LOCK 1/4x.493 ZI	FOR TILT BACK LEG INSTALL
6	0022319000	WSHR FLAT 1/4x9/16 NI	FOR TILT BACK LEG INSTALL
2	0022327000	WSHR FLAT 8x7/16 NI	
1	0022491000	CLAMP CABLE NYL SCRW MNT 5/16	POWER CORD TO CABINET
1	0023192000	*NAMEPLATE FNDR 65 TWIN	
3	0037985000	SCRW SMA 2x3/8 PHP BLX	SECURES NAMEPLATE
2	0024646000	WASHER LEG STOP TN	
2	0024752000	STRAP CHASSIS 4-1/2" NICKEL	SECURES CHASSIS
4	0022236000	SCRW M 8-32x3-1/4 OHP NI CP	SECURES CHASSIS WITH STRAPS
2	0024828000	LEG AMP TILT 16"	

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PARTS LIST:		END ITEM ASSEMBLY	
QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
8	0029828000	SCRW PB 8x3/4 PHP ZI	VARIOUS PLACES
2	0031344000	SCRW SMA 10x3/4 OHP NI	SECURES WASHER LEG STOP
1	0037211000	FTSW 2BTN VIB/REV ASSY	COMPLETE FOOTSWITCH ASSY
1	0064063000	REVERB UNIT 4 SPRING 4AB3C1B	
1	0025722000	CABLE REVERB 1100mm	FOR DOMESTIC REVERB INSTALL
1	0059849000	CABLE REVERB 1300mm	NON-DOMESTIC REVERB (FERRITE)
1	0031849000	REVERB BAG	
1	0028453000	PAD CARDBOARD REVERB #12FN86	
8	0037952000	SCRW SMA #6x1 OHP NI	SECURES CABINET REAR PANELS
8	0037215000	WSHR C/SUNK NICKEL #6	SECURES CABINET REAR PANELS
2	7700343000	SPKR 12" 8ohm 70W T5901AX60	
1	0038566000	CABLE ASSY SPKR RT ANG 13-1/2"	
1	0049055000	**COVER TUBE 65 TWIN	MOUNT ON UPPER REAR PANEL
2	0025819000	NUT KEPS 10-32 ZINC	SECURES COVER TUBE
2	0025743000	SCRW M 10-32x1/2 PHP BLX	SECURES COVER TUBE
1	0059848000	**FERRITE CORE EMI SUPRES 80 OHM	FOR NON-DOMESTIC UNITS – EMC

PARTS LIST:		FOOTSWITCH ASSY	
QTY	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	0994058000	FOOTSWITCH ASSEMBLY 2 BTN VIB/REV	COMPLETE FOOTSWITCH ASSY
1	0013172000	PLUG PHONE 3 CONDUCTOR 238 RA	
2	0024042000	SWITCH SPST PUSH BUTTON	

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** Safety Requirement part. Replacement must match Safety Agency...–Value, if specified –Type, if specified –Approval Mark(s) if on part.

*shaded + *** Both a unique Fender[®] part and a Safety Requirement part as defined above.



