MOBILE RADIO

MAINTENANCE MANUAL

VEHICULAR CHARGER MODEL 4EP75A10 (Option 5413) & SPEAKER-AMPLIFIER MODEL 4EZ18A13 (Option 5422)

VEHICULAR CHARGER

SPEAKER-AMPLIFIER

SPECIFICATIONS *

VEHICULAR CHARGER

Used With	Personal Pagers (PC05 & PC06)
Nominal DC Input Voltage (± Gnd)	13.8 Volts, 26.4 Volts, 36 Volts, 48 Volts and 72 Volts
Current Drain	
Charging	30 milliamperes
Not Charging	10 milliamperes
Charging Current	22 milliamperes
Trickle-Charge Current	5 milliamperes
Maximum Charge Time	
100% Charge	14 hours
70% Charge	8 hours
Temperature Range	+0°C to +50°C (+32°F to 122°F)

SPEAKER AMPLIFIER

Nominal Input Voltage (± Gnd)	13.8 Volts and 26.4 Volts DC
Audio Power Output	5-watts
Audio Power Input	150 milliwatts
Current Drain	
Standby	80 milliamperes
Rated Audio	900 milliamperes

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

EP-75-A & EZ-18-A

GENERAL ELECTRIC

TABLE OF CONTENTS

SPECIFICATIONS ..... Cover

DESCRIPTION 1

INSTALLATION 1

OPERATION 2

CIRCUIT ANALYSIS 2

CHARGER ADJUSTMENT 3

MAINTENANCE 4

- Disassembly 4
- Troubleshooting 4
- Charger Voltage Changes 5

OUTLINE DIAGRAMS

- Vehicular Charger 7
- Speaker-Amplifier 9

SCHEMATIC DIAGRAMS

- Vehicular Charger 7
- Speaker-Amplifier 9

PARTS LIST

- Vehicular Charger 8
- Speaker-Amplifier 10

PRODUCTION CHANGES

- Vehicular Charger 8
- Speaker-Amplifier 10

TROUBLESHOOTING PROCEDURE 11

WARNING

Under no circumstances should any person be permitted to handle any portion of the equipment that is supplied with high voltage, or to connect any external apparatus to the units while the units are supplied with power. KEEP AWAY FROM LIVE CIRCUITS.

DESCRIPTION

General Electric Vehicular Charger Model 4EP75A10 will fully recharge the nickel-cadmium battery used in the Personal Pager in 14 hours from a ± ground, 12- through 72-volt source. The charger will also provide a 70% charge in 8 hours.

The charger is equipped with a circuit that prevents the battery from overcharging. When the battery is charged to 70% of capacity, the charging circuit applies a trickle-charge for the remainder of the charging time. The Pager may be left on trickle charge indefinitely without damage to the battery.

Optional Speaker-Amplifier Model 4EZ18A13 is available for use with the vehicular charger. The speaker-amplifier provides an audio output of up to five watts in 12- and 24-volt systems only.

The vehicular charger consists of two assemblies -- the charger assembly and the charging insert. A layout of the vehicular charger is shown in Figure 1.

INSTALLATION

CHARGER

Installation of the vehicular charger consists of mounting both the charger assembly and the charging insert. The charger assembly is normally mounted on the firewall of the vehicle. The charging insert is normally mounted on the underside of the instrument panel.

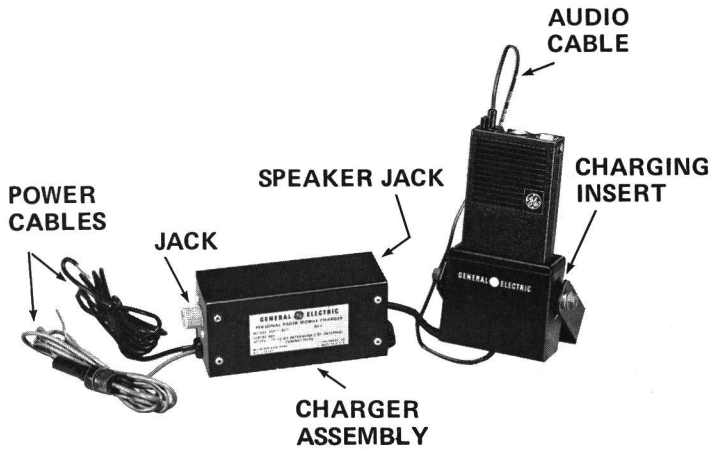


Figure 1 - Vehicular Charger Layout

To mount the charger assembly:

1. Remove the four Phillips-head screws in the top of the assembly, and remove the top cover.
2. Use the bottom panel as a template and drill the four mounting holes with a #26 drill.
3. Attach the bottom panel to the mounting surface with the four #8 x 1/2-inch self-tapping screws, and replace the top cover.
4. Connect the Green fused lead to battery hot, and the black lead to battery ground. Leave sufficient slack so that the assembly may be removed for servicing with the power applied.
5. A grommet and a cable clamp are provided for running the power leads through the vehicle firewall to the engine compartment. Drill a 5/16-inch mounting hole for the grommet. Use a #26 drill for drilling the cable clamp mounting hole. Mount the cable clamp with the #8 x 1/2-inch screw provided.

To mount the charging insert:

1. Select a mounting location where the radio will be within convenient reach of the operator and where it will not interfere with the safe operation of the vehicle.
2. Use the mounting bracket as a template and drill the two pilot holes with a #26 drill.
3. Attach the bracket to the mounting surface with the #8 x 1/2-inch self-tapping screws provided.
4. Mount the charging insert in the mounting bracket with the two machine screws and lockwashers provided.

ANTENNA

Installation instructions for the antenna are packaged with the antenna. The antenna must be installed in accordance with good engineering practice for optimum results.

The most effective mounting position for the 132-470 MHz antenna is usually in the center of the roof of the vehicle.

The antenna cable will normally run from the antenna jack on the charger assembly, behind sections of the interior trim to a door or window post, and then up between the roof and header in the passenger compartment to the antenna base.

SPEAKER-AMPLIFIER

Mount the speaker-amplifier where it will direct sound to the operator and not interfere with his vision or with the safe operation of the vehicle. The speaker may be mounted on the underside of the instrument panel, on the firewall, above the windshield in trucks, or behind the built-in speaker grille of some vehicles.

