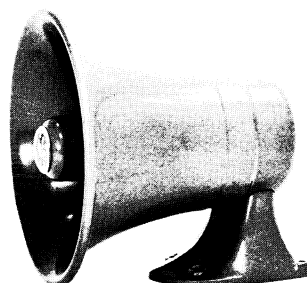


MAINTENANCE MANUAL

INTERNAL/EXTERNAL SPEAKER



LOUDSPEAKER - 19B209425P1/P2
 SPEAKER CABLE - 19B219826G1

SPECIFICATIONS *

Audio Power

	<u>PHOENIX-S, SX</u>	<u>MASTR® II</u>	<u>Exec II</u>	<u>DELTA</u>
Applied to External Speaker	3 Watts	9 Watts	3.5 Watts	12 Watts
Applied to Internal Speaker	3 Watts	1 Watt	0.5 Watt	12 Watts
Internally Dissipated	0	2 Watts	1.0 Watt	0

Power Requirement

0.01 Amperes (additional
 current required by
 Control Unit)

Loudspeaker (19B209425P2)

Impedance	8 ohms $\pm 10\%$
Power (max.)	25 Watts
Voice Coil Resistance	6.75 ohms $\pm 15\%$

Loudspeaker (19B209425P1)

Impedance	4 ohms $\pm 10\%$
Power (max.)	25 Watts
Voice Coil Resistance	3.2 ohms

*These specifications are intended primarily for the use of the serviceman. Refer to the appropriate Specification Sheet for the complete specifications.

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WARNING

Although the highest DC voltage in Mobile Radio Equipment is supplied by the vehicle battery, high currents may be drawn under short circuit conditions. These currents can possibly heat objects such as tools, rings, watchbands, etc., enough to cause burns. Be careful when working near energized 12 Volt circuits!

High-level RF energy in the transmitter Power Amplifier assembly can cause RF burns upon contact. KEEP AWAY FROM THESE CIRCUITS WHEN THE TRANSMITTER IS ENERGIZED!

DESCRIPTION

The Internal/External Speaker Option provides the user with the capability of switching audio from the radio to an external speaker. The Option Kit contains all the necessary parts to place the option in service. Refer to the Parts List. An external speaker only option for the S500 control unit provides an external loudspeaker (19B209425P1) and cable assembly (19B219826G1).

The PHOENIX-S, SX radio utilizes a speaker control box, mounted in a convenient location (typically under the dash), to switch full audio.

Extender Board 19C320588G1 is available for accessing the S500/C500 component board for maintenance purposes.

CIRCUIT ANALYSIS

Speaker selection is determined by the setting of speaker switch on the front of the control unit. When the speaker switch is placed in the INT position, all receiver audio power is applied to the internal speaker. Placing the speaker switch to the EXT position transfers approximately 75 per cent of the receiver audio power to the external speaker, while applying up to 1 Watt (MASTR® II) or 0.5 Watt (Executive II) to the internal speaker. The remaining audio power is dissipated internally by resistor R1701.

In DELTA and PHOENIX applications full audio power is switched.

The Option Light on the C500 control unit (CR1701) illuminates whenever the

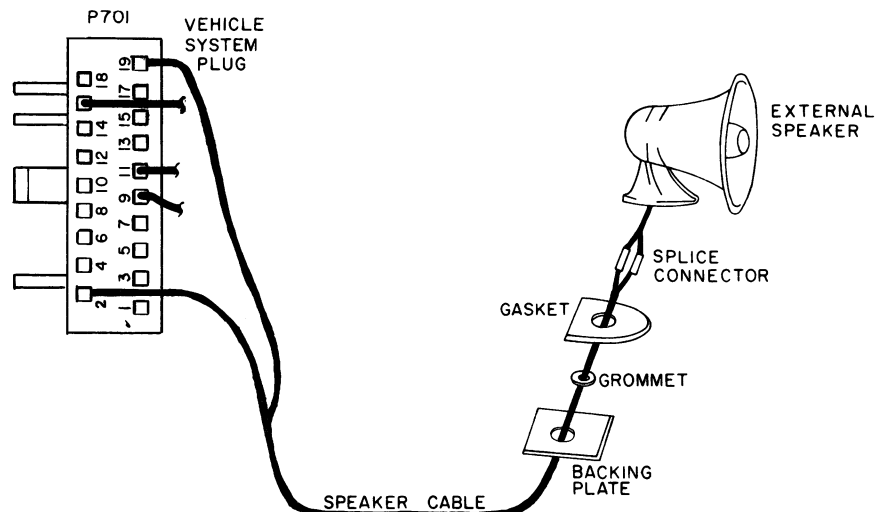
speaker switch is placed in the EXT position, indicating the selection of the external speaker. The use of the option light adds an additional 10 milliamperes current drain. Resistor R1702 limits the current through CR1701.

INSTALLATION

Control units equipped with the factory installed Internal/External Speaker Option is supplied with an external Speaker and a Speaker Cable Assembly. Mount the external Speaker in the desired location (on vehicle roof, under hood, etc.) and make the Speaker electrical connections using the cable assembly in accordance with the following:

EXTERNAL SPEAKER MOUNTING

1. Using the backing plate as a template, mark and drill two 13/64-inch holes for the backing plate retaining screws, and four 9/32-inch holes for the speaker mounting screws. Next, drill a 5/8-inch hole for the Speaker Cable and insert rubber grommet in the hole.
2. Attach the backing plate to the mounting surface with two #8-32 threadforming screws and lock-washers.
3. Route cable from the control unit through backing plate (under mounting surface), grommet, and gasket, to the Speaker (see Figure 1).
4. Connect the Speaker Cable leads and the Speaker leads using the two splice connectors furnished.



RC-2536

Figure 1 - External Speaker Connections

CAUTION

Do not ground either side of the External Speaker leads.