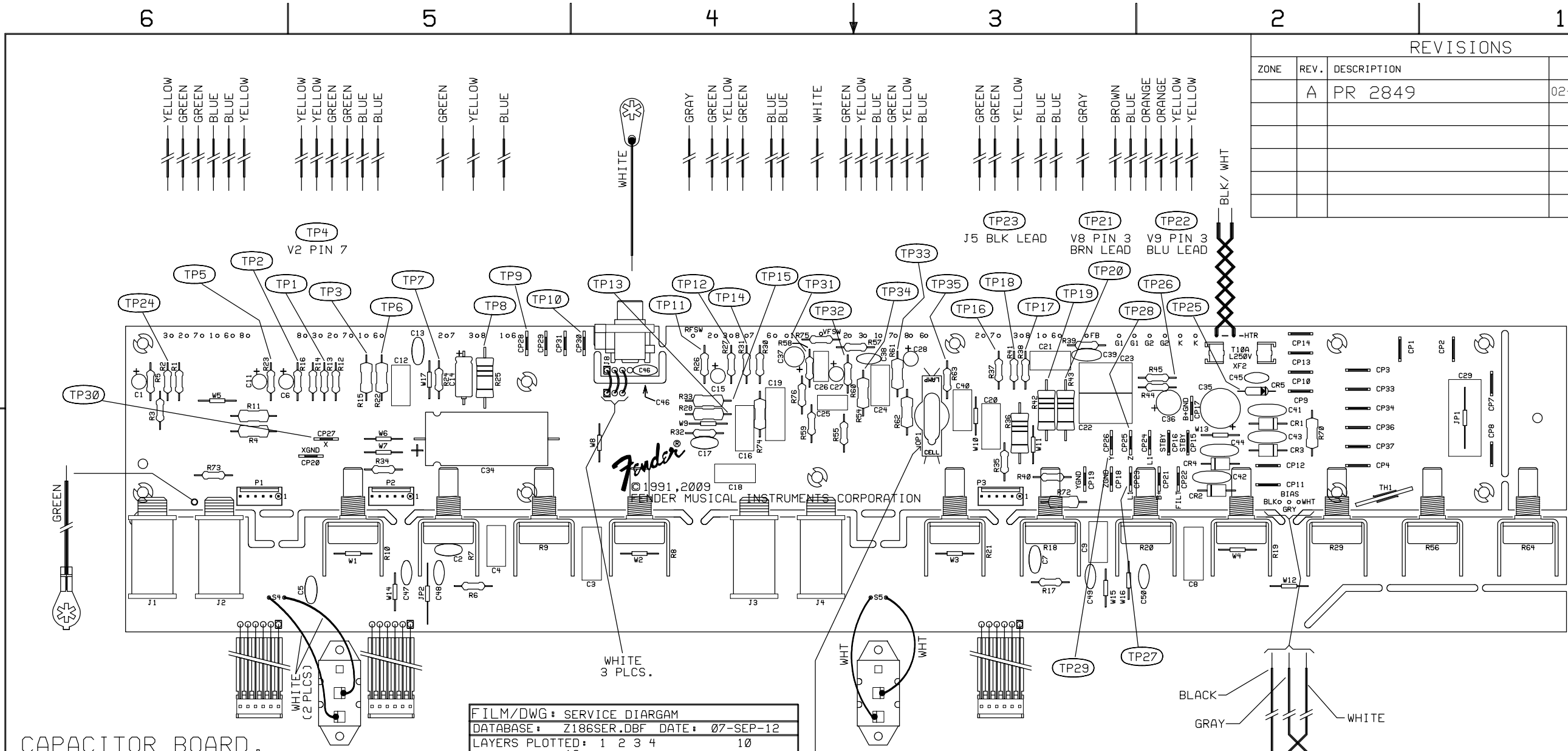
'68 Custom Twin[®] Reverb

(This is the model name for warranty claims)

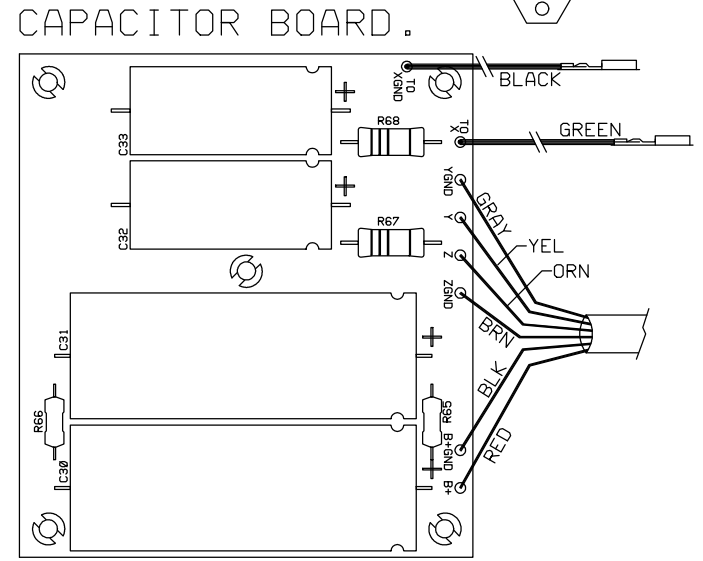
Service Diagram List

Service Diagram (Schematic).....	'68 CUSTOM TWIN [®] REVERB PCB
Service Diagram (PCB Assembly).....	'68 CUSTOM TWIN [®] REVERB PCB
Solid State Tremolo (Schematic-Export Only).....	'68 CUSTOM TWIN [®] REVERB PCB
Solid State Tremolo Power Supply (Schematic-Export Only)....	'68 CUSTOM TWIN [®] REVERB PCB