NOTE

Whenever the speaker-amplifier is used, it is recommended that Paging receiver be modified for Volume control of the alert tone as directed in the Maintenance Manual for the Pager. This modification permits the alert tone to be set for a comfortable listening level.

To mount the speaker:

1. Use the mounting bracket as a template and drill the two mounting holes with a #29 (9/64-inch) drill.
2. Attach the mounting bracket to the mounting surface with the #10 x 5/8-inch screws provided.
3. Mount the speaker in the mounting bracket with the two machine screws and lock washers provided.
4. Connect the speaker cable to the speaker jack located on the charger assembly.
5. Connect the audio cable from the charging insert to the accessory jack on the Pager.

OPERATION

Due to the temperature characteristics of nickel-cadmium batteries, the batteries will not accept a full charge at temperature extremes. For maximum capacity, recharge the battery pack at a temperature of from 65° to 85° Fahrenheit whenever possible.

To use the mobile charger, turn the Pager OFF and the Off-On switch on the regulator assembly On. Due to the low battery drain, it is not necessary to turn the charger off unless the charger will not be used for two or three weeks. Next, press open the belt clip on the Pager and place the radio into the charging insert until the belt clip catches into the retaining slot on the charging insert.

The Personal Pager can be used to monitor the channel and receive calls while in the charger. However, the battery will only charge up to approximately 50% of capacity while charging with the Pager turned on.

An external antenna is supplied with the charger to provide better reception when the Pager is used in the vehicle. Placing the Pager into the charger with the belt clip locked into the retaining slot automatically connects the Pager to the external antenna. Then adjust the Personal Pager as directed in the Operation Instructions (LBI-4210).

If the optional speaker-amplifier is used, the speaker output level is controlled by the VOLUME control on the Personal Pager. It is recommended that the Pager be modified for Volume control of the alert tone so that the alert tone can be set for a comfortable listening level. The Off-On switch on the regulator assembly also turns the speaker-amplifier on and off.

CIRCUIT ANALYSIS

VEHICULAR CHARGER

The charger assembly consists of the power leads, Off-On switch S1, Charger Board A1, antenna jack J1 and speaker jack J2. The charging insert consists of sensing transistor Q1, the charging and external antenna contacts, and audio cable W3. The two assemblies are interconnected by cable W3.

The vehicular charger is normally shipped from the factory wired for 12-volt systems. Modifications for 24-volt through 72-volt operation are described in the MAINTENANCE section of this manual (see Table of Contents).

Reference to symbol numbers mentioned in the following test can be found in the Schematic and Outline Diagrams and the Parts List (see Table of Contents).

POLARITY CIRCUIT

Turning switch S1 to the ON position applies the supply voltage to a diode bridge consisting of CR1 through CR4. The diode bridge provides a supply voltage of the correct polarity to operate the charging circuit in either a positive or negative ground system. Thyrector CR8 and capacitor C1 protect the charging circuit against abnormal voltage surges.

CHARGING CIRCUIT

The charger operates as a current-limited voltage regulator. Placing a radio into the charger causes regulator transistor Q1 on charger board A1 to conduct. This forward biases CR9 and applies a 22 milliampere charging current to the battery. The charging current is limited by R7 and CR5, CR6 and CR7. Diode CR9 prevents the battery from discharging into the charging circuit whenever power is removed from the charger.

At the start of the charging cycle, the regulator transistor normally operates as a current limiter with the charge current determined by R1, CR5, CR6 and CR7. As the battery charges up, the voltage at the anode of CR9 increases to a level that causes sensing transistor Q1 in the charging insert to start conducting. When the sensing transistor starts conducting, its collector becomes more negative. This reduces the base voltage of the regulator transistor, reducing the current applied to the battery.

When the battery is charged up to approximately 70% of capacity, the charger is in the trickle charger mode. The sensing transistor conducts at a level that has the regulator transistor nearly turned off, and the output of the charger has been reduced to 5 milliamperes. The charger remains in the trickle charge mode until the radio is removed.

The setting of R10 in the base circuit of the sensing transistor determines the voltage level of the trickle charge mode. Complete instructions for setting R10 are contained in the ADJUSTMENT section.

SPEAKER-AMPLIFIER

Speaker-Amplifier Model 4EZ18A13 is designed for operation in 12- and 24-volt systems only. The speaker-amplifier is normally shipped from the factory wired for 12-volt systems. Jumper charges for 24-volt systems are described in the MAINTENANCE section of this manual.

Audio from the Pager is coupled through transformer T1 to the base of the Class B, push-pull amplifier transistors Q1 and Q2. Base bias is provided by resistors R4, R5, R8, R9 and RT1. R5, R8 and R9 may be shorted by jumper leads to provide proper bias for the 24-volt operation. Thermistor RT1 and resistor R4 form a parallel compensating network which stabilizes the emitter current of Q1 and Q2 under varying temperature conditions.

The output taken from the emitters of Q1 and Q2 is coupled through impedance matching auto-transformer T2 to speaker LS2.

CHARGER ADJUSTMENT

Potentiometer R10 is adjusted and secured with a sealant at the factory to prevent tampering. If CR5 through CR7, CR9, CR10, R8, R9, R10, VR 1, or either transistor is replaced, it will be necessary to adjust R10. It is recommended that R10 be replaced to facilitate adjustment.

If a replacement part for R10 is not available, the sealant may be loosened by heating the metal ring on the potentiometer with a soldering iron while making the adjustment.

PREFERRED METHOD

If calibrator Model 4EX10A10 is used, set R10 as follows:

Equipment Required:

- Calibrator Model 4EX10A10.
- GE Test Set Model 4EX3A10 (or equivalent 20,000 ohms-per-volt meter).

NOTE

The charger contains temperature-compensating components for safely recharging the battery at different ambient temperatures. Therefore, a knowledge of the temperature is required during the Adjustment Procedure. Also, both the vehicular charger and the calibrator must be at the same temperature during the adjustment.

Procedure

1. Turn the charger off. Then remove the charger assembly cover as directed in the Disassembly Procedure to expose Charger Board A1.
2. Connect a clip lead from the red calibrator jack to J7 (+) and a clip lead from the black calibrator jack to J10 (-).
3. Connect Test Set 4EX3A10 across R5.
4. Place the calibrator switch in Position A, and turn on the charger.
5. Adjust R10 for the correct voltage across R5 (± 0.15-volt) according to the room temperature as shown in Figure 2.