5. Mount the Speaker using four 1/4" x 7/8" screws, and lock-washers supplied.

ELECTRICAL CONNECTION TO VEHICLE SYSTEM PLUG, C500

1. Insert one lead of the speaker cable assembly (19B219826G1) into P701-2 (Speaker Lo of the Vehicle System Plug).
2. Insert the other lead of the Speaker Cable assembly into P701-19 (External Speaker Hi of the Vehicle System Plug).
3. Strain relieve the Speaker Cable to the control unit using a standard cable clamp (not supplied) in order to prevent damage to P701-2 and P701-19.
4. Connect P701 (Vehicle System Plug) to J701 on the control unit. The Internal/External Speaker Option is now ready for operation.

FIELD MODIFICATION INSTRUCTIONS

C500 Control Unit

The following modification instructions are used to install the Internal/External Speaker Option Kit (19A129567G1) in a C500 control unit which is not equipped with an exclusive option, such as, the Public Address Option or the Priority Search-Lock Monitor Option.

NOTE

When using a C600/S600 control unit refer to the Wiring Diagram in control unit manual.

Step 1 - Remove the printed wiring board from the control unit and cut the printed wiring run at Point B (19D417737G3) or when control unit board 19D423588G5 is used cut DA jumper wire between H65 and H66. Disassemble the control unit to gain access to the bottom of the printed wiring board as follows:

- a. Remove the two screws on the bottom of the front edge of the control unit and lift off the top cover.

- b. Remove the two screws securing the microphone jack.
- c. Remove the screw between J701 and J702, and the screw between J702 and J703.
- d. Remove the screw at each end of the switch and control mounting bracket.
- e. Remove the screw securing the Power-On switch (S701), to the control unit housing, then swing the board up from the front and lift out.
- f. Cut the printed wiring run or DA jumper wire at Point B. Refer to the Control Unit Outline Diagram (Control Unit Maintenance Manual) for the location of Point B.
- g. Re-install the board assembly in the control unit.

Step 2 - Position the Internal/External Speaker board assembly in the guide slots located inside the sides of the control unit housing. Gently insert the board assembly into the control unit, making sure that the connectors on the board assembly mate correctly with the square pins of the control unit board assembly.

Step 3 - Mount the speaker switch (S1701) in the space provided in the control unit. Orient the Speaker switch as shown on the Outline Diagram. Secure the switch to the switch and control mounting bracket with the 4-40 x 1/4 inch Phillips head POZIDRIV® tap screw provided. Secure the other end of the switch to the Control Unit housing with the 4-40 x 1/4 inch Phillips head tap screw provided.

Step 4 - Position the LED (CR1701) in the Option light slot of the control unit housing and secure in place with the spring clip provided.

Step 5 - Make connections as indicated in Connection Chart on the Outline Diagram.

Step 6 - Remove the existing nameplate from the Control Unit top cover and install new nameplate (NP270753P3) as follows:

- a. Viewing the control unit from the front, there are only three of the plastic

nameplate tabs which lock in place. These are the top left hand tab, the top right hand tab and the bottom center tab. The remaining tabs function only as guide tabs.

- b. Release the locking action of the tabs, starting with the top right hand tab, then the top left hand tab. Apply pressure with fingers or use a small flat blade screwdriver to release tabs. Push released tabs up through slots to prevent re-locking of tabs.
- c. Release the locking action of the bottom center tab and pry the nameplate loose from the top cover. The old nameplate will not be used with the Internal/External Speaker Option.
- d. Install new nameplate (NP270753P3) in place of the old nameplate. Exercise care when inserting the nameplate tabs through the slots in the Control Unit top cover.

Step 7 - Replace the control unit top cover and secure with the two screws previously removed from the bottom of the control unit housing.

PHOENIX-S, SX RADIO

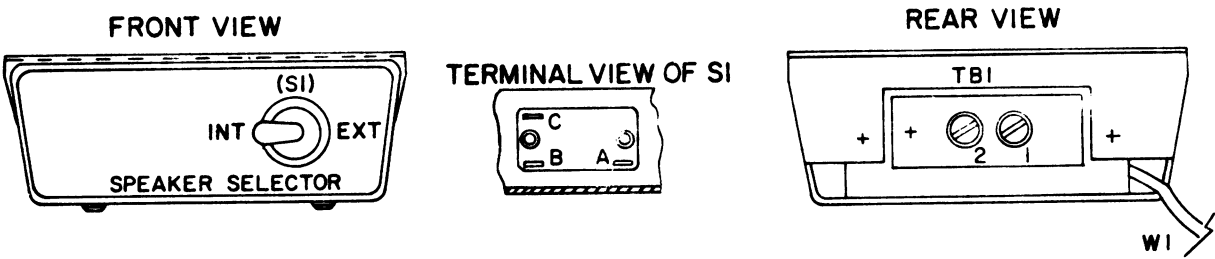
Field Modification instructions install an external speaker and speaker switch assembly for use with the General Electric PHOENIX-S, SX radios. Refer to the installation instructions, schematic, and outline diagrams.

- 1. Install the internal/external switch assembly in a convenient location under the dash.
- 2. Install the external speaker as shown in Figure 1.
- 3. Remove the radio from the vehicle and remove the top cover. Modify the synthesizer/interconnect board as follows:
 - a. Install a jumper wire between HL6 and HL3 on HL5.
 - b. Delete W903 connected between HL15 and HL16.
- 4. Cut off the end of J910-10 to a length of 9 to 10 millimeters (approximately 3/8 inch).
- 5. Insert wires from W1 of switch assembly to P910 as shown on wiring diagram.
- 6. Connect leads from external speaker to TB1-1 & 2. of switch assembly.
- 7. Reassemble and mount the radio.

