



LOADHOG THREE-PHASE BATTERY CHARGER

PLEASE SAVE THESE IMPORTANT SAFETY AND OPERATING INSTRUCTIONS

For correct operation of the equipment, 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, INJURY OR PROPERTY DAMAGE CAN OCCUR.

1. IMPORTANT SAFETY INSTRUCTIONS

- a. Before using the battery charger, read all the instructions and caution markings on the battery charger, the battery, and all the products using the battery.
- b. Do not touch uninsulated parts of the DC output connector or the battery terminals as there is a possibility of electric shock.
- c. Batteries produce hydrogen gas while operating, which can explode if ignited. Never smoke, use an open flame, or create sparks near the battery. Ventilate the area well when the battery is charging in an enclosed place.
- d. Lead-acid batteries contain sulfuric acid which may cause burns. Do not get in eyes, on skin, or clothing. If contact with the eyes occurs, flush immediately with clean water for 15 minutes and obtain medical attention.
- e. Connect or disconnect the battery plug only when the charger output is off to prevent arcing or burning.
- f. Only qualified personnel should program or service this equipment.
- g. De-energize all AC and DC power connections before servicing this unit. If injury does occur, apply standard treatment for electric shock and, if necessary, consult with a physician.
- h. The charger is not for outdoor use. Do not expose the charger to rain or snow.
- i. This charger is factory set to charge lead-acid batteries. It may be programmed for sealed batteries by a qualified EnerSys service agent.
- j. Do not operate the charger if it has received a sharp blow, been dropped, or otherwise damaged. Take it to a qualified service center.
- k. Do not disassemble the charger. Have the charger examined by an EnerSys service agent, or a local qualified service center. Incorrect reassembly of the charger may result in an explosion, electric shock, or fire.

2. INTRODUCTION

The EnerSys LOADHOG three-phase battery charger is a convection cooled, solid state, SCR

regulated charger designed to make battery charging simple. The charger is factory set to charge wet batteries, but also may be configured by an EnerSys technician to charge sealed batteries.

The charger has a comprehensive, self-checking, diagnostic program to monitor the quality of charge and check its own safety conditions. A large, easy-to-read, five-button keypad controls all the charger functions. The charger also has a five-digit alphanumeric display to show charger status messages and charge cycle data.

3. RECEIVING CHARGER

Unpack the charger and examine it for possible in-transit damage. If any damage is found, report it as a claim to the carrier.

4. LOCATING AND INSTALLING CHARGER

Proper installation of the charger is important in order to achieve good charger performance and to prevent damage to the charger and batteries. The charger should be located in a clean, cool, dry, and well ventilated area. To permit free air flow for convection cooling, allow four inches (4") minimum between the charger and any wall, six inches (6")

from other equipment, and never store anything beneath the charger.

⚠ WARNING: DO NOT PLACE THE CHARGER ON OR NEAR FLAMMABLE MATERIALS. POSITION THE CHARGER ON A FOUNDATION OF STONE, BRICK, CONCRETE, OR GROUNDED METAL.

5. AC ELECTRICAL SUPPLY

The charger must be connected to a three-phase, $60 \pm 3\%$ Hertz AC power source, which can be either 208, 240, or $480 \pm 10\%$ VAC. The AC input wire size, dependent on the charger model and the AC input voltage, can be obtained from Table 1. AC input lines must be installed by a qualified electrical contractor.

5.1 AC FUSE MOUNTING

From Table 1, locate the proper AC fuse size to insert for fuses F1, F2, and F3 (cartridge type fuses). Fuses with an ampere rating of 30 amps or less are smaller and require the usage of the fuse reducer supplied with the charger. Insert the fuses into the fuse mount clip located to the right of the SCR heatsink assemblies.

TABLE 1

Model	Output Current	208 VAC INPUT			240 VAC INPUT			480 VAC INPUT		
		Fuse Size	AC Wire Size	Current	Fuse Size	AC Wire Size	Current	Fuse Size	AC Wire Size	Current
40-850	136 A							OTS-35	10 AWG	25.8 A
24-1000	160 A	OTS-60	6 AWG	43.8 A	OTS-50	6 AWG	37.9 A	OTS-30	10 AWG	19.0 A
18-1600	256 A				OTS-60	6 AWG	42.4 A	OTS-30	10 AWG	21.9 A
18-1000BR	122 A	OTS-35	8 AWG	23.0 A	OTS-30	10 AWG	20.0 A	OTS-15	12 AWG	10.0 A
18-1000	160 A	OTS-40	8 AWG	30.5 A	OTS-35	8 AWG	26.4 A	OTS-20	12 AWG	13.2 A
18-765	122 A	OTS-35	8 AWG	24.7 A	OTS-30	10 AWG	21.4 A	OTS-15	12 AWG	10.7 A
18-550	88 A	OTS-25	10 AWG	18.1 A	OTS-20	12 AWG	15.6 A	OTS-10	14 AWG	7.8 A
12-850	136 A	OTS-25	10 AWG	18.6 A	OTS-20	12 AWG	16.2 A	OTS-10	14 AWG	8.1 A

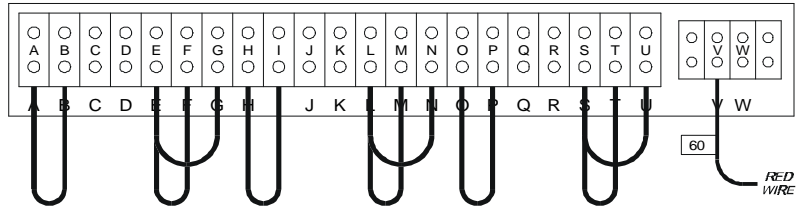
5.2 CONFIGURATION OF JUMPERS

When changing between 208 or 240 VAC (terminal V) to 480 VAC (terminal W), be sure to change the RED wire (label number 60) as shown below. Locate the AC tap strip found inside the charger on the bottom of the case. Connect the jumpers as shown below for the AC input voltage

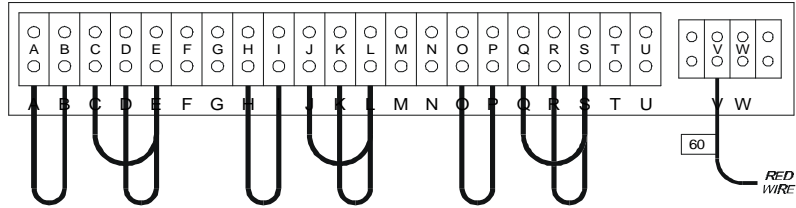
that you are using. Torque the 1/8th inch Allen screws to 20 inch-pounds for proper connection.

⚠ WARNING: IMPROPER JUMPER CONNECTION MAY CAUSE SEVERE DAMAGE TO THE CHARGER AND BATTERY.

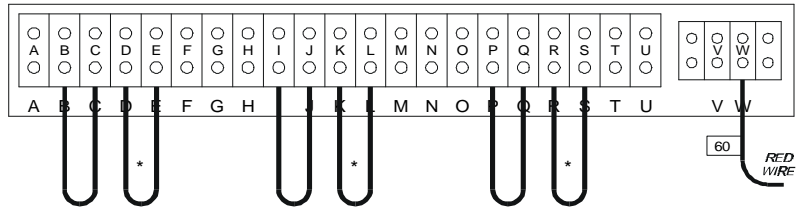
208 VAC JUMPER SETTING



240 VAC JUMPER SETTING



480 VAC JUMPER SETTING



* PUT EXTRA JUMPER IN PARALLEL

5.3 AC VOLTAGE CONNECTIONS

To connect the input AC voltage, route the AC conduit through the desired knockout hole. Route the AC wiring to terminal lugs L1, L2, and L3 located above the AC fuses. For proper connection, torque the screws to 35 inch-pounds. When a charger has the quick disconnect option, torque the 3/16th inch Allen screws to 80 inch-pounds.

⚠ WARNING: IMPROPERLY CONNECTED AC VOLTAGE CONDUCTORS CAN CAUSE AN ELECTRICAL FIRE.

Connect the AC ground to the terminal lug located just above and to the left of the AC terminal lugs.

⚠ WARNING: DO NOT OPERATE THE CHARGER WITHOUT PROPER GROUNDING. IMPROPER GROUNDING CAN RESULT IN THE RISK OF AN ELECTRIC SHOCK.

When the AC voltage is applied to the charger, a message is shown on the display giving the present version number and date of the charger software.

6. DC OUTPUT

The DC charging cable has a commonly used battery plug or receptacle. The polarity of the charger plug must be the same as the battery connector. The BLACK DC cable must be connected to the battery negative (-), and the RED DC cable must be connected to the battery positive (+). The charger will not operate in a reversed polarity condition. The DC output fuse (F5) is a "fast-acting" fuse used to protect the silicon controlled rectifiers (SCRs). USE ONLY IDENTICAL REPLACEMENT FUSES OBTAINABLE FROM YOUR ENERSYS SERVICE AGENT.

7. APPLICATION

The charger can automatically charge and determine battery sizes within the range on Table 2. Batteries rated from 64% to 200% of the charger's 6 hour AH rating may be charged on a periodic basis. If the battery's 6 hour AH rating does not match the charger's size, battery life may suffer. For battery sizes not listed, contact your local EnerSys service agent.

TABLE 2

NAMEPLATE RATING	BATTERY CELL RANGE
40 CELLS	40, 36, 30, 24, 18
24 CELLS	24, 18, 12, 9, 6
18 CELLS	18, 12, 9, 6
12 CELLS	12, 9, 6

8. OPERATION

The charger is set to automatically start a charge cycle when a battery is connected to the charger. During the charge cycle, the battery voltage, charge current, amphours returned to battery, and charge time are shown on the display in a rotating pattern. When 80% of the charge is completed, the message "80%" is included in the display rotation. When the battery is fully charged, the charge cycle will be terminated and the message "READY" will be displayed.

The keypad (Figure 1), located on the front of the charger, is used to manually operate the charger. Two modes of operation are accessed with the keypad: the DISPLAY mode (Section 8.2) is used to view charge cycle data and the SELECT mode (Section 8.3) is used to clear faults, set the real time clock, enable delay start, set equalize day, and view previous charge data.

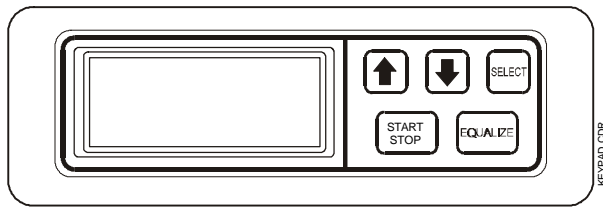




Figure 1

8.1 KEYPAD

This section gives a brief description of each of the buttons on the keypad. Each button or combination of buttons provides different functions as described in Sections 8.2 and 8.3.

 8.1.1 This button is used to manually start or stop a charge cycle. When a charge cycle is stopped with this button, pressing it again within one hour will continue the charge cycle where it was interrupted if the battery is not disconnected. Contact your local EnerSys service agent for information about the delay start override option.


 8.1.2 Pressing this button once will either enable or disable a manual equalize charge depending on the equalize status when the button is pushed. The message "EQUALIZE ON" is displayed when not charging to indicate the next charge will be an equalize cycle. An equalize


charge cycle has a termination rate of six hours after the 80% point is reached. Automatic equalize charges run weekly when the charger is set up per Section 8.3.3 and 8.3.5. An automatic equalize cycle can also be disabled by pressing this button.


Pressing this button rapidly twice will display the last charge data. The display will respond with "*****" and will scroll the following:

LAST CHARGE DATA VOLTS aa-aa, bb-bb, AMPS cc, AMPHR dd, CTIME ee-ee. "xxxxxxxxxx" where aa = start voltage, bb = finish voltage, cc = finish amps, dd = amp hours returned, ee = charge time, xxxxxxxxxxx = charge termination.

This button is also used in the SELECT mode to exit a function.

 8.1.3 This button is used in both the DISPLAY mode and the SELECT mode and is referred to as the UP button. In the DISPLAY mode, this button is used to scan the display variables as described in Section 8.2. In the SELECT mode, it is used to scan the variable list and to change the variable values as described in Section 8.3. Holding the UP button in allows a variable's value to be changed at an accelerated rate.

 8.1.4 This button is used in both the DISPLAY mode and the SELECT mode and is referred to as the DOWN button. In the DISPLAY mode, this button is used to scan the display variables as described in Section 8.2. In the SELECT mode, it is used to scan the variable list and to change the variable values as described in Section 8.3. Holding the DOWN button in allows a variable's value to be changed at an accelerated rate.

 8.1.5 The select button is used to access the SELECT mode (Section 8.3). Variables in the SELECT mode can only be changed when not charging because the select button is disabled when a charge cycle begins.

8.2 DISPLAY (see page 12)

The battery voltage per cell, charge current, amphours returned, and charge time are automatically displayed on a rotating basis during a charge cycle. Additional information found in Sections 8.2.5 through 8.2.7 are added to the rotating display when they become active.

To manually display any of the information in Sections 8.2.1 through 8.2.17, press the UP or DOWN arrow button repetitively until the descriptive word desired is displayed. Releasing the button displays that item's value. Only the information shown in brackets will be displayed (xx.xx = numerical value, hh-mm = hours-minutes).

8.2.1 AMPS

Release the UP or DOWN button to display the DC current to the battery. For a normal charge cycle, the current value is displayed as: [xx.xx A]. For an equalize charge cycle, the current value is displayed as [xx.xx E].

8.2.2 VOLTS

Release the UP or DOWN button to display the voltage per cell as: [x.xx V].

8.2.3 AMPHR

Release the UP or DOWN button to display the cumulative amp-hours returned to the battery as: [xxxx H].

8.2.4 CTIME

Release the UP or DOWN button to display the elapsed time since the charge cycle was started as: [hh-mm].

8.2.5 80%

This is only displayed after reaching 80% (2.37 vpc) of the charge. Release the UP or DOWN button to display the maximum time until a charge cycle is terminated as: [hh-mm].

8.2.6 EQUAL

This is only displayed when an equalize charge is in effect. When the UP or DOWN button is released, the display will not change.

8.2.7 RFRSH

This is only displayed when a refresh charge is in effect (see Section 9). When the UP or DOWN button is released, the display will not change.

8.2.8 BVOLT

Release the UP or DOWN button to display the battery voltage as: [xx.xx V].

8.2.9 CELLS

Release the UP or DOWN button to display the cell size of the battery as: [cc].

cc = number of cells charger is programmed for or number of cells charger is charging.

8.2.10 BATAH

Release the UP or DOWN button to display the battery ampere hour rating the charger senses as: [xxxx].

8.2.11 TEMPERATURE

Release the UP or DOWN button to display the temperature as [xxx.x] in degrees Fahrenheit (°F). When the temperature probe option is not used, it will display "32.0".

8.2.12 TIME

The time of day stored in the real time clock module will display the time in 24-hour format as

[hh-mm] when the UP or DOWN button is released.

8.2.13 YEAR

The present year stored in the real time clock module will be displayed when the UP or DOWN button is released.

8.2.14 DATE

The month and day of month stored in the real time clock module will be displayed when the UP or DOWN button is released.

8.2.15 DAY

The day of the week stored in the real time clock module will be displayed when the UP or DOWN button is released.

8.2.16 LEAD

This is displayed to indicate the charger is to be used with lead-acid batteries. "GEL" is displayed when the gel mode is activated. When the UP or DOWN button is released, the display will not change.

8.2.17 REMOT

When this is displayed, it indicates the remote battery voltage sense cable is being used to determine the battery voltage. When the UP or DOWN button is released, the display will not change.

8.3 SELECT

There are nine functions in the SELECT mode of operation as listed in Sections 8.3.1 to 8.3.9. All of the functions may not be available to be selected, depending on how the charger was set up. If none of the functions are available, the message "BLANK" is displayed when the SELECT button is pressed.

THE CHARGE FUNCTIONS CANNOT BE CHANGED DURING A CHARGE CYCLE (the SELECT mode is not accessible during a charge cycle). To exit a function, press the EQUALIZE button ("EXIT" will be displayed when leaving the SELECT mode).

8.3.1 BATID (optional)

This is used to set the battery identification number used by both the printer and the charger network. When a printer is attached to the charger, the battery identification number is printed with the charge data for record-keeping purposes.

When a battery is connected to the charger, a two minute delay becomes active. This allows the operator time to change the BATID number. When selected, the last value entered will be displayed by selecting VIEW. Change the number by selecting the proper digit to be changed. If no

new number is entered when the delay time expires, the BATID number will default to zero. Contact your local EnerSys service agent for information about this option.

8.3.2 CLEAR

Fault messages are cleared using this function. Press SELECT and press the UP button until "CLEAR" is displayed. When SELECT is pressed again, the fault or faults will be cleared.

8.3.3 CLOCK

This function sets the real time clock for the charger. **THIS MUST BE SET FOR THE CHARGER TO EQUALIZE AND DELAY AUTOMATICALLY.** Press SELECT then press the UP button until "CLOCK" is shown on the display. Press SELECT again and use the arrow buttons to choose which option to change: YEAR, DATE, DAY, or TIME.

Press SELECT to enter the option and use the arrow buttons to change the value. Press SELECT after the change is complete to save the new value. The time function is displayed using 24-hour time and should be set accordingly (8:30 PM = 20:30 and 11:00 PM = 23:00).

8.3.4 DELAY

When shipped from the factory the charger is set to start when a battery is connected. With this function a charge cycle start can be delayed either by a certain amount of time (WAIT) or to start at a specific time of the day (UNTIL). If a delay time is set using either WAIT or UNTIL, all future charge cycles will have that type of delayed start until delay is turned OFF. Press SELECT, then press either the UP or DOWN buttons until "DELAY" is shown. Press SELECT. Use the UP or DOWN buttons to display either OFF or ON.

OFF: When this is displayed, press SELECT to disable both WAIT and UNTIL delay start.

ON: When this is displayed, press SELECT to select the type of delayed start. Use the arrow buttons to choose either WAIT or UNTIL then press SELECT.

WAIT: The delay time before a charge cycle starts can now be selected using the UP or DOWN buttons. Press SELECT to save the value. The wait time can be set anywhere within a range of 0-24-hours.

UNTIL: The time of day at which the charger will start can now be set with the UP or DOWN buttons. Press SELECT to save the new time to start a charge cycle.

8.3.5 EQUAL

When shipped from the factory, the automatic equalize day is set to Friday and only two batteries can be equalized on that day. With this function, the automatic equalize day can be changed to a

different day of the week and the number of batteries to equalize can be adjusted from one to three (number of work shifts). Press SELECT, then press either the UP or DOWN buttons until "EQUAL" is shown. Press SELECT. Use the UP or DOWN buttons to display either EQDAY or BATTERIES.

EQDAY: Press the SELECT button and the present day selected will be displayed. Press the UP or DOWN buttons to select a new day. Press SELECT to save the new automatic equalize day.

BATTERIES: Press the SELECT button and the maximum number of batteries to be equalized on the equalize day will be displayed. Press the UP or DOWN buttons to select a new number (one, two or three). Press SELECT to save the new number of batteries on the equalize day.

"AUTO EQUALIZE" is displayed when not charging to indicate the next cycle is to be an automatic equalize charge.

8.3.6 LOG

Data from previous charge cycles can be displayed by using this function. The log file will save only approximately 20 to 25 charge cycle entries, so after the log file becomes full, any new entry made will overwrite the oldest log entry. Press the SELECT button and then press the UP button until "LOG" is shown on the display. Press the SELECT button and the word "VIEW" will be displayed. Press SELECT and after a short delay the last entries line number is displayed.

Each entry in the log has its own distinct line number. Use the UP and DOWN arrow buttons to select the line number you wish to see displayed. The line number is shown for about a second then the display scrolls to show the entry data. Several different types of entries are saved in the log data which include charge data, error messages, cycle start and stop messages, AC power on and off messages, EnerSys technician passkey entries, and EPROM revision dates. The following is an example of a charge data entry (data in brackets is displayed).

[L - ##	]	Entry line number
[mm/dd/yy	]	Date of data entry
[hh-mm	]	Time of Entry
[V=xx.xx xx.xx	]	Battery voltage (start finish)
[A=xx.xx	]	Charge current (finish current)
[AH=xxx	]	Amphours returned
[T=hh-mm	]	Charge time
[BC=xx	]	Number of battery cells
[BA=xxxx	]	Battery amphour setting
[TC=xxxx	]	Number of total cycles started

If the optional printer is used, two modes can be selected with the UP or DOWN button: PRINT and VIEW. With "PRINT" shown on the display,

press the SELECT button to print the log data to an attached printer. While the charger is printing "PRINT" is shown solid on the display, then it will scroll when the print routine is completed.

8.3.7 CHGID (optional)

This is used to set the charger identification number used by both the printer and the charger network. When a printer is attached to the charger, the charger ID number is printed with the charge data for record-keeping purposes. Contact your local EnerSys service agent for information about this option.

8.3.8 BATAH (optional)

When several different sizes of batteries are to be charged with this charger, set this function to the desired amp-hour rating of the battery. Contact your local EnerSys service agent for information about this option.

8.3.9 BCELL (optional)

This is used to set the number of cells for an odd battery whose cell count is not shown in Table 2. Contact your local EnerSys service agent for information about this option.

9. CHARGE TIME

The amount of time a battery charges will vary depending on the depth of discharge (DOD). After the charge cycle has reached 80%, a normal charge cycle will be terminated either of two ways: specified time (usually three hours) or DV/DT (when the charger senses a very small change in battery voltage during its sampling time period). Normal charge cycles will usually not exceed ten hours. An equalize charge cycle will terminate six hours after 80% has been reached. A charge cycle will automatically terminate if it remains in the high rate longer than allowed (see Section 12.1, START TIME EXCEEDED). Both normal and equalize charge cycles will terminate if they extend beyond the maximum time allowed (see Section 12.1, CHARGER RAN TOO LONG).

If the battery is not disconnected from the charger after a charge cycle has stopped, every 12 hours the charger will start a refreshing charge to keep the battery fully charged. A refresh charge will terminate either with DV/DT or 15 minutes after the last cycle finish current point is reached. The different types of charge cycle termination are listed below:

STOP SW	Stop button pressed
DVDT	DV/DT
KNEE-T	Three hours past 80%
AMPHRS	Amphours returned
FAULT	Aborted because of error

10. AC POWER FAILURE

If the AC power fails during a charge cycle or a delayed start, the charger will resume the operation in progress when the power is restored. When the power source remains off for more than approximately a week, the clock and log data will be lost.

 **WARNING: IF THE DISPLAY IS BLANK, DO NOT ASSUME THE POWER IS OFF. AN ELECTRIC SHOCK COULD RESULT.**

11. MAINTENANCE

The charger requires minimal maintenance. It should be kept clean and all connections tight. BE SURE THE CHASSIS IS SECURELY GROUNDED. Twice a year, or as often as the cleanliness of the area may dictate, the louvers should be vacuumed and the interior thoroughly blown with dry air.

12. MESSAGES

The five-digit alphanumeric display is used to display messages about the charger status. Messages longer than the five-digit display are scrolled across the display. The two types of messages displayed are:

- FAULT MESSAGES
- OPERATIONAL MESSAGES

12.1 FAULT MESSAGES

The charger has a self-diagnostic feature used to detect and display problems using fault messages. If a charge cycle is in progress when a fault message occurs, the cycle may be terminated. If a fault message occurs, it will be displayed until the battery is removed from the charger or until the fault is cleared (see Section 8.3.1). If any problem cannot be resolved, consult your EnerSys service agent. The following are the fault messages shown on the display. A message will also be displayed after each fault message to indicate the status of the present charge cycle.

BATTERY WILL NOT CHARGE

If the battery voltage falls below 2.32 V/cell any time after one past the switchover point and the current is 80% or greater, the start rate the charge will terminate.

CHECK AC PWR FUSES

One or more of the AC power fuses has opened.

DC CORD OR FUSE OPEN

The DC cord was unplugged or the DC fuse opened during a charge cycle.

EEPROM WRITE ERROR

A problem has occurred with the control module.

HIGH AMPHOURS RETURNED

More than 150% of the amhours has been delivered to the battery.

HIGH BATTERY VOLTAGE

The start charge voltage exceeded 2.9 volts per cell. Example: An 18 cell charger is connected to a 24 cell battery.

HIGH CELL COUNT

The battery cell count is larger than the value programmed. The charger will charge the battery to the programmed value.

HIGH START CURRENT

The start charge current is greater than 125% of the desired current.

ID BOARD MISREAD

The number of battery cells or the battery AH capacity exceeded the chargers capacity.

LOW START CURRENT

This is displayed when the charger is unable to deliver 80% of the start charge current.

MAX CHARGER TIME EXCEEDED

The charge cycle ran longer than the maximum time allowed.

NO SHUTOFF FLAGS

The normal types of charge cycle termination are inactive.

OPEN SCR TEMP PROBE

The charger's SCR temperature sensor has failed, thus terminating the charge.

REMOTE SENSE BAD

The charger's remote battery voltage sensor has failed.

SCR(S) OR PCB HOT

The charger's temperature sensor indicates high temperature.

START TIME EXCEEDED

The charger remained in the start rate longer than allowed.

12.2 Operational Messages

Operational messages are displayed as required before, during, and after a charge cycle. The information displayed is intended to inform the operator of charge option settings and charger performance. The operational messages are shown below (cc = number of cells, xxx = numerical values, hh-mm = hours-minutes).

THIS LOADHOG CHARGER AUTOMATICALLY ADJUSTS ITS OUTPUT TO CHARGE cc CELL BATTERIES RANGING FROM xxx TO xxx AH WITHOUT ADJUSTMENT:

Displayed as a greeting message after the AC power is applied.

NEXT:

Displayed when the charger does not have a battery connected to it.

CHARGER SEES A cc CELL BATTERY STARTING CHARGE SELF TEST CHARGING A cc CELL BATTERY:

Displayed when the charger is starting a charge cycle.

TESTING FOR cc CELL BATTERY:

Displayed when the charger is determining the number of battery cells or when a battery appears to have less cells than the number of cells programmed.

PUSH START:

Displayed when the charger is connected to a battery that is ready to charge.

NOBAT:

Displayed if START was pushed and the charger is not connected to a battery.

STOP:

Displayed when STOP is pressed during a charge cycle.

EQUALIZE ON:

Displayed when EQUALIZE is pressed, turning a normal charge cycle into an equalize charge cycle.

UNTIL DELAY ON:

Displayed after exiting the SELECT mode when UNTIL delay start is enabled.

WAIT DELAY ON:

Displayed after exiting the SELECT mode when WAIT delay start is enabled.

DELAY hh-mm:

Displayed when a delayed start (either WAIT or UNTIL) is active to indicate when charge cycle starts.

READY:

Displayed when the charge cycle is completed and the battery is ready for use.

TIME hh-mm:

Displayed when a charge cycle is not running to indicate the time of day.

*****.

Displayed when the onboard computer is processing information.

PRINT:

Displayed when the optional printer is printing information.

AUTO EQUALIZE:

Displayed before charge cycle starts to indicate the next charge cycle will be an automatic equalize charge.

WAIT CHARGE WILL CONTINUE:

Displayed when the AC voltage is toggled to indicate about a one minute delay before the battery voltage will be read.

13. PARTS LIST

The following is a list of parts found in the various model LOADHOG chargers. When replacing a part, USE ONLY ORIGINAL FACTORY REPLACEMENT PARTS of the correct size and rating.

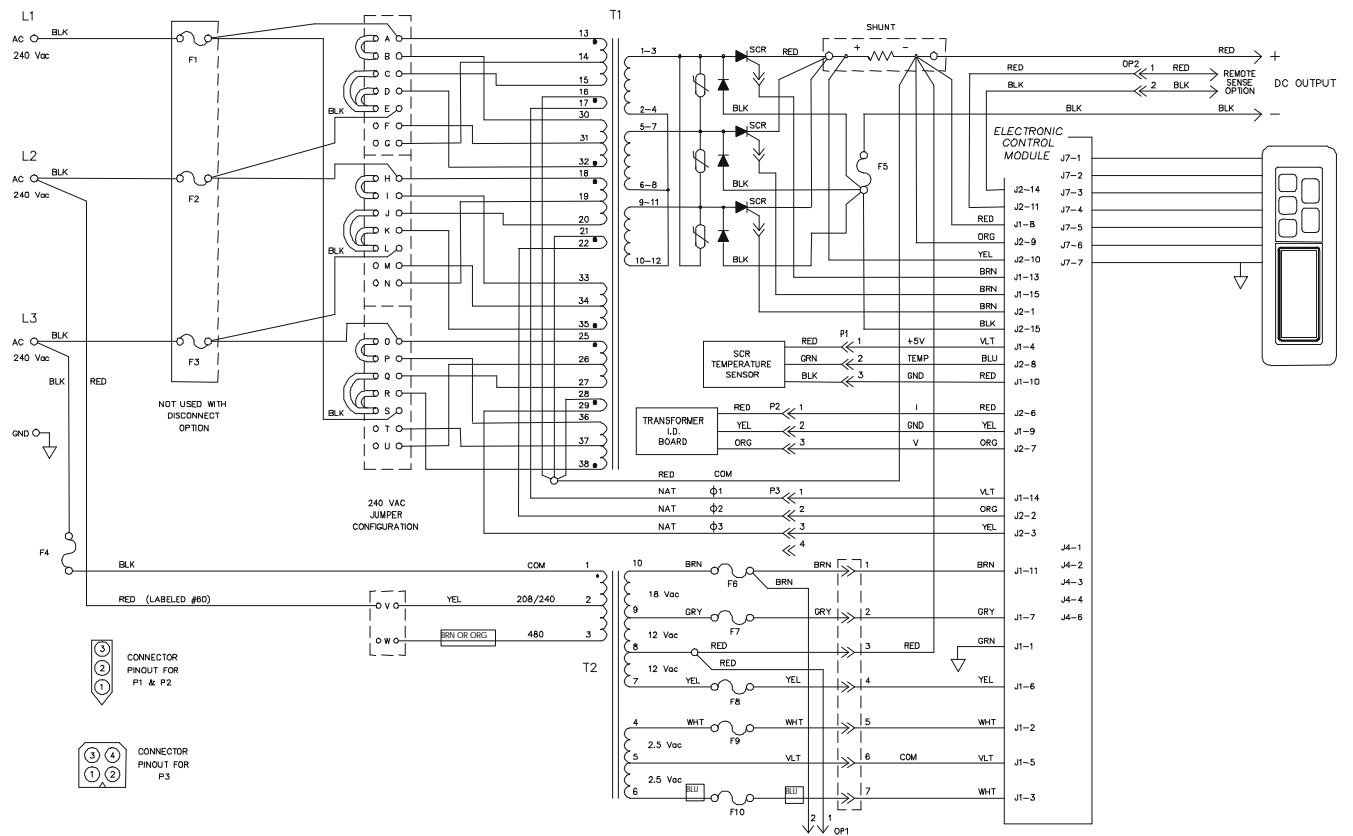
DESCRIPTION	MODEL								
	12-680 24V	12-850 24V	18-550 36V	18-1000BR 36V	18-1000 36V	18-1600 36V	24-1000BR 48V	24-1000 48V	40-850 80V
TRANSFORMER ASSEMBLY	84914665S	84914675S	84914685S	84919175S	84914695S	84914705S	84920555S	84914715S	84914725S
SCR ASSEMBLY	84312948S	84312948S	84312948S	84313716S	84317963S	84317963S	84312948S	84317963S	84312948S
SHUNT	83613257S	83612867S	83613257S	83612867S	83612867S	83618402S	83612867S	83612867S	83612867S
CASE, BASE PANEL	85718576S	85718586S	85718362S	85724927S	85717717S	85718392S	85727222S	85718328S	85718592S
CASE, INNER PANEL	85718578S	85718588S	85718475S	85724928S	85717843S	85718394S	85727221S	85718331S	85718594S
TRANSFORMER ID BOARD	80113498S	80113499S	80113507S	20113533S	80117662S	80113514S	80113534S	80117825S	80114735S
DC CORD (W/ SB350 GRAY PLUG)	85218583S	85217715S	85218583S	85217715S	85217715S	85218419S	85217715S	85217715S	85217715S
BUSHING, DC CORD	83702009S	83702009S	83702009S	83702009S	83702009S	-	83702009S	03702009S	83702009S
TRANSFORMER ASSEMBLY, SMALL	84914610S	84914610S	84914610S	84918205S	84914610S	84914610S	84918205S	84914610S	84914610S
HEATSINK	83117708S	83117708S	83117708S	83123279S	83117705S	83117708S	83117708S	83117708S	38117708S
FUSEHOLDER (F6-F10)	82803837S	82803837S	82803837S	82824407S	82803837S	82803837S	82824407S	82803837S	82803837S
DC FUSE	82810925S	82810901S	82810910S	82820901S	82817678S	82818408S	82810901S	82817678S	82810901S
FUSE, OTS-10	128-104-088	128-407-088	128-104-088	-	-	-	-	-	-
FUSE, OTS-15	128-104-089	-	-	128-104-090	-	-	-	-	-
FUSE, OTS-20	128-104-090	128-104-090	128-104-090	-	128-104-090	-	128-104-090	-	-
FUSE, OTS-25	-	128-104-091	128-104-091	-	-	-	-	128-104-092	-
FUSE, OTS-30	-	-	-	-	-	128-104-092	-	-	-
FUSE, OTS-35	-	-	-	-	128-104-095	-	128-104-095	-	128-104-095
FUSE, OTS-40	-	-	-	-	128-104-096	-	128-104-096	-	-
FUSE, OTS-50	-	-	-	-	-	-	-	128-104-097	-
FUSE, OTS-60	-	-	-	-	-	128-104-098	-	128-104-098	-

COMMON PARTS

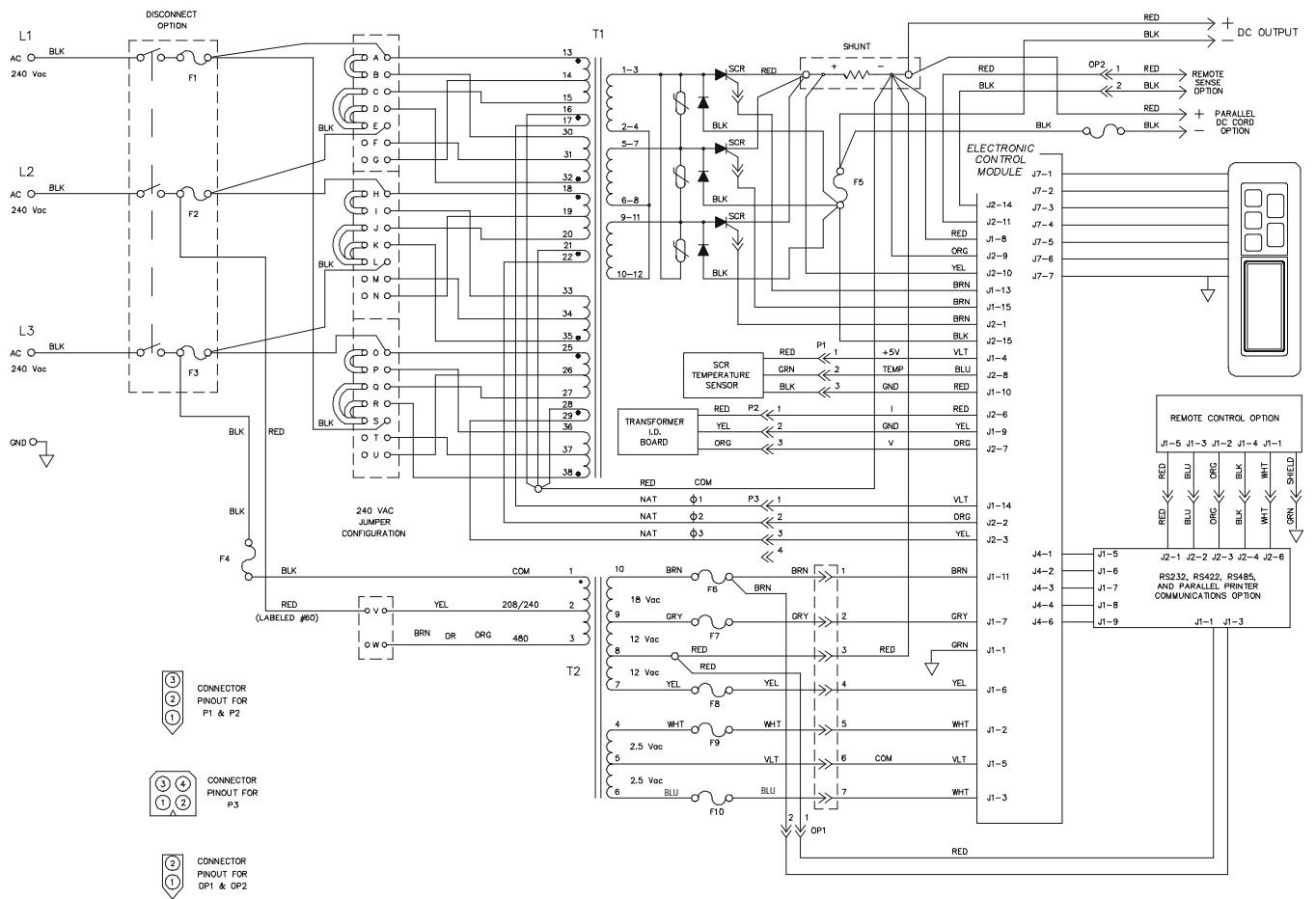
CASE, FRONT PANEL	85717691S
CASE, FRONT PANEL W/ DISCONNECT	85717667S
CASE, BACK PANEL	85717668S
CASE, SIDE PANEL	85717666S
CASE, TOP PANEL	85717669S
BOTTOM TRANSFORMER MOUNTING RAIL	85717692S
TOP TRANSFORMER MOUNTING RAIL	85717706S
CASE, DOOR	85717758S
RUBBER DOOR BUMPER	83713592S
DOOR HANDLE	85717687S
DOOR LATCH	83717689S
KEYPAD **	84517646S
DISPLAY PLEXIGLAS **	85712902S
CONTROL HARNESS	85417720S
JUMPER TAP STRIP	84617716S
TAP STRIP PHENOLIC	85717844S
CONTROL MODULE *	-
TERMINAL STRIP, 2 POLE	84604494S
DISCONNECT	80118501S
SCR TEMPERATURE TRANSDUCER	85812393S
STUD DIODE	85718101S
VARISTOR ASSEMBLY	89013966S
WIRE JUMPER (SET OF 9)	83717869S
HEATSINK INSULATOR	85717711S
SHUNT AND FUSE INSULATOR	85717713S
INNER PANEL BUSHING, BLACK	83010917S
AC GROUND LUG	85214998S
FUSEHOLDER (F4)	82817842S
FUSE, 1 AMP (F4)	82804630S
FUSE, .5 AMP (F6, F9, F10)	82805135S
FUSE, 3 AMP (F7, F8)	82804688S
FUSE REDUCER	82817176S
FUSEHOLDER (F1, F2, F3)	82817673S

* CONTACT YOUR SERVICE AGENT
 ** PARTS INCLUDED WITH CASE, DOOR

14. WIRING DIAGRAM USING AC FUSE BLOCK



14.1 WIRING DIAGRAM USING AC DISCONNECT OPTION



15. PROGRAMMING GUIDE

This section is a simplified guide to aid you in programming the basic functions (SELECT mode options not included) of the three-phase LOADHOG charger. Use it in conjunction with the flowchart on Page 13 in which each section is shown in dashed lines.

SECTION A - Displaying Charger Data

Press the UP or DOWN arrow button to display the following charge data.

AMPS	BATAH
VOLTS	TEMP
AMPHR	TIME
CTIME	YEAR
80%	DATE
EQUAL	DAY
RFRSH	LEAD
B VOLT	REMOT
CELLS	

SECTION B – Selecting Clear

Used to clear fault messages.

Press the SELECT button
The word "CLEAR" will appear
Press the SELECT button (faults are cleared)
The word "CLEAR" will appear
Press EQUALIZE button to exit
"EXIT" is displayed

SECTION C – Setting Clock

Used to set the real time clock (YEAR, DATE, DAY, TIME).

Press the SELECT button
The word "CLEAR" will appear
Press the arrow buttons until "CLOCK" is displayed
Press the SELECT button
The word "YEAR" will appear
Press the SELECT button
Enter the present year (91 = 1991) using the UP or DOWN arrow button
Press the SELECT button
The word "YEAR" will appear
Press DOWN arrow button
The word "DATE" will appear
Press the SELECT button
Enter the present date (11/30 = November 30) using the UP or DOWN arrow button
Press the SELECT button
The word "DATE" will appear
Press DOWN arrow button
The word "DAY" will appear
Press the SELECT button
Enter the present day using the UP or DOWN arrow button
Press the SELECT button
The word "DAY" will appear
Press DOWN arrow button
The word "TIME" will appear
Press the SELECT button
Enter the present time (15-45 = 3:45 PM) using the UP or DOWN arrow button
Press the SELECT button
The word "TIME" will appear
Press EQUALIZE button to exit, "EXIT" is displayed

SECTION D – Setting Delay

Used to set delay start time (WAIT, UNTIL, or OFF). Only the last one selected will be active.

Press the SELECT button
The word "CLEAR" will appear
Press the arrow buttons until "DELAY" is displayed
Press the SELECT button
The word "OFF" or "ON" will appear
Use the arrow buttons to select either "OFF" or "ON" then press the SELECT button
If "OFF" was shown the delay time is disabled which CELLS inactivates both the WAIT and UNTIL delays
If "ON" was shown the display will now show the word "WAIT"
Use the arrow buttons to select either "WAIT" or "UNTIL" then press the SELECT button
For WAIT enter the amount of wait time desired (00-30 = 30 minutes) using the arrow buttons, then press the SELECT button
For UNTIL enter the time of day the charger should start (18-00 = 6:00 PM) using the arrow buttons, then press the SELECT button
Press the EQUALIZE button to exit, "EXIT" is displayed

SECTION E – Setting Equal

Used to set the equalize day and the number of batteries per equalize day.

Press the SELECT button
The word "CLEAR" will appear
Press the arrow buttons until "EQUAL" is displayed
Press the SELECT button
The word "EQDAY" will appear
Use the arrow buttons to select either "EQDAY" or "BATTERIES" then press the SELECT button
If "EQDAY" was shown the present equalize day will now be shown
Use the arrow buttons to select a new equalize day then press the SELECT button
If "BATTERIES" was shown the present number of batteries per equalize day will be displayed
Use the arrow buttons to select the number of batteries then press the SELECT button
Press EQUALIZE button to exit, "EXIT" is displayed

SECTION F – Viewing Log

Used to display or print* past charge cycle data

*Optional printer required

Press the SELECT button
The word "CLEAR" will appear
Press the arrow buttons until "LOG" is displayed
Press the SELECT button
Select either "VIEW" or "PRINT"* with the arrow buttons
Press the SELECT button
Select the charge data to be displayed by its line number
Data which a charge log would contain:
Entry line number Amphours returned
Date of data entry Charge time
Time of entry Number of battery cells
Battery voltage Battery amphour setting
Charge current (finish) Number of total cycles
Press EQUALIZE button to exit, "EXIT" is displayed