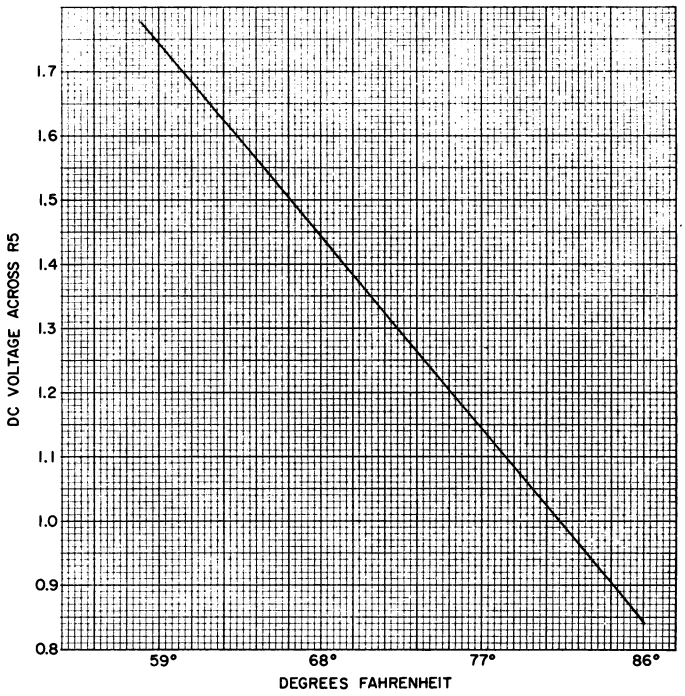


Figure 2 - Voltage versus Temperature Chart

ALTERNATE METHOD

If calibrator model 4EX10A10 is not available, this alternate method of adjusting R10 may be used. This alternate method should be used only at a room temperature of 74°F to 80°F. Set the potentiometer as follows:

Equipment Required:

- DC-VTVM accurate to ±.02 volt.
- Test Set Model 4EX3A10 or equivalent 70,000 ohms-per-volt meter.
- 6,000 mF capacitor (GE part No. 5496520-P6) and a 0 to 500-ohm potentiometer.

CAUTION

Failure to adjust R10 to within .02 volt may result in an insufficient charge or damage to the battery.

Procedure

1. Turn the charger off. Then remove the charger assembly housing as directed in the Disassembly Procedure.
2. Connect the equipment as shown in Figure 3.
3. Turn the charger on.
4. Set the 500-ohm pot for a VTVM reading of 4.18 volts ±.02 volt
5. Adjust R10 for 1.15 volts across R5 while keeping the 500-ohm pot set for 4.18 volts. It may be necessary to alternately adjust the 500-ohm pot and R10 several times to obtain the proper setting.

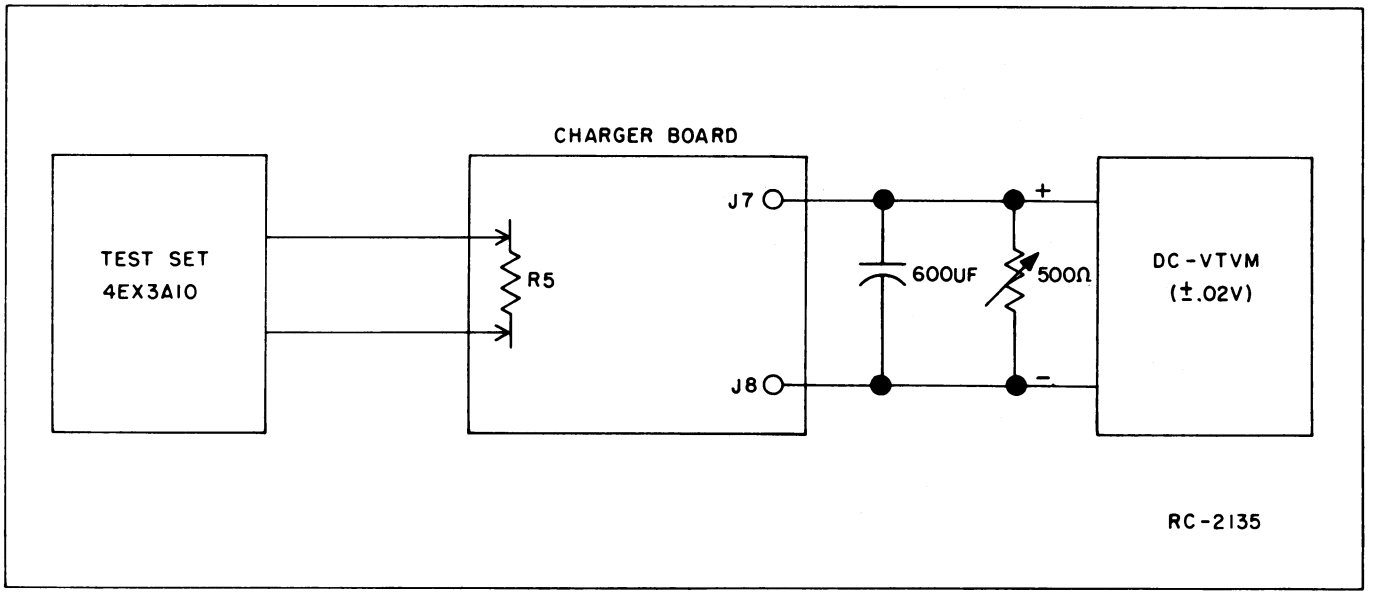


Figure 3 - Test Set-Up

MAINTENANCE

DISASSEMBLY

Charger

To gain access to the charger assembly circuitry for servicing, remove the four Phillips-head screws in the top of the charger and carefully lift off the housing.

To gain access to the charging insert circuitry, remove the six Phillips-head screws in the back panel, and lift off the panel.

Speaker-Amplifier

To gain access to the speaker-amplifier circuitry, remove the two screws on each side of the speaker case and lift off the front section of the speaker housing.

TROUBLESHOOTING

Should a difficult service problem arise, the Troubleshooting Procedure listed in the Table of Contents is provided to assist the serviceman. The procedure includes servicing both the desk charger and the multi-charger.