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	PR 2849	02-AUG-13	



FILM/DWG: SERVICE DIAGRAM
 DATABASE: Z186SER.DBF DATE: 07-SEP-12
 LAYERS PLOTTED: 1 2 3 4 10 18

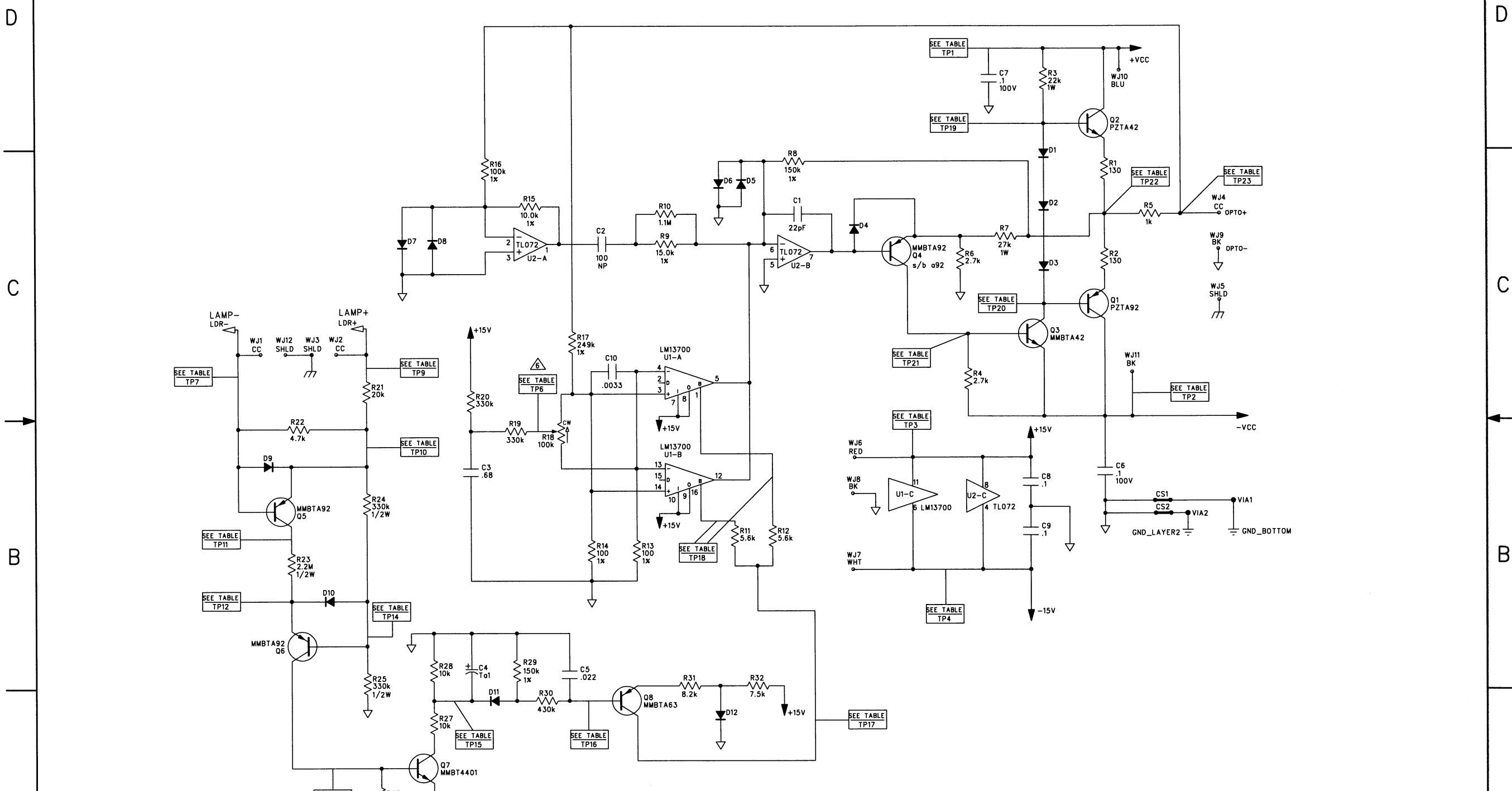


NOTES:
 1.) PCB SHOWN AS FABRICATED, EXCEPT WITH CAPACITOR BREAK-AWAY BOARD SEPARATED.
 2) OP1 IS NOT INSTALLED ON EUROPEAN AND UK AMPS. REF. DRAWINGS 0073578000 AND 0073575000 FOR ADDED CKT ASSEMBLIES. REF. DRAWING 0073581000 FOR WIRING.

