

TROUBLE SHOOTING GUIDE FOR LESTER CHARGER MODEL 9865

THIS GUIDE HAS BEEN PREPARED AS AN AIDE IN THE DIAGNOSIS OF PROBLEMS WHICH MIGHT OCCUR WITH THE OPERATION OF THE CHARGER IN THE FIELD.

THIS GUIDE COVERS SOME OF THE MORE BASIC PROBLEMS WHICH MAY BE RECOGNIZED BY VISUAL INSPECTIONS OR WITH THE USE OF SIMPLE TEST EQUIPMENT SUCH AS A VOLT-OHM METER AND A CLAMP ON AMMETER (SPERRY SNAP 6, MODEL OHM-150, OR EQUIVALENT)

REMEDIES FOR THE PROBLEMS ARE LIMITED TO MECHANICAL ADJUSTMENTS, REPLACEMENT OF FRAME-MOUNTED COMPONENTS, AND REPLACEMENT OF THE PRINTED CIRCUIT CONTROL BOARD(S).

HOW TO USE THIS GUIDE

IF A PROBLEM DEVELOPS IN THE PERFORMANCE OF THE CHARGER, LOCATE UNDER THE SYMPTOM HEADING, THE CONDITIONS WHICH MOST CLOSELY MATCH THE PROBLEM YOU HAVE OBSERVED. NEXT, CHECK OUT THE POSSIBLE CAUSES BY FOLLOWING THE REMEDY INSTRUCTIONS UNDER THE APPROPRIATE REMEDY SECTION(S).

SYMPTOMS 1 THRU 2 COVER FAILURE TO OPERATE (TURN "ON") PROBLEMS.
SYMPTOMS 3 THRU 6 COVER ABNORMAL OPERATING PROBLEMS.
SYMPTOMS 7 THRU 10 COVER FAILURE TO SHUT "OFF" PROBLEMS.
SYMPTOM 11 COVERS AUXILIARY OUTPUT PROBLEMS.

REFER TO "INSTALLATION AND OPERATING INSTRUCTIONS", FORM 492-1 THRU 492-3, FOR PROPER INSTALLATION AND OPERATION, AND FOR PRECAUTIONS BEFORE STARTING TO TROUBLE SHOOT THE CHARGER.

TROUBLE SHOOTING GUIDE FOR LESTER CHARGER MODEL 9865

SYMPTOM	POSSIBLE CAUSE	REMEDY
1) CHARGER WILL NOT TURN ON. AMMETER SHOWS NO CURRENT FLOW	LOSS OF AC INPUT POWER	CHECK INPUT AC VOLTAGE & CONNECTION
	BLOWN VANE SWITCH FUSE	REPLACE FUSE
	VANE SWITCH IN BATTERY COMPARTMENT IS OFF	IF FAN IS OPERATING, REPLACE SWITCH
	DC CORD NOT CONNECTED TO BATTERY	CONNECT DC CORD TO BATTERY
	BLOWN AC FUSE (IF FUSE BLOWS AGAIN AFTER REPLACEMENT, SEE SYMPTOM (5))	REPLACE FUSE. USE IDENTICAL REPLACEMENT FUSE AND MAKE SURE IT FITS SNUG IN HOLDER
	LOSS OF RELAY COIL VOLTAGE DUE TO FAULTY SWITCH CONTACTS OR LOOSE CONNECTIONS	DISCONNECT CHARGER FROM AC INPUT AND BATTERIES! PERFORM CONTINUITY TEST (A)
	LOSS OF RELAY COIL VOLTAGE DUE TO ELECTRONIC CONTROL BOARD FAILURE	CONNECT CHARGER TO AC INPUT AND BATTERIES. PERFORM VOLTAGE TEST (C)
	BLOWN FUSE IN NEGATIVE LEG OF DC OUTPUT (DC FUSE)	CHECK DC CORD FOR SHORT CIRCUIT. IF OK, PERFORM SCR TEST (C)
	DEFECTIVE SCR	PERFORM SCR TEST (E)
	DEFECTIVE EVC P.C. BOARD	REPLACE BOARD
	OPEN TRANSFORMER	PERFORM TEST (D)
2) CHARGER EMITS A "HUMMING" SOUND, BUT AMMETER SHOWS NO CURRENT FLOW	DEFECTIVE AMMETER	CHECK 0-50 AMP METER WITH CLAMP-ON AMMETER. REPLACE IF BAD