CHARGER VOLTAGE CHANGES

The following circuit changes must be performed on Charger Board A1 when changing the vehicular charger for 12-, 24-, 36-, 48-, or 72-volt operation. Refer to the Outline and Schematic Diagrams for the location of components mentioned in the following procedures.

12-Volt Operation

1. Connect a jumper from the junction of R6 - R11 to the + lead of C1.
2. Connect P13 on the Green power lead to J1 on Charger Board A1.

24-Volt Operation

1. Remove the jumper connected from the junction of R6 - R11 to the + lead of C1.
2. Connect P13 on the Green power lead to J1 on Charger Board A1.

36-Volt Operation

1. Remove the jumper connected from the junction of R6 - R11 and the + lead of C1.
2. Connect PB on the Green power lead to J2 on Charger Board A1.

48-Volt Operation

1. Remove the jumper connected from the junction of R6 - R11 to the + lead of C1.
2. Connect P13 on the Green power lead to J3 on Charger Board A1.

72-Volt Operation

1. Remove the jumper connected from the junction of R6 - R11 to the + lead of C1.
2. Connect P13 on the Green power lead to J4 on Charger Board A1.

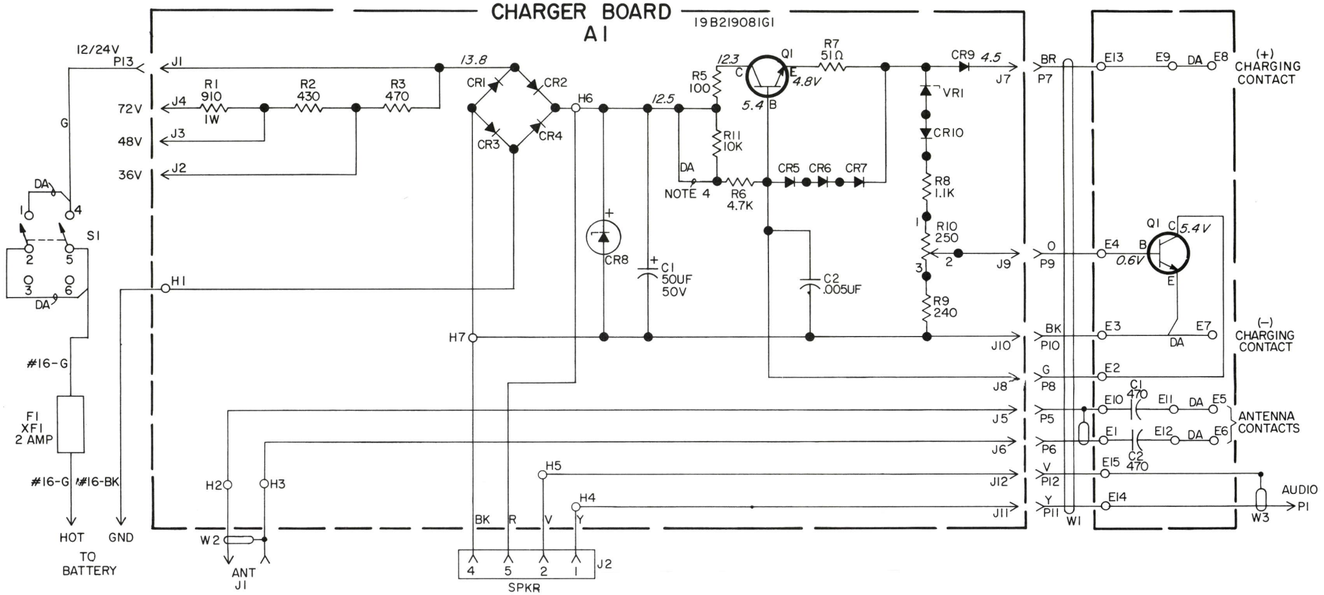
SPEAKER VOLTAGE CHANGES

The speaker-amplifier Schematic Diagram is shown with the jumper connections made for 12-volt operation. Refer to the Outline and Schematic Diagram for the location of components mentioned in the following procedure.

For 24-Volt Operation

1. Connect P1 to TB2-J3.
2. Connect P2 to TB2-J6.
3. Connect P3 to TB1-J3.

SCHEMATIC DIAGRAM



SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.
THIS ELEM DIAG APPLIES TO
MODEL NO. REV LETTER
PLI9C317600G1

ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS.

IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

NOTES:
1. P5-P13 ARE A4029840P2 CONTACT.
2. ALL WIRING SF24 UNLESS OTHERWISE SPECIFIED.
3. DA = #22 AWG.
4. REMOVE DA JUMPER FOR OPERATION ABOVE 12 VDC.

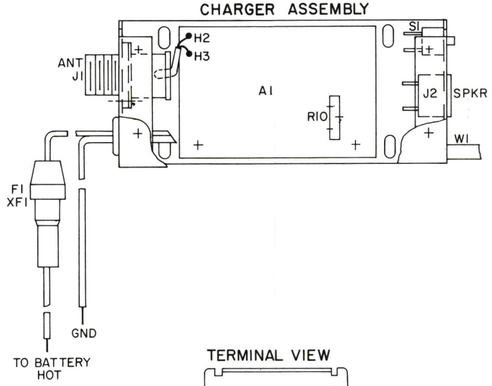
VOLTAGE READINGS

ALL VOLTAGES MEASURED WITH A 20,000 OHM-PER-VOLT METER WITH THE CHARGER WIRED FOR 12-VOLT OPERATION, AND WITH NO BATTERY BEING CHARGED.

