

FLEETWOOD

SERVICE MANUAL

for

BATTERY CONTROL CENTER

As used on: American Eagle, Dream, and Tradition



Note: The Battery Control Center is a centralized power switching, fusing, and distribution center. Power from both the chassis and coach batteries is fed into the box. The full power of these batteries is available within this box. Inadvertent shorts inside this box could result in severe damage and/or injury.

All servicing within this box should be done only by a qualified Service Technician.

Tools Required:

Low current Test Light, Accurate Voltmeter (digital read-out preferred).

Access to circuit protection:

To gain access to the fuses and circuit breakers, turn each of the two latches a quarter turn to the left and pull the cover away from the box.

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BATTERY CONTROL CENTER

BATTERY DISCONNECT

The Battery Disconnect relays are used to disconnect the batteries during periods of storage or during service. The disconnect relays operate by momentarily applying 12 volts to the solenoid coil in either of two directions, (+12 volts on the "S" terminal and ground on the "I" terminal for opening and +12 volts on the "I" terminal and ground on the "S" terminal for engaging the relay).

The actuation voltage is supplied from the coach battery through F19. It is supplied to the momentary switches mounted in the coach and then fed back to the relays in the control center. (See Battery Disconnect schematic, Figure 1).

Problem

Both disconnect relays fail to operate.

One disconnect relay fails to operate.

Chassis relay fails to operate.

Coach functions operate when coach is plugged in, but not from battery.

Possible Cause/Solution

Coach battery may be dead. Check for voltage at the top end of F9, the feed from the coach battery. F9 is located at the top, center of the printed circuit board. This voltage should be at least 11 volts. If it is less, charge the coach battery. If it is more than 11 volts, go on.

F9 may be blown. Using a test light, check for voltage at both ends of F9. This voltage should be at both ends of F9. If not, replace fuse F9.

Ground lead to switches may be open. Check for ground and 12 volts on "I" and "S" terminals of the Disconnect Relay while pressing the switch in the coach.

Wiring or switch faulty. To check the operation, have an assistant operate the switch inside the coach while checking for voltage on the "I" terminal of the relay and ground on the "S" terminal.

Disconnect Relay faulty. If at least 11 volts is available on "I" or "S" terminals, and relay fails to operate, replace relay.

Ignition may be on. Check to be sure that the switched-ignition voltage is 0 volts.

Interlock relay, K3, faulty. Check for 12 volt power feeding switch, at connector G, pin 2.

No 12 volt power to switch. If there is no 12 volts, check fuse F9.

Circuit breakers feeding converter opened. Reset circuit breakers in box.