SYMPTOM	POSSIBLE CAUSE	REMEDY
3) WHEN CHARGER TURNS ON, AMMETER INDICATES CHARGING CURRENT IS MUCH LESS THAN NORMAL	LOOSE ELECTRICAL CONNECTIONS	CHECK CONNECTIONS, TIGHTEN IF LOOSE
	DEFECTIVE AMMETER	CHECK 0-50 AMP METER WITH CLAMP-ON AMMETER. REPLACE IF BAD
	AC INPUT VOLTAGE SOURCE TOO LOW	CHANGE SOURCES OR CONNECTIONS SOP THE TWO ARE COMPATIBLE
	DEFECTIVE COMPU-TIME 2 P.C. BOARD	REPLACE BOARD
	DEFECTIVE SCR	PERFORM SCR TEST (C)
4) WHEN CHARGER TURNS ON, 0-50 AMP AMMETER READS LOWER THAN NORMAL AND IS ERRATIC, OR "JERKY"	DEFECTIVE TRANSFORMER	PERFORM TRANSFORMER TEST (D)
	LOOSE SHUNT CONNECTIONS	CHECK SHUNT CONNECTIONS. TORQUE TO APPROXIMATELY 60 IN.-LBS (SHUNT LOCATED ON TRANSFORMER BRACKET)
5) WHEN CHARGER TURNS ON, 0-50 AMP AMMETER "FLUTTERS" AND AC LINE FUSE BLOWS AFTER A SHORT OPERATING TIME	DEFECTIVE COMPU-TIME 2 P.C. BOARD	REPLACE CONTROL BOARD
	ONLY ONE SCR IS CONDUCTING CURRENT	PERFORM SCR CURRENT TEST (E)
6)WHEN CHARGER TURNS ON, AMMETER INDICATES CHARGING CURRENT IS MUCH HIGHER THAN NORMAL	AC INPUT SOURCE VOLTAGE TOO HIGH	CHANGE SOURCES OR CONNECTIONS SO THAT THE TWO ARE COMPATIBLE
	DEFECTIVE AMMETER	CHECK AMMETER WITH CLAMP-ON AMMETER. REPLACE IF BAD

SYMPTOM	POSSIBLE CAUSE	REMEDY
6)(continued)WHEN CHARGER TURNS ON, AMMETER INDICATES CHARGING CURRENT IS MUCH HIGHER THAN NORMAL	DEFECTIVE COMPU-TIME 2 P.C. BOARD	REPLACE CONTROL BOARD
	DEFECTIVE SCR	PERFORM SCR TEST (C)
7) CHARGER DOES NOT SHUT OFF AFTER NORMAL AMOUNT OF CHARGING TIME	NEW BATTERIES OR ABOVE NORMAL FINISH CHARGE RATE	SEE BATTERY EXPLANATION (F)
	DEFECTIVE COMPU-TIME 2 P.C. BOARD	REPLACE CONTROL BOARD
	AC LINE RELAY CONTACTS STUCK IN CLOSED POSITION	FREE ANC CLEAN CONTACTS OR REPLACE RELAY
	START SWITCH CONTACTS STUCK IN CLOSED POSITION OR SHORTED DIODE (DIODE IS CONNECTED TO SWITCH)	REPLACE SWITCH OR DIODE
8) FANS DO NOT STOP IN NORMAL AMOUNT OF TIME AFTER CHARGER HAS SHUT OFF	DEFECTIVE EVC P.C. BOARD	REPLACE CONTROL BOARD
	AC LINE RELAY CONTACTS STUCK IN CLOSED POSITION	FREE AND CLEAN CONTACTS OR REPLACE RELAY
9) CHARGER SHUTS OFF BEFORE BATTERIES ARE FULLY CHARGED	DEFECTIVE COMPU-TIME 2 P.C. BOARD	REPLACE CONTROL BOARD
	DEFECTIVE COMPU-TIME 2 P.C. BOARD	REPLACE CONTROL BOARD
	DEFECTIVE BATTERY CELL(S)	CHECK CONDITION OF BATTERIES
10) CHARGER SHUTS OFF BEFORE BATTERIES ARE FULLY CHARGED AND RED OVER TEMPERATURE LIGHT IS ON	DEFECTIVE EVC P.C. BOARD	REPLACE CONTROL BOARD
	CHARGER IS OVERHEATING DUE TO AN ELECTRICAL OVERLOAD OR RESTRICTED AIR PASSAGE	LET CHARGER COOL, THEN RESET AND RESTART AND CHECK FOR ABNORMAL OPERATING CONDITIONS. CHECK FAN AND CLEAR AIR PASSAGE
	DEFECTIVE COMPU-TIME 2 P.C. BOARD	REPLACE CONTROL BOARD
	DEFECTIVE EVC P.C. BOARD	REPLACE CONTROL BOARD