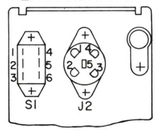
(19C317597, Rev. 2)

OUTLINE DIAGRAM

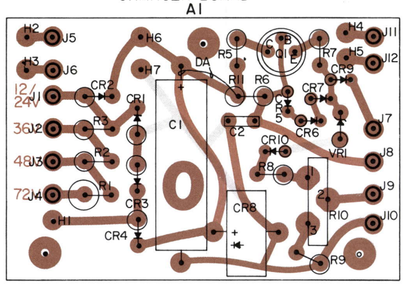
CHARGER ASSEMBLY



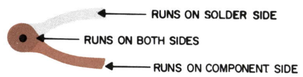
TERMINAL VIEW



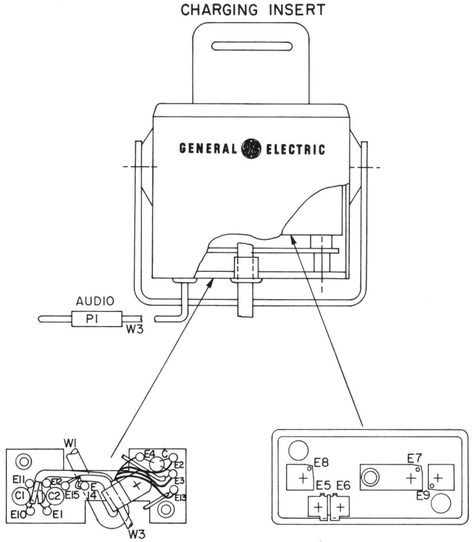
CHARGER BOARD
A1

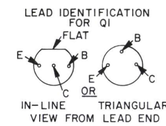


(19C317910, Rev. 0)
(19B219077, Sh. 1, Rev. 0)
(19B219077, Sh. 2, Rev. 0)



CHARGING INSERT





NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.

SCHEMATIC & OUTLINE DIAGRAM

VEHICULAR CHARGER
MODEL 4EP75A10

PARTS LIST

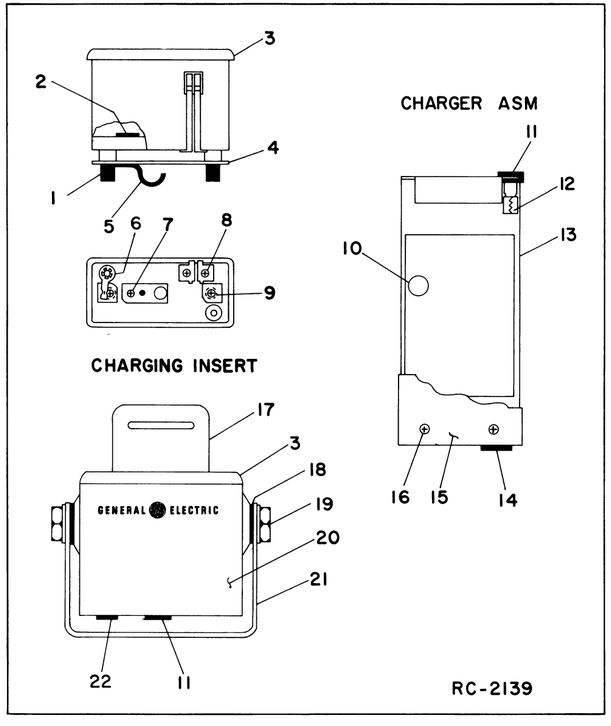
LBI-4239

VEHICULAR CHARGER
MODEL 4EP75A10
(19C317600G1)

SYMBOL	GE PART NO.	DESCRIPTION
A1		COMPONENT BOARD 19B219081G1
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	19A115680P6	Electrolytic: 50 µf +150% -10%, 50 VDCW; sim to Mallory Type TT.
C2	5495323P14	Ceramic: .005 µf +100% -20%, 75 VDCW.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1 thru CR4	4037822P1	Silicon.
CR5 thru CR7	19A115250P1	Silicon.
CR8	19A116062P2	Selenium.
CR9 and CR10	19A115250P1	Silicon.
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J1 thru J12	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19A115300P1	Silicon, NPN; sim to Type 2N3053.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	19A116310P21	Composition: 910 ohms ±5%, 1.0 w; sim to Allen Bradley Type GB.
R2	19A116310P19	Composition: 430 ohms ±5%, 0.5 w; sim to Allen Bradley Type EB.
R3	19A116310P120	Composition: 470 ohms ±10%, 0.5 w; sim to Allen Bradley Type EB.
R5	3R77P101K	Composition: 100 ohms ±10%, 1/2 w.
R6	3R77P472K	Composition: 4700 ohms ±10%, 1/2 w.
R7	3R77P510J	Composition: 51 ohms ±5%, 1/2 w.
R8	3R77P112J	Composition: 1100 ohms ±5%, 1/2 w.
R9	3R77P241J	Composition: 240 ohms ±5%, 1/2 w.
R10	19B209358P101	Variable, carbon film: approx 25 to 250 ohms ±10%, 0.2 w; sim to CTS Type X-201.
		- - - - - - - - VOLTAGE REGULATORS - - - - - -
VR1	4036887P1	Silicon, Zener.
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1 and C2	5494481P7	Ceramic disc: 470 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - - - TERMINALS - - - - - - - - - -
E5	19B216848P2	Contact.
E6	19B216848P1	Contact.
		- - - - - - - - - - FUSES - - - - - - - - - -
F1	1R16P5	Quick blowing, cartridge: 1 amp 250 v; sim to Littelfuse 312001 or Bussmann AGC -1.
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J1		(Part of W2).