DATABASE FILE: Z2849SER.PDF		PROPRIETARY	
CHECKED BY:		THIS DRAWING DOCUMENT CONTAINS INFORMATION WHICH IS PROPRIETARY TO AND IS THE PROPERTY OF THE FENDER MUSICAL INSTRUMENTS CO. AND MAY NOT BE USED, REPRODUCED OR DISCLOSED IN ANY MANNER WITHOUT THE EXPRESSED WRITTEN CONSENT FROM FENDER MUSICAL INSTRUMENTS CO. CORONA, CA U.S.A. STILL GLOWING...	
DATE:		TITLE: SERVICE DIAGRAM, COMBINED '68 CUSTOM TWIN REVERB AMPLIFIER	
APPROVED:		SIZE: B	DRAWN: HAYDEN
DATE:		ENGR: GIT'LO	DRAWING NUMBER: 7701463000
TOLERANCES: UNLESS OTHERWISE NOTED		NEXT HIGHER ASSEMBLY: 68 CUSTOM TWIN REVERB AMPLIFIER	
X.X	±0.050"	SCALE: NONE	CREATED: 31-JUL-13
X.XX	±0.010"		PLOTTED: 02-AUG-13
X.XXX	±0.005"		SHEET 3 OF 3
ANGLES	±0.500°		

Fender MUSICAL INSTRUMENTS
 Corona, CA U.S.A.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	EC3718	15-DEC-06	S M M