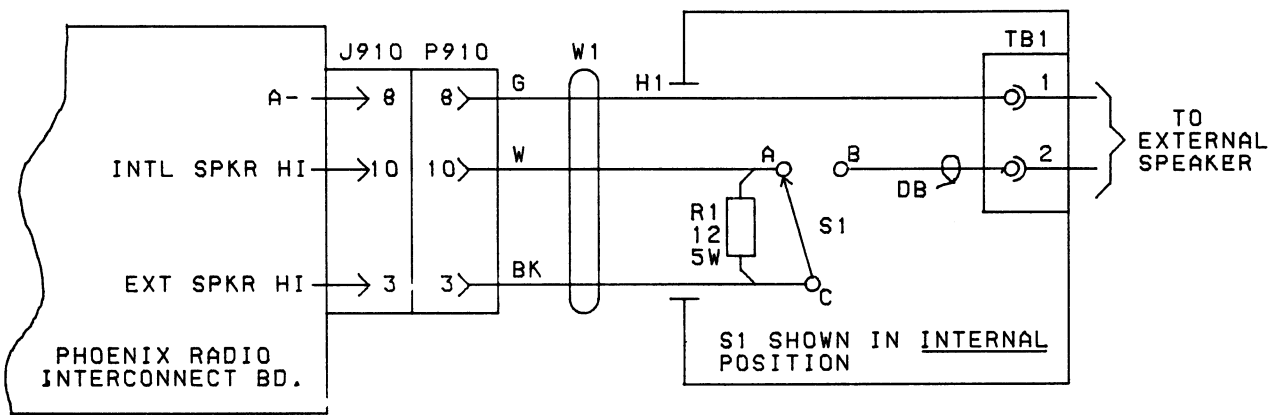
GENERAL ELECTRIC COMPANY • MOBILE COMMUNICATIONS DIVISION
WORLD HEADQUARTERS • LYNCHBURG, VIRGINIA 24502 U.S.A.



INSTALLATION INSTRUCTIONS



(19B205650, Rev. 0)

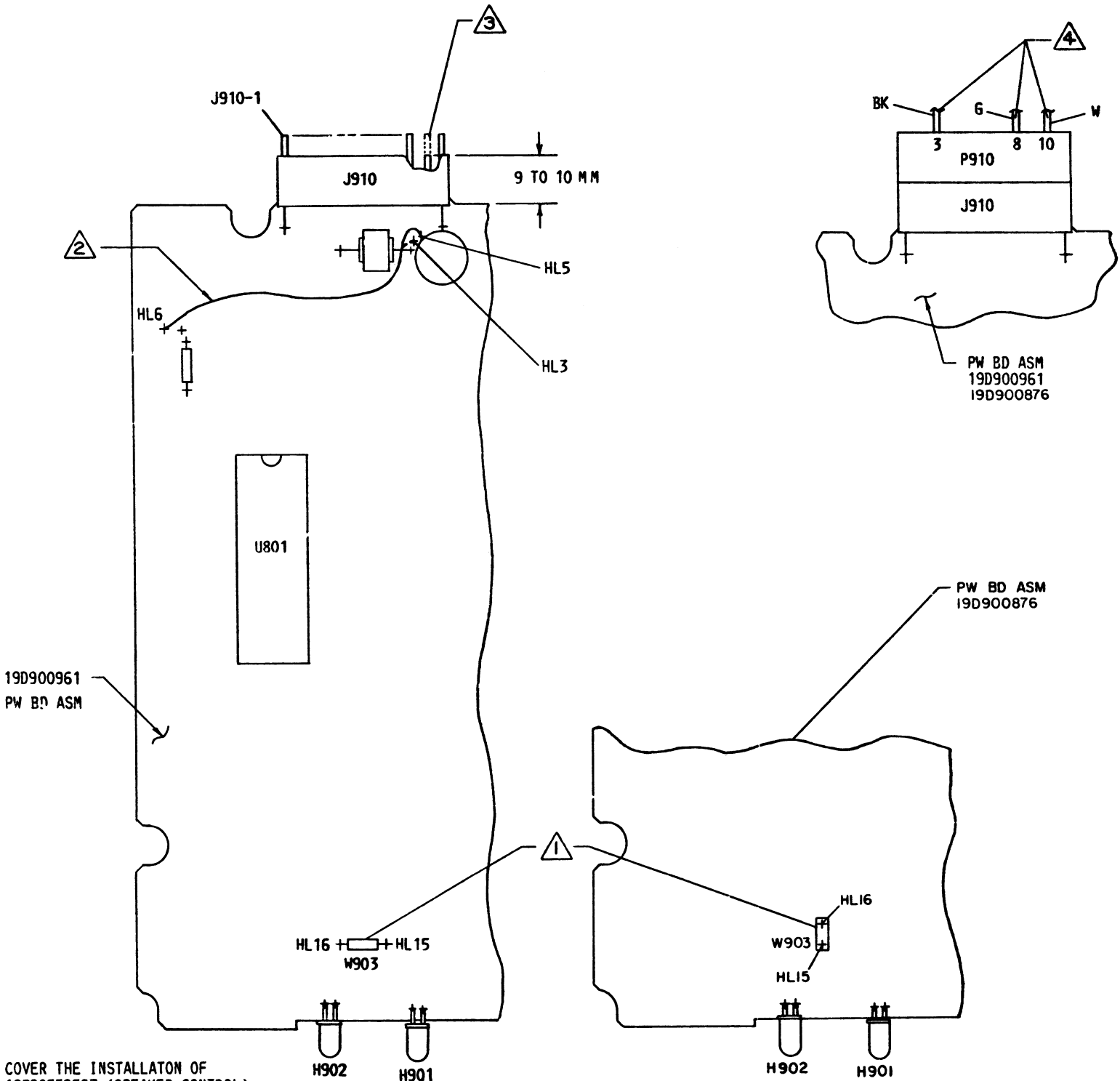


NOTE:
1. TERMINATE WIRES FROM W1 TO P910 WITH 19A116781P5. P910 IS PART OF SYSTEM CABLE.