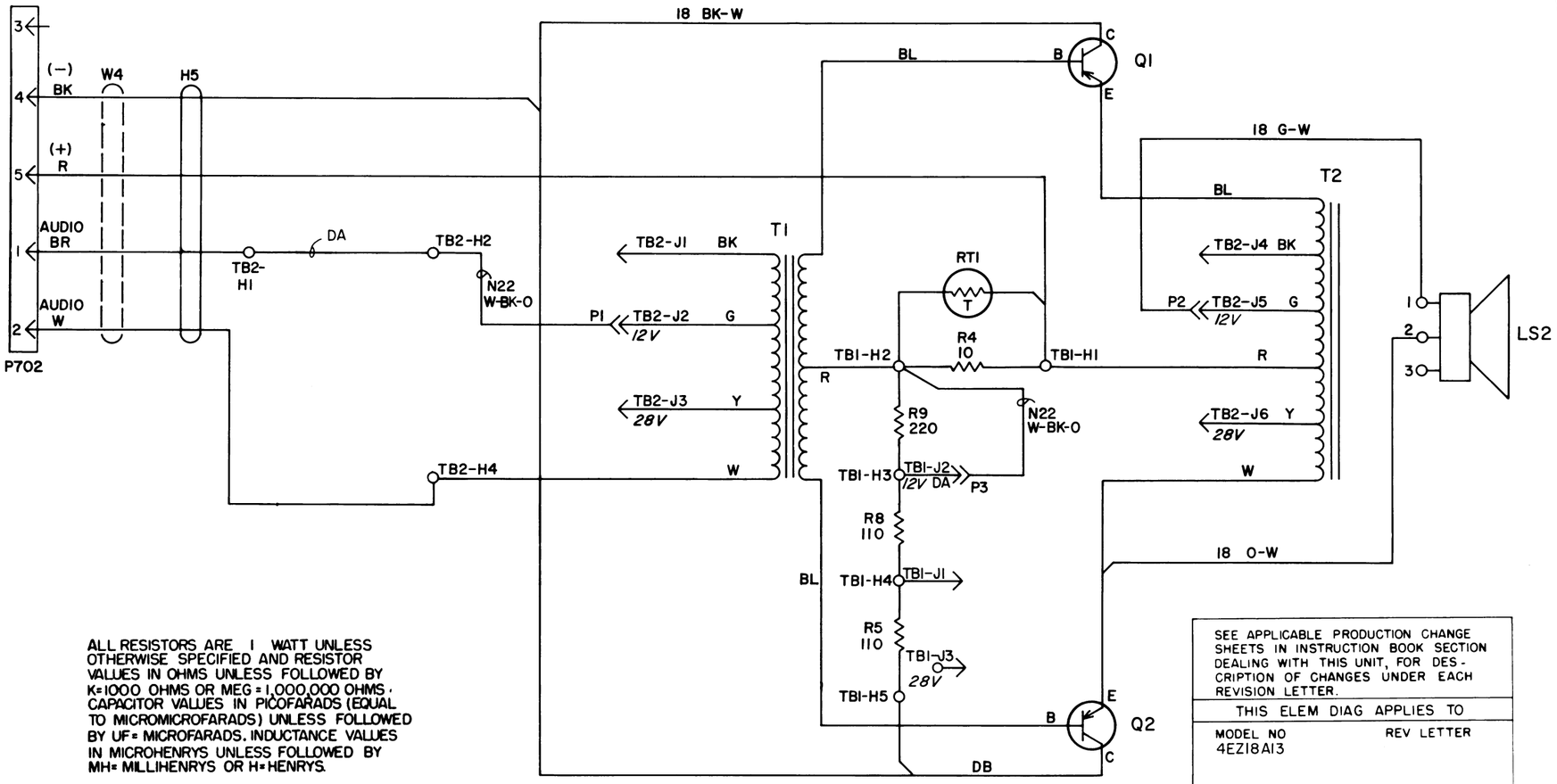
SYMBOL	GE PART NO.	DESCRIPTION
J2	5493018P1	Connector: 5-contact, molded black phenolic, steel mounting saddle; sim to Cinch Mfg Co 203-41-05-081.
J13	4029840P2	Contact, electrical: sim to Amp 42827-2.
		- - - - - - - - - - INDUCTORS - - - - - - - - -
L5 thru L12		(Part of W1).
		- - - - - - - - - - PLUGS - - - - - - - - - - -
P1		(Part of W3).
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19A115362P1	Silicon, NPN; sim to Type 2N2925.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S1	19B209040P1	Slide: DPDT, 0.5 amp at 125 v; sim to Continental-Wirt Type 126.
		- - - - - - - - - - CABLES - - - - - - - - - -
W1	19B219072G1	Cable: approx 53 inches long. Includes:
	4029840P2	(8) Contact, electrical: sim to Amp 42827-2.
W2		CABLE ASSEMBLY 19B216886G3
J1		Includes:
	2R22P3	Connector: 1 contact. Signal Corps SO-239 or sim to Amphenol 83-1R.
	19B204398P2	Can.
	19A121436P1	Cap.
	19B201074P206	Tap screw: 4-40 x 3/8.
W3	19A128036G2	Cable: approx 14 inches long. Includes (P1).
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XF1	19A122111G5	Fuse, lead: approx 5 feet long.
		INSERT ASSEMBLY 19C317366G1
		- - - - - - - - - CAPACITORS - - - - - - - - -
C501	5494481P11	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - - - - TERMINALS - - - - - - - - - -
E7	19A127739G1	Contact.
E8 and E9	19B216851P1	Contact.
		COMPONENT BOARD 19A127963G1
		- - - - - - - - - - TERMINALS - - - - - - - - - -
E1 thru E4	19A115296P1	Terminal, standoff: sim to Cambridge Thermionic Corp X1558-BB.
E10 thru E15	19A115296P1	Terminal, standoff: sim to Cambridge Thermionic Corp X1558-BB.
		MECHANICAL PARTS (SEE RC-2139)
1	19A128039P1	Spacer.
2	4032591P38	Tape, pressure sensitive.
3	19E500908P1	Insert. (Block only- if entire assembly is desired order 19C317366G1).
4	19A127963G1	Component board. (Includes E1-E4, E10-E15 and item 1).
5	7763541P4	Clip, spring tension.

SYMBOL	GE PART NO.	DESCRIPTION
6	4036835P10	Terminal, solder: sim to Shakeproof 2120-06-00.
7	N108P303B	Tap screw: No. 2 x 3/16. (Used with E7-E9).
8	N108P503C	Tap screw: No. 2. (Used with E5 and E6).
9	N404P8C13	Lockwasher: No. 2. (Located under E8 and E9).
10	4036555P1	Insulator, washer: nylon. (Used with Q1 on A1).
11	5490407P4	Grommet, rubber: 5/8 inch dia.
12	7147223P1	Cable clamp.
13	19A127957G1	Chassis.
14	5491419P3	Strain relief: sim to Heyco SR-5P-1.
15	19B219071P1	Cover.
16	19B201074P204	Tap screw: 4-40 x 1/4.
17	19B219067P1	Support.
18	N405P11C13	Lockwasher: 1/4 inch.
19	19A115495P2	Screw, hex: 1/4-20 x 5/16.
20	19A127967G1	Case.
21	19A127953G1	Mounting bracket.
22	5490040P2	Grommet, rubber: 7/16 inch dia.



*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SCHEMATIC DIAGRAM



ALL RESISTORS ARE 1 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG = 1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF = MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH = MILLIHENRYS OR H = HENRYS.

IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

(19C317673, Rev. 0)

SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.

