
Leslie® Speaker Model 825

GENERAL OPERATING AND MAINTENANCE INSTRUCTIONS



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Introduction

THE LESLIE MODEL 825 SPEAKER

The Model 825 is a powerful, single channel speaker equally effective with console or combo organs.

Several console connector kits are available for connecting console organs to the 825, and Leslie Combo Preamp II supplies the necessary amplification and connections for mating the 825 to a combo organ.

Foot switches on the Combo Preamp II control the speakers' Tremolo and Chorale functions. Dual inputs on the preamp allow an additional instrument—a guitar, for example—to be played through the 825 speaker. Volume controls at each of the dual inputs permit the two signals to be balanced before they are combined to enter the speaker.

The cabinet of the 825 is a rugged, one piece unit covered with black Levant leatherette. It is

completely portable, with its own castors and hand holds.

Inside the cabinet, a solid state amplifier and power supply drive the high efficiency 12" Jensen speaker to 70 watts power through the patented Leslie rotor. A belt links this rotor to the two-speed motor assembly to propel the rotor at fast tremolo speed, slow chorale speed, or brake the rotor to a stop, depending on the speaker control selected.

Switching the speaker control from tremolo to OFF activates the unique rotor braking circuit incorporated in the 825. This braking circuit will start the small motor of the two-speed motor assembly to brake the rotor to a stop in approximately four seconds. After this time elapses, the small motor shuts off automatically. (A complete explanation of the rotor braking circuit is included on page 9).

Figure 1 illustrates the organ signal's path after it enters the 825 speaker.

BLOCK DIAGRAM—MODEL 825 SPEAKER

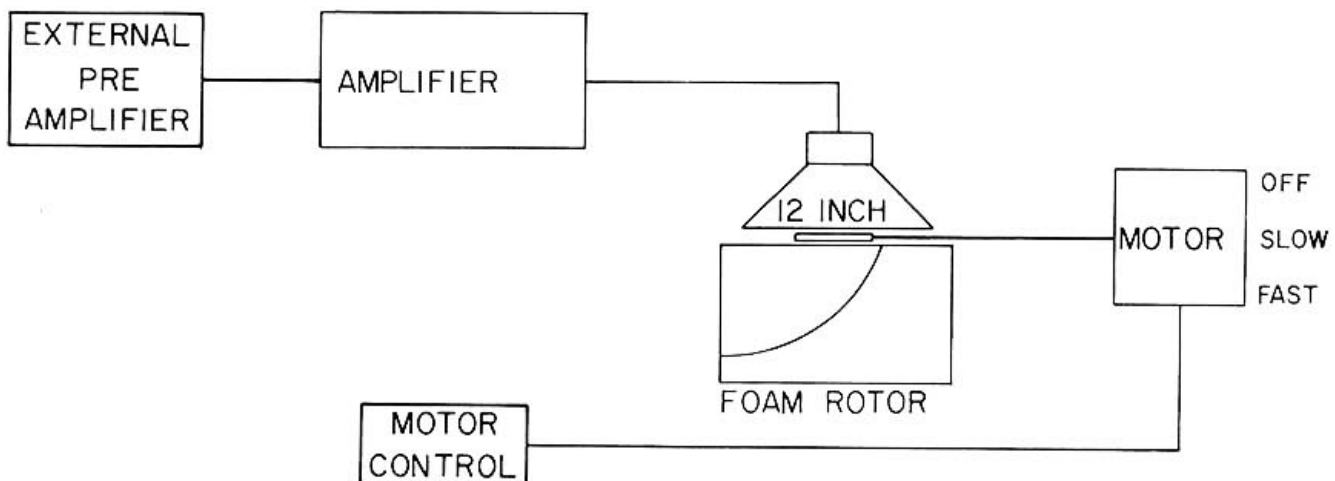


Fig. 1

SPECIFICATIONS

Cabinet Finish:	The cabinet is covered with Black Levant Leatherette with silver and black grill cloth over the speaker ports. Edge trim is of silver-gray molding.
Dimensions:	31¼" x 14⅞" x 18½"
Amplifier:	One channel solid state amplifier, 70 watts output.
Power Supply:	Solid state — available in 117 volt; 234/250 volt models.

Power Requirements: 117 Volt: 2.2 Amp.,
215 Watts
234/250 Volt: 1 Amp.,
215 Watts

Fuses: 117 Volt Model: 1.5 Amp.
"Slo-Blo" fuse
234/250 Volt Model:
1 Amp. "Slo-Blo" fuse

Weight: Boxed: 106 lbs.
Unboxed: 94 lbs.

Guarantee: The speaker is guaranteed against all defects in materials and workmanship for one year from date of purchase. This guarantee does not cover belts or speaker cones, which may wear out sooner due to severe use.

Operation

234/250 VOLT CONVERSION — See page 8 of this manual.

60/50 Hz CONVERSIONS — See Exploded View and Parts List, page 13 of this manual.

825 Volume Control Adjustment

1. Locate the volume control at the lower left-hand corner of the cabinet's back.
2. Play a chord with the instrument set at full volume.
3. Using a screwdriver, turn the 825 volume control clockwise until distortion is heard.
4. Turn volume control counter-clockwise until distortion disappears.

Console Connector Kits

These kits allow you to use the Leslie speaker with a wide variety of organs. Consult the Leslie Speaker Price List for your make organ to determine which console connector kit will be needed. **Installation:** See instructions packed with the console connector kit designed for your organ/speaker combination.

Console Connector Controls

CHORALE Position:

Model 825 speaker rotor revolves slowly for Chorale effect.

TREMOLO Position:

Model 825 speaker rotor spins rapidly for Tremolo effect.

OFF Position:

Small motor in two-speed motor assembly slows rotor to a complete stop within three to four seconds.

THE LESLIE COMBO PREAMP II (117 Volt Model: 044370, 234/250 Volt Model: 044388)

This unit serves as a console connector for combo type organs, supplying necessary signal preamplification as well as fast and slow rotor controls. An additional input allows the musician to connect another instrument — a guitar, for example — to the 825 speaker. Individual volume controls above each preamp input permit the two signals to be balanced before they are blended and channeled to the 825 speaker. Available through your Leslie Speaker dealer.

MULTIPLE SPEAKER INSTALLATION

When requirements of volume and sound distribution exceed what can be obtained from one Model 825, additional speakers should be used to maintain proper balance. Each additional speaker is connected to another speaker through a Leslie 021709 power relay. The power relay provides a source of AC power independent of the organ console for each additional cabinet. The added cabinet is controlled by the console Off/On Switch through the relay in the adapter.

Procedure

1. Connect the speaker end of the console connecting cable to the power relay.
2. Connect the power relay pigtail to the speaker.
3. Plug the connecting cable for additional speaker into the receptacle on the power relay.
4. Plug the line cord from the power relay into an AC outlet.

This procedure should be followed, using an additional power relay, for each speaker added to the system.

CONNECTING CABLE

The 9-conductor connecting cable is supplied in a standard 30-foot length, complete with plug and socket — designated Leslie Part Number 021600. If distances between console and speakers exceed 30 feet, two or more of these standard cables may be connected in series.

If a specific length of cable, other than 30 foot or a multiple of 30 feet is required, bulk cable and necessary plug and socket connectors specified in the parts list in this manual can be obtained through your Leslie Speaker dealer.

In attaching the connectors to the cable, the color coding should be followed exactly, with special care given to handling all connections involving AC. The sketch below shows the color coding.



SPECIAL USES

Broadcasting and Recording

When a Leslie Speaker is used in a broadcast or recording set-up, allowance must be made for the limitation of the microphone. The microphone will not pick up exactly the same sound and effects heard in the studio. The ideal set-up can only be accomplished by experiment. Here are a few general recommendations for recording and broadcasting:

1. Select a fairly "live" studio.
2. Play the organ at medium to full volume level.
3. Place the microphone ten to fifteen feet from the speaker.

Non-Organ Use of the Leslie Speaker

The Leslie Speaker is a high-quality product, designed expressly for use with electric organs and other musical instruments. The unique musical characteristics of this speaker are the result of electrical and acoustical properties very different from those in "high-fidelity" sound equipment. The speaker will function satisfactorily only in its intended use as a musical instrument, and no other applications are recommended.

MOVING THE 825

The Model 825 is provided with casters and may easily be rolled from place to place.

The 825 speaker cabinet may be carried easily by two persons — one using the rear handgrips with the other gripping the cabinet at the bottom edge.

Service

ORDERING PARTS

Standard hardware, connectors, and electronic components may be obtained locally. Non-standard items can be obtained through a Leslie Speaker dealer. Orders should include part numbers provided on the parts lists in this manual. Model and serial numbers would be helpful.

PREVENTIVE MAINTENANCE

The Leslie Speaker is carefully engineered for durability and maximum service. Except for lubrication and periodic belt tension checks, the Leslie Speaker requires little attention.

CAUTION: Keep hands and tools away from the spinning parts when adjustments are made inside the cabinet. The rotor's momentum could cause personal injury or damage the Leslie components.

