BOSE®
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FreeSpace® Model 32SE Surface-Mount Environmental Loudspeaker

Service Manual

Part Number 257200 Rev. 01

CONTENTS

CAUTION: The Bose® Model 32SE loudspeaker contains no user-serviceable parts. To prevent warranty infractions, refer servicing to warranty service stations or factory service.

WARRANTY

The Bose Model 32SE Loudspeaker is covered by a five-year limited warranty.

SPECIFICATIONS

External Dimensions:	Single Speaker:	9.12" x 6" x 5.6" (23 cm x 15 cm x 14 cm)
	Packed System:	7.3" x 14.2" x 10.3" (18.5 cm x 36.1 cm x 26.2 cm)
Weight:	Single Speaker:	5.0 lb (2.3 kg)
	Packed System:	11.0 lb (5 kg)
Transducer Complement:		One 4.5" environmental driver per loudspeaker
Internal Cabinet Volume:		180 cu in (2.94 liters) Does not include 0.25 liter displaced by mounted driver
Port:	Description:	(2) oval ports located on one side of the driver
	Total Port Area:	0.97 sq in (6.3 sq cm)
	Port Length:	3.5 in (8.9 cm)
Resonance Frequency:		80 Hz
Impedance:	70 V Units:	130 Ohms @ 70 V, 32 W from 70 Hz - 15 kHz
	100 V Units:	250 Ohms @ 100 V, 32 W from 70 Hz - 15 kHz
	Passive Units:	4 Ohms
Power Handling:		32 W (VRMS) continuous per IEC 268-5 for duration of 100 hours
Sensitivity:		87 dB-SPL, 1 W, 1 m (speech) 85 dB-SPL, 1 W, 1 m (music)

PRODUCT DESCRIPTION

The Model 32SE loudspeaker is an environmental version of the Pro Model 25 surface mount loudspeaker. It meets the European requirements for loudspeakers used in fire and evacuation applications in dry, damp and wet environments, as well as meeting the new UL1480 requirements for fire and evacuation / voice warning systems in wet environments.

Three variations of the Model 32SE loudspeaker are available, 70V/32W, 100V/32W and 4 Ohms passive.

The Model 32SE loudspeaker uses one, 1.2 Ohm, 4.5" environmental driver per enclosure. It also uses a metal grille similar to the Model 25.

On the 70 and 100V variations, the input connection interface is the Model 32 transformer, internally mounted in the enclosure. The access to the transformer is covered by an aluminum plate with an installed gasket on the rear of the enclosure to ensure the terminals are "touchproof" once the loudspeaker is installed and to seal out water.

The packed system consists of two loudspeakers, hardware, brackets, an owner's manual and packaging. The speaker housing color is arctic white or black.

DISASSEMBLY/ASSEMBLY PROCEDURES

Note: Refer to Figures 2 & 3 for the following procedures.

1. Grille Removal

1.1 Take a small flat-blade screwdriver or scribe and grasp the edge of the grille (2) at one of the corners.

1.2 Gently work the grille out of the retaining slot in the baffle (5).
Note: There is no grille frame exposed. You must grasp the grille on the metal portion of the grille and not on the polypropylene, which is part of the cabinet/baffle assembly.

2. Grille Replacement

2.1 Make sure that the Bose® logo on the nameplate (1) is facing the same way as the print on the back of the cabinet (6).

2.2 Fit the grille (2) to two adjacent corners of the baffle (5).

2.3 Gently apply pressure to the two remaining corners to fit the grille into the baffle.

3. Driver Removal

3.1 Perform procedure 1.

3.2 Using a phillips-head screwdriver, remove the three screws (3) that hold the driver (4) in place.

3.3 Carefully lift the driver out of the baffle (5). Make a note of the driver wiring and cut the wires as close to the driver terminals as possible.

4. Driver Replacement

4.1 Strip the wires and, observing polarity, solder them to the replacement driver (4). Refer to the wiring diagram made in step 3.3.

4.2 Align the driver to the baffle (5). Make sure the gasket is correctly positioned behind the driver to provide an airtight seal.