SYMPTOM	POSSIBLE CAUSE	REMEDY
11) CHARGER OPERATION IS NORMAL, BUT THERE IS NO 108 VDC CONVERTER POWER OUTPUT AND/OR DC/DC CONVERTER CONTROL	DEFECTIVE EVC P.C. BOARD	REPLACE CONTROL BOARD
	DEFECTIVE RELAY RL3	REPLACE RELAY

TESTS

- A. CONTINUITY TEST; (CAUTION! DISCONNECT CHARGER FROM AC AND BATTERY SOURCES)
PLACE BATTERY COMPARTMENT VENTILATION VANE IN A POSITION WHICH WILL ENGAGE VANE SWITCH. CONNECT THE POSITIVE(+) LEAD OF AN OHMMETER TO THE + 108 VDC OUTPUT TERMINAL AND CONNECT THE NEGATIVE (-) LEAD OF THE OHM METER TO THE YELLOW LEAD (# 3) ON THE EVC P.C. BOARD.

THE RESISTANCE READING SHOULD BE APPROXIMATELY 5 TO 6 KOHMS. (DC RESISTANCE OF THE 110V DC RELAY COIL). IF THE OHMMETER SHOWS AN OPEN CIRCUIT, CHECK THE VANE SWITCH, VANE SWITCH CONNECTOR, VANE SWITCH FUSE (F1), RELAY COIL (RL1) AND EVC BOARD CONNECTOR (P2) FOR FAULTY CONTACTS OR LOOSE CONNECTIONS. IF THE OHMMETER READING IS NEAR ZERO OHMS, THE DIODE ACROSS THE 110V DC RELAY COIL (RL1) MAY BE SHORTED.

- B. VOLTAGE TEST; (CONNECT CHARGER TO AC AND BATTERY SOURCES) START CHARGER. (USE EXTREME CAUTION WHEN PERFORMING VOLTAGE CHECKS IN ORDER TO AVOID POSSIBLE ELECTRICAL SHOCK!)

CONNECT THE (-) LEAD OF DC VOLTMETER TO THE, 0-50 AMP AMMETER TERMINAL AND CONNECT THE (+) LEAD OF THE VOLTMETER TO THE GREEN LEAD (A) ON THE COMPU-TIME 2 P.C. BOARD. (USE 150V OR GREATER METER SCALE).

THE VOLTAGE READING SHOULD BE IN THE RANGE OF 118 TO 135 VOLTS DC (SAME AS 108V BATTERY VOLTAGE). IF THE VOLTAGE IS LOWER THAN THE 108V BATTERY VOLTAGE BY ABOUT 1.0 VOLTS OR MORE THEN THE COMPU-TIME P.C. BOARD IS PROBABLY DEFECTIVE AND SHOULD BE REPLACED.

IF FIRST TEST IS OK, NEXT, CONNECT (+) LEAD OF THE VOLTMETER TO THE YELLOW LEAD (#3) ON THE EVC P.C. BOARD. (START WITH 150V METER SCALE THEN SWITCH TO A 10V OR LESS SCALE).

THE VOLTAGE READING AT THIS POINT SHOULD BE LESS THAN 1.0VDC. IF READING IS HIGHER THAN 1.0 VOLTS THEN THE EVC P.C. BOARD IS PROBABLY DEFECTIVE AND SHOULD BE REPLACED.

IF THE SECOND TEST IS OK, NEXT, CONNECT THE (+) LEAD OF THE VOLTMETER TO THE WHITE LEAD (1) ON THE 110 VDC RELAY COIL (RL1). (USE 150V OR GREATER METER SCALE).

THE VOLTAGE READING AT THIS POINT SHOULD BE IN THE RANGE OF 118 TO 135 VOLTS DC (SAME AS THE 108V BATTERY VOLTAGE). IF THE VOLTAGE IS WITHIN THIS RANGE, AND THE RELAY (RY1) IS NOT ENERGIZED, THEN THE RELAY IS DEFECTIVE AND SHOULD BE REPLACED. IF THE VOLTAGE IS AT OR NEAR ZERO VOLTS, THEN THE VANE SWITCH IS PROBABLY DEFECTIVE OR THE VANE SWITCH FUSE (F1) IS BLOWN.

- C. SCR CONTINUITY TEST: (DISCONNECT CHARGER FROM AC AND BATTERY SOURCES).
THE SCR(S) ARE MOUNTED ON THE TWO ALUMINUM HEAT SINKS WHICH ARE MOUNTED ON THE BASE OF THE CHARGER NEAR THE AIR EXHAUST.

DISCONNECT THE TRANSFORMER LEADS FROM THE HEAT SINKS OF EACH SCR. THE HEAT SINKS ARE COMMON WITH THE ANODES OF THE SCR(S).

IF THE FUSE IN THE NEGATIVE LEG OF THE OUTPUT HAS BEEN BLOWN, ONE OF THE SCR(S) MAY BE SHORTED. WITH AN OHMMETER, CHECK CONTINUITY IN BOTH DIRECTIONS BETWEEN THE ANODE AND CATHODE OF THE SCR. (THE CATHODE IS THE HEAVY SOLID PROTRUDING LEAD AND THE ANODE IS THE HEAT SINK.

THE OHMMETER SHOULD INDICATE AN OPEN CIRCUIT. IF THE OHMMETER SHOWS A CONTINUITY READING, THE SCR IS DEFECTIVE AND SHOULD BE REPLACED.

IF THE SCR SHOWS AN OPEN CIRCUIT ON THE OHMMETER, FURTHER TESTING ON A CURVE TRACER OR OTHER SCR TEST EQUIPMENT WOULD BE NECESSARY TO DETERMINE IF THE SCR IS DEFECTIVE. IF THIS EQUIPMENT IS NOT AVAILABLE, THE SCR COULD BE REPLACED WITH A NEW ONE AND THE SUSPECT SCR RETURNED TO LESTER ELECTRICAL FOR EVALUATION.

RECONNECT TRANSFORMER LEADS WHEN THE TEST IS COMPLETE.

- D. TRANSFORMER (S) TEST: (CHARGER DISCONNECTED FROM AC AND BATTERY SOURCES)
EXAMINE THE TRANSFORMER(S) FOR SIGNS OF EXTREME OVERHEATING (CHARRED WINDINGS, ETC), OR BROKEN CONNECTIONS AT THE ENDS OF THE LEADS. CONSULT LESTER ELECTRICAL IF IN DOUBT OF WORKING CONDITION OF THE TRANSFORMER.

- E. SCR CURRENT TEST: (CHARGER CONNECTED TO AC AND BATTERY SOURCES AND OPERATING)
(USE EXTREME CAUTION IN ORDER TO AVOID ELECTRICAL SHOCK)
MEASURE EACH SCR CURRENT BY PLACING A CLAMP-ON AMMETER AROUND THE TRANSFORMER LEADS CONNECTED TO THE SCR HEAT SINKS. IF ONE OF THE SCR CURRENTS IS ZERO, THEN THAT SCR IS NOT FIRING. IF THE COMPU-TIME 2 P.C. BOARD HAS BEEN REPLACED, THEN REPLACE THAT SCR WHICH IS NOT CONDUCTING (ZERO CURRENT).
- F. BATTERY EXPLANATION: NEW BATTERIES OR BATTERIES IN A COLD ENVIRONMENT (BELOW 50 DEGREES F.) MAY REQUIRE MORE CHARGING TIME. AFTER APPROXIMATELY 25 TIMES, AND IN A WARM ENVIRONMENT, CHARGING TIME SHOULD BE WITHIN THE NORMAL 8 TO 10 HOURS. (BATTERY VOLTAGE OF NEW OR COLD BATTERIES TENDS TO CREEP UPWARD FOR A TIME AFTER THEY ARE CHARGED AND THIS PREVENTS CHARGER SHUTOFF.)

LESTER ELECTRICAL OF NEBRASKA, INC.

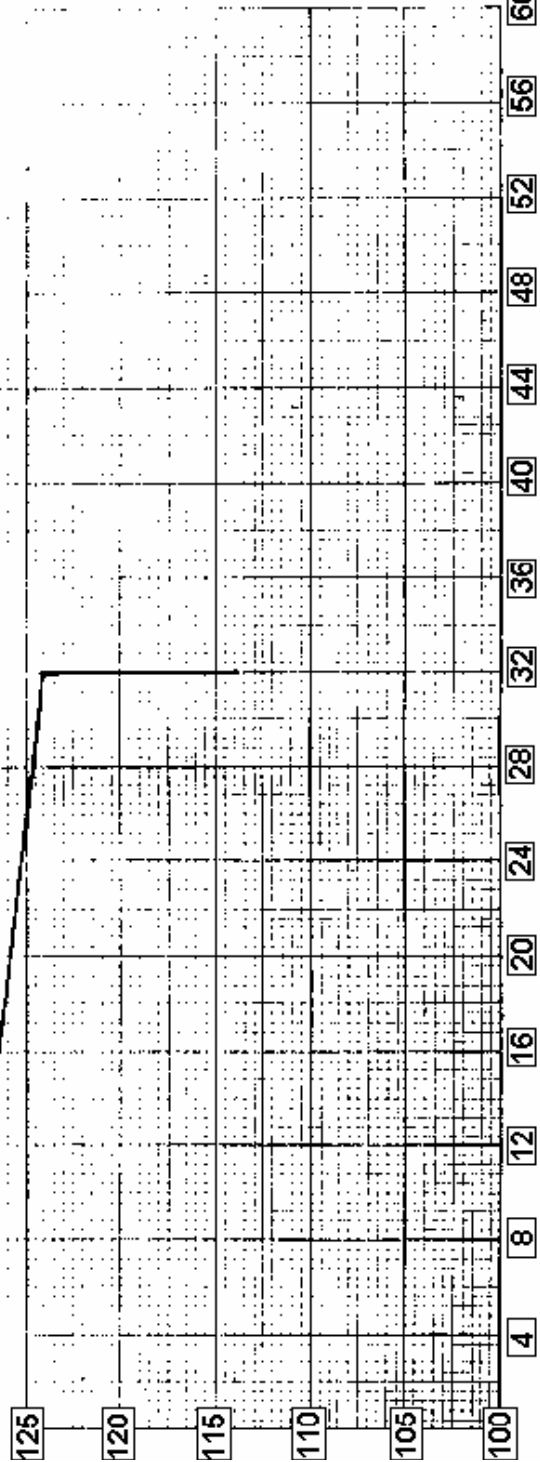
BATTERY MAKE
CYCLE

VOLTS DC

BATTERY RUN
 BATTERY SIMULATION
 LOAD UNIT SIMULATION

DATE 3-20-83

MODEL # 7865
 TRANSFORMER #
 TYPE 1086L32-06E7
 NP
 NS
 NC
 SHUNTS #
 CAPACITOR V
 CAP VA OUTPUT VA
 LAMINATIONS
 M GA BUILD
 WEIGHT
 COMPARATOR READING
 MASTER 128 Vac
 115 Vac
 106 Vac