MOTOR LUBRICATION

Usage, climate, and dust conditions determine motor lubricating requirements. In normal service, yearly oiling is usually sufficient. However, if the speaker is used several hours a day, more frequent lubrication may be necessary. Motors failing to start immediately may have dried up, dirt-clogged bearings.

To determine if oiling is necessary, press a clean, dry screwdriver against the felt pads around the motor bearings (two in each motor).

If oil is transferred to the screwdriver, the **bearings should not be oiled**. Remember, over-oiling is just as detrimental to the motors as under-lubrication.

CHECKING ROTOR BELT ADJUSTMENT:

Although the rotor belt normally lasts several years, check it periodically for wearing or fraying. Worn-out belts cause noise and reduce rotor speed due to belt slippage. Replacement instructions are given on page 10 of this manual.

CHECKING LINE VOLTAGE

Line voltage lower than 100 volts (200 volts in 234 volt models) or higher than 130 volts (260 volts in 234 volt models) causes either distortion due to underpowered components or overheating due to excessive voltage. A voltage regulating device available at an electronic parts supply store will correct this problem. Power supply conversions to 234 volt or 250 volt line current are covered on page 8 of this manual.

CHECKING FUSES

The amplifier uses a 1.5 amp fuse for protection against overloads. (A one amp fuse is used in all 234 Volt/250 Volt 825 Speakers.) If a fuse blows, find the cause and eliminate it **before** replacing the fuse. Never use a replacement fuse rated higher than the recommended amperage.

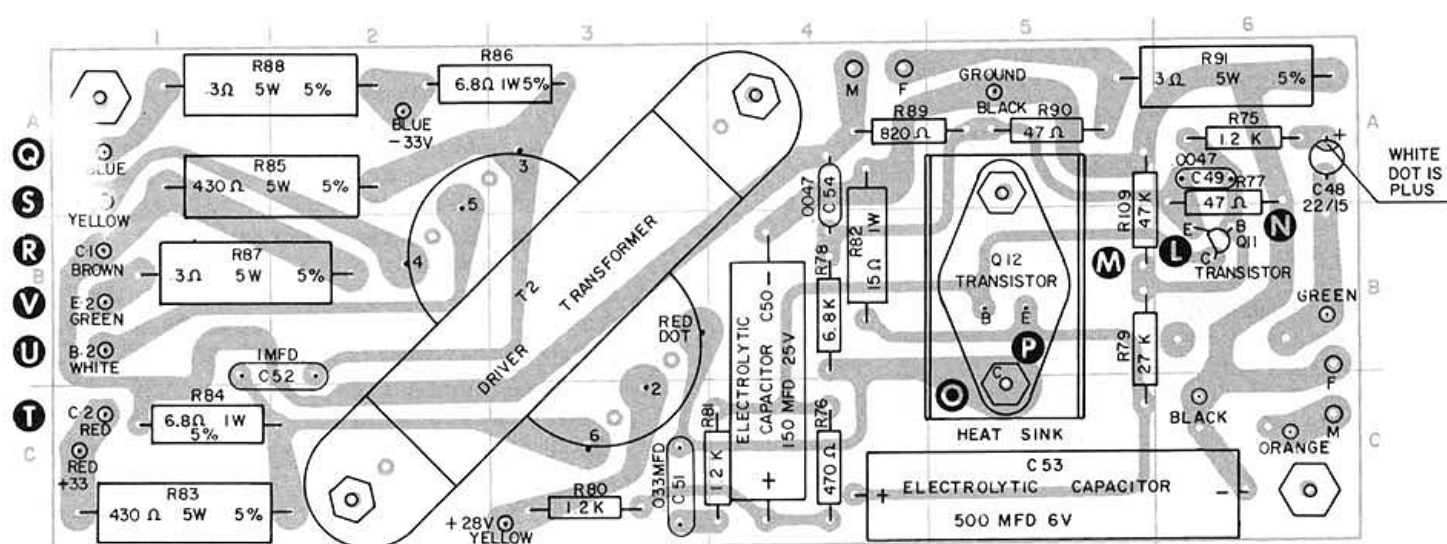


Fig. 2

PARTS LIST: 825 AMPLIFIER CIRCUIT BOARD ASSEMBLY (045773)

PART No.	LOCATION	DESCRIPTION	EMI No.
R75	A6	Resistor, 1.2 K Ohm, 1/2 Watt, 10%	018036
R76	C4	Resistor, 470 Ohm, 1/2 Watt, 10%	028068
R77	A6	Resistor, 47 Ohm, 1/2 Watt, 10%	016311
R78	B4	Resistor, 6.8K Ohm, 1/2 Watt, 10%	016501
R79	B5	Resistor, 27K Ohm, 1/2 Watt, 10%	020834
R80	C3	Resistor, 1.2K Ohm, 1/2 Watt, 10%	018036
R81	C4	Resistor, 1.2K Ohm, 1/2 Watt, 10%	018036
R82	B4	Resistor, 15 Ohm, 1 Watt, 10%	031823
R83	C1	Resistor, Wire Wound, 430 Ohm, 5 Watt, 5%	023648
R84	C1	Resistor, 6.8 Ohm, 1 Watt, 5%	055475
R85	A1,2	Resistor, Wire Wound, 430 Ohm, 5 Watt, 5%	023648
R86	A2	Resistor, 6.8 Ohm, 1 Watt, 5%	055475
R87	B1	Resistor, Wire Wound, 0.3 Ohm, 5 Watt, 5%	023218
R88	A1	Resistor, Wire Wound, 0.3 Ohm, 5 Watt, 5%	023218
R89	A4	Resistor, 820 Ohm, 1/2 Watt, 10%	028373
R90	A5	Resistor, 47 Ohm, 1/2 Watt, 10%	016311
R91	A6	Resistor, Wire Wound, 0.3 Ohm, 5 Watt, 5%	023218
R109	B5	Resistor, 47K Ohm, 1/2 Watt, 10%	028506
C48	B6	Capacitor, Tantalum, 22 Mfd, 15 V	062638
C49	A6	Capacitor, Disc, .0047 Mfd, 100 V, 10%	028431
C50	C4	Capacitor, Electrolytic, 150 Mfd, 25 V	031294
C51	C3	Capacitor, Mylar, .033 Mfd, 100 V, 10%	028654
C52	B2	Capacitor, Poly, 0.1 Mfd, 250 V, 20%	022251
C53	C5	Capacitor, Electrolytic, 500 Mfd, 6 V	028407
C54	A4	Capacitor, Disc, .0047 Mfd, 100 V, 10%	028431
Q11	B6	Transistor, MSPS 4382	026237
Q12	B5	Transistor, Driver 2N3054	023754
T2	B3	Transformer, Driver	023770

ELECTRICAL SERVICING AMPLIFIER

WARNING: Due to the possibility of shock and component damage, this unit should be serviced by a qualified Leslie Speaker repairman only.

AMPLIFIER CIRCUIT BOARD REMOVAL

1. Remove screws fastening heat sink to the cabinet. Pull heat sink off cabinet, but don't attempt complete removal yet.
2. Disconnect console connector plug from speaker.
3. Unplug Red/Black Input leads and Green/Black Output leads from their sockets on the amplifier circuit board. (See Fig. 2).
4. Unplug the amplifier power plug from its socket on the power supply circuit board. With a phillips screwdriver, remove the screw and clamp fastening amplifier power leads to the speaker cabinet.
5. Remove heat sink from the cabinet.
6. Unsolder the three volume control leads and the six output transistor leads from the transistor side of the amplifier circuit board. (See Fig. 2).
7. Remove four nuts fastening amplifier to the heat sink and remove the amplifier.

AMPLIFIER CIRCUIT BOARD REPLACEMENT:

Reverse removal procedure previously outlined. **NOTE:** Use Fig. 2 to verify correct reconnection of leads and power plugs to the amplifier circuit board.

AMPLIFIER DRIVER TRANSFORMER

DRIVER TRANSFORMER REMOVAL:

WARNING: Due to the possibility of shock and component damage, this unit should be serviced by a qualified Leslie Speaker repairman only.

1. Remove the heat sink from cabinet. Be careful. Heat sink is connected to the power supply by amplifier's power cable. Remove heat sink completely by detaching all wires and plugs attaching it to the cabinet.
2. Remove the four mounting nuts holding amplifier to heat sink. Detach amplifier and set it on its side.
3. Unsolder the transformer leads at their terminals on foil side of amplifier circuit board. Easiest method is to heat the six solder joints in rapid succession, while pulling the transformer away from the board. Be careful not to overheat the foil pattern.
4. Lift driver transformer away from the amplifier circuit board.

DRIVER TRANSFORMER REPLACEMENT:

1. Reverse removal procedure previously outlined.
2. **IMPORTANT:** Red dot on transformer's paper cover must face the driver transistor's heat sink. (See Fig. 2).

OUTPUT TRANSISTOR

OUTPUT TRANSISTOR REMOVAL:

WARNING: Due to the possibility of shock and component damage, this unit should be serviced by a qualified Leslie Speaker repairman only.

