

Lester Electrical

OWNERS MANUAL BATTERY CHARGER MODEL 19300

Specifications

AC Input:	108-125 Volts AC, 60 Hertz, single-phase, 10.5 amps
DC Output:	36 Volts DC, 21 amps tapering to 6 @ 45 VDC
Connections:	9 1/4 ft. DC cord with Power Wise plug, Option -98 (602718) 17 ft. DC cord with Power Wise plug, Option -18 (602719) 9 1/4 ft. DC cord with Anderson SB 50 gray connector, Option -03 (602715) 6 ft. DC cord with ring terminal & QD ignition enable, Option -23 (602714) 6 ft. min. / 7 3/4 ft. max. AC cord with grounded 3-prong plug
Dimensions:	8-15/16H X 7-13/16W X 10-5/8D
Mounting:	Set on shelf, wall mount with keyholes, or hang from ceiling securely
Weight:	31 lbs.

PLEASE SAVE THESE IMPORTANT SAFETY AND OPERATING INSTRUCTIONS

For correct operation of this charger, it is important to read and be familiar with this entire manual before installing and operating the charger.
DO NOT DISCARD THIS MANUAL AFTER READING.



LOOK FOR THIS SYMBOL TO POINT OUT SAFETY PRECAUTIONS. IT MEANS: BECOME ALERT—YOUR SAFETY IS INVOLVED. IF YOU DO NOT FOLLOW THESE SAFETY INSTRUCTIONS, PERSONAL INJURY OR PROPERTY DAMAGE CAN OCCUR.

INTRODUCTION

This battery charger is designed to recharge deep-cycle, wet lead-acid batteries. A ferroresonant transformer is used to provide a highly reliable, AC line voltage compensating unit with a minimum of moving parts, designed for long, trouble-free service. An electronic charge controller turns the charger on and off automatically. This controller determines full charge of the batteries by measuring the rate at which the battery voltage increases. When the battery is fully charged, the charger turns off.

INITIAL INSTALLATION

The AC line to which the charger is to be connected must be capable of supplying 10 amperes to this charger.



CAUTION: TO REDUCE THE RISK OF FIRE, USE THIS CHARGER ONLY ON CIRCUITS PROVIDED WITH A MAXIMUM OF 20 AMPERE BRANCH CIRCUIT PROTECTION (CIRCUIT BREAKER OR FUSE), IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, ANSI/NFPA 70, AND ALL LOCAL CODES AND ORDINANCES.

The use of an extension cord with the charger should be avoided. The use of an improper extension cord could result in a risk of a fire or electric shock. If an extension cord must be used, use a three-conductor, No. 14 AWG cord with ground, properly wired, in good electrical condition and keep it as short as possible. Make sure that the pins on the plug of the extension cord are the same number, size, and shape as that of the plug on the battery charger. Locate all cords so that they will not be stepped on, tripped over, or otherwise subjected to damage or stress.

Do not operate this charger if it has received a sharp blow, was dropped or otherwise damaged in any manner; refer to a qualified service agent.

Provide adequate ventilation for the batteries and charger. The convection-cooled design requires an unobstructed flow of cooling air for proper operation. Keep all charger ventilation openings at least two inches (2") (5cm) away from walls and other objects. Do not allow clothing, blankets, or other material to cover the charger. Do not block cooling vents.

⚠ WARNING: CHARGERS CAN IGNITE FLAMMABLE MATERIALS AND VAPORS. DO NOT USE NEAR FUELS, GRAIN DUST, SOLVENTS, OR OTHER FLAMMABLES.

⚠ WARNING: TO REDUCE THE RISK OF AN ELECTRIC SHOCK, KEEP THE CHARGER DRY. DO NOT EXPOSE IT TO RAIN, SNOW OR LIQUIDS. FOR STORAGE, KEEP THE CHARGER IN A BUILDING.

⚠ ATTENTION! Ne pas exposer a la pluie.

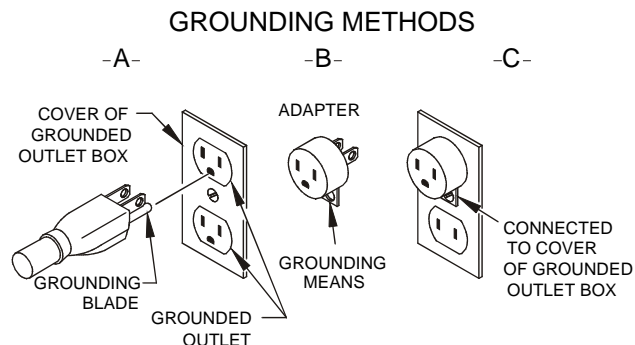
GROUNDING INSTRUCTIONS

This battery charger must be grounded to reduce the risk of electric shock. This charger is equipped with an electric cord having an equipment-grounding conductor. Chargers designed for a nominal 120 volts, 60 Hertz come equipped with a grounding type plug as well. This plug must be connected to an appropriate receptacle that is properly installed and grounded in accordance with the National Electrical Code and all local codes and ordinances.

⚠ WARNING: IMPROPER CONNECTION OF THE EQUIPMENT-GROUNDING CONDUCTOR CAN RESULT IN A RISK OF AN ELECTRIC SHOCK.

The conductor with insulation having an outer surface that is green, with or without yellow stripe(s), is the equipment-grounding conductor. If repair or replacement of the electric cord or plug is necessary, do not connect the equipment-grounding connector to a live terminal. Refer to a qualified service agent.

Battery chargers equipped with a grounding plug as illustrated in Figure A are for use on a nominal 120 volt circuit. A temporary adapter, as illustrated in Figures B and C, may be used to connect this plug to a two-pole receptacle as shown in Figure C if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet can be installed by a qualified electrician. The green-colored rigid ear or lug extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box.



NOTE: The use of the adapter shown in Figures B and C is not permitted in Canada.

NORMAL OPERATION

The instructions printed on the charger are for daily reference.

With the charger DC output plug disconnected from the vehicle, connect the AC power supply cord to a 120 Volt, 60 Hertz outlet.

⚠ WARNING: TO REDUCE THE RISK OF AN ELECTRIC SHOCK, CONNECT ONLY TO A PROPERLY GROUNDED, SINGLE-PHASE (3-WIRE) OUTLET. REFER TO GROUNDING INSTRUCTIONS.

⚠ CAUTION: MAKE SURE THE BATTERY PACK IS A 36 VOLT, 18 CELL, SERIES CONNECTED WET LEAD-ACID SYSTEM WITH A CAPACITY OF 180 TO 245 AMPERE-HOURS (20 HR. RATE). OTHER TYPES OF BATTERIES MAY BURST CAUSING PERSONAL INJURY AND DAMAGE.

⚠ ATTENTION! Utiliser pour charger uniquement les accumulateurs au plomb à électrolyte liquide. D'autres types d'accumulateurs pourraient éclater et causer des blessures ou dommages.

⚠ DANGER: RISK OF ELECTRIC SHOCK! DO NOT TOUCH UNINSULATED PORTION OF CHARGER/VEHICLE OUTPUT CONNECTION OR BATTERY TERMINALS.

⚠ DANGER: Risque de chocs électriques. Ne pas toucher les parties non isolées du connecteur de sorti ou les bornes non isolées de l'accumulateur.

⚠ DANGER: VISUALLY AND MANUALLY INSPECT TO VERIFY THAT THE DC OUTPUT CORD, PLUG AND BATTERY CHARGING RECEPTACLE ARE IN GOOD WORKING CONDITION BEFORE EACH AND EVERY USE AND DO NOT USE THE CHARGER IF:

- The DC charging receptacle does not grip the DC output plug tightly, is loose or does not make a good electrical connection.
- The DC output plug and/or charging receptacle feel hotter than normal.
- The DC output plug pins or receptacle contacts are bent, corroded or are dark or bluish in appearance.
- The DC output plug, cords, receptacle or vehicle charging wiring are cut, worn, broken, or have any exposed conductors.
- The DC output plug, cords, charger or receptacles are damaged or distressed in any way.

Using the charger with any of the above symptoms could result in a fire, property damage, or personal injury.

Have your distributor, dealer or other qualified service agent repair or replace worn or damaged parts immediately. Repairs should not be attempted by people who are not qualified.

1. Insert the DC output plug completely into the matching vehicle receptacle by grasping the plug handle and pushing the plug straight into the receptacle.
2. Charger will start automatically three to five (3-5) seconds after plug insertion.

⚠ DANGER: USE IN WELL VENTILATED AREA. ELECTRICAL ARCING COULD IGNITE HYDROGEN GAS PRODUCED BY THE BATTERY WHILE CHARGING. KEEP SPARKS, OPEN FLAME AND SMOKING MATERIALS AWAY FROM BATTERIES. NEVER DISCONNECT OR CONNECT DC PLUG FROM VEHICLE UNLESS CERTAIN THAT THE CHARGER IS OFF. TO INTERRUPT CHARGE CYCLE, DISCONNECT AC PLUG FROM OUTLET BEFORE REMOVING DC PLUG FROM VEHICLE RECEPTACLE.

Monitor the ammeter for the correct charge rate. The initial charge rate will vary from 16 to 25 amperes, depending upon the condition of the batteries and how much the batteries have been discharged.

Slight variations in the initial charge rate may also result from AC input line voltages which are higher or lower than nominal. Higher line voltages increase the initial charge rate while lower line voltages reduce the charge rate.

If the batteries are heavily discharged and the AC input line voltage is higher than nominal, the initial charge rate may exceed 25 amperes. Under normal conditions the charge rate will taper to less than 25 amperes within 30 minutes. If the ammeter still reads 25 amperes or more

after 30 minutes, turn the charger off by disconnecting the AC plug from its outlet.

⚠ CAUTION: TO PREVENT BATTERY DAMAGE, CHARGER OVERHEATING, AND TRANSFORMER BURNOUT, DO NOT ALLOW THE CHARGER TO OPERATE FOR MORE THAN 30 MINUTES WITH THE AMMETER READING IN EXCESS OF 25 AMPS. THIS IS MISUSE AND WILL CAUSE OVERHEATING AND TRANSFORMER BURNOUT.

During charge, the battery voltage increases gradually which causes the charge rate to decrease. Good battery cells should each rise to approximately 2.5 volts DC which will allow the charge rate to taper to less than 6 amps. Since each cell accepts charge at a slightly different rate, normal charging with the ammeter reading in the 4 to 8 amps area for the last few hours of charge is important to achieve equalization of all battery cells every time the batteries are charged.

As batteries age, individual cells weaken resulting in lower than normal finish charge voltage. As the finish charge voltage decreases, the charge rate will no longer decrease and taper into the 4 to 8 amps range on the ammeter. The electronic charge controller will, however, still determine when the batteries have reached full charge and turn the charger off. Even though they are properly charged, older batteries will gradually lose capacity, and should be replaced when they will no longer perform as required.

3. Charger will automatically stop when batteries are fully charged. Charge time will vary with battery capacity, depth of discharge, temperature and age. Allow 10 to 12 hours for normal charging. Batteries that are heavily discharged, new batteries, or batteries charged in cool temperatures require more time. The electronic charge controller will turn charger off after 16 hours regardless of battery state of charge.
4. To stop charger during the charge cycle, disconnect AC plug from outlet before disconnecting DC plug from vehicle receptacle. After charger is off, remove DC plug by grasping plug handle and pulling plug directly out of receptacle.

⚠ WARNING: TO AVOID DAMAGE TO THE CHARGER CORD, PLUG, AND BATTERY RECEPTACLE, DO NOT PULL ON THE CHARGER CORD. DO NOT TWIST, ROCK, OR PULL THE PLUG SIDEWAYS.

BATTERY STORAGE MAINTENANCE

During vehicle storage the charger may be left connected to the batteries. Charger will turn on periodically to keep batteries charged. Be sure charger is connected to a live AC power outlet. If AC power is turned off during storage periods, do not leave charger DC output plug connected to vehicle receptacle.

PROPER CARE OF DEEP CYCLE MOTIVE POWER BATTERIES

Motive power batteries are subjected to severe deep-cycle duty on a daily basis. Although these batteries are designed to withstand such duty, the following precautions must be observed to obtain good performance and maximum cycle life:

⚠ CAUTION: ALWAYS WEAR PROTECTIVE EYE SHIELDS AND CLOTHING WHEN WORKING WITH BATTERIES. BATTERIES CONTAIN ACIDS WHICH CAN CAUSE BODILY HARM. DO NOT PUT WRENCHES OR OTHER METAL OBJECTS ACROSS THE BATTERY TERMINAL OR BATTERY TOP. ARCING OR EXPLOSION OF THE BATTERY CAN RESULT.

1. When installing new batteries, be sure the polarity of each battery and overall battery pack is correct. Due to the electrical characteristics of this charger, it is possible to hook up the batteries improperly and not blow the fuse when charging. Battery and/or charger damage can result.
2. New batteries should be given a full charge before their first use because it is difficult to know how long the batteries have been stored.
3. Limit the use of new batteries for the first 20 cycles. New batteries and older batteries that have been in storage are not capable of their rated output until they have been discharged and charged a number of times.
4. DO NOT EXCESSIVELY DISCHARGE THE BATTERIES. Excessive discharge can cause polarity reversal of individual cells resulting in complete failure shortly thereafter. Heavily discharging (over 60%) new batteries before they have been broken in (approximately 20 cycles) can cause permanent cell damage, resulting in reduced energy capacity and shortened life.
5. Maintain the proper electrolyte level by adding water when necessary. Distilled or deionized water is free of contaminants and preferred for this use. Never allow the electrolyte level to fall below the top of the battery plates. Electrolyte levels lower during discharge and rise during charge. Therefore, to prevent the overflow of

electrolyte when charging, it is mandatory that water be added to cells AFTER they have been fully charged; do not overfill. Old batteries require more frequent additions of water than do new batteries.

6. Hard crystalline sulfates form when batteries in storage are not maintained in a charged active state. Internal self-discharge can bring about the start of this condition in as little as three days in warm temperatures. Batteries allowed to sit unmaintained in storage will self-discharge, sulfate to various degrees and lose capacity. Repeated charging without using the batteries between charges can recover some of the lost power, range, and life, but some permanent loss should be expected.
7. When the temperature falls below 65°F, the batteries should be placed on charge as soon after use as possible. Cold batteries require more time to fully recharge.
8. The tops of the batteries and battery hold-downs must be kept clean and dry at all times to prevent excessive self-discharge and flow of current between the battery posts and frame. Electrolyte spilled on the batteries never dries or evaporates.
9. All connections to batteries that are bolted must be maintained clean and tight. Due to heating and vibration, bolted connections may loosen over time. Re-tighten the connections twice yearly to the manufacturer's specified torque.
10. Follow all operating instructions, cautions, and warnings as specified in this manual, on the charger, and in your vehicle owner's manual.

TROUBLESHOOTING GUIDE

To be able to troubleshoot safely and effectively, it is important to read this guide completely before beginning any tests.

⚠ CAUTION: DO NOT DISASSEMBLE THE CHARGER. TAKE IT TO A QUALIFIED SERVICE AGENT WHEN SERVICE OR REPAIR IS REQUIRED. INCORRECT REASSEMBLY MAY RESULT IN A RISK OF ELECTRIC SHOCK OR FIRE. THE FOLLOWING PROCEDURES ARE INTENDED ONLY TO DETERMINE IF A MALFUNCTION MAY EXIST IN THE CHARGER.

⚠ DANGER: TO REDUCE THE RISK OF ELECTRIC SHOCK, ALWAYS DISCONNECT BOTH THE AC POWER PLUG AND THE DC OUTPUT PLUG BEFORE ATTEMPTING ANY MAINTENANCE OR CLEANING.

⚠ WARNING: DO NOT OPERATE THE CHARGER IF IT IS MALFUNCTIONING. PERSONAL INJURY OR PROPERTY DAMAGE COULD RESULT.

To determine if a charger malfunction exists, identify the problem from the following list and refer to the appropriate section for detailed instructions.

1. CHARGER DOES NOT TURN ON
2. CHARGER FUSE BLOWS
3. THE AMMETER NEEDLE REMAINS AT 25 AMPS OR HIGHER FOR MORE THAN ONE-HALF (½) HOUR
4. CHARGER DOES NOT TURN OFF
5. THE BUILDING AC LINE CIRCUIT BREAKER OR FUSE BLOWS

If the problem is other than listed above, refer to a qualified service agent for additional troubleshooting procedures.

1. CHARGER DOES NOT TURN ON

The DC plug must be disconnected and reconnected to start the charger after turn off.

Connect the power supply cord securely to a live AC outlet. Visually inspect the DC output plug and battery receptacle to be sure they are in good working condition.

⚠ WARNING: IF THE PLUG OR RECEPTACLE IS BROKEN, TWISTED, BENT OR LOOSE AND DOES NOT MAKE GOOD ELECTRICAL CONTACT, HAVE IT REPLACED BY A QUALIFIED SERVICE AGENT IMMEDIATELY. DO NOT USE THIS CHARGER IN THIS CONDITION AS FIRE OR PERSONAL INJURY CAN RESULT.

If the plug and receptacle are good, connect the DC plug into the receptacle and listen for the power relay inside the charger to "click" on within five seconds. If the "click" is not heard remove the DC plug from the receptacle and connect the DC plug of another charger, which you know is operating properly, to the receptacle.

If still no "click" is heard, a malfunction in the batteries or receptacle wiring exists. If the "click" is heard, the batteries and receptacle are good, and a malfunction exists in the original charger.

If the relay "click" is heard, a hum from the transformer should be heard and the ammeter should indicate the charge rate. If no transformer hum is heard, check to be sure the AC power supply cord is securely connected to a live AC outlet. When three-prong to two-prong adapters are used, they tend to work loose, resulting in a poor connection. Check the AC line fuse or circuit breaker and, if possible, connect a functioning charger, utility light, or other electrical appliance to

the outlet to verify the presence of AC power. If AC power is present, and still no transformer hum is heard, the charger is malfunctioning. If the relay "clicks" and the transformer hums, but no charge rate is indicated on the ammeter, the charger is malfunctioning.

2. CHARGER FUSE BLOWS

The charger fuse assembly consists of a double ended fuse wire visible through a transparent cover mounted on the front panel. Each half of the fuse wire serves as an individual fuse link which protects the charger in the event one or both rectifier diodes fail, or a reverse polarity connection is made to the batteries.

Check the fuse assembly visually for an open or blown fuse link. If both half links of the fuse assembly blow as soon as the DC output plug is connected to the battery receptacle, the polarity of the batteries may be reversed. If no battery or receptacle maintenance has been performed prior to the fuse blowing, the charger is malfunctioning. If only one half link blows the charge rate will be low and the charger is malfunctioning.

⚠ CAUTION: DO NOT USE THE CHARGER IF THE OUTPUT IS LOW. BATTERIES WILL NOT REACH FULL CHARGE, THEREBY INCREASING THE POSSIBILITY OF A HARMFUL DEEP DISCHARGE DURING THEIR NEXT USE.

3. AMMETER NEEDLE REMAINS AT 25 AMPS OR HIGHER FOR MORE THAN ONE-HALF (½) HOUR

This high charge rate is caused by misuse. The charger is connected to a battery pack with a system voltage lower than or amp-hour capacity greater than specified on the charger. If connected to a 12, 18, 24, 30, 32 or other battery system less than 36 volts, the charge rate will not taper and decrease to 25 amps or less within 30 minutes. If battery maintenance has recently been performed, a possible error is to install one or more of the 6 volt batteries in the battery pack in reverse polarity. Have a qualified service agent inspect the battery connections and test the system voltage with a suitable voltmeter.

4. THE CHARGER DOES NOT TURN OFF

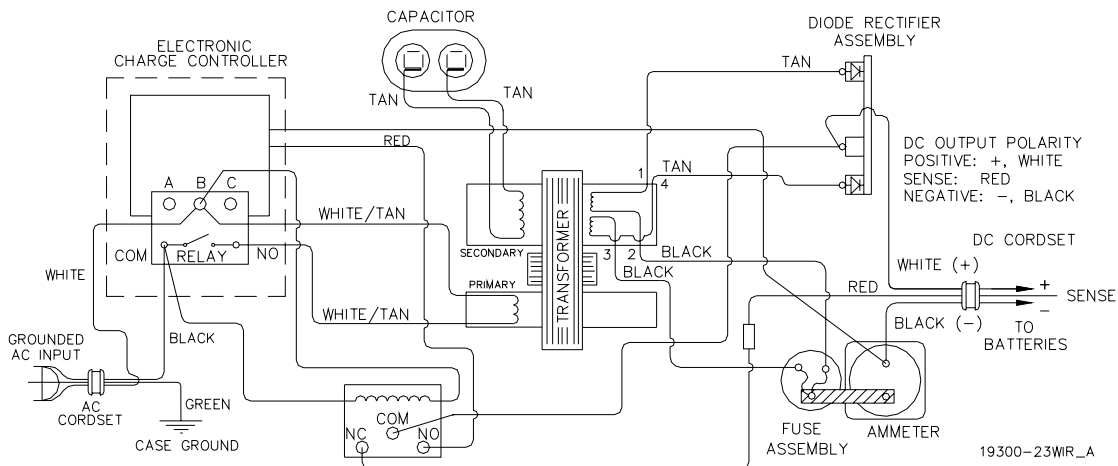
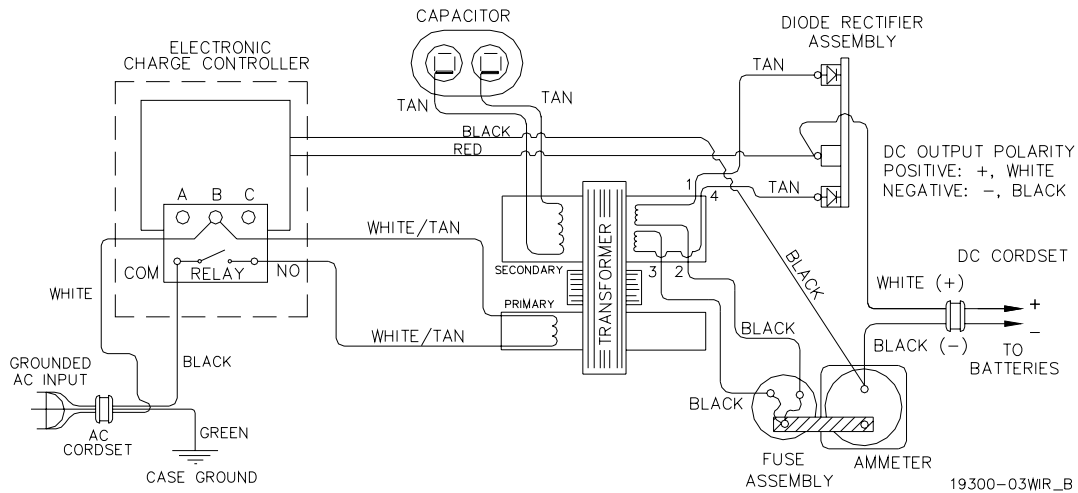
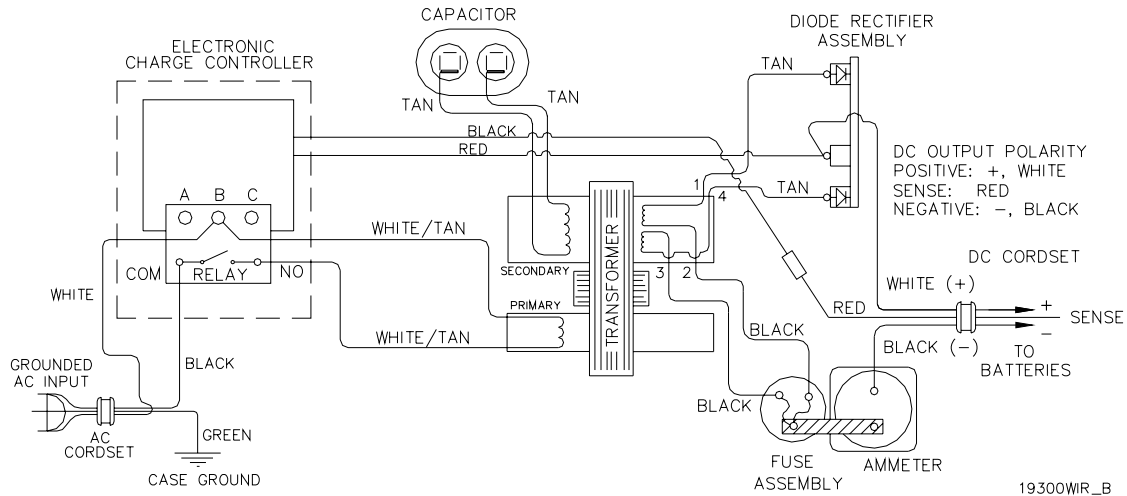
New batteries or batteries charged in cold temperatures may require an extended charge time to achieve full charge. However, if the charger runs for more than 16 hours without shutting off, the charger is malfunctioning.

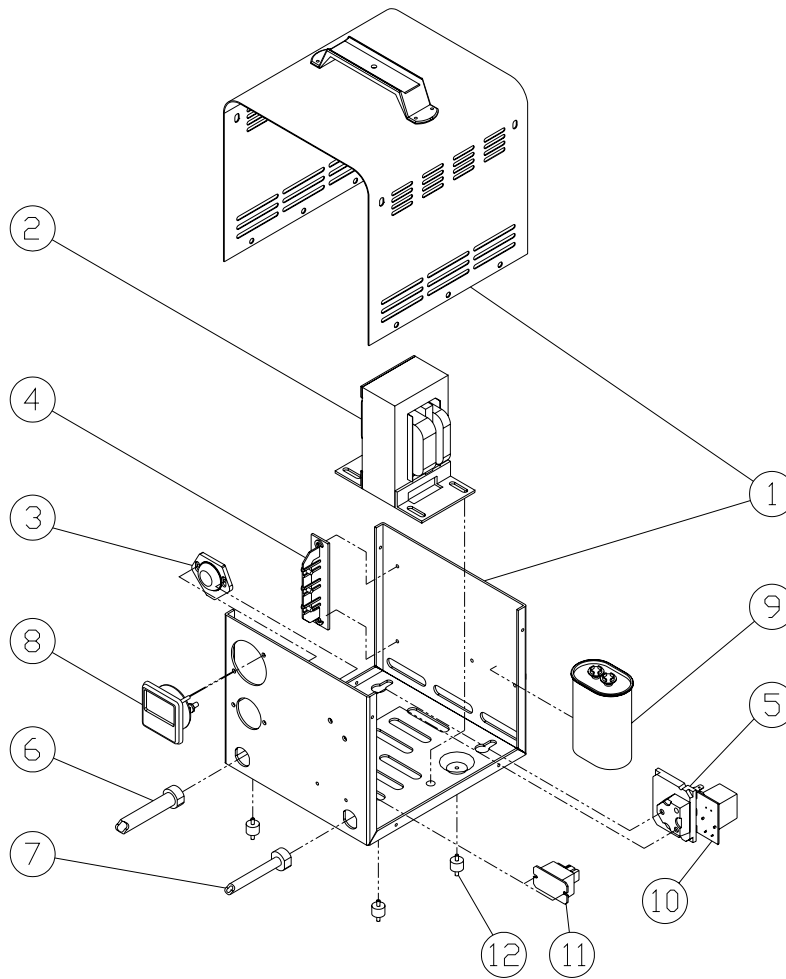
5. THE BUILDING AC LINE CIRCUIT BREAKER OR FUSE BLOWS

This condition can be caused by a charger problem, a "weak" fuse or circuit breaker protecting the circuit, or an overloaded circuit. If the building AC power fuse or circuit breaker blows, connect the charger to

other outlets (on different circuits) in the building. If the charger operates properly on other circuits, have a qualified electrician inspect and test the original circuit. If the charger causes other fuses or circuit breakers (in the building) to blow, the charger should be tested by a qualified service agent.

WIRING DIAGRAM MODEL 19300





**PARTS LIST FOR CHARGER
Model 19300**

E-Z-GO

REF. No.	PART NO.	QTY.	DESCRIPTION
1	603192	1	CASE ASSEMBLY, OPTION -98 (602718), -18 (602719), -03 (602715)
1	604094	1	CASE ASSEMBLY, OPTION -23 (602714)
2	603193	1	TRANSFORMER ASSEMBLY
3	603207	1	FUSE ASSEMBLY
4	603208	1	DIODE RECTIFIER ASSEMBLY
5	603194	1	ELECTRONIC CHARGE CONTROLLER (INCLUDES RELAY BOARD #10), OPTION -98 (602718), -18 (602719), -03 (602715)
5	604091	1	ELECTRONIC CHARGE CONTROLLER (INCLUDES RELAY BOARD #12), OPTION -23 (602714)
6	603195	1	DC CORDSET, 12/2 & 16/1, 120" POWER WISE PLUG, OPTION-98 (602718)
6	603843	1	DC CORDSET, 12/2 & 16/1, 216" POWER WISE PLUG, OPTION-18 (602719)
6	603844	1	DC CORDSET, 12/2, 133" SB50 GRAY, OPTION -03 (602715)
6	604093	1	DC CORDSET, 12/2 & 16/1, 72" W/ 5/16 RING TERM. & ¼ QD, OPTION -23 (602714)
7	603196	1	AC CORDSET, 16/3, 97" W/BUSHING & NEMA 5-15P
8	603209	1	AMMETER, 30 AMP
9	603210	1	CAPACITOR, 3 MFD, 660 VAC
10	603197	1	RELAY BOARD ASSEMBLY, OPTION -98 (602718), -18 (602719), -03 (602715)
10	604092	1	RELAY BOARD ASSEMBLY, OPTION -23 (602714)
11	604124	1	RELAY KIT, DC SENCE DISCONNECT, OPTION -23 (602714)
12	22009G1	4	BUMPER, RUBBER, OPTION -23 (602714)