4.3 Secure the driver to the baffle using the three screws (3) removed in step 3.2.

4.4 Perform procedure 2.

5. Baffle Removal

5.1 Perform procedure 1.

5.2 Remove the six screws (3) that hold the baffle (5) in place. Do not remove the three screws holding the driver (4) in place.

5.3 Pull the baffle away from the cabinet (6). This can be accomplished by inserting the hook portion of a scribe or your fingers into the ports and using this as a grasping area to pull the two sections apart.
Note: If you are unable to separate the two sections using the method above, remove the driver using procedure 3 and gently but firmly pull the baffle away from the cabinet.

5.4 Remove all of the sealing material from around the baffle.

6. Baffle Replacement

6.1 Align the port side of the baffle to the left side of the cabinet (6) when facing the front of the cabinet. Slide the baffle into the cabinet. Perform procedure 4 if necessary.

6.2 Secure the baffle in place using the six screws (3) removed in step 5.1. Be sure to remove any excess sealant that may come up from around the baffle.

6.3 Perform procedure 2.

DISASSEMBLY/ASSEMBLY PROCEDURES

7. Crossover Assembly Removal (passive variation)

7.1 Perform procedure 5.

7.2 Make a note of the wiring and cut the wires as close to the crossover assembly terminals as possible.

7.3 Remove the two screws (14) that secure the crossover assembly (15) to the baffle (5).

8. Crossover Assembly Replacement (passive variation)

8.1 Align the crossover assembly (15) to the baffle (5) and secure it using the two screws (14) removed in step 7.3.

8.2 Using the wiring diagram from step 7.2, solder the wires to the crossover assembly terminals. See Figure 3.

8.3 Perform procedure 6.

Note: Refer to Figure 3 for the following procedures.

9. Terminal Strip Removal (passive variation)

9.1 Using a phillips-head screwdriver, remove the two screws (14) that secure the terminal strip (13) to the rear of the cabinet (6).

9.2 Gently pull the terminal strip away from the cabinet and cut the wires as close to the terminals as possible.

10. Terminal Strip Replacement (passive variation)

10.1 Strip the two wires leading from the driver (4) and crossover assembly (15).

10.2 Observing polarity, solder the wires onto the rear of the terminal strip (13).

10.3 Secure the terminal strip to the rear of the cabinet (6) using the two screws (14) removed in step 9.1. Make sure the gasket is aligned properly to provide an airtight seal.

Note: Refer to Figure 2 for the following procedures.

11. Transformer Removal (70/100V variation)

11.1 Perform procedure 5.

11.2 Using a phillips-head screwdriver, loosen the two screws (3) that secure the junction box cover (10) to the rear of the cabinet (6). Slide the keyhole slots in the cover over the screw heads and remove the cover.

11.3 Using a phillips-head screwdriver, remove the two screws (11) that secure the transformer (12) to the cabinet.

11.4 Lift the transformer out of the cabinet.

11.5 Make a note of the driver wiring from the transformer and cut the wires on the driver (4) as close to the terminals as possible.

12. Transformer Replacement (70/100V variation)

12.1 Using the driver wiring diagram from step 11.5, solder the wires from the transformer (12) to the driver (4) terminals.

12.2 Align the transformer with the rear of the cabinet (6) and secure it in place using the two screws (11) removed in step 11.3.

12.3 Align the junction box cover (10) with the rear of the cabinet (6). Secure it in place using the two screws (3) loosened in step 11.2.

12.4 Perform procedure 6.

TEST PROCEDURES

1. Phase Test

Note: Perform the Phase Test on the 4 Ohm passive variation of the Model 32SE loudspeaker only.

1.1 Apply a +6 Vdc level to the input terminals on the rear of the loudspeaker enclosure. Be sure to observe polarity.

1.2 With the dc voltage applied, observe the motion of the loudspeaker cone. It should move outward.

Note: For the following tests, all listening should be done at a distance not to exceed one foot. Set all transformer version loudspeakers to the 32 Watt tap for these tests.

2. Air Leak Test

2.1.1 **4 Ohm passive units:** Apply a 6 Vrms, 80 Hz signal to the loudspeaker input terminals.