1. Disconnect console connector plug from the cabinet and remove screws fastening heat sink to the cabinet. It is not necessary to remove wires connecting heat sink to the cabinet; merely lift heat sink off cabinet.
2. Using a phillips screwdriver, remove the screws holding the plastic output transistor cover(s) to the heat sink. Screws are located on heat sink's amplifier side.
3. Remove plastic transistor cover to expose the output transistor.
4. Remove screws fastening output transistor(s) to heat sink. Remove output transistor(s).

OUTPUT TRANSISTOR REPLACEMENT

1. Reverse removal procedure previously outlined, noting the following:
 - A. Transistor(s) installed should have matching GREEN, BLUE, VIOLET, or WHITE color codes only.
 - B. Use thermal compound on both surfaces of the mica washer separating the transistor(s) from the heat sink.

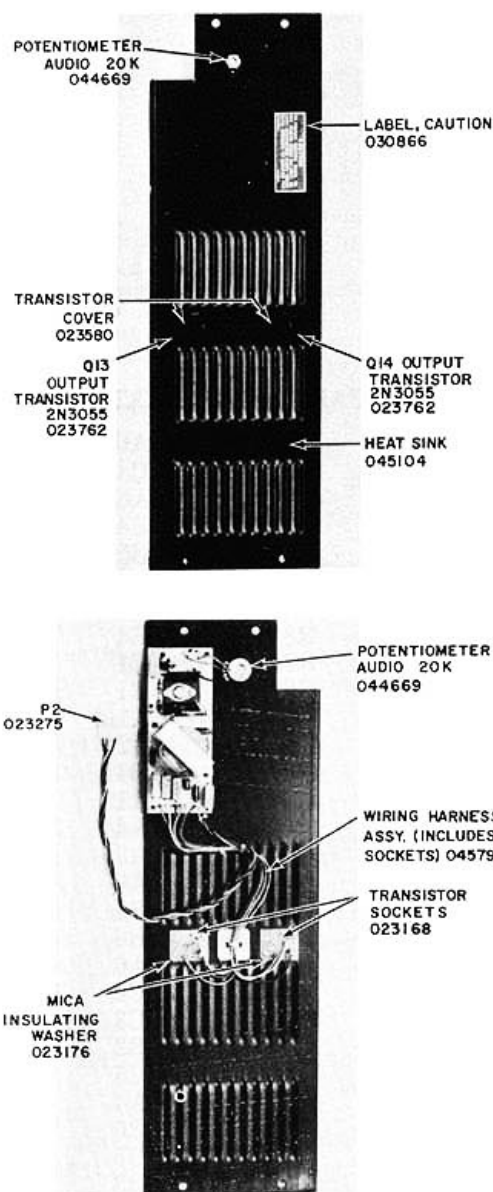


Fig. 3

POWER SUPPLY

WARNING: Due to the possibility of shock and component damage, this unit should be serviced by a qualified Leslie Speaker repairman only.

POWER SUPPLY REMOVAL

1. Disconnect console connector plug from speaker cabinet and remove the heat sink.
2. Disconnect all power plugs from their sockets on the power supply circuit board.
3. Disconnect the Red/Black signal output plug from its socket on the amplifier circuit board.
4. Using a screwdriver, remove mounting screws on either end of the power supply chassis. Slide the power supply out of the cabinet.

POWER SUPPLY REPLACEMENT

1. Reverse removal procedure previously outlined.

POWER SUPPLY CAPACITORS

CAPACITOR REMOVAL

1. Remove power supply as outlined above.
2. Loosen capacitor mounting clamp located on top of power supply chassis. It is not necessary to completely remove the clamp to remove capacitor.
3. Turn power supply upside down. Using a screwdriver, remove the two screws fastening the capacitor to the power supply circuit board. Slide the capacitor out of the power supply chassis.

CAPACITOR REPLACEMENT:

1. Reverse removal procedures previously outlined.

NOTE: During installation be careful to match capacitor's positive terminal (indicated by a red dot) to the positive-marked hole on the power supply circuit board.

POWER SUPPLY CIRCUIT BOARD

WARNING: Due to the possibility of shock and component damage this unit should be serviced by a qualified Leslie Speaker repairman only.

POWER SUPPLY CIRCUIT BOARD REMOVAL

1. Remove the power supply from the speaker cabinet as outlined above. Turn power supply upside down.
2. Remove the four screws fastening the two large capacitors to the power supply circuit board.
3. Unsolder all leads connecting power supply circuit board to its chassis. When unsoldering leads, be careful not to overheat the circuit board's foil pattern.
4. Remove the four nuts fastening circuit board to the power supply chassis. Remove circuit board.

POWER SUPPLY CIRCUIT BOARD REPLACEMENT

Reverse removal procedure previously outlined. Use Fig. 5 as a guide when reconnecting leads to power supply circuit board.

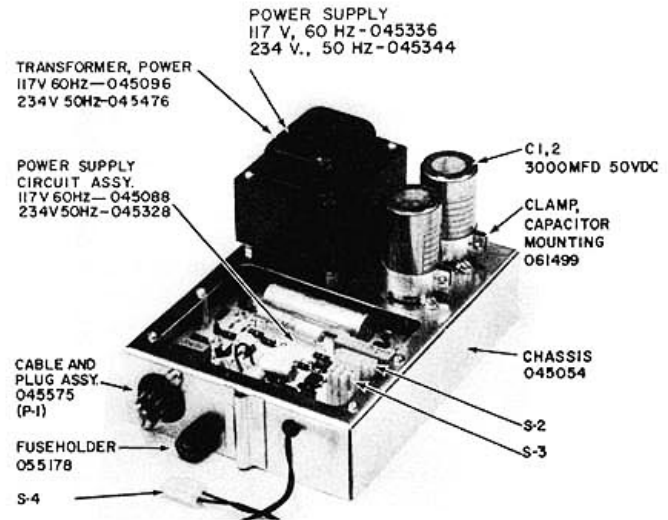


Fig. 4

POWER SUPPLY TRANSFORMER

WARNING: Due to the possibility of shock and component damage, this unit should be serviced by a qualified Leslie Speaker repairman only.

TRANSFORMER REMOVAL

1. Remove power supply from speaker cabinet as outlined on page 6.
2. Turn power supply upside down. Disconnect leads connecting power supply circuit board to the power supply chassis.
3. Remove the four nuts fastening power supply circuit board to power supply chassis. Lift board off chassis. This will expose four transformer mounting nuts on the power supply chassis' underside.
4. Remove the four transformer mounting nuts and lift transformer off the power supply chassis.

TRANSFORMER RELACEMENT

Reverse removal procedure previously outlined.

NOTE: Use Fig. 5 as a guide when reconnecting leads to the power supply circuit board.