THIS ELEM DIAG APPLIES TO	
MODEL NO	REV LETTER
4EZ18A13	

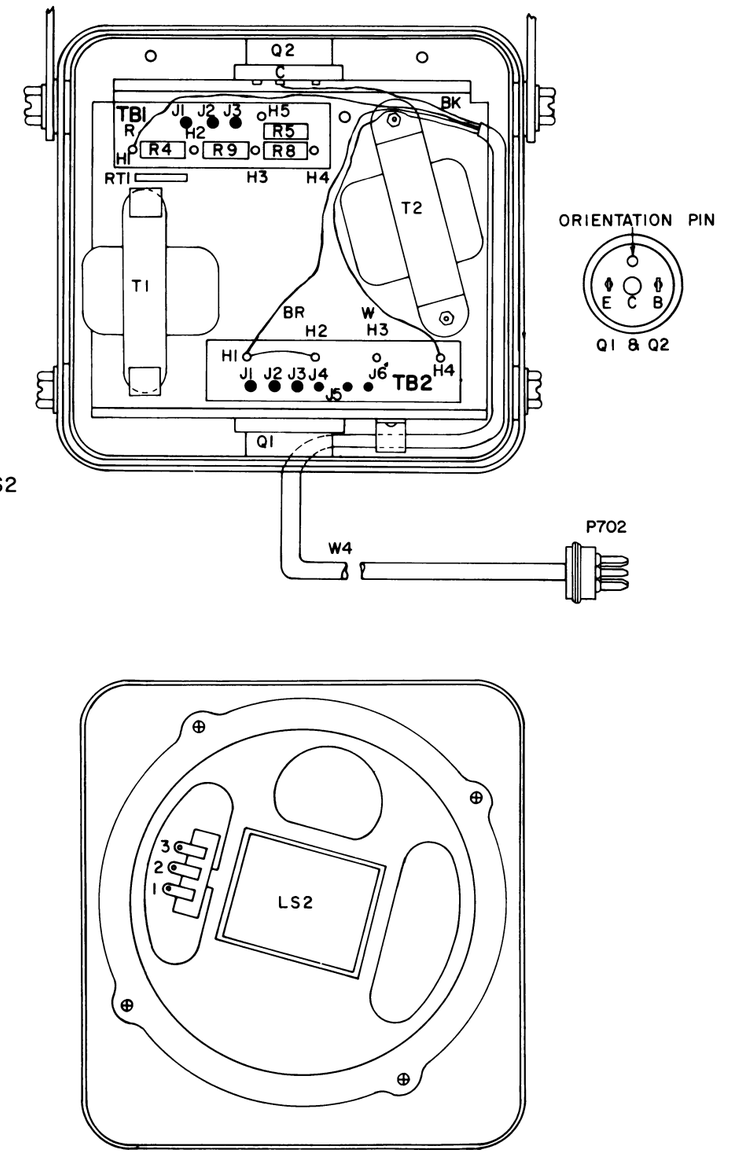
RESISTANCE READINGS

READINGS TAKEN FROM TRANSISTOR PIN TO RED LEAD OF SPEAKER CABLE (POSITIVE).

TRANSISTORS	BASE	EMITTER
Q1 & Q2	3.0Ω*	0.2Ω

*MEASURED AT 70° F AMBIENT

OUTLINE DIAGRAM



(19C317906, Rev. 1)

SCHEMATIC & OUTLINE DIAGRAM

SPEAKER-AMPLIFIER
MODEL 4EZ18A13

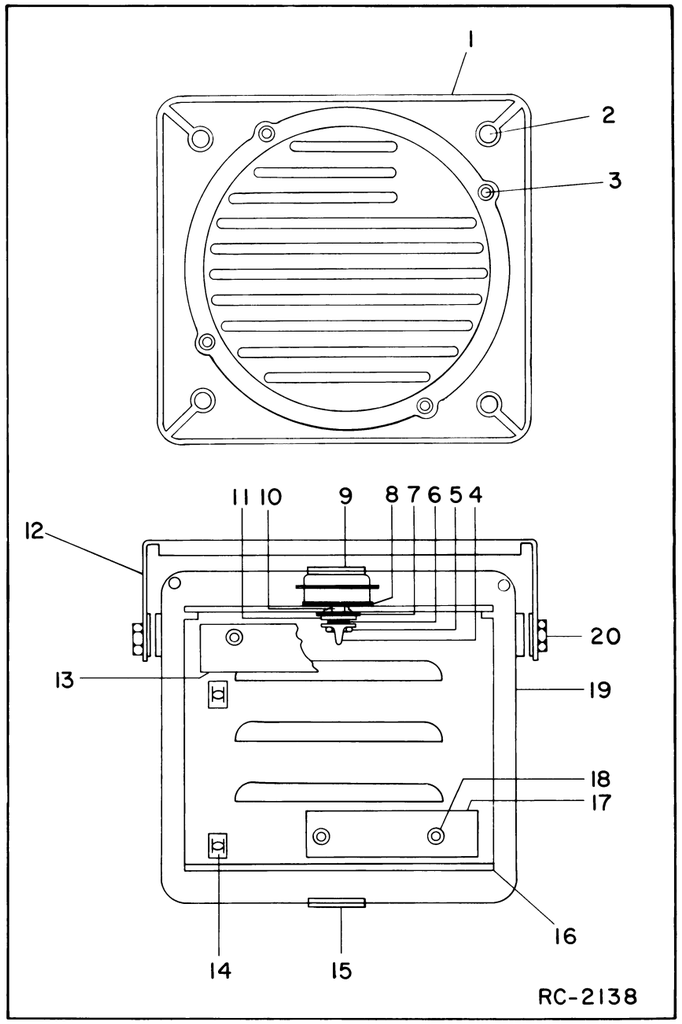
Issue 1 9

PARTS LIST

LBI-4238

SPEAKER-AMPLIFIER
MODEL 4EZ18A13 (19D402449G16)