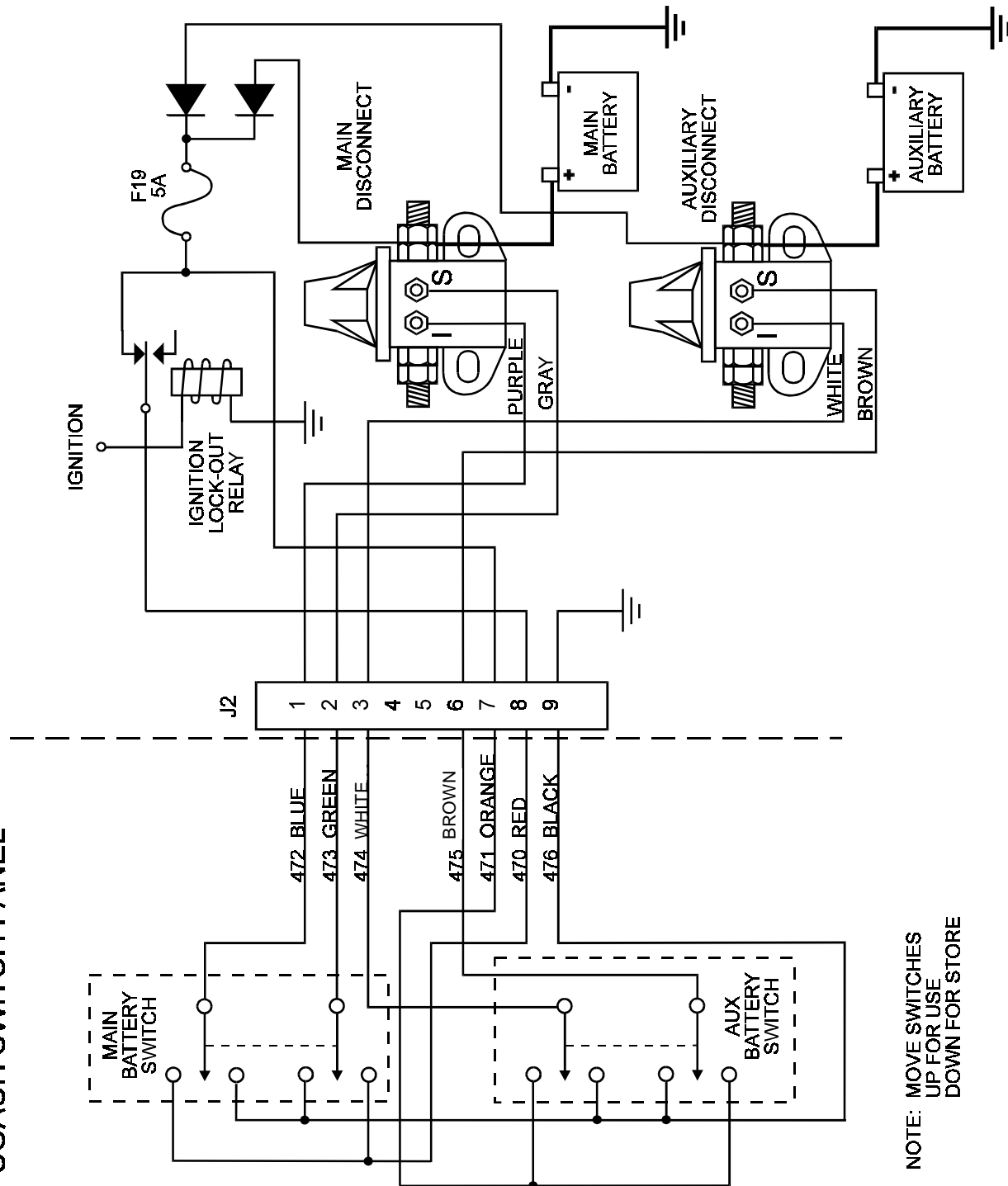
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COACH SWITCH PANEL



NOTE: I TERMINAL + FOR USE
S TERMINAL + FOR STORE

NOTE: MOVE SWITCHES
UP FOR USE
DOWN FOR STORE

FIGURE 1

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CHARGING CIRCUIT

The charging circuit will charge both batteries if either battery is being charged. It operates by sensing the voltage on the Main and Auxiliary batteries. If either voltage goes above 13.3 volts for more than 14 seconds, the isolator solenoid will pull in, charging both batteries. If, while the ignition is on, the voltage falls below 12 volts for more than 4 seconds, the isolator relay will open, keeping all of the alternator's output available for the chassis functions. If the ignition is off and the auxiliary battery voltage should drop below 12.8 volts for 4 seconds, the isolator relay will open, preventing the coach loads from discharging the main battery.

To prevent overcharging when connected to shore power for long periods of time, the system monitors the battery voltage and when it exceeds 13.8 volts for one hour, the chassis battery will be disconnected. When the voltage on that battery drops below 12.6 volts, the isolator will reconnect to recharge the battery. (See Charging Circuit/Aux Start schematic, Figure 2).

Problem

Coach battery does not charge

Possible Cause/Solution

The isolator relay is not closing. Check for voltage on coil terminals of isolator relay (should be approximately 4 volts). Operate the engine at a high idle for at least 20 seconds and check the chassis battery voltage. It must be at least 13.3 volts. If it is less, check alternator.

If no voltage on coil, replace printed circuit board.

If there is voltage on coil (should be approximately 4 volts), check for voltage on both main terminals of relay. If different, replace relay.

Chassis battery continues to drain.

Isolator relay not opening. Replace relay.

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IGNITION RELAY

The ignition relay, K1, turns power on with the ignition switch to feed the ignition signal, rear heater, and leveling jacks controller. Failure of this relay will prevent the operation of these functions. The power for the coil of this relay comes from the ignition switch through Connector D, pin 3. (See Charging Circuit/Aux Start schematic, Figure 2).

Problem

The rear heater, leveling jacks, and/or the refrigerator fail to operate.

Possible Cause/Solution

Ignition relay fails to operate. Check for 12 volt power at terminals of ignition relay, at relay.

Check for 12 volt power coming into printed board on Connector D, pin 3. If no power here, check for faulty wiring from ignition switch.

Replace printed circuit board.

AUXILIARY START

The Auxiliary Start function is used to provide a "jump start" from the coach battery, in the event that the chassis battery does not have sufficient amount of charge to start the engine. It operates by momentarily connecting the chassis and coach batteries together through the isolator relay. This is accomplished by pressing the dash mounted switch which applies 12 volts to the isolator relay coil. This power is supplied to the switch by fuse F10. (See Charging Circuit/Aux Start schematic, Figure 2).

Problem

Auxiliary Start fails to operate.

Possible Cause/Solution

Fuse 10 blown. Check F10.

Coach battery dead. Charge battery.

Isolator relay defective. Replace relay.

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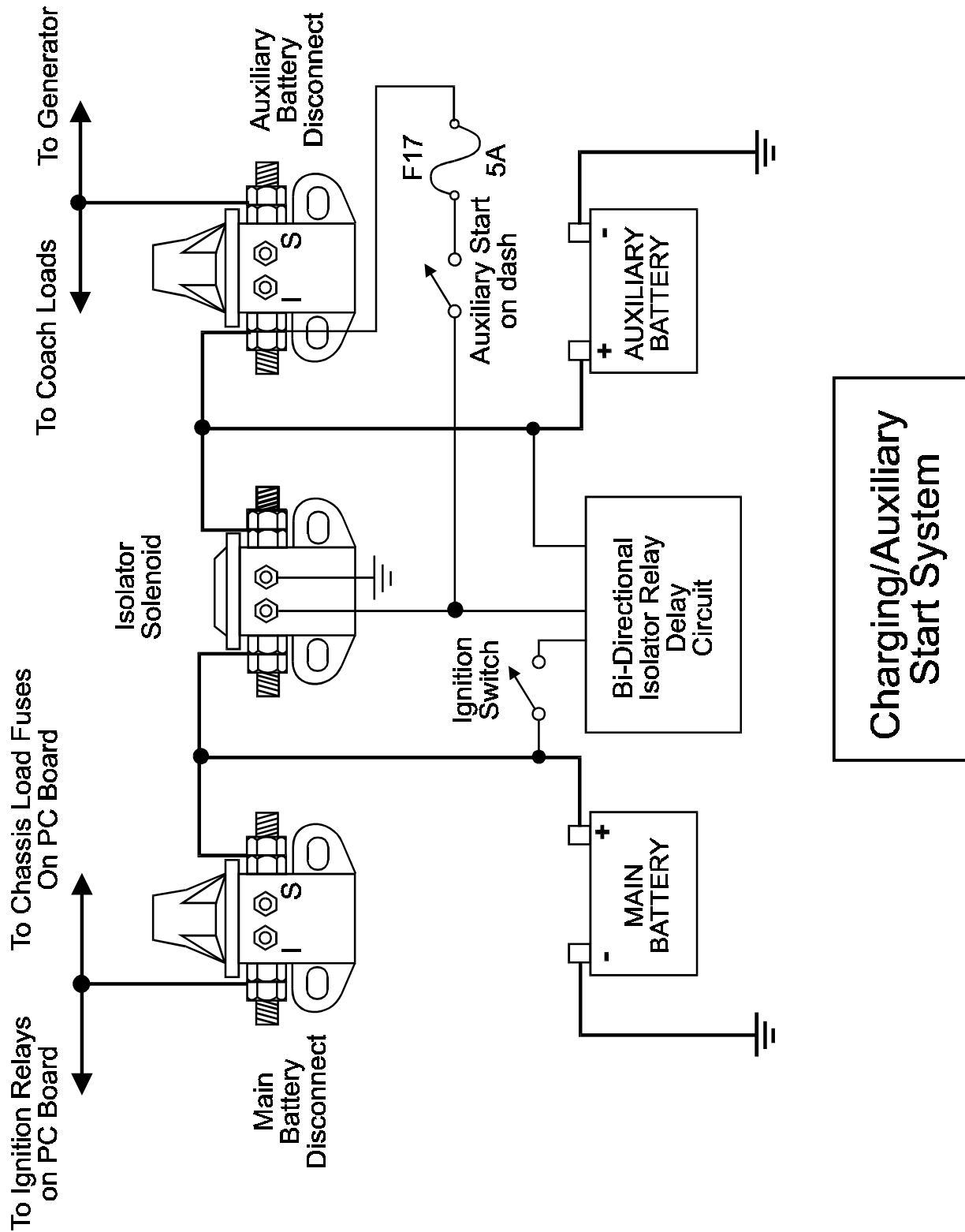
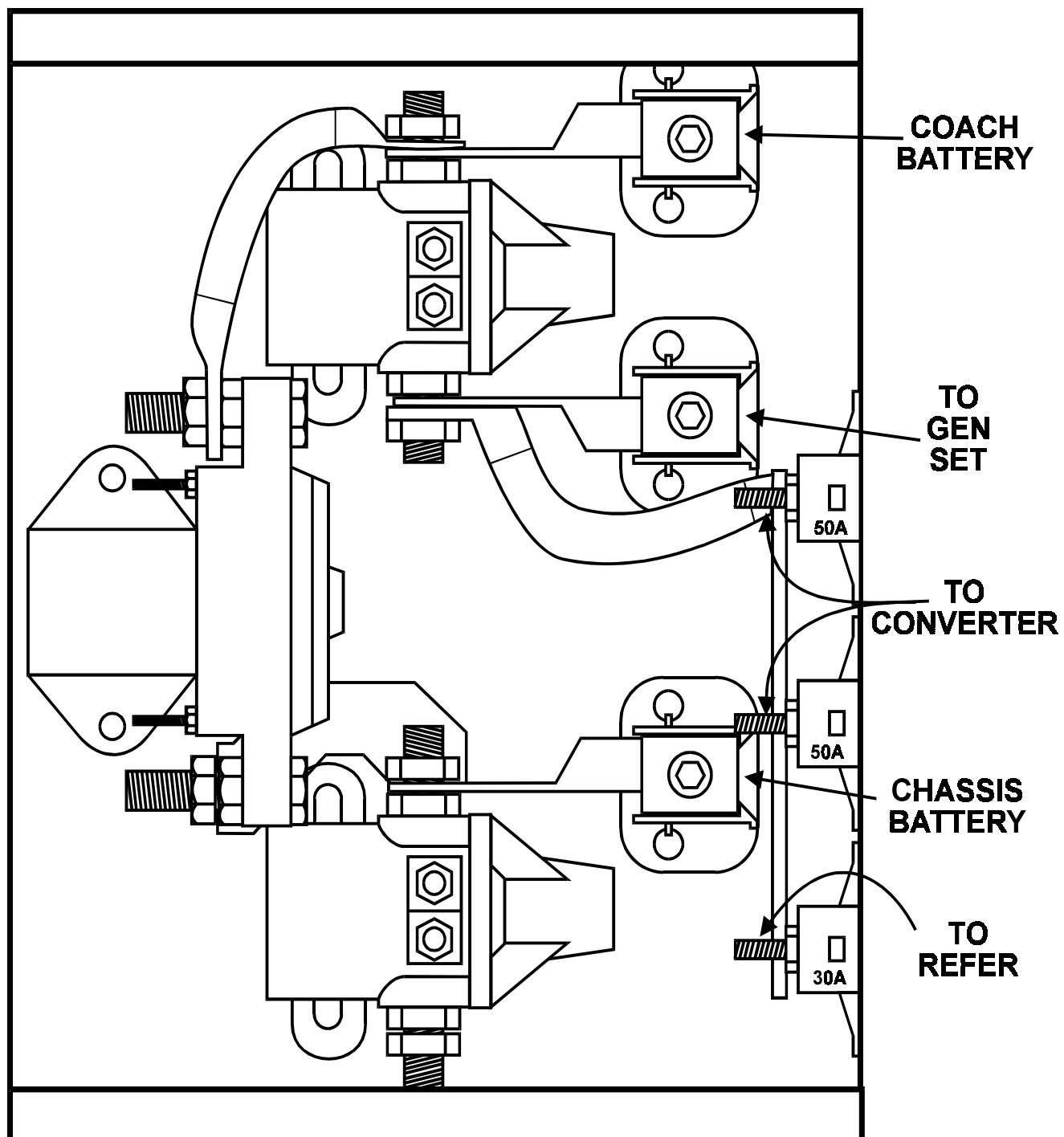


FIGURE 2

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SOLAR CHARGER

The Solar Charger is used to control the output of roof-top mounted solar panels. These 50 watt panels can put out up to 21 volts and as much as 3.5 Amps of current. When the batteries are below 13 volts and there is output from the panels, the controller will operate in the full charge mode, applying the full output of the panels to the batteries, through a relay mounted on the printed circuit board. When the voltage on the batteries reaches 14.4 volts, the controller switches into a current limited, constant voltage mode. In this mode, the battery voltage is maintained at 13.6 volts at a maximum of 1 Amp. In either of the first two modes, the "CHARGING" LED on the monitor panel will be lit.

When the current falls below 0.25 Amps, the "CHARGING" LED goes out and the "CHARGED" LED will come on. If the voltage falls below 13 volts, the controller will switch back into the full charge mode.

The voltage thresholds are temperature compensated to assure proper charge on the batteries. (See Solar Charging Schematic, Figure 3).

<u>Problem</u>	<u>Possible Cause/Solution</u>
CHARGING LED does not come on.	Solar panel not putting out sufficient power. Check for sun light on panel. Check voltage coming from panel on CNE1. If low check panel wiring. Replace Printed board.
CHARGED LED does not come on.	More than 0.25 Amp drain on batteries. Turn off Battery Disconnect Relays.
Batteries not charging.	Check voltage from solar panel when in sun light. Should be more than 15 volts. If less, check solar panel for damage. Check wiring from panel. Relay K4 on board should be closed. If not replace board. Check for excessive drain on batteries. Turn off Battery Disconnect relays to see if charging occurs.

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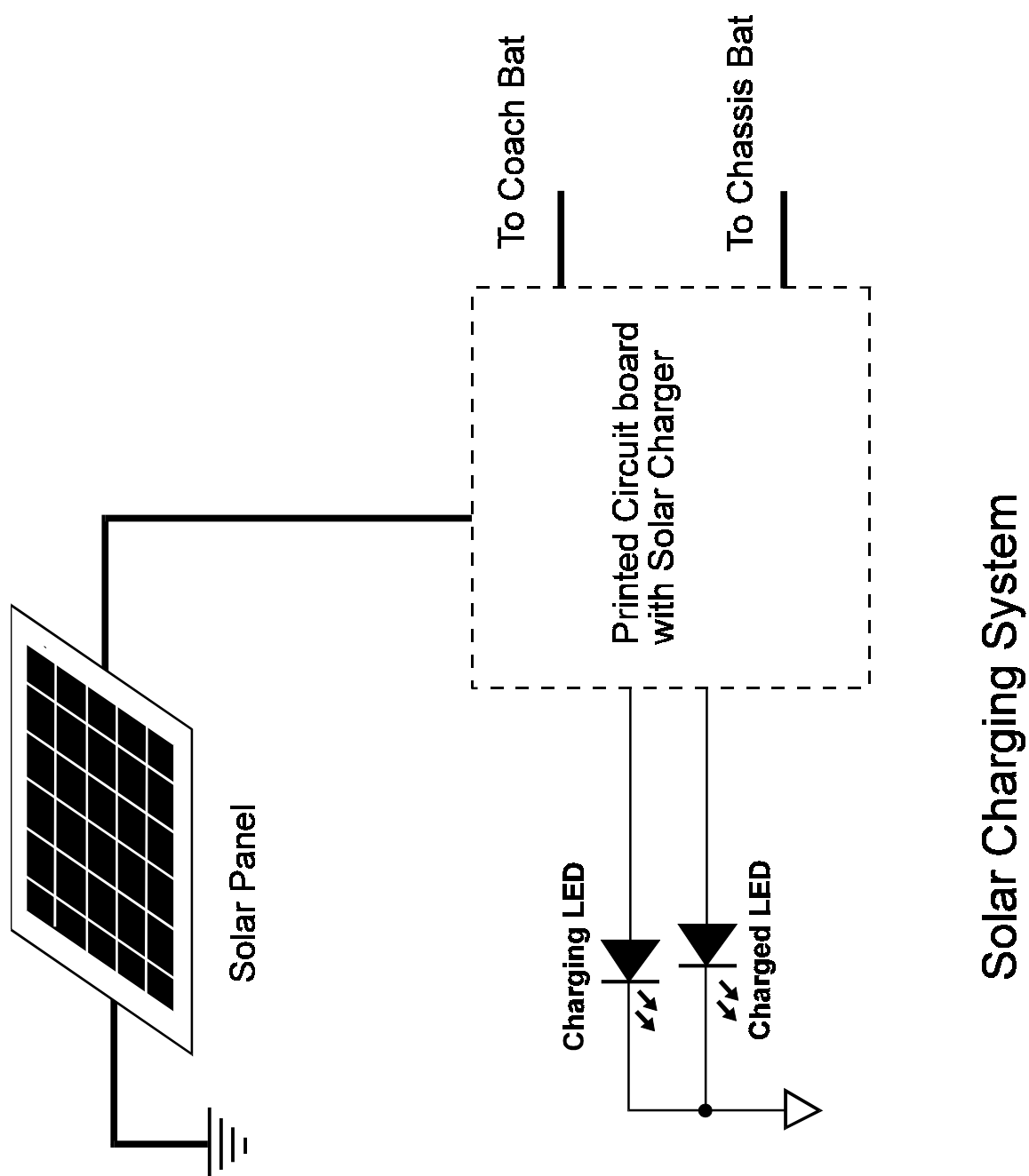


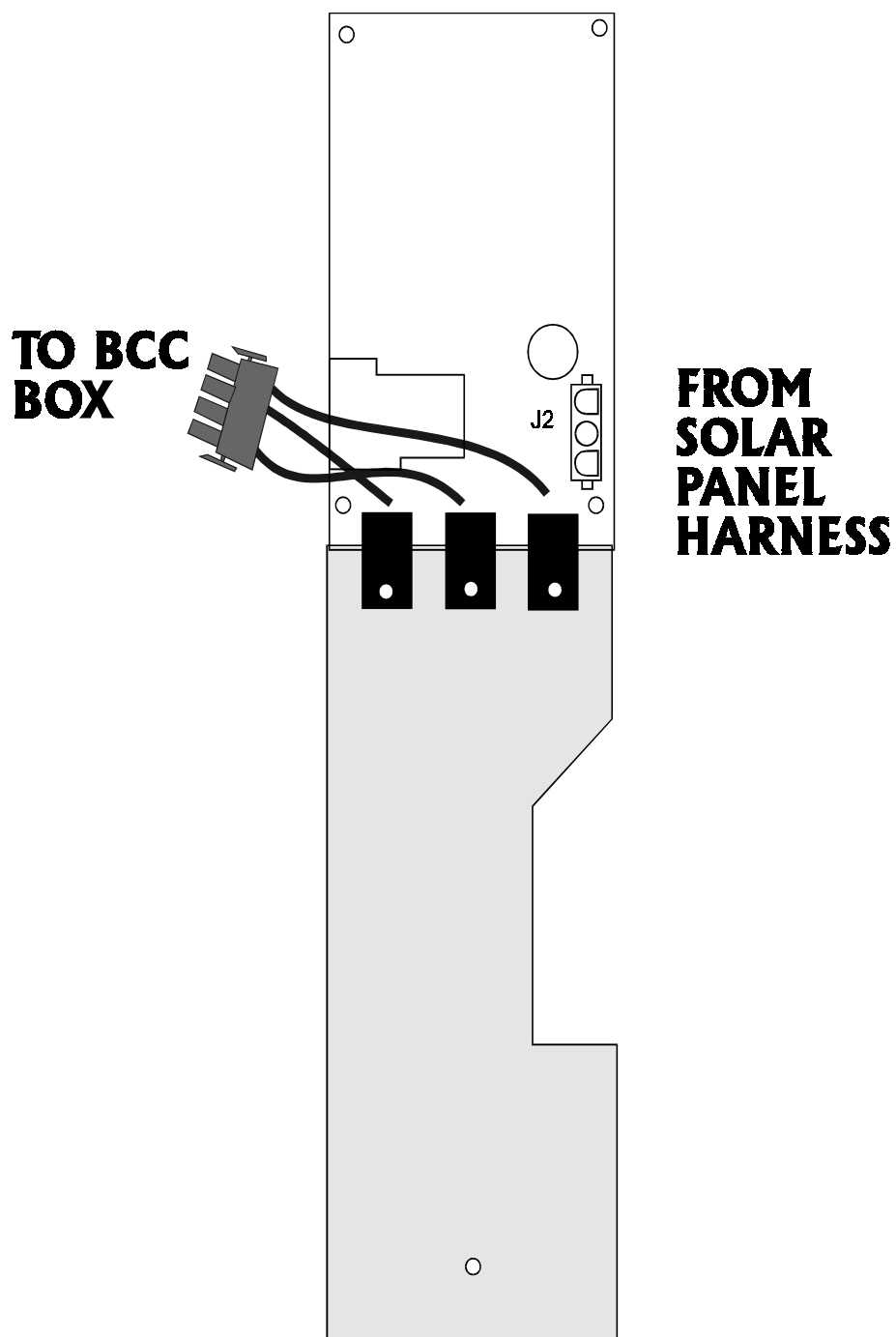
FIGURE 3

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Solar charger Module



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FUSES

The fuses used on this board are standard, plastic "ATO", blade (automotive) type.

There are 18 positions for fuses on the board (See Figure 4). These are fed from four main sources, Disconnect-Switched Coach Battery, Coach Battery, Disconnect-Switched Chassis Battery, and Ignition Switched Chassis Battery.

The 18 fuses and their size are as listed:

<u>Disconnect-Switched Coach Battery</u>			<u>Connector Pin-Out</u>
LP Detector Aux	F1	3 Amp	CNC4
Mntr Panel Aux	F2	10 Amp	CNB2
Luggage Lights	F3	15 Amp	CNB6
CO Detector Aux	F4	3 Amp*	CNC3
Spare	F5	20 Amp	CNC2
<u>Coach Battery</u>			
Spare	F6	3 Amp*	CND2
Bat Disconnect Pwr	F9	5 Amp	J7 - 3
Aux Strt Sw Pwr	F10	10 Amp	CND5
Radio Power Aux	F11	10 Amp	CNC1
<u>Disconnect-Switched Chassis Battery</u>			
Mntr Panel Main	F12	5 Amp	CNA1
LP Detector Main	F13	3 Amp	CNA4
Step Switch	F14	5 Amp	CNA6
Step Power	F15	25 Amp	CNA8
Spare	F16	20 Amp	CNA2
CO Detector Main	F17	3 Amp*	CNB5
<u>Ignition Switched Chassis Battery</u>			
Spare	F18	15 Amp	CNA7
Ignition Signal	F8	5 Amp	CNA3
Spare	F7	3 Amp	CNA5

* These values may be different than the ones listed. Check the label on the door for the correct value.

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CIRCUIT BREAKERS

There are two 50 Amp and one 30 Amp, type III (manual reset), circuit breakers mounted in the box. The two 50 Amp units are connected to the Coach battery through the Disconnect relay. These breakers are intended to connect to the converter and fuse panel within the coach. The 30 Amp unit is connected to the Main battery to feed the 12 volt power to refrigerator.

Plugs - Pins & Functions

CNA - 8 pin in-line Mate-N-Lock Mating Housing AMP 640586-1

<u>Pin</u>	<u>Function</u>	<u>Fuse</u>
1	Mntr Panel Bat Main	F12
2	Spare	F16
3	Ignition Signal	F8
4	LP Detector Main	F13
5	Spare	F7
6	Step Switch	F14
7	Spare	F18
8	Step Power	F15

CNB - 6 pin in-line Mate-N-Lock Mating Housing AMP 640585-1

<u>Pin</u>	<u>Function</u>	<u>Fuse</u>
1	Start Solenoid Power	
2	Mntr Panel Bat Aux	F2
3	Spare	F2
4	Start Solenoid Power	
5	CO Detector Main	F17
6	Luggage Lts	F3

CNC - 4 pin Mate-N-Lok Mating Housing AMP 1-480702-0

<u>Pin</u>	<u>Function</u>	<u>Fuse</u>
1	Radio Power Aux	F11
2	Spare	F5
3	CO Detector Aux	F4
4	LP Detector Aux	F1

CND - 5 pin Mate-N-Lok Mating Housing AMP 1-480763-0

<u>Pin</u>	<u>Function</u>	<u>Fuse</u>
1	Start Switch	
2	Spare	F6
3	Ignition Signal	
4	Not Used	
5	Aux Start Sw Pwr	F10

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J5 - 4 pin Mate-N-Lok Mating Housing AMP 1-480702-0

To Solar Charger

<u>Pin</u>	<u>Function</u>	<u>Fuse</u>
1	Aux Battery	
2	Not Used	
3	Ground	
4	Main Battery	

CNF - 9 pin Mate-N-Lok Mating Housing AMP 1-480706-0

<u>Pin</u>	<u>Function</u>	<u>Fuse</u>	<u>Wire Color</u>
1	Chassis BD "I" terminal		Violet
2	Chassis BD "S" terminal		Grey
3	Coach BD "S" terminal		Brown
4	NC		
5	NC		
6	Coach BD "I" terminal		White
7	Coach BD Power	F9	Orange
8	Chassis BD Power (ign switched)	F9	Red
9	BD Relay Ground		Black

J7 - 3 pin Molex KK156

<u>Pin</u>	<u>Function</u>	<u>Fuse</u>
1	Isolator relay coil	
2	Chassis BD Power	F6
3	Coach BD Power	

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Printed Circuit Board