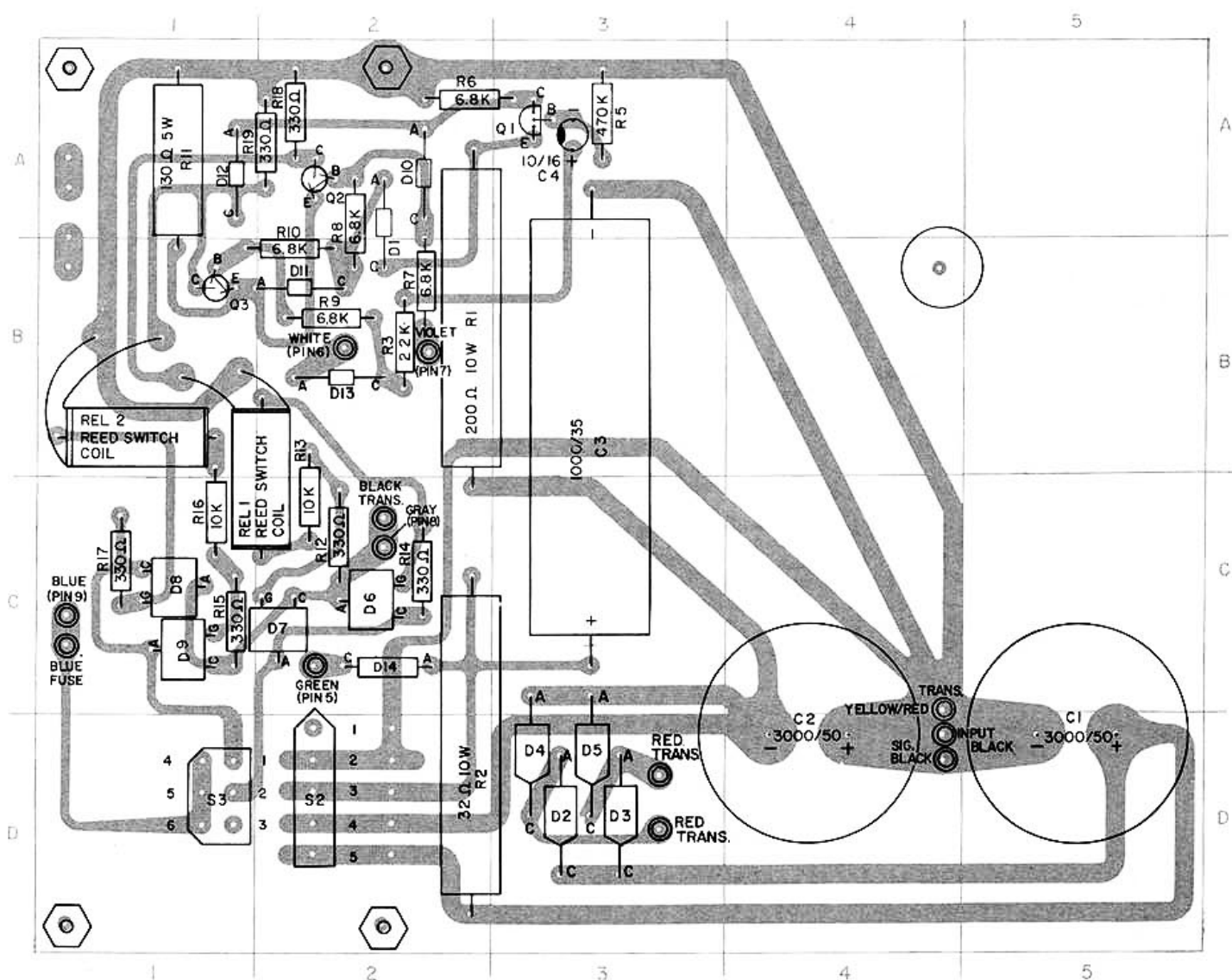
POWER SUPPLY CIRCUIT BOARD ASSEMBLY

117V: (045088) 234V: (045328)

PART No.	LOCATION	DESCRIPTION	EMI No.
C1	D5	Capacitor, Electrolytic, 3000 Mfd, 50 V	044826
C2	D4	Capacitor, Electrolytic, 3000 Mfd, 50 V	044826
C3	B3	Capacitor, Electrolytic, 1000 Mfd, 35 V	023507
C4	A3	Capacitor, Tantalum, 10 Mfd, 16 V	041707
D1	A2	Rectifier, Silicon, 30 PIV, 500 MW	041616
D2	D3	Rectifier, Silicon, 200 PIV, 3 Amp.	031450
D3	D3	Rectifier, Silicon, 200 PIV, 3 Amp.	031450
D4	D3	Rectifier, Silicon, 200 PIV, 3 Amp.	031450
D5	D3	Rectifier, Silicon, 200 PIV, 3 Amp.	031450
D6*	C2	Rectifier, SCR, 200 PIV, 4 Amp.	030387
D7*	C2	Rectifier, SCR, 200 PIV, 4 Amp.	030387
D8*	C1	Rectifier, SCR, 200 PIV, 4 Amp.	030387
D9*	C1	Rectifier, SCR, 200 PIV, 4 Amp.	030387
D10	A2	Rectifier, Silicon, 30 PIV, 500 MW	041616
D11	B2	Rectifier, Silicon, 30 PIV, 500 MW	041616
D12	A1	Rectifier, Silicon, 30 PIV, 500 MW	041616
D13	B2	Rectifier, Silicon, 30 PIV, 500 MW	041616
D14	C2	Rectifier, Silicon, 30 PIV, 500 MW	041616
FZ1 (not shown)		Fuse, 1.5 Amp, 125 V "Slo-Blo" (used in 117 V Power Supply)	021766
FZ1 (not shown)		Fuse, 1 Amp, 125 V "Slo Blo" (used in 234 V Power Supply)	038158
Q1	A3	Transistor, MSPS 4382	026237
Q2	A2	Transistor, 2N3414	030254
Q3	B1	Transistor, 2N3414	030254
R1	B2	Resistor, Wire Wound, 200 Ohm, 10 Watt, 10%	049767
R2	D2	Resistor, Wire Wound, 32 Ohm, 10 Watt, 10%	029769
R3	B2	Resistor, 22K Ohm, 1/2 Watt, 10%	028530
R5	A3	Resistor, 470K Ohm, 1/2 Watt, 10%	018002
R6	A2	Resistor, 6.8K Ohm, 1/2 Watt, 10%	016501
R7	B2	Resistor, 6.8K Ohm, 1/2 Watt, 10%	016501
R8	A2	Resistor, 6.8K Ohm, 1/2 Watt, 10%	016501
R9	B2	Resistor, 6.8K Ohm, 1/2 Watt, 10%	016501
R10	B2	Resistor, 6.8K Ohm, 1/2 Watt, 10%	016501
R11	A1	Resistor, Wire Wound, 130 Ohm, 5 Watt, 10%	023739
R12	C2	Resistor, 330 Ohm, 1/2 Watt, 10%	016493
R13	B2	Resistor, 10K Ohm, 1/2 Watt, 10%	028548
R14	C2	Resistor, 330 Ohm, 1/2 Watt, 10%	016493
R15	C1	Resistor, 330 Ohm, 1/2 Watt, 10%	016493
R16	C1	Resistor, 10K Ohm, 1/2 Watt, 10%	028548
R17	C1	Resistor, 330 Ohm, 1/2 Watt, 10%	016493
R18	A2	Resistor, 330 Ohm, 1/2 Watt, 10%	016493
R19	A2	Resistor, 330 Ohm, 1/2 Watt, 10%	016493
Rel 1	C1	Coil, Reed Switch	023150
Rel 1	C1	Switch, Reed	023747
Rel 2	B1	Coil, Reed Switch	023150
Rel 2	B1	Switch, Reed	023747

234 V Power Supplies use the following rectifier in place of rectifiers indicated by an asterisk ():

Rectifier, SCR, 400 PIV, 4 Amp 031997



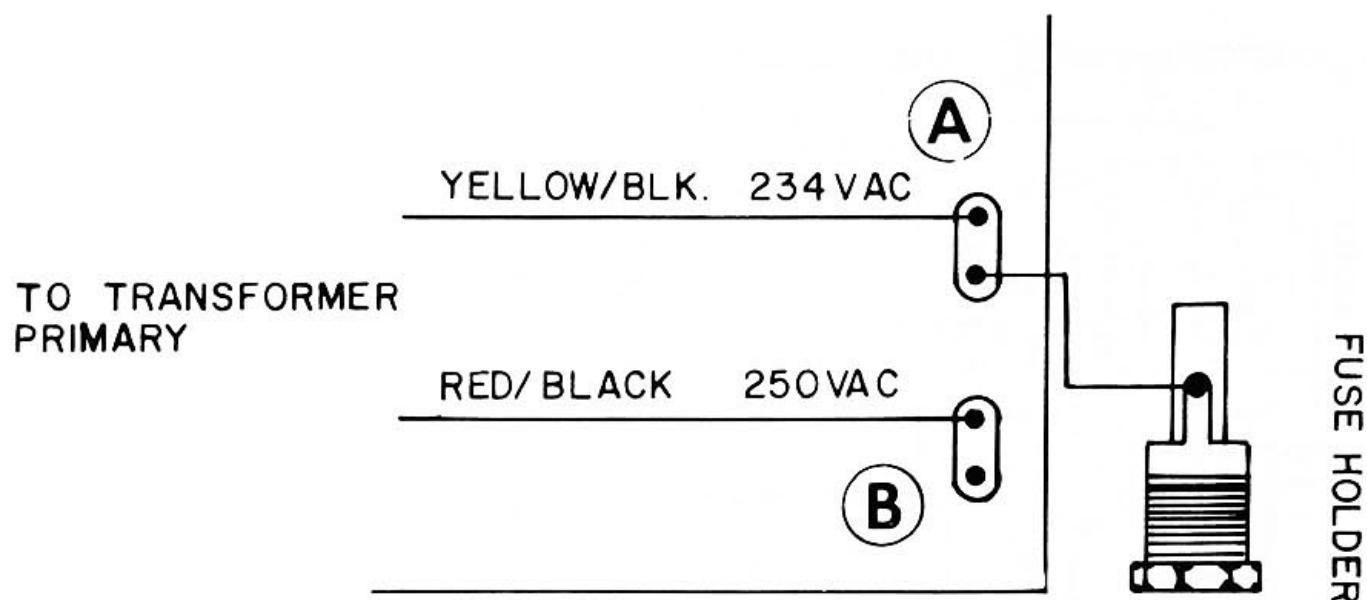


Fig. 6

THE 234 VOLT/250 VOLT POWER SUPPLY TRANSFORMER

Overseas models of the 825 Speaker use a high voltage transformer wired for either 234 volts or 250 volts in their power supplies. Because line voltage varies from country to country, conversion for 250 volt usage or 234 volt usage may be necessary. High voltage transformer power conversions are explained below:

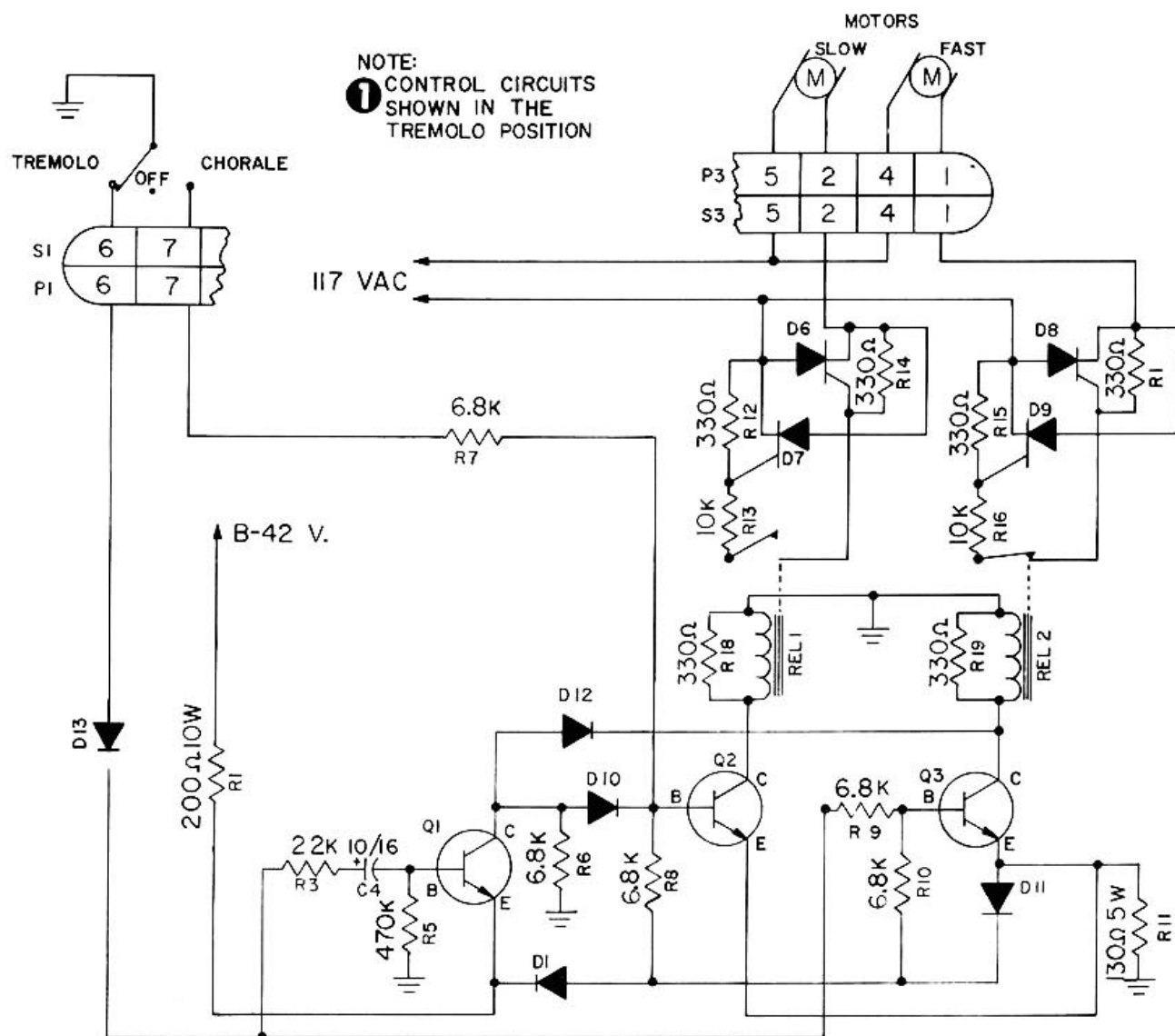
CONVERSION TO 250 VOLT USE

1. Remove 234/250 volt power supply from speaker cabinet as outlined on page 6 of this manual. Turn power supply upside down.
2. Locate **Black** fuse lead. It is soldered to **Yellow/Black** lead terminal on power supply circuit board. (See Fig. 6A).

3. Unsolder **Black** Fuse Lead.
4. Solder **Black** fuse lead to adjacent **Red/Black** lead terminal. See Fig. 6B).

CONVERSION TO 234 VOLT USE

1. Remove 234/250 volt power supply from speaker cabinet as outlined on page 6 of this manual. Turn power supply upside down.
2. Locate **Black** fuse lead. It is soldered to **Red/Black** lead's terminal on power supply circuit board. See Fig. 6B).
3. Unsolder **Black** fuse lead.
4. Solder **Black** fuse lead to adjacent **Yellow/Black** lead's terminal on circuit board. (See Fig. 6A).



MOTOR AND BRAKE CIRCUIT OPERATION

Refer to figure 7. Note motor circuitry is switched for fast motor operation.

SLOW MOTOR OPERATION

When the speaker control is switched to CHORALE, pin 7 (see Fig. 7) is grounded. Current flows through resistor R7. Transistor Q2 conducts. Switch closes at relay 1, triggering the gates of silicon controlled rectifiers D6 and D7, allowing the small motor to run.

FAST MOTOR OPERATION:

When the speaker control is switched to TREMOLO, pin 6 (see Fig. 7) is grounded. Current flows through resistor R9 and transistor Q3 conducts. The switch at relay 2 closes, triggering the gates of silicon controlled rectifiers D8 and D9, allowing the fast motor to run.

BRAKE CIRCUIT OPERATION:

The brake circuit can only be activated by switching the speaker control from TREMOLO to OFF. This is because capacitor C4, the key element in the brake circuit, charges only when the fast (large) motor is operating.

In tremolo mode, transistor Q1 conducts, drawing current through resistor R6. Diode D10 will be reverse biased, not affecting the base of transistor Q2.

Switching the control from TREMOLO to OFF breaks contact between ground and pin 6. The charge on capacitor C4 causes transistor Q1 to turn off for a time determined by the values of capacitor C4 and resistor R5—about 3 to 4 seconds. Diode D10 becomes forward biased, permitting current to pass through resistor R6, turning on transistor Q2. Relay 1 closes, triggering SCR's D6 and D7. The slow (small) motor will run for 3 to 4 seconds—the time required to discharge capacitor C4. After capacitor C4 finishes discharging, relay 1 opens, the slow motor stops, and the brake cycle is completed.

MECHANICAL SERVICING

117/234/250 VOLT AND 50/60 HZ. MOTOR CONVERSIONS:

See Exploded View, and Parts List, page 13 of this manual.

ROTOR DRIVE BELT BELT REMOVAL

1. Remove back panel and heat sink from the speaker cabinet.
2. Using a screwdriver, remove four screws fastening speaker to upper cabinet shelf. Remove speaker from cabinet. **CAUTION:** Be careful not to puncture the speaker cone with your fingers.

NOTE: Do not alter shape of acoustical pad when removing speaker. This could affect cabinet's tonal quality.

3. Loosen the three motor mount wingnuts. This will permit removal of rotor belt from the motor pulley. To release belt tension, twist motor assembly counter-clockwise.
4. Remove rotor support bracket by unscrewing its mounting screws.
5. Lift the old belt over the rotor pulley and motor pulley.
6. Slip belt out of its channel; then carefully remove it from cabinet.

BELT REPLACEMENT

1. After centering replacement belt on the rotor pulley, channel it into belt grooves in upper shelf.
2. Slip belt over motor pulley.
3. Replace rotor support bracket and fasten it in place. Make certain the bracket's washer is between the two upper rotor bearing felts when replacing the bracket.
4. Adjust belt tension as outlined below. Full tremolo rotor speed should be reached in four seconds.

ROTOR BELT ADJUSTMENT

1. Remove heat sink from cabinet.
2. Loosen the two motor mount wingnuts.
3. Twist motor assembly clockwise until rotor belt is pulled taut. Gently release motor assembly. Motor assembly will come to rest at the point of proper belt tension.

NOTE: Do not allow motor to snap back. This would result in overly loose belt adjustment.

4. Re-tighten the two motor mount wingnuts. Rotor should reach full tremolo speed in approximately six seconds with the rotor belt properly adjusted.

TWO SPEED MOTOR ASSEMBLY

TWO SPEED MOTOR REMOVAL

1. Remove heat sink from cabinet.
2. Remove power supply from cabinet as outlined on page 6 of this manual.
3. Loosen the three motor mounting wingnuts suspending motor assembly from the upper shelf.
4. Lift rotor belt off motor pulley.
5. While holding motor assembly firmly, completely remove the three motor mount wingnuts. Slip motor assembly off its mounting screws and out of the cabinet.

TWO SPEED MOTOR REPLACEMENT

Reverse removal procedure previously outlined.

NOTE: Before completely tightening motor mount wingnuts, adjust rotor belt tension as outlined on page 10 of this manual.

TWO SPEED MOTOR DISASSEMBLY FOR CLEANING AND LUBRICATION

IMPORTANT: It is not necessary to completely disassemble the motors for proper cleaning. A thorough cleaning job can be done with compressed air or a vacuum hose after following motor disassembly procedures given below. If the motors must be completely disassembled, smooth the large motor shaft with crocus cloth or light filing **before** removing large motor end bells. This will prevent damage to the large motor bearings.

SMALL MOTOR DISASSEMBLY

1. After removing two-speed motor assembly as previously outlined, detach small motor and its mounting bracket from the "U" bracket by unscrewing the four mounting bracket screws. (See Fig. 8).
2. Remove the two nuts and washers attaching small motor to its mounting bracket. (See Fig. 8).
3. Remove lower adjustment nut from small motor adjustment screw. (See Fig. 9, INCREASE CONTACT ADJUSTMENT).
4. Remove small motor mounting bracket. Small motor is now ready for cleaning and lubrication.

LARGE MOTOR DISASSEMBLY

1. Remove rubber tired rim drive pulley from the "U" bracket end of large motor shaft with a 3/32 allen wrench. (See Fig. 9).
2. **IMPORTANT:** Mark "U" bracket and corresponding point on the end bell of the large motor before performing step three. This permits correct re-alignment of the "U" bracket and the large motor during reassembly.
3. Remove three screws holding "U" bracket in place. Remove "U" bracket. Large motor is now ready for cleaning and lubrication.

MOTOR CLEANING AND LUBRICATING

1. After disassembling motors as previously outlined, remove dust and dirt from end bells of the large motor with compressed air or a vacuum hose. If necessary, clean small motor in same manner.
2. Clean all accessible parts with solvent. Allow motors to dry.
3. Apply enough LESLIE oil or other light machine oil to soak the bearing felts of each motor. (See "Oil Hole" and "Oil Felt" points on Fig. 9). Don't add more oil than these felts will readily absorb. Cleaning and lubricating of small and large motors is now complete.

REASSEMBLY OF LARGE AND SMALL MOTOR

1. Reverse disassembly procedures for each motor, observing the following:
 - A. Replace rim drive pulley if it is excessively worn.

- B. When installing rim drive pulley on the large motor shaft, push it on as far as it will go; then back it off 1/16 inch.
 - C. Be sure to align rim drive pulley's set screw with FLAT part of the large motor shaft; then tighten pulley in place.
 - D. Make certain outer edge of the rim drive pulley is smooth. If rough spots exist, twist pulley's "O" ring until pulley's outer edge is smooth. (See Exploded View, page 13 for location of "O" ring).
2. After reassembly is completed, clean all moving parts thoroughly with alcohol. Then re-install motor assembly in cabinet, reversing the removal procedure previously given.
 3. Before adjusting the rotor belt, adjust small motor shaft as outlined below.
 4. After adjusting small motor shaft, make rotor belt adjustment outlined on page 10.

MOTOR NOISE

Excessive motor noise usually indicates bearings are slightly misaligned. Light tapping on sides of the motor laminations should align bearings and reduce motor noise.

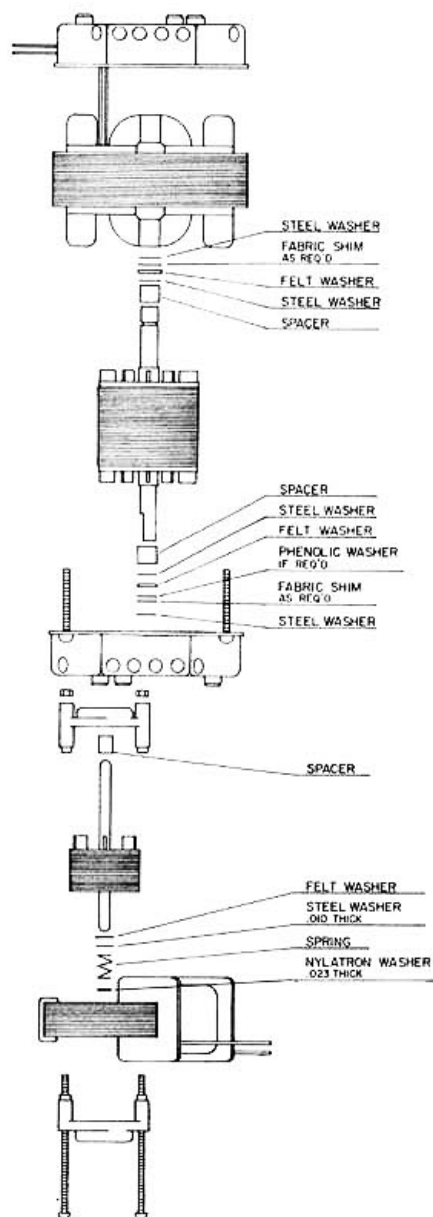


Fig. 8

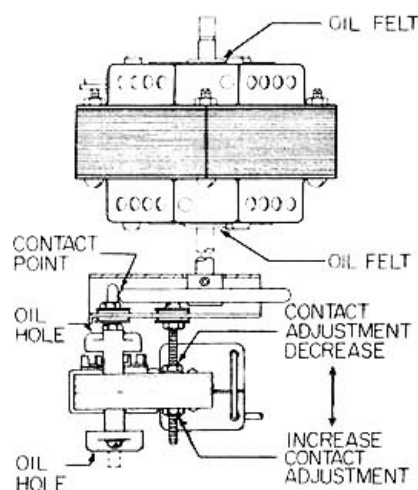


Fig. 9

SMALL MOTOR SHAFT: OPERATION AND ADJUSTMENT

On the 825 Speaker, the small motor slows the rotor to Chorale speed or brakes it to a stop within four seconds.

The small motor is actuated by switching the speaker control to either CHORALE or OFF.

Switching to CHORALE magnetizes the small motor laminations. This "pulls" the small motor shaft into contact with the large motor's rim drive pulley, slowing the rotor from TREMOLO to CHORALE speed in approximately four seconds.

When the speaker control is switched to OFF, a unique braking circuit activates the small motor for about four seconds to brake the rotor to a stop. (See page 9 of this manual.) Then all power to the two-speed motor assembly is discontinued.

After disassembling and reassembling the motors, contact pressure between the small motor shaft and the rim drive pulley should be readjusted as follows:

1. With motor assembly in the cabinet and rotor drive belt on its pulleys, turn power to small motor ON by switching console connector or Combo Preamp II control to CHORALE.
2. Loosen the contact adjustment nuts on small motor until small motor shaft no longer touches the rim drive pulley. (See Fig. 9, CONTACT ADJUSTMENT INCREASE/CONTACT ADJUSTMENT DECREASE).
3. Grasp the rotor to prevent it from turning.
4. Slowly tighten upper adjustment nut to force small motor shaft against rim drive pulley. (See Fig. 9, CONTACT ADJUSTMENT INCREASE.) Continue turning until rim drive pulley turns under the belt. Don't over-tighten upper adjustment nut.
5. Re-tighten the other shaft adjustment nut against small motor laminations.
6. Test-run motor assembly, switching between chorale and tremolo modes. Readjust shaft or rotor belt tension as necessary to slow rotor from tremolo speed to chorale speed in three to four seconds.

TREMULANT ROTOR

ROTOR REMOVAL

1. Remove upper back cover from cabinet.
2. Remove the four speaker mounting screws and move speaker to one side, exposing rotor and pulley assembly below.
CAUTION: Do NOT alter shape of the acoustical padding surrounding the speaker.
3. Remove rotor support bracket and rotor belt from the rotor pulley.
4. Remove rotor drive link from its rotor drive pin. (See Fig. 10).
5. Pull the rotor pulley shaft out of the rotor by grasping the pulley with one hand and holding rotor down with the other hand.
6. Remove rotor from cabinet.

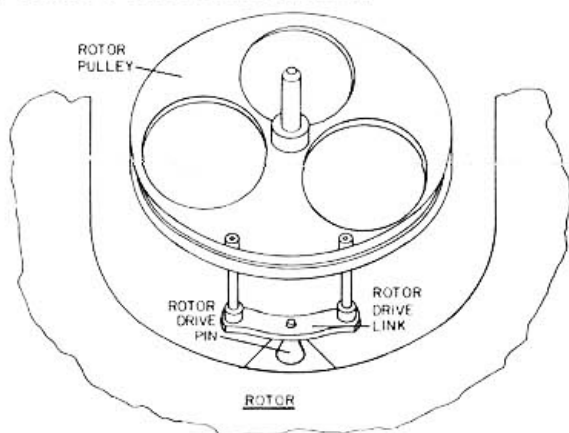


Fig. 10

ROTOR REPLACEMENT

Reverse removal procedure previously outlined. Use exploded view of the rotor assembly on page 13 to assure proper placement of the washers and grommets during reassembly.

Hint: When centering rotor shaft over lower bearing, lift rotor slightly and sight through shaft hole. Be careful not to dislodge lower bearing's metal washer while centering the rotor.

UPPER BEARING, TREMULANT ROTOR

UPPER ROTOR BEARING OILING

The upper rotor bearing may be oiled without removing the rotor assembly. Simply remove the speaker and apply oil to the felt pad around the bearing, avoiding excess which cannot be absorbed by the pad. Ten drops should be sufficient.

UPPER ROTOR BEARING REPLACEMENT (See exploded view on page 13 for parts location.)

1. Remove the speaker.
2. Remove the upper rotor support assembly.
3. Remove the "Oilite" (sleeve) bearing from rotor support assembly.
4. Replace the "Oilite" bearing. Reassemble by reversing the above procedure.

LOWER BEARING, TREMULANT BEARING

LOWER ROTOR BEARING OILING

The lower rotor bearing is a sealed ball bearing and does not require lubrication.

LOWER ROTOR BEARING REPLACEMENT (See exploded view on page 13 for parts location.)

1. Lay the speaker cabinet on its front.
2. Remove the bearing assembly from underneath cabinet.
3. Disassemble and reassemble the bearing assembly according to exploded view, page 13 of this manual.
4. To reassemble the speaker cabinet, reverse above procedure.

LOUDSPEAKER

LOUDSPEAKER REMOVAL

(See exploded view on page 13 for parts locations).

1. Remove back from the cabinet.
2. Remove speaker leads and the four speaker mounting screws.
3. Remove speaker from cabinet.

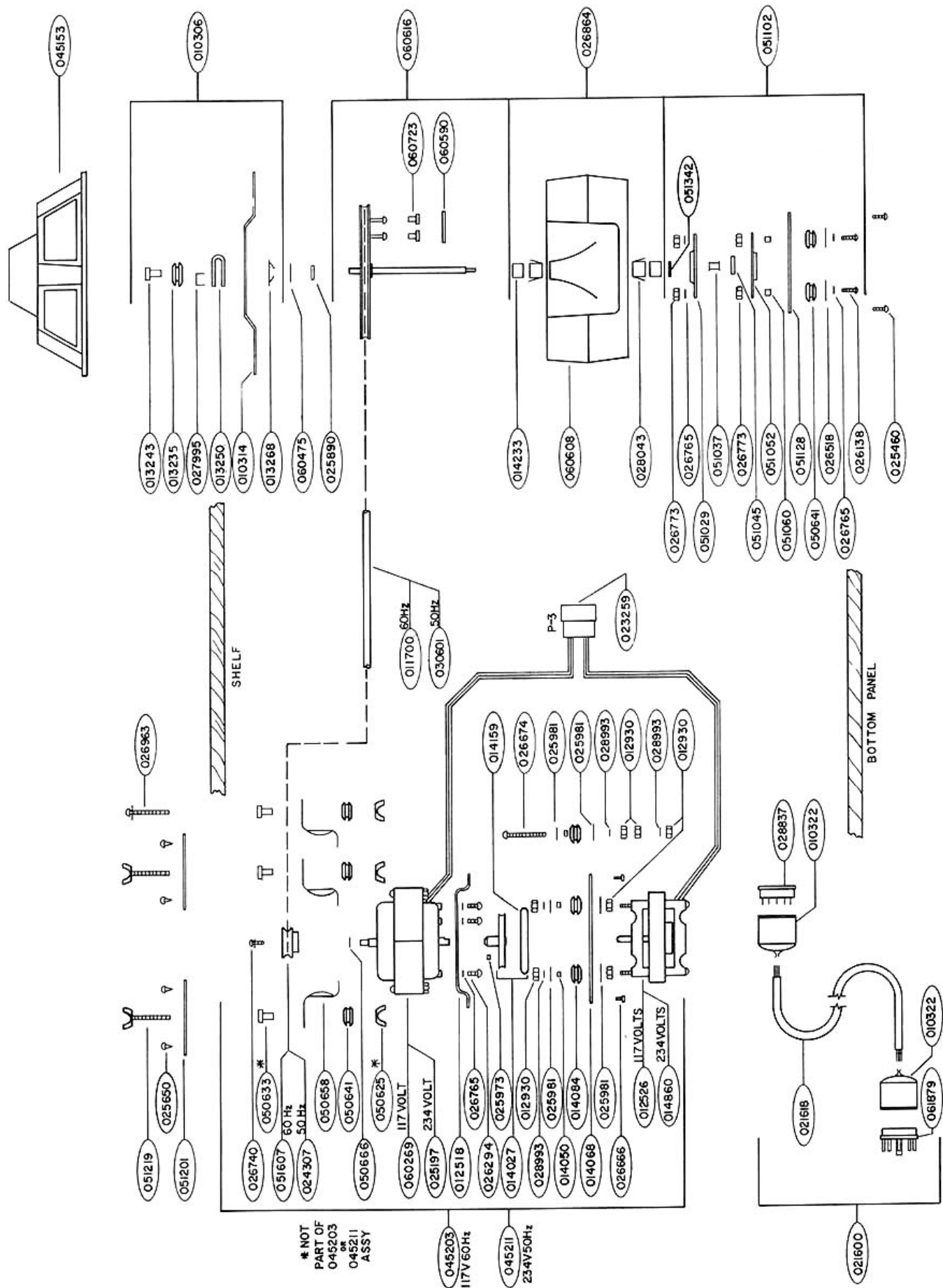
CAUTION: Do NOT alter shape of the acoustical padding surrounding speaker.

LOUDSPEAKER REPLACEMENT

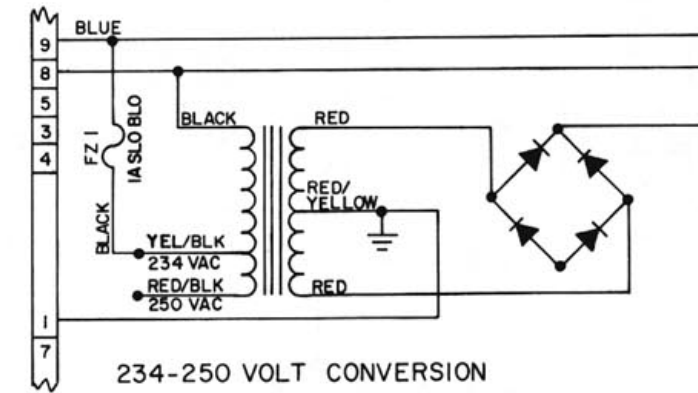
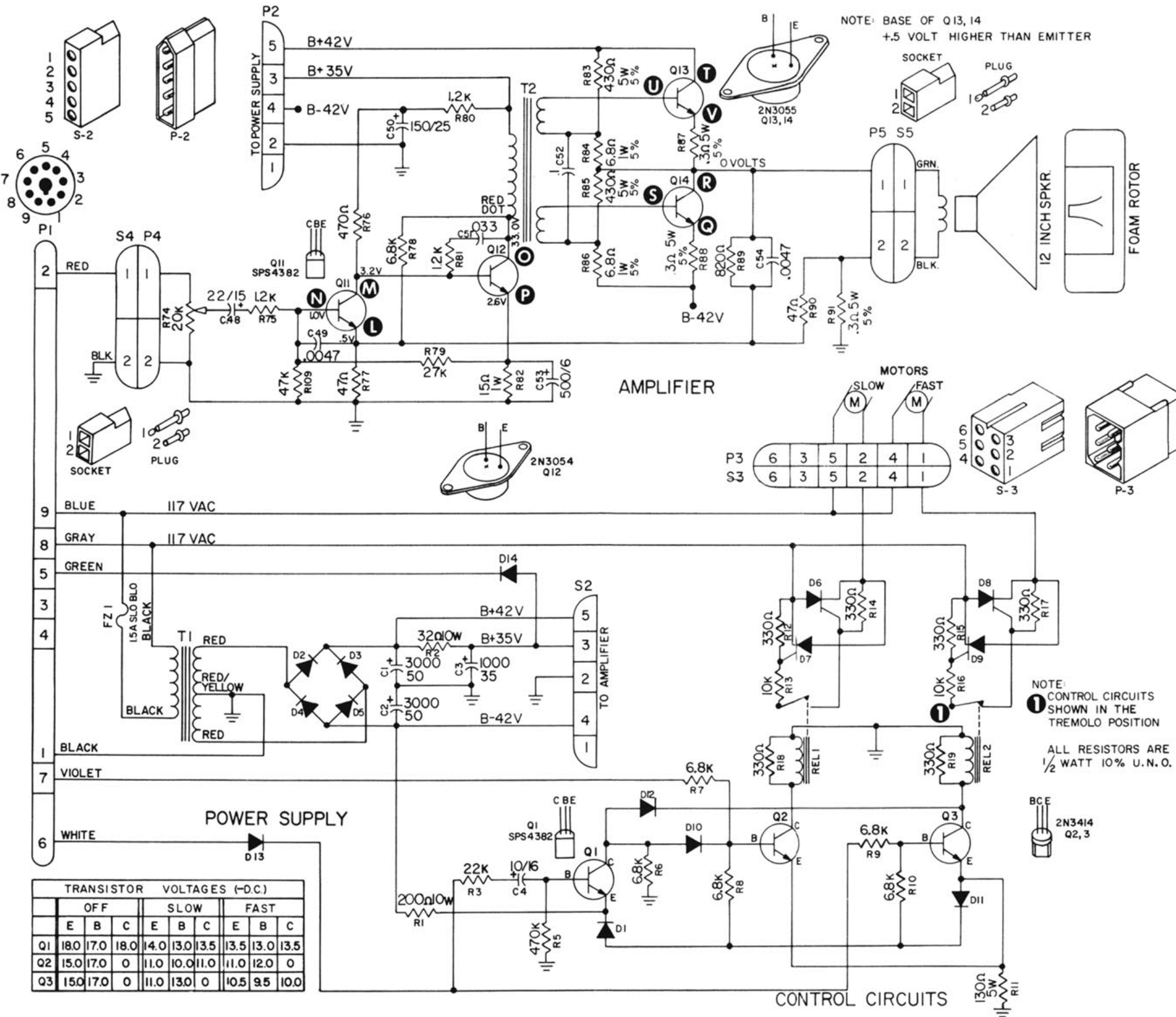
Because of the extremely strong magnetic fields in the loudspeaker, it is inadvisable to attempt cone replacements or any other repairs involving disassembly of the speaker. Repairs or replacement of the loudspeaker should be arranged through your Leslie Speaker dealer.

CAUTION

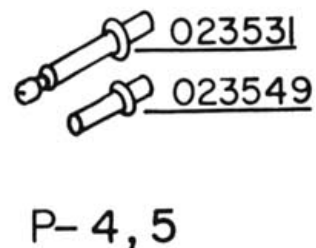
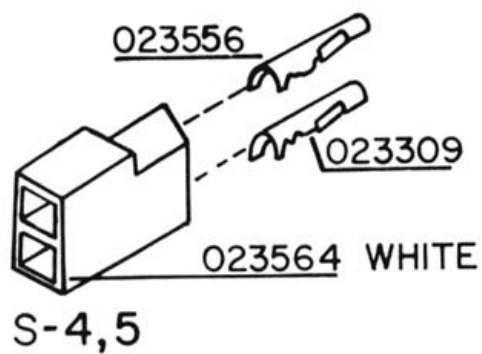
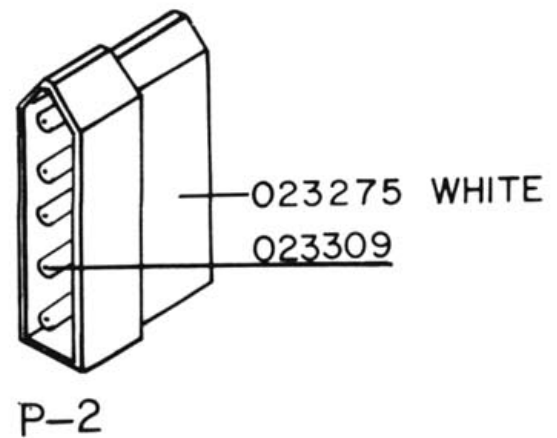
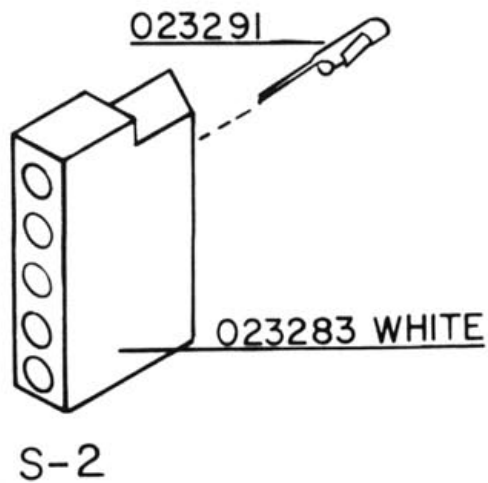
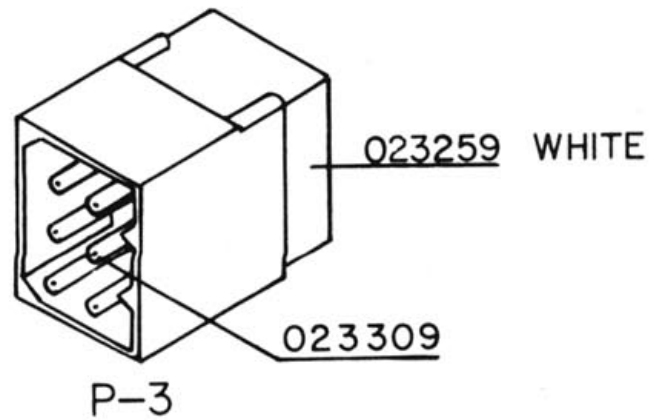
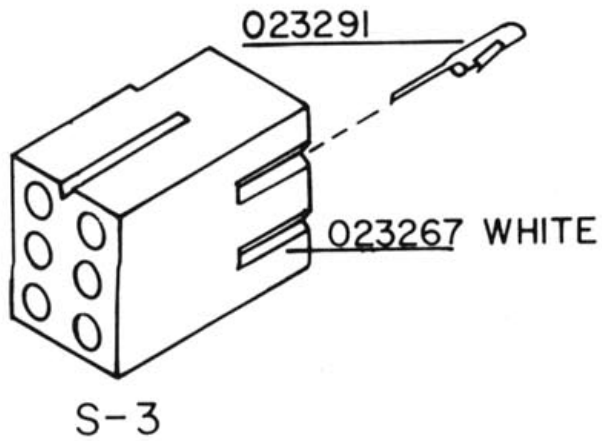
When installing speakers, observe correct polarity by noting the large and small pins and sockets of the speaker connectors.



SCHEMATIC: MODEL 825 AMPLIFIER AND POWER SUPPLY



825 PLUGS & SOCKETS



SOCKETS

PLUGS

825 PARTS LIST—

MECHANICAL ASSEMBLY

010306	Bearing Assembly, Back Rotor Support	026773	Nut, Hex, 8-32 x 11/32 x 1/8
010314	Support, Rotor, Back	026864	Rotor and Grommet Assembly
010322	Cap, w/Cut Clamp	026963	Screw, Machine, 10-24 x 7/8, Round Head w/Int. Lock Washer
011700	Belt, Drive, 60Hz	027995	Staple, Wire, 3/8"
012518	Bracket, U"	028043	Shim, Cloth
012526	Motor, A5, 117 Volt, 60 Hz	028837	Socket, 9 Contact, Amphenol
012930	Nut, Hex 6-32 x 5/16" x 7/64"	028993	Lock Washer, Internal, No. 6
013235	Grommet, 5/8 x 1/2 x 3/8	030601	Belt, Drive, 50Hz
013243	Bearing, Oilite Sleeve	045153	Speaker, 12", 6 Ohm
013250	Felt, Oil	045203	Motor Assembly, 2 speed, 117V/60 Hz
013268	Nut, Push-On	045211	Motor Assembly, 2 speed, 234V/50 Hz
014027	Pulley Assembly, Rim Drive	050625	Nut, Wing, 10-24
014050	Bushing	050633	Bushing, Shoulder
014068	Bracket, Small Motor Mounting	050641	Grommet, 1 x 3/4 x 5/16
014159	Ring, "O", Neoprene	050658	Bracket, Z Motor Mounting
014233	Bushing, Neoprene, Square, 1/2" x 1" x 3/4"	050666	Ring, "C"
014860	Motor, A5, 234 Volt, 50 Hz	051029	Retainer, Rotor Bearing, Upper
021600	Cable Assembly, Tone Cabinet, 9 Conductor, 30 Ft.	051037	Grommet, 9/16 x 3/8 x 5/16
021618	Cable, 9 Conductor	051045	Bearing, Ball — Rotor
023259	Housing, Plug, 6 Circuit	051052	Retainer, Rotor Bearing, Lower
024307	Pulley, Motor, 50 Hz	051060	Bushing
025197	Motor, D6, 2 Shaft, 234 Volt, 50 Hz	051102	Bearing Assembly, Ball, Rotor, Lower
025460	Screw, Machine, 10-24 x 3/8, Round Head	051128	Plate, Bearing
025650	Screw, Sheet Metal B, 10 x 7/8, Phillips Head	051201	Plate, Belt Adjusting
025890	Washer, Flat, 1/14 x 1/2 x 1/16	051219	Screw and Wing Nut Assembly
025973	Screw, Set, 10-32 x 3/16, Hex Socket, Cup Point	051342	Washer, Flat
025981	Washer, Flat, No 6 x 9/16 x 3/64	051607	Pulley, Motor, 60 Hz
026138	Screw, Machine, 8-32 x 13/16, Round Head	060269	Motor, D6, 117 Volts, 50/60 Hz
026294	Screw, Machine, 8-32 x 1/4, Round Head	060475	Washer, Flat,
026518	Washer, Flat, No. 10 x 3/4 x 3/64	060590	Link, Drive
026666	Screw, Sheet Metal, Type B, 6 x 1/4 Hex Washer Head	060608	Rotor, Foam
026674	Screw, Machine, 6-32 x 2 1/4", Round Head	060616	Shaft and Pulley Assembly
026740	Screw, Machine, 8-32 x 3/8", Round Head w/Int. Lock Washer	060723	Bushing, Neoprene
026765	Lock Washer, Internal, No. 8 x 5/16 x 0.020	061879	Plug Assembly, 9 pin, w/o Mounting, w/Screws