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - LOUDSPEAKERS - - - - - - - - -
LS2	5491260P7	Permanent magnet, 5-inch: 3.2 ohms ±10% voice coil imp, 15 w max operating, 385 Hz ±15% resonance, paper dust cap; sim to Jensen Model P5-VAS12761.
		- - - - - - - - - - - PLUGS - - - - - - - - - - -
P1	4036731P1	Contact, friction: sim to Bead Chain M152-30.
P2	4029840P1	Contact, electrical: sim to AMP 41854.
P3	4029840P2	Contact, electrical: sim to AMP 42827-2.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1 and Q2	5490810P1	Germanium, PNP.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R4	3R78P100J	Composition: 10 ohms ±5%, 1 w.
R5	3R78P111J	Composition: 110 ohms ±5%, 1 w.
R8	3R78P111J	Composition: 110 ohms ±5%, 1 w.
R9	3R78P221J	Composition: 220 ohms ±5%, 1 w.
		- - - - - - - - - THERMISTORS - - - - - - - - -
RT1	19C300048P3	Disc: 1 ohm ±10%.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T1	19B209220P1	Audio freq: 0.3-3 KHz freq range nominal, Pri: 0.17 ohm DC res max, Sec: 5.2 ohms DC res max.
T2	19B209218P1	Audio freq: 0.3-3 KHz freq range nominal, 0.3 ohm DC res max.
		- - - - - - - TERMINAL BOARDS - - - - - - - - -
TB1		BOARD 19A121707G1
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J1 thru J3	4033513P12	Contact, electrical: sim to Bead Chain L93-3.
TB2		BOARD 19A121291G1
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J1 thru J3	4033513P12	Contact, electrical: sim to Bead Chain R125-17.
J4 thru J6	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - - - - CABLES - - - - - - - - - -
W4	19B205410G1	Power: 4-conductor, 300 VRMS, approx 4 feet (modified).
P702	5493018P2	Plug, phen: 5 contacts; sim to Cinch 204-31-05-010.
		MECHANICAL PARTS (SEE RC-2138)
1	19B216269G1	Housing.
2	19B201806P5	Insert.
3	19B201806P2	Insert.
4	4036835P1	Terminal: solder; sim to Shakeproof 2118-10-01-2520N.
5	4032596P1	Nut: No. 10-32.
6	N405P9C13	Lockwasher: No. 10.
7	19A115221P3	Insulator, washer: mica.
8	4031291P1	Insulator: approx 1-1/8 inch dia.
9	5490407P6	Grommet, rubber. (Upper)
10	4034215P2	Bushing: approx 3/8 inch dia.
11	4034225P1	Flatwasher: approx 1/2 inch dia.
12	19A121521G1	Mounting support.
13	19A121711P1	Insulator: approx 2-1/2 x 3/4 inches.
14	4038072P2	Speed nut: sim to Tinnerman C8092-632-1.
15	19A115470P1	Grommet, rubber: (Lower) sim to Atlantic India Rubber 2279 (without hole).
16	19B204603G2	Chassis.
17	19A121645P1	Insulator.
18	7150186P105	Spacer.
19	19A121550G3	Rear Cover.



*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

QUICK CHECKS

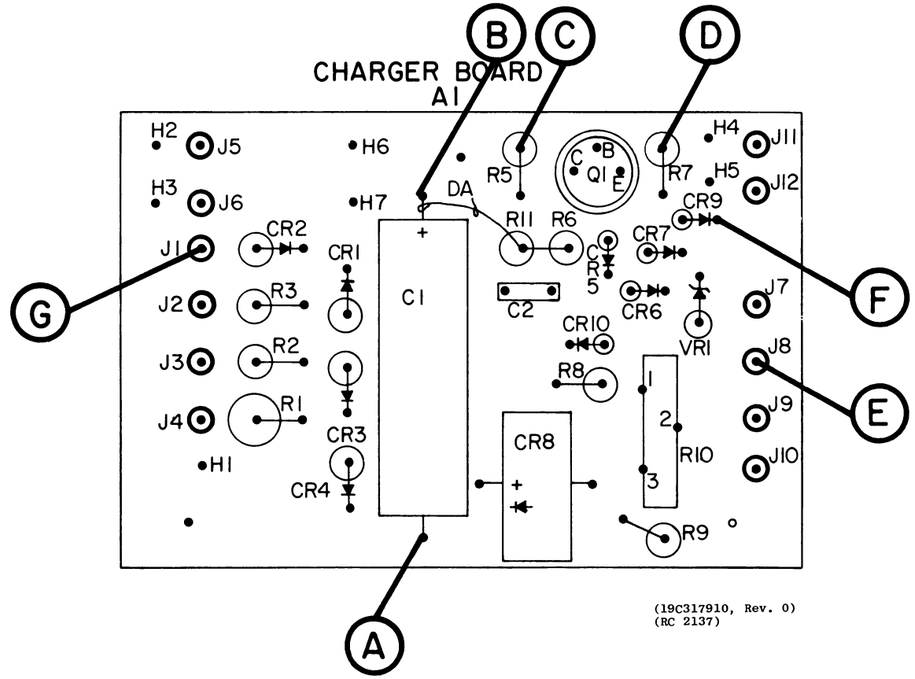
SYMPTON	CHECK FOR:
Battery will not charge	1. Blown fuse or power switch off. 2. Defective Q1. 3. Open CR9
High current drain or fuse blows	1. Defective CR8. 2. Shorted C1.
Charger won't trickle-charge	1. Defective CR9, VR1, CR10 or R10. 2. Open Q1.
Charge current too high	Defective R7, CR5, CR6 or CR7.

VOLTAGE READINGS

Voltage readings are DC readings measured with GE Test Set Model 4EX3A10 or equivalent 20,000 ohm-per-volt meter. Readings were measured from metering point shown to component board ground.

METERING POINT	WITHOUT BATTERY	WITH BATTERY
Ⓐ - Ground		
Ⓑ - Bridge Output	12.5V	
Ⓒ - Q1 Collector	12.3V	10.2V
Ⓓ - Q1 Emitter	4.8V	5.6V*
Ⓔ - Q1 Base	5.4V	6.2V*
Ⓕ - Charger Output	4.5V	3.6V*
Ⓖ - Charger Supply	±13.8V (measured to H1)	

* Depends on battery charge



(19C317910, Rev. 0)
(RC 2137)

ORDERING SERVICE PARTS

Each component appearing on the schematic diagram is identified by a symbol number, to simplify locating it in the parts list. Each component is listed by symbol number, followed by its description and GE Part Number.

Service parts may be obtained from Authorized GE Communication Equipment Service Stations or through any GE Radio Communication Equipment Sales Office. When ordering a part, be sure to give:

1. GE part Number for component
2. Description of part
3. Model number of equipment
4. Revision letter stamped on unit

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance.

Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact the nearest Radio Communication Equipment Sales Office of the General Electric Company.