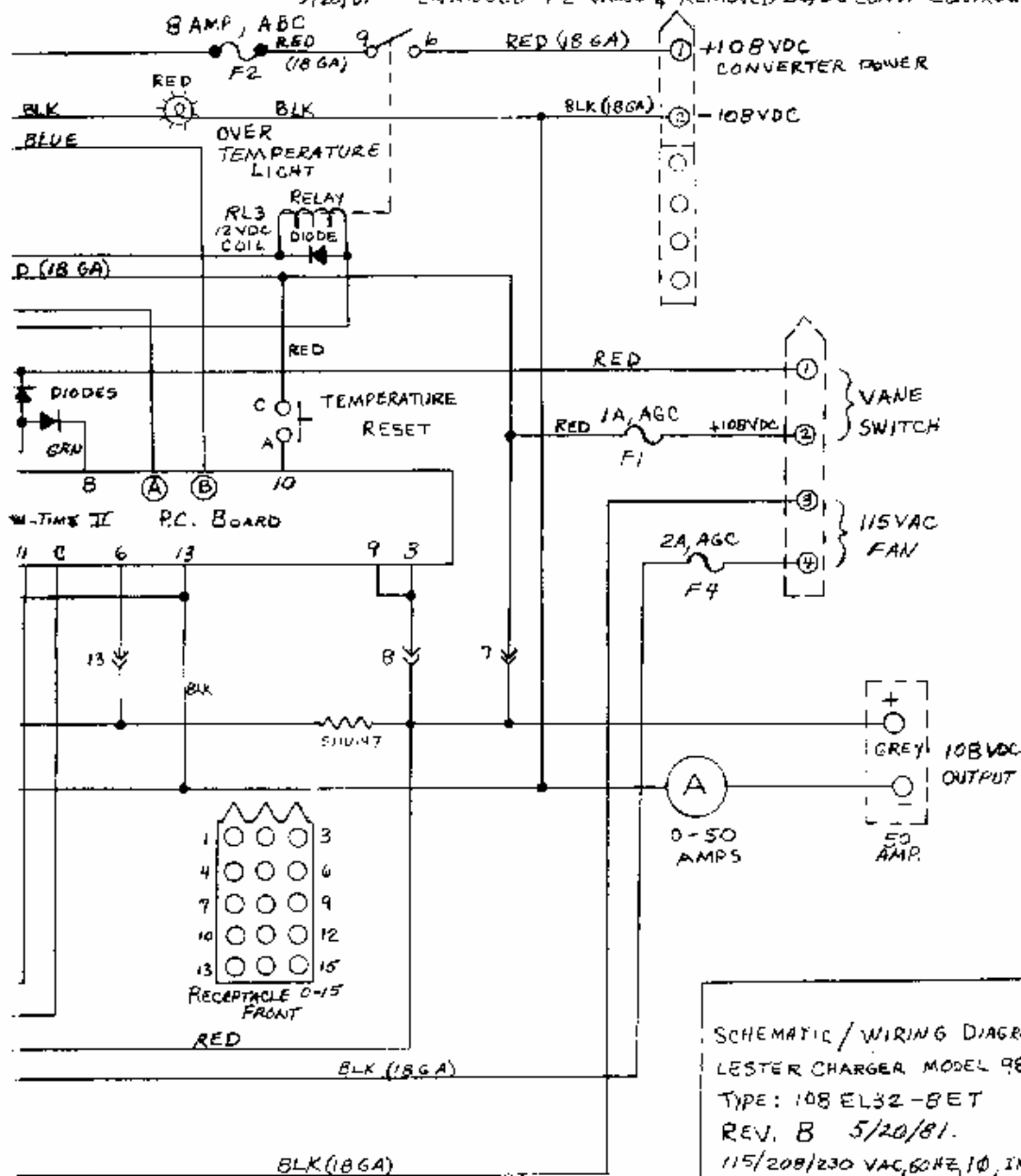
AMPS DC

REPLACEMENT PARTS LIST
 LESTRONIC BATTERY CHARGER
 MODEL 9865 - TYPE 108EL32-8ET
 INPUT: 115/208/230 VOLTS A.C. 60 HZ.
 INPUT: 108 VOLTS D.C., 32 AMP

PART NO.	DESCRIPTION
9938	Case, Complete
9866	Transformer
7962	Heat Sink Assembly w/SCR
9983	SCR assembly w/lead
2367	Ammeter, 0-50 Amp
8415	Capacitor, 20 Mfd.
4327	Shunt, Electronic
3853	Relay, 110 VDC
3861	Relay, 12 VDC
4633	Fuse block for AC Fuses, 1 Pole
4632	End Barrier, for Fuse Block
4627	Fuse, FNW-30
4631	Fuse, FNW-20
4063	Fuse Base for Bussman Fuse
4692	Fuse, ANN-60
7965	Control Cable Assembly
7919	Receptacle Assembly, 6 Pin Receptacle
7998	Receptacle Assembly, 15 Pin Receptacle
8982	Lamp Assembly, Red
3837	Fuse Holder Cartridge Type for 12 VDC
4303	Fuse AGC-1
4687	Fuse AGC-2
4860	Fuse ABC-8
9872	Electronic Control Board, 108 VDC
7810	Electronic Control Board, Fans & Vane Switch
2807	Switch, Pushbutton
4726	Tap Strip
7957	Receptacle Assembly, DC
7958	Receptacle Assembly, AC
9973	Extension Cord, 115 VAC
9974	Extension Cord, 220 VAC
9975	Receptacle, Charger to Vehicle
9978	Cordset, D.C. (Battery to Charger)
4558	Relay, 120 VAC

* REV. A: BLK. ELS (100V CONV. PUMP, LEAD AND
 RESIST. THAN RL3 6 & 9

* REV. B: CHANGE EVC1 TO EVC2 P.C.B.D. + CONNECTIONS
 5/20/81 CHANGED F2 VALUE & REMOVED DC/DC CONV. CONTROL



F NOTED.

SCHEMATIC/WIRING DIAGRAM
 LESTER CHARGER MODEL 9865
 TYPE: 108 EL32-BET
 REV. B 5/20/81.
 115/208/230 VAC, 60HZ, 10, INPUT
 108VDC, 32AMP BATTERY
 CHARGE OUTPUT.