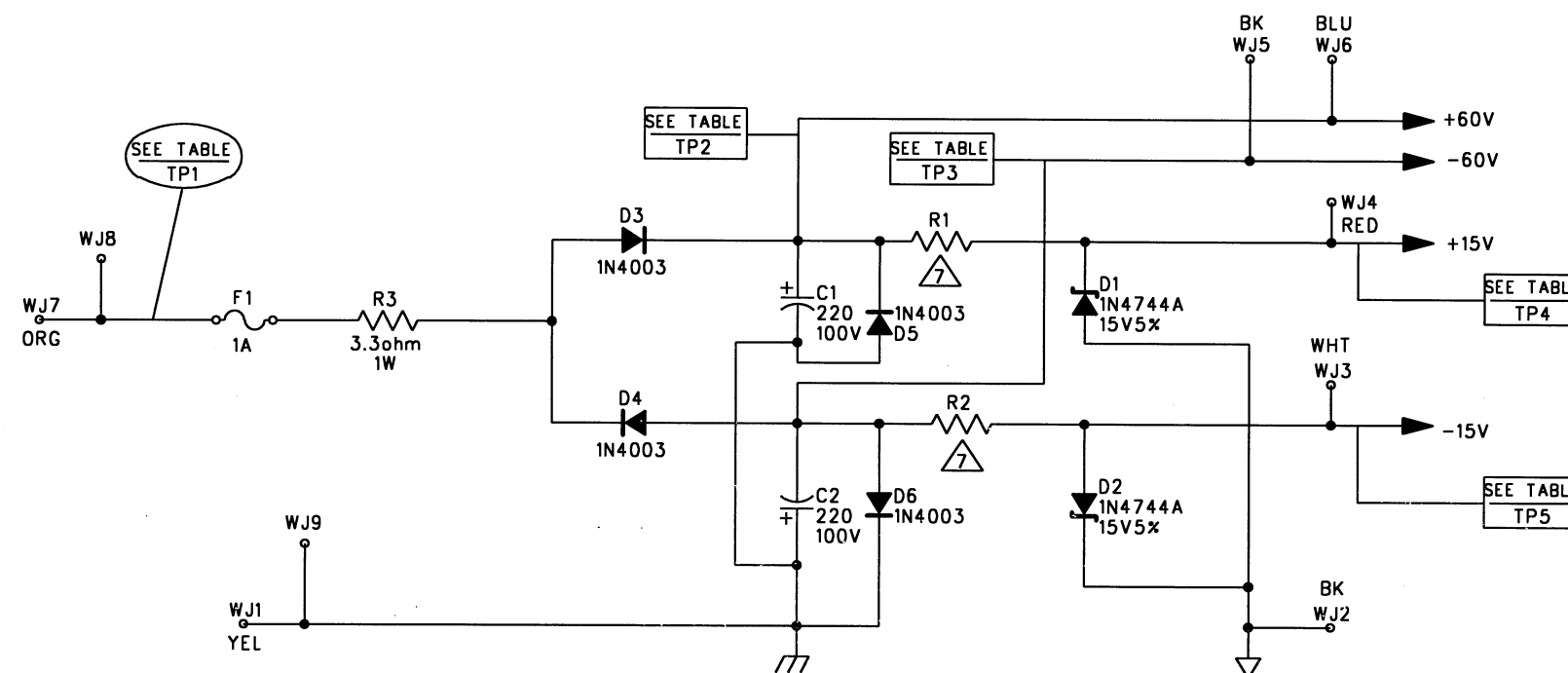


- 8. SEE SHEET2 FOR TEST POINT VALUES.
 - 7. MEASUREMENTS TO BE PERFORMED AT RATED LINE (230V/50HZ) WITH NO SIGNAL INPUT & VIBRATO DISABLED. PERFORM MEASUREMENTS WITH THIS ASSEMBLY IN THE FINAL PRODUCT. REFERENCE VOLTMETER TO CHASSIS.
 - △ ADJUST R18 TO REMOVE AUDIBLE TREMOLO PULSING WHEN NO SIGNAL IS PRESENT.
 - 5. THIS SCHEMATIC IS FOR PCB FABRICATION P/N 0073580000 AND PCB ASSEMBLY P/N 0073578000.
 - 4. ALL DIODES ARE 1N4448.
 - 3. ALL POLARIZED CAPACITORS IN μ F, 20%; 50V MINIMUM.
 - 2. ALL UNPOLARIZED CAPACITORS IN μ F, 10% OR BETTER; 50V MINIMUM. (POWER SUPPLY BYPASS CAPACITORS ARE 20%).
 - 1. ALL RESISTORS IN OHMS, 5%; 1/4W.
- NOTES: (UNLESS OTHERWISE NOTED)

THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO FENDER MUSICAL INSTRUMENTS AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED OR TRANSMITTED TO OTHERS WITHOUT AUTHORIZATION FROM FENDER MUSICAL INSTRUMENTS.		MUSICAL INSTRUMENTS Corona, CA U.S.A.		
CHECKED BY: <i>M. Miller</i> DATE: <i>12/18/2006</i>				TITLE: SERVICE DIAGRAM, COMBINED (schematic) TREMOLO LDR REPLACEMENT TREMOLO PCB
APPROVED BY: <i>M. Marshall</i> DATE: <i>12/18/06</i>		SIZE C	DRAWING NUMBER 0073579000	REV. A
DRAWN: GIT'LO ENGR: GIT'LO		RELEASE DATE: 15-DEC-06 SHEET: 1 OF 3		
DATABASE FILE: E3718S1.SCH				

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED
B	EC3717	23-JAN-07	S M M



MODEL	TP1	TP2	TP3	TP4	TP5
65 TWIN REVERB	50 Vrms	+65.8 Vdc	-65.7 Vdc	+15.5 Vdc	-15.9 Vdc
65 DELUXE REVERB	37 Vrms	+48.3 Vdc	-48.3 Vdc	+15.2 Vdc	-15.4 Vdc
65 SUPER REVERB					
CUSTOM VIBROVERB					
CUSTOM VIBRO-KING					

- 7. R1 & R2 VALUE FOR PCB ASSY 0073575000 is 1.5k/5W.
R1 & R2 VALUE FOR PCB ASSY 0074184000 IS 3.3k/5W.
- 6. ALL TEST VOLTAGES TAKEN WITH VOLTMETER REFERENCED TO THE CHASSIS. NO AC SIGNALS APPLIED TO INPUT. VIBRATO IS OFF. AC LINE SET TO 230V, 50HZ.
- 5. THIS SCHEMATIC IS FOR PCB FABRICATION P/N 0073577000 AND PCB ASSEMBLIES P/N 0073575000 & 0074184000.
- 4. ALL DIODES ARE 1N4448.
- 3. ALL POLARIZED CAPACITORS IN μ F, 20%; 50V MINIMUM.
- 2. ALL UNPOLARIZED CAPACITORS IN μ F, 10% OR BETTER; 50V MINIMUM. (POWER SUPPLY BYPASS CAPACITORS ARE 20%).
- 1. ALL RESISTORS IN OHMS, 5%; 1/4W.

NOTES: (UNLESS OTHERWISE NOTED)

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Fender MUSICAL INSTRUMENTS
Corona, CA U.S.A.

CHECKED BY: GIF
DATE: 2/2/07

TITLE: SERVICE DIAGRAM, COMBINED (schematic)
TREMOLLO POWER

APPROVED BY: [Signature]
DATE: 2/2/07

SIZE	DRAWING NUMBER	REV.
B	0073576000	B

DRAWN: GIT'LO ENGR: GIT'LO
DATABASE FILE: E3717S2.SCH

RELEASE DATE: 18-DEC-06 SHEET: 1 OF 2