(19B801063, Rev. 1)

OUTLINE & SCHEMATIC DIAGRAM

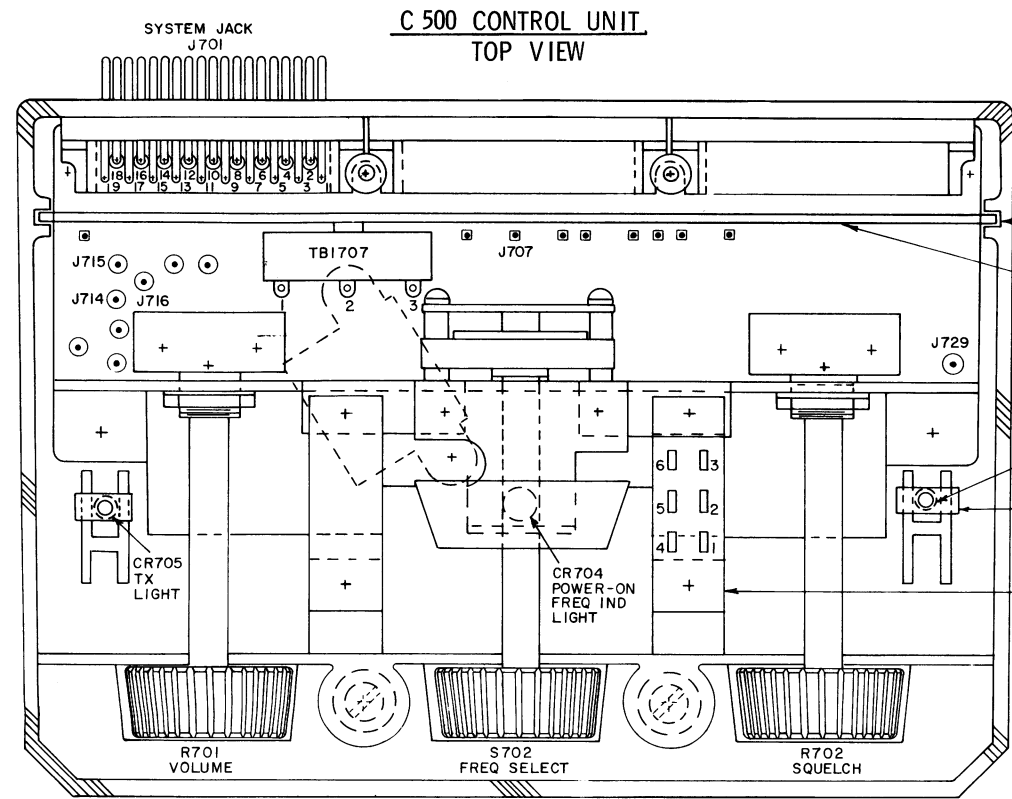
INTERNAL/EXTERNAL SPEAKER CONTROL
PHOENIX-S, SX



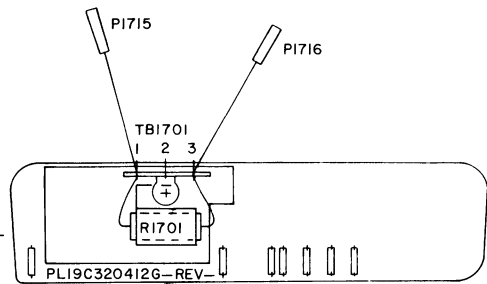
1 THESE INSTRUCTIONS COVER THE INSTALLATION OF MODIFICATION KIT PL19B205525G3 (SPEAKER CONTROL) FOR APPLICATION OF INTERNAL/EXTERNAL SPEAKER OPTION USED ON PHOENIX S.

- 1 DELETE W903
- 2 ADD WIRE FROM HL6 TO HL5 OR HL3
- 3 CUT OFF END OF J910-10 TO 9 TO 10 DIM
- 4 INSERT WIRES FROM W1 INTO P910

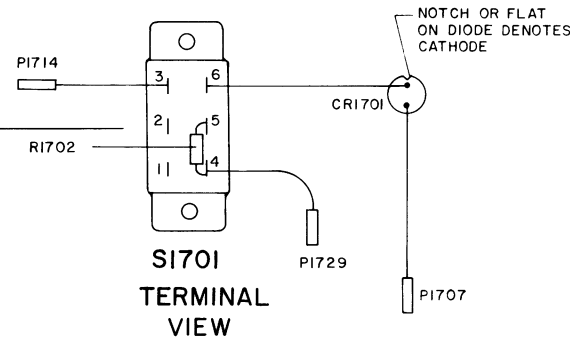
(19C851127, Rev. 1)



INT /EXT SPEAKER OPTION

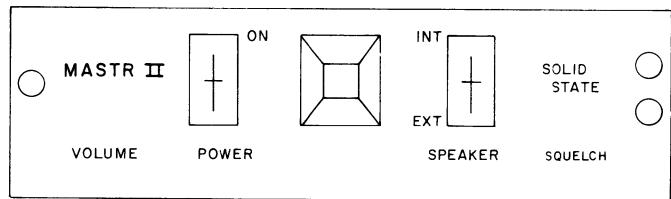


INT/EXT SPEAKER BOARD ASM.