2.1.2 **70/100V variation units:** Apply a 30 Vrms, 80 Hz signal to the loudspeaker input terminals.

2.2 Listen for air leaks around the driver, front baffle and rear input terminals. Air leaks will be heard as a hissing or sputtering noise. Repair any air leaks. All repairs must be hidden.

3. Rub and Tick Test

3.1.1 **4 Ohm passive units:** Apply a 6 Vrms, 80 Hz signal to the loudspeaker input terminals.

3.1.2 **70/100V variation units:** Apply a 30 Vrms, 80 Hz signal to the loudspeaker input terminals.

3.2 Listen for any rubbing or ticking noise from the driver. Replace any driver that is defective.
Note: There is a normal suspension noise. To distinguish between a rub or tick and suspension noise, displace the cone slightly with your finger. If the rubbing can be made to go away or get worse, then it is a rub or tick. If the noise stays the same, it is suspension noise.

4. Power Sweep Test

4.1.1 **4 Ohm passive units:** Apply a 6 Vrms, 80 Hz signal to the loudspeaker input terminals.

4.1.2 **70/100V variation units:** Apply a 30 Vrms, 80 Hz signal to the loudspeaker input terminals.

4.2 Sweep the signal generator from 80 Hz up to 3 kHz listening for any buzzes, rattles or extraneous noises.
Note: The whooshing noise from the port around 80 Hz is acceptable.

4.3 Reduce the input level to 4 Vrms for 4 Ohm passive units or to 14 Vrms for 70/100V units. Continue sweeping the signal generator up to 5 kHz, listening for any buzzes, rattles or extraneous noises.

4.4 Replace any driver that has a buzzing noise. Redress any wires that make a buzzing or rubbing noise.

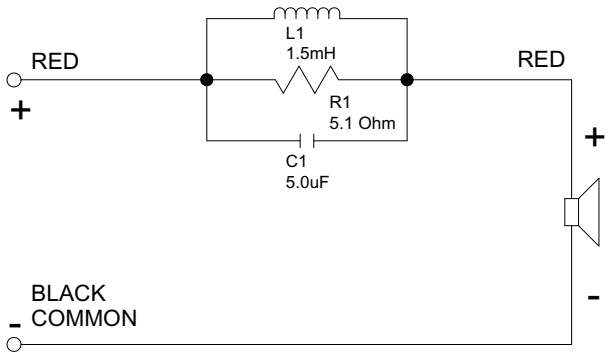

Figure 1. Model 32SE Passive Crossover Schematic Diagram

MAIN PART LIST

Model 32SE Loudspeaker (see Figures 2 and 3)

Item Number	Description	Part Number	Qty. per Pair	Note
1	NAMEPLATE, LOGO, MD 32SE, BLK	252414-001	2	
	NAMEPLATE, LOGO, MD 32SE, WHT	252414-002		
2	GRILLE, METAL, BLACK	278049-1	2	
	GRILLE, METAL, ARCTIC WHITE	278049-2		
3	SCREW, TAPP, 8-11.75, PAN, ASY, SQ	290306-12	22	70/100V
	SCREW, TAPP, 8-11.75, PAN, ASY, SQ	290306-12	18	PASSIVE
4	DRIVER ASSY, 4.5", 32SE	291019-001	2	
5	BAFFLE, BLACK	254323-01	2	1
	BAFFLE, WHITE	254323-11		
6	CABINET, BLK, PASSIVE	254322-021	2	1, PASSIVE
	CABINET, WHT, PASSIVE	254322-121		
	CABINET, BLK, 70/100V	254322-024		1, 70/100V
	CABINET, WHT, 70/100V	254322-124		
7	INSERT, NUT, DECORATIVE CAP	123991	4	
8	INSERT, EXT/INT THREAD	187499	4	
9	NUT, KEP, .375-16	290848-00	4	
10	COVER, JUNCT, BOX, ENVR, BLK	250129-001	2	70/100V
	COVER, JUNCT BOX, ENVR, WHT	250129-002		
11	SCREW, MACH, 8-32, PAN, XREC/SLOT	290850-08	4	70/100V
12	XFMR, 100V, 32W, W/GASKET	180102	2	70/100V
	XFMR, 70V, 32W, W/GASKET	291231-001		
13	CONN, TERMINAL STRIP, JACK, 2 POS	291729-001	2	PASSIVE
14	SCREW, TAPP, 6-13X.500, PAN, AS, SQ	290306-08	8	PASSIVE
15	CROSSOVER ASSY	291185-001	2	2, PASSIVE
-	GASKET, DRIVER, 4.5"	116572	2	

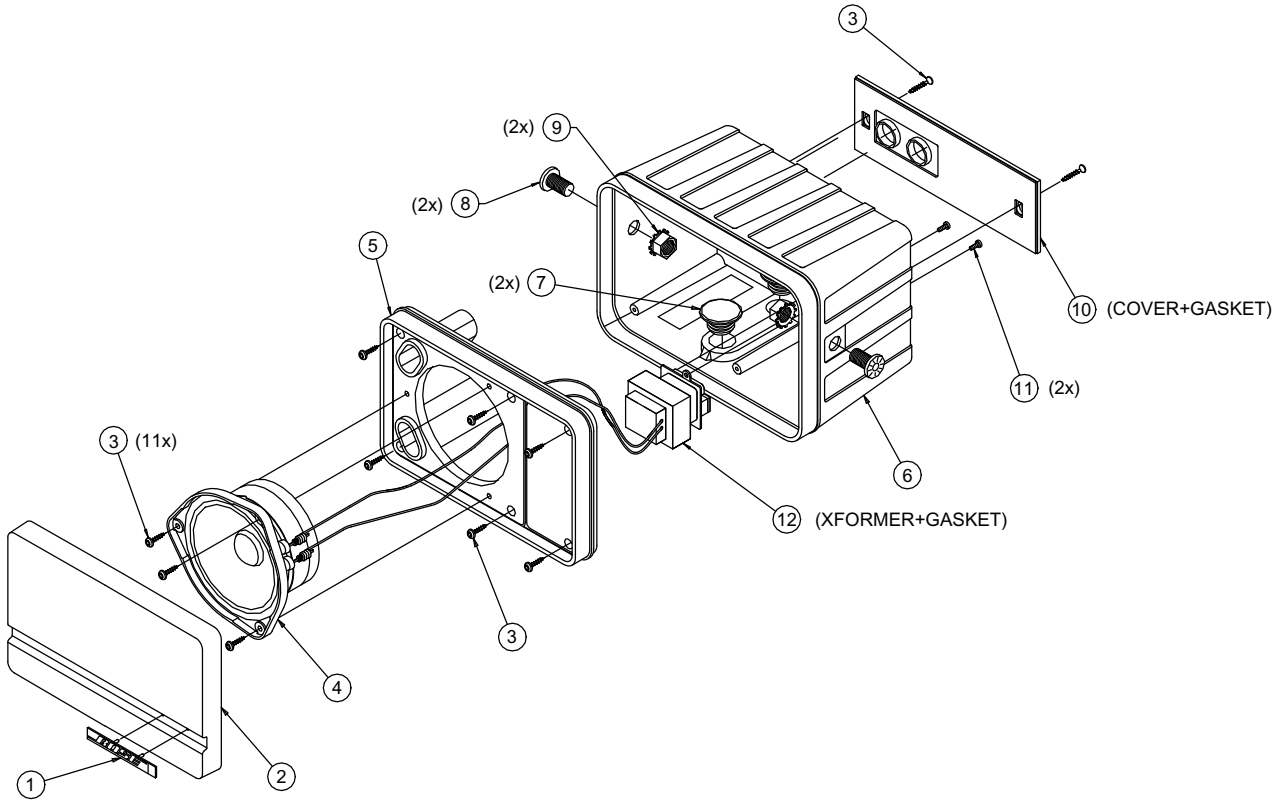

Figure 2. Model 32SE Loudspeaker Exploded View (70/100V Variation)

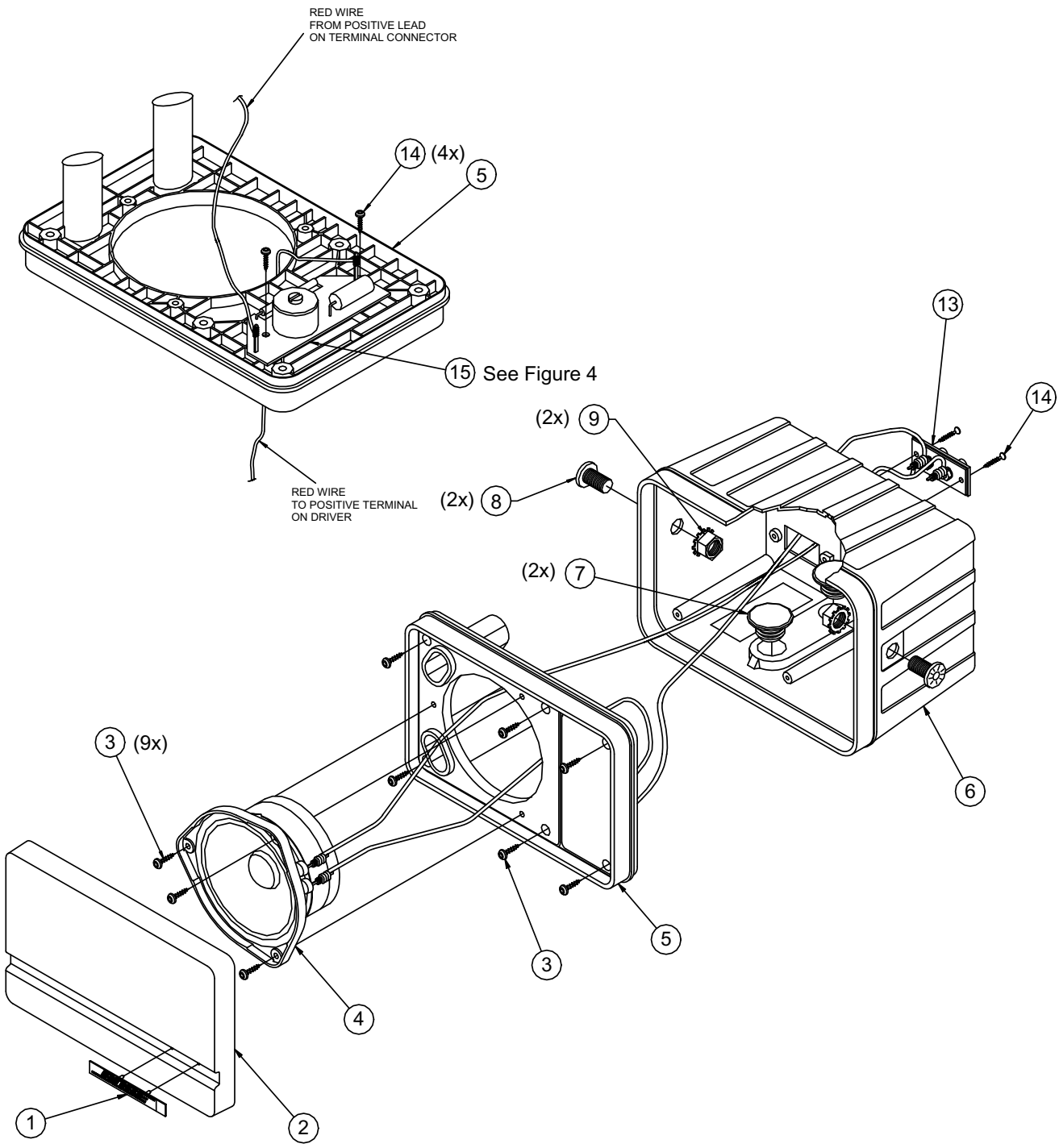

Figure 3. Model 32SE Loudpeaker Exploded View (Passive Variation)

ELECTRICAL PART LIST

Crossover Assembly, Model 32SE Loudspeaker Passive Variation (see Figure 4)

Item Number	Description	Part Number	Note
1	5.1 OHM, WW, 5W, 10%	125605-5R1	R1
2	5.0uF, EL, BP, 85C, 50V, 10%	291092-001	C1
3	1.5mH	293529-001	L1 INDUCTOR ONLY, NO HARDWARE
4	SCREW, MACH, 6-32, PAN, XREC	181701-01	
5	WASHER, FENDER, NON MAG	181700-01	
6	TAPE, FOAM CUT, .5”	129284-005	
7	WASHER, LOCK, .172, #8, INTL TOOTH	121692-08	
8	NUT, HEX, 6-32	103234-632	

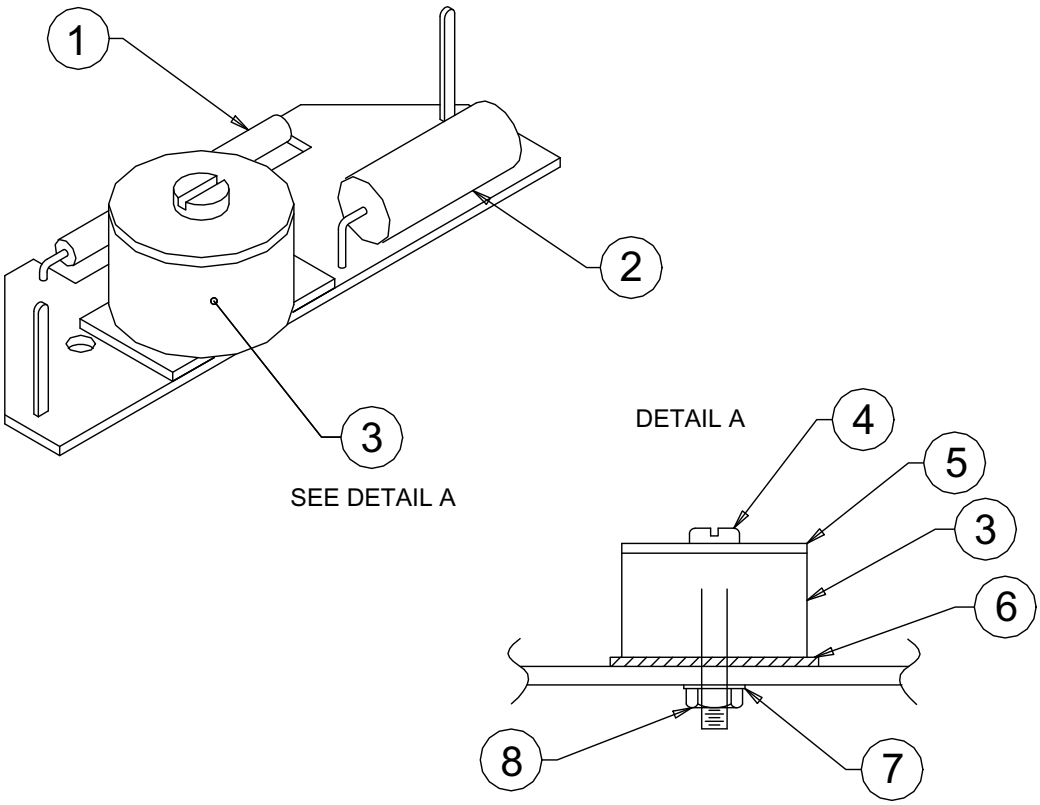

Figure 4. Model 32SE Loudpeaker Passive Variation Crossover Assembly

PACKAGING PART LIST

Model 32SE Loudspeaker (see Figure 5)

Item Number	Description	Part Number	Note
1	BRACKET, MOUNTING, BLK	178098-1	
	BRACKET, MOUNTING, WHT	178098-2	
2	HARDWARE KIT, ENV., BLK	290853-001	70/100V
	HARDWARE KIT, ENV., WHT	290853-002	70/100V
	HARDWARE KIT, ENV., BLK	290307-001	PASSIVE
	HARDWARE KIT, ENV., WHT	290307-002	PASSIVE
3	COMMITMENT LETTER	251001	
4	MANUAL, OWNERS, MD 32SE	273603	
5	CARD, REGISTRATION	180089	
6	PACKING, END CAP	124921	QTY. 2
7	CARTON, RSC, MD 32SE, IRL	254370	
8	PACKING, CREASE SHT, D/C	179109	

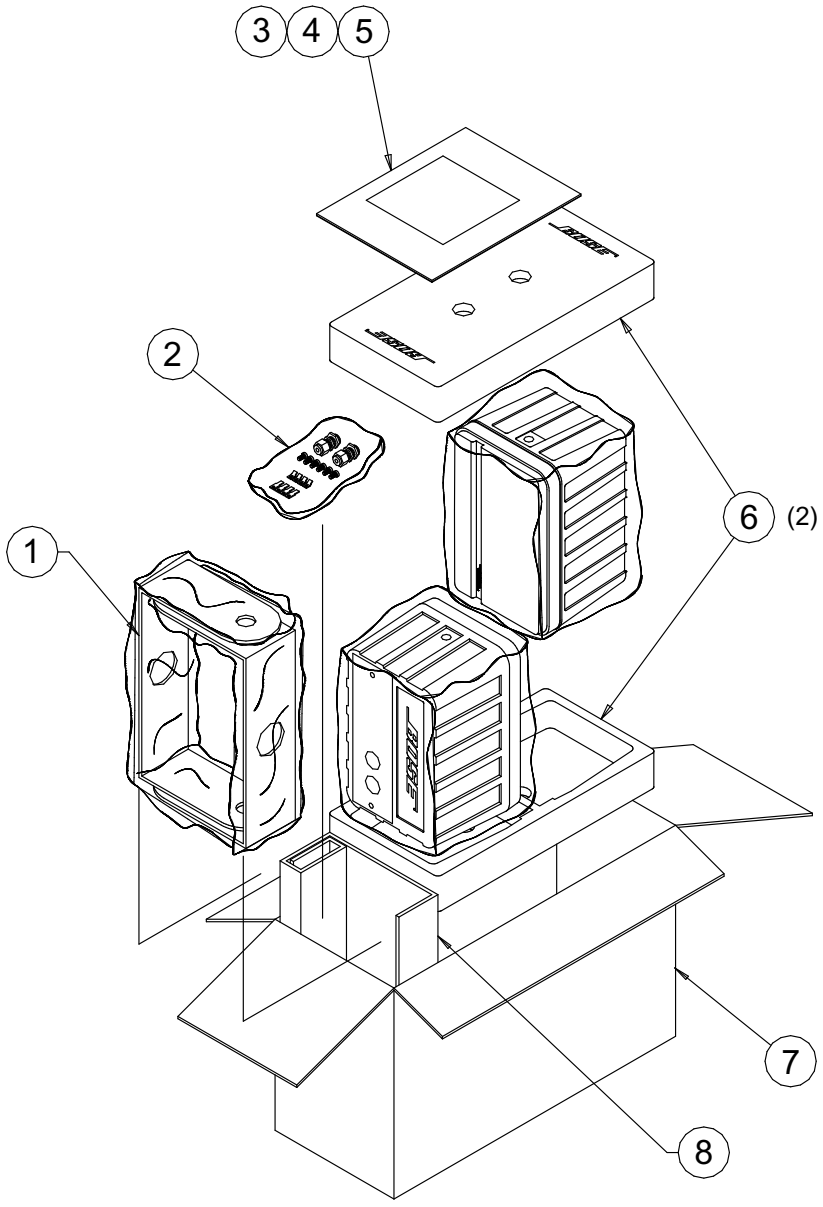

Figure 5. Model 32SE Loudspeaker Packaging View

SERVICE MANUAL REVISION HISTORY

Date	Revision Level	Description of Change	Change Driven By	Pages Affected
06/00	00	Document release revision 00	Service manual release	All
02/06	00 to 01	Added RoHS part numbers	This product is now built with RoHS compliant parts.	6,8,9

SPECIFICATIONS AND FEATURES SUBJECT TO CHANGE WITHOUT NOTICE

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P/N: 257200 Rev. 01 1/06 FOR TECHNICAL ASSISTANCE OR PART ORDERS, CALL 1-800-223-4408