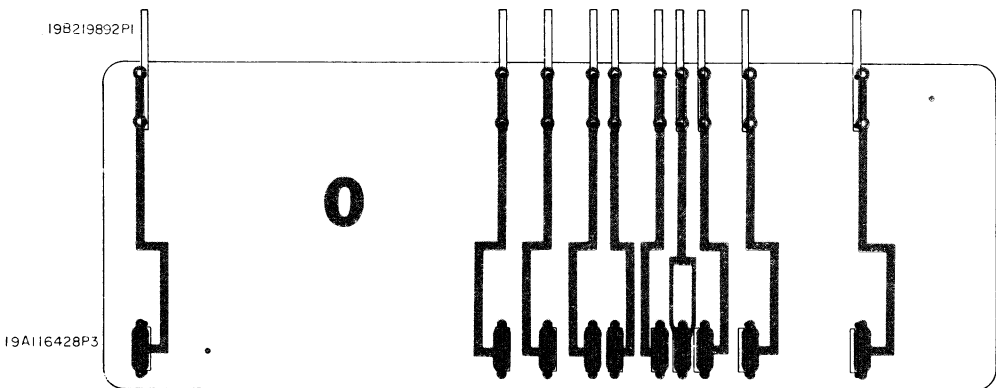


CONNECTION CHART		
WIRE SIZE AND COLOR	FROM INT/EXT SPEAKER KIT	TO CONTROL UNIT PRINTED WIRE BOARD
SF24-R	PI707	J707 (A+)
V18-R	PI714	J714 (PA/EXT SPKR HI)
V18-BL	PI715	J715 (SPKR HI)
V18-W	PI716	J716 (SPKR HI)
SF24-BK	PI729	J729 (CONTROL A-)

(19D417786, Rev. 0)

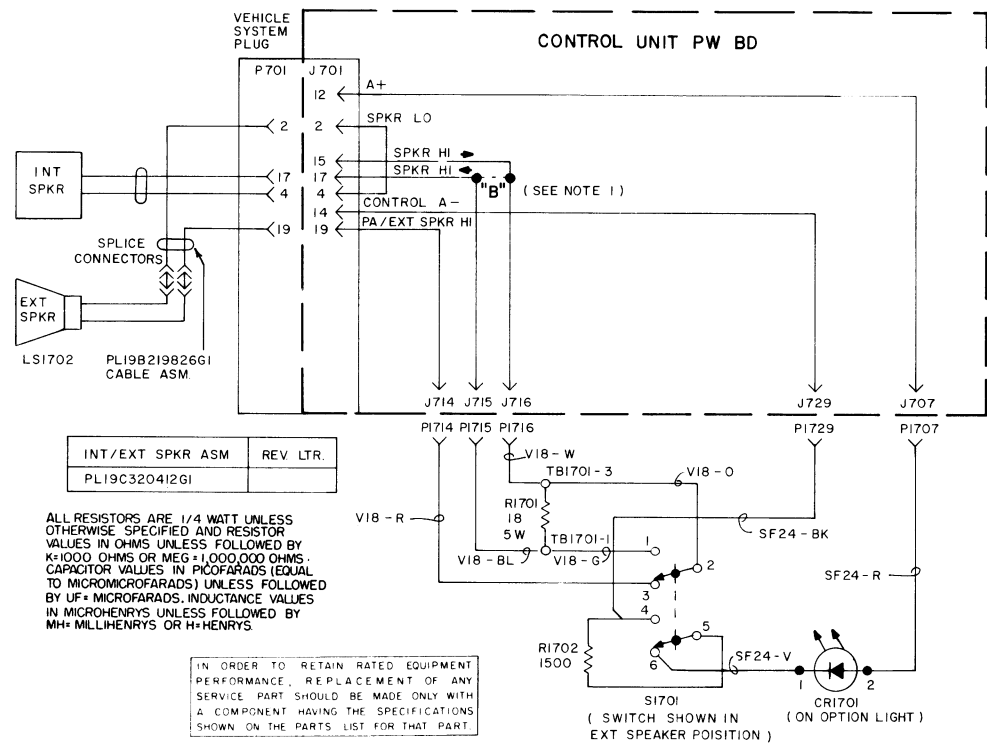


NAMEPLATE



(19C321356, Rev. 0)
(19C320590, Sh. 2, Rev. 0)
(19C320590, Sh. 3, Rev. 0)

SCHEMATIC DIAGRAM

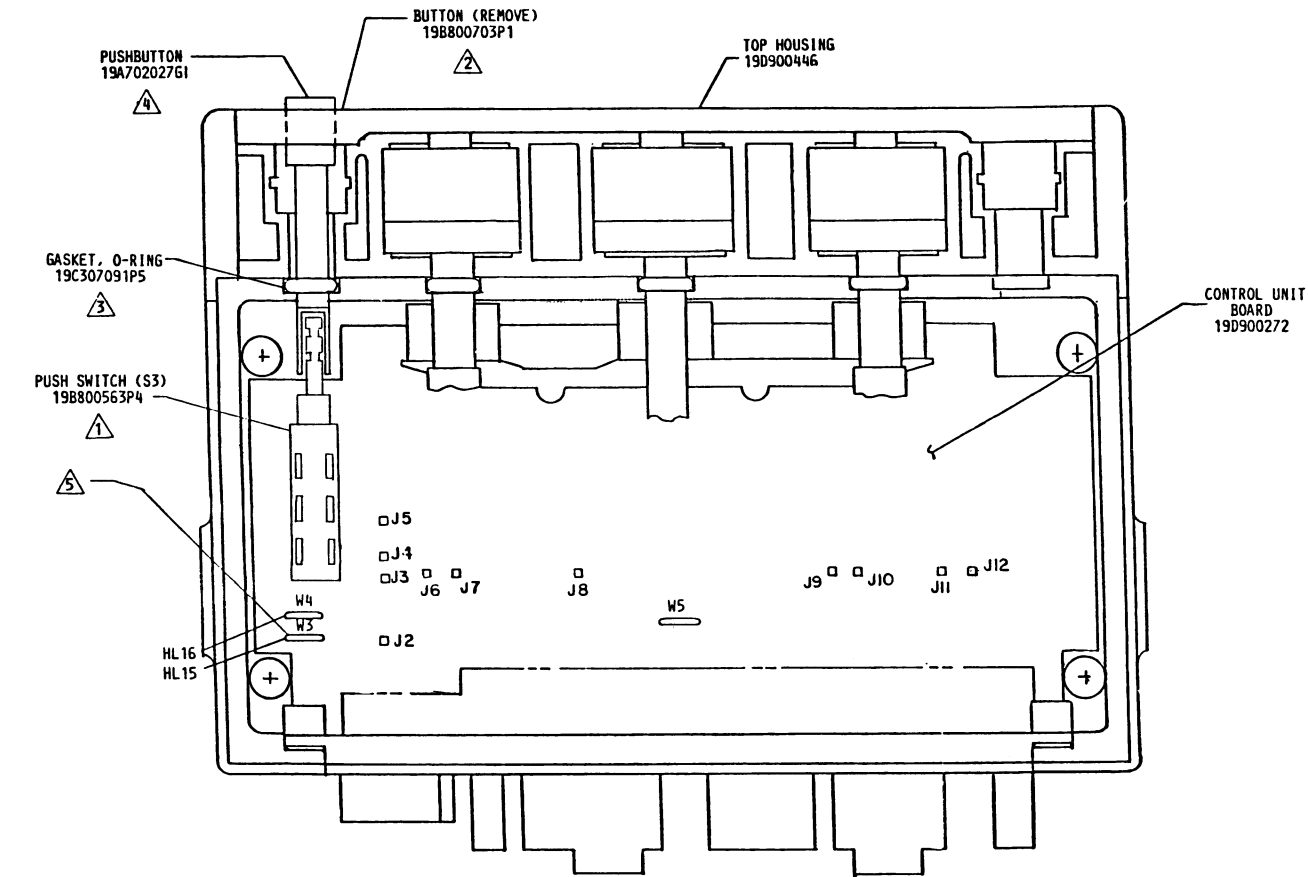


NOTES:
1. REMOVE CIRCUIT AT "B" LOCATION ON CONTROL UNIT PW BD.

(19C320471, Rev. 3)

SCHEMATIC & OUTLINE DIAGRAM

INTERNAL/EXTERNAL SPEAKER
C500 CONTROL UNIT



- 3
- NOTES:
- 1

INSTALL S3 IN CONTROL BOARD IN LOCATION SHOWN.
- 2

REMOVE BUTTON 19B800703P1 AND DISCARD.
- 3

REMOVE SOLID RING PORTION OF GASKET 19C850785P1 WHICH NORMALLY FILLS THE S3 O-RING SLOT.
- 4

INSTALL O-RING ON PUSHBUTTON AND LOCATE O-RING AND PUSHBUTTON AS SHOWN.
- 5

REMOVE JUMPER W3

(19C850793, Rev. 1)

EXTERNAL SPEAKER

INSTALLATION DIAGRAM

S600 AND C600 CONTROL UNIT

PARTS LIST

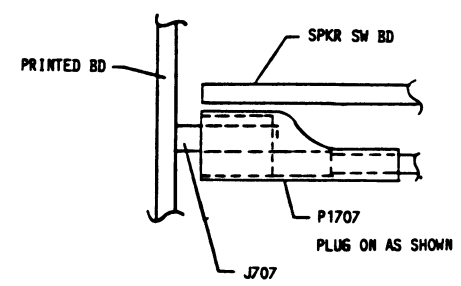
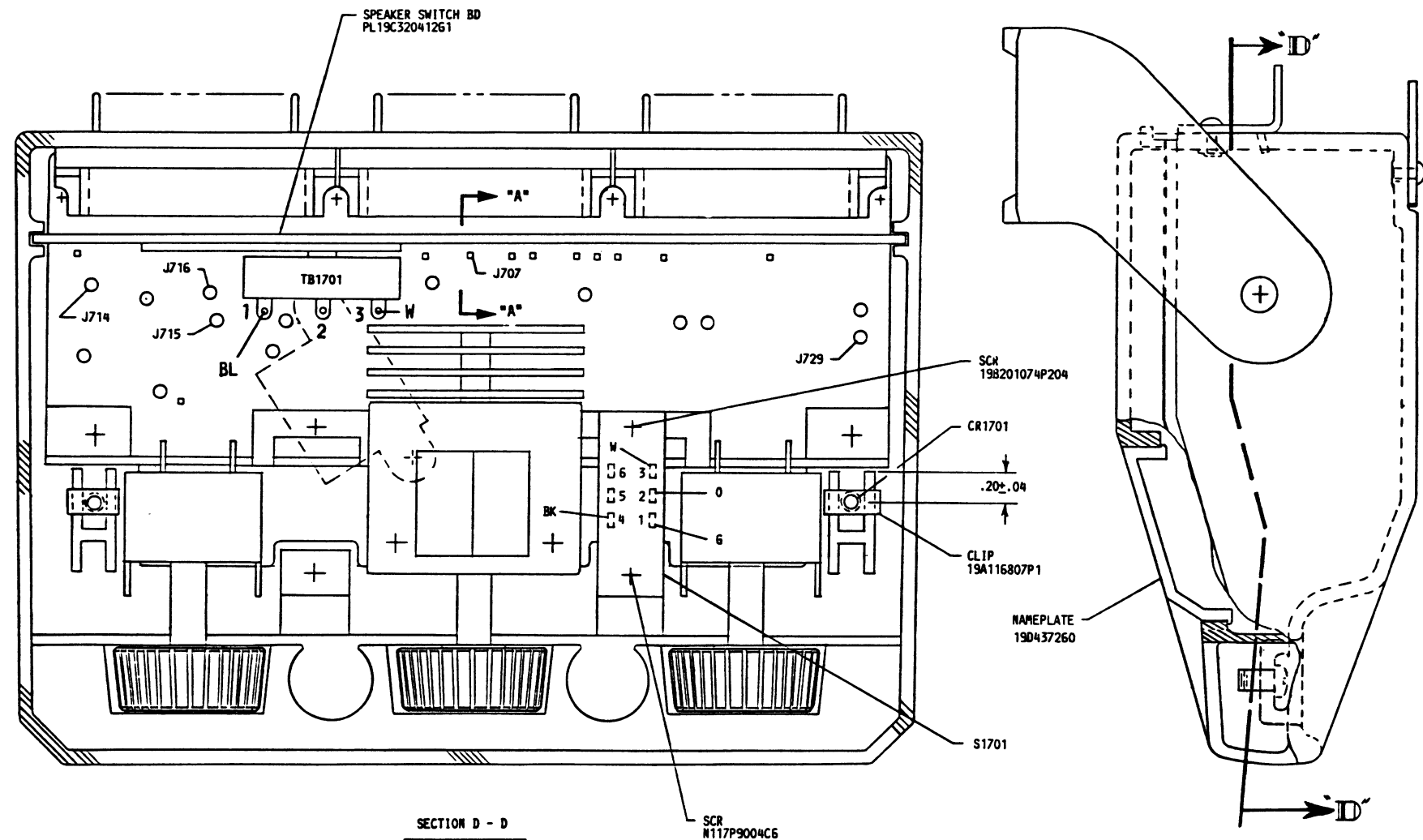
LBI4618C
INTERNAL/EXTERNAL SPEAKER OPTION
FOR
S500/C500 CONTROL UNIT

SYMBOL	GE PART NO.	DESCRIPTION
		C500 CONTROL UNIT MODIFICATION KIT 19A129567G1 S500 INTERNAL/EXTERNAL SPEAKER 19A129567G24
	NP270753P3	Nameplate.
	19B201074P204	Tap screw, phillips POZIDRIVE®: No. 4-40 x 1/4.
	N117P9004C6	Tap screw, phillips: No. 4-40 x 1/4.
	19A116807P1	Clip, spring tension.
		BOARD AND SWITCH ASSEMBLY 19C320412G1
		----- DIODES AND RECTIFIERS -----
CR1701	19A134354P5	Diode, optoelectronic: red; sim to Hew. Packard 5082-4693.
		----- PLUGS -----
P1707	19A127042P2	Solderless terminal: 20-24 AWG; sim to Malco 120-93-10.
P1714 thru P1716	19A702402P1	Contact, electrical: sim to AMP 41854.
P1729	19A702402P2	Contact, electrical; sim to AMP 42827-2.
		----- RESISTORS -----
R1701	5493035P53	Wirewound: 18 ohms ±5%, 5 w; sim to Hamilton Hall Type HR.
R1702	19A700106P67	Composition: 1.5K ohms ±5%, 1/4 w.
		----- SWITCHES -----
S1701	19A116622P4	Push: DPDT, 6 position, contacts rated 0.5 amp DC or 3 amps at 125 VAC; sim to Switchcraft 11K1039.
		----- TERMINAL BOARDS -----
TB1701	7775500P7	Phenolic: 2 insulated, 1 ground terminal.
		----- MISCELLANEOUS -----
	19A129732P1	Plate. (Mounts R1701, TB1701).
	4038930P1	Clip: approx 13/16 x 13/16 inches. (Secures R1701).
	19A701883P3	Contact, electrical; sim to AMP 85487-3. (Strip Form). (Located on printed wiring board).
		ASSOCIATED ASSEMBLIES
LS1	19B209425P2	Loudspeaker, permanent magnet: 25 w, 8 ohms ±10% voice coil imp, 6.75 ohms ±15% DC res., freq range 300 to 13,000 Hz; sim to Atlas SA-340 M2. (Used in G1).
LS06	19B209425P1	Loudspeaker, permanent magnet: 4 ohms ±10% coil imp, 3.2 ohms ±15% DC res., 25 watt, freq range 300 to 13,000 Hz; sim to Atlas SA-340. (Used in G24).
W1	19B219826G1	Speaker cable: 2 conductor, approx 20 feet.
		SPEAKER CABLE 19B219826G1
	19A116781P5	Contact, electrical: wire range No. 18-24 AWG; sim to Molex 08-50-0106.
	4029484P11	Terminal, quick disconnect: 22-18 AWG; sim to AMP 41772.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
	5490407P10	Grommet, neoprene.
	19A122633G1	Plate.
	19A701863P7	Clip loop.
	19B201074P206	Tap screw, Phillips POZIDRIVE®: No. 4-40 x 3/8. (Secures clip loop).
	N22P21008C13	Cap screw, hex head: No. 1/4-20 x 1/2. (Mounts speaker with thin mounting surface).
	N22P21014C13	Cap screw, hex head: No. 1/4-20 x 7/8. (Mounts speaker with thick mounting surface).
	N404P25C13	Lockwasher, internal tooth: 1/4 inch. (Used to mount speaker).
	N210P21C13	Hex nut: No. 1/4-20. (Used to mount speaker).

5 INT/EXT SPKR OPTION PL19A129567624



SECTION 'A - A'
PARTIAL AND ENLARGED

CONNECTIONS		
FROM	TO	WIRE
TB1701-1	J715	V18 BL
TB1701-3	J716	V18 W
S1701-3	J714	V18 R
S1701-4	J729	SF24-BK
CR1701-2	J707	SF24-R

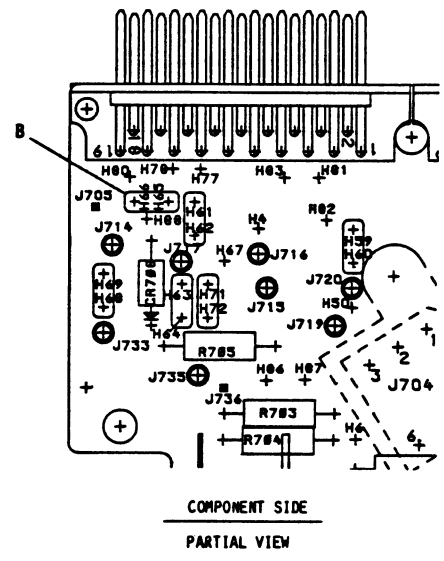
(19D437185, Rev. 0)

THIS UNIT CONTAINS THE FOLLOWING
OPTION KITS:

PL19A129567G1 □, G2 □, G3 □, G4 □, G5 □,
G6 □, G7 □, G8 □, G9 □, G10 □, G11 □, G12 □,
G13 □, G14 □, G15 □, G16 □, G17 □, G18 □, G19 □,
G20 □, G21 □, G22 □, G23 □, G24 □, G25 □, G26 □,
PL19A129567G27 □, G28 □, G29 □, G30 □, G31 □.

MARK THIS SQUARE
AS SHOWN
PER 19A115740P1

NOTE: ON PRINTED BOARD CUT JUMPER
'B' BETWEEN H65 AND H66, SEE
BELOW.



PARTS LIST

LBI31264A
 INTERNAL/EXTERNAL SPEAKER OPTION
 FOR
 PHOENIX S, SX

SYMBOL	GE PART NO.	DESCRIPTION
		SPEAKER CONTROL 19B205525G3 - - - - - RESISTORS - - - - - Wirewound: 12 ohms \pm 5%, 5 watts; sim to Hamilton Hall HR-5W. - - - - - SWITCHES - - - - - Toggle: SPDT rated 1 amp at 250 V, sim Cutler-Hammer 8282K13. - - - - - TERMINAL BOARDS - - - - - 2 terminals; sim to Cinch 1781. - - - - - CABLES - - - - - Special purpose: 3 conductor, No. 18 AWG. - - - - - MISCELLANEOUS - - - - - Shield. (Located behind S1). Case. Cover. Clip, loop. Hex nut: 15/32. (Secures S1 between cover and case). Nut, knurled: thd. size No. 15/32-32. (Secures S1 at nameplate). SPEAKER CABLE 19B219826G1 19A116781P5 Contact, electrical: wire range No. 18-24 AWG; sim to Molex 08-50-0106. 4029484P11 Terminal, quick disconnect: 22-18 AWG, sim to AMP 41772. 5490407P10 Grommet, neoprene. 19A122633G1 Plate. 19A701863P7 Clip loop. 19B201074P206 Tap screw, Phillips POZIDRIVE®: No. 4-40 x 3/8. (Secures clip loop). N22P21008C13 Cap screw, hex head: No. 1/4-20 x 1/2. (Mounts speaker with thin mounting surface). N22P21014C13 Cap screw, hex head: No. 1/4-20 x 7/8. (Mounts speaker with thick mounting surface). N404P25C13 Lock washer, internal tooth: 1/4 inch. (Used to mount speaker). N210P21C13 Hex nut: No. 1/4-20. (Used to mount speaker). ASSOCIATED PARTS 19B209425P1 Loudspeaker, permanent magnet: 4 ohms \pm 10% voice coil imp, 3.2 ohms \pm 15% DC res., 25 watt, freq range 300 to 13,000 Hz; sim to Atlas SA340.
R1	5493035P26	
S1	5491899P1	
TB1	7117710P2	
W1	19A115469P2	

PARTS LIST

LBI31205
 INTERNAL/EXTERNAL SPEAKER OPTION
 FOR
 S600/C600 CONTROL UNIT

SYMBOL	GE PART NO.	DESCRIPTION
		LS06 19B209425P1 Loudspeaker, permanent magnet: 4 ohms \pm 10% coil imp, 3.2 ohms \pm 15% DC res., 25 watt, freq range 300 to 13,000 Hz; sim to Atlas SA-340. 19B800563P4 Switch, push: DPDT, contacts rated 2 amps @ 16.6 VDC; sim to IEEE/SCHADOW F2UEE. 19A702027G1 Pushbutton. (Used with 19B800563P4 switch). 19C307091P5 "O" Ring, rubber; sim to National Seal 6227-5. SPEAKER CABLE 19B219826G1 19A116781P5 Contact, electrical: wire range No. 18-24 AWG; sim to Molex 08-50-0106. 4029484P11 Terminal, quick disconnect: 22-18 AWG; sim to AMP 41772. 5490407P10 Grommet, neoprene. 19A122633G1 Plate. 19A701863P7 Clip loop. 19B201074P206 Tap screw, Phillips POZIDRIVE®: No. 4-40 x 3/8. (Secures clip loop). N22P21008C13 Cap screw, hex head: No. 1/4-20 x 1/2. (Mounts speaker with thin mounting surface). N22P21014C13 Cap screw, hex head: No. 1/4-20 x 7/8. (Mounts speaker with thick mounting surface). N404P25C13 Lock washer, internal tooth: 1/4 inch. (Used to mount speaker). N210P21C13 Hex nut: No. 1/4-20. (Used to mount speaker). SPEAKER ASSEMBLY 19C850550G1 LS1 Permanent magnet: 3 x 5 inch, 4 ohms \pm 10% imp at 400 Hz,, 18 w. W1 Cable. Includes 2 - 19A116781P5 contacts. 19B800534G1 Housing. 19C850549P1 Grille. 19C320016P1 Mounting bracket. 19A701354P2 Nameplate. (GENERAL ELECTRIC). 19A701631P516 Machine screw: M5-.8 x 16. (Secures bracket to housing). 19A700033P10 Lockwasher, external tooth: No. 10. (Secures bracket to housing). 19A701312P7 Flatwasher: No. 10. (Secures bracket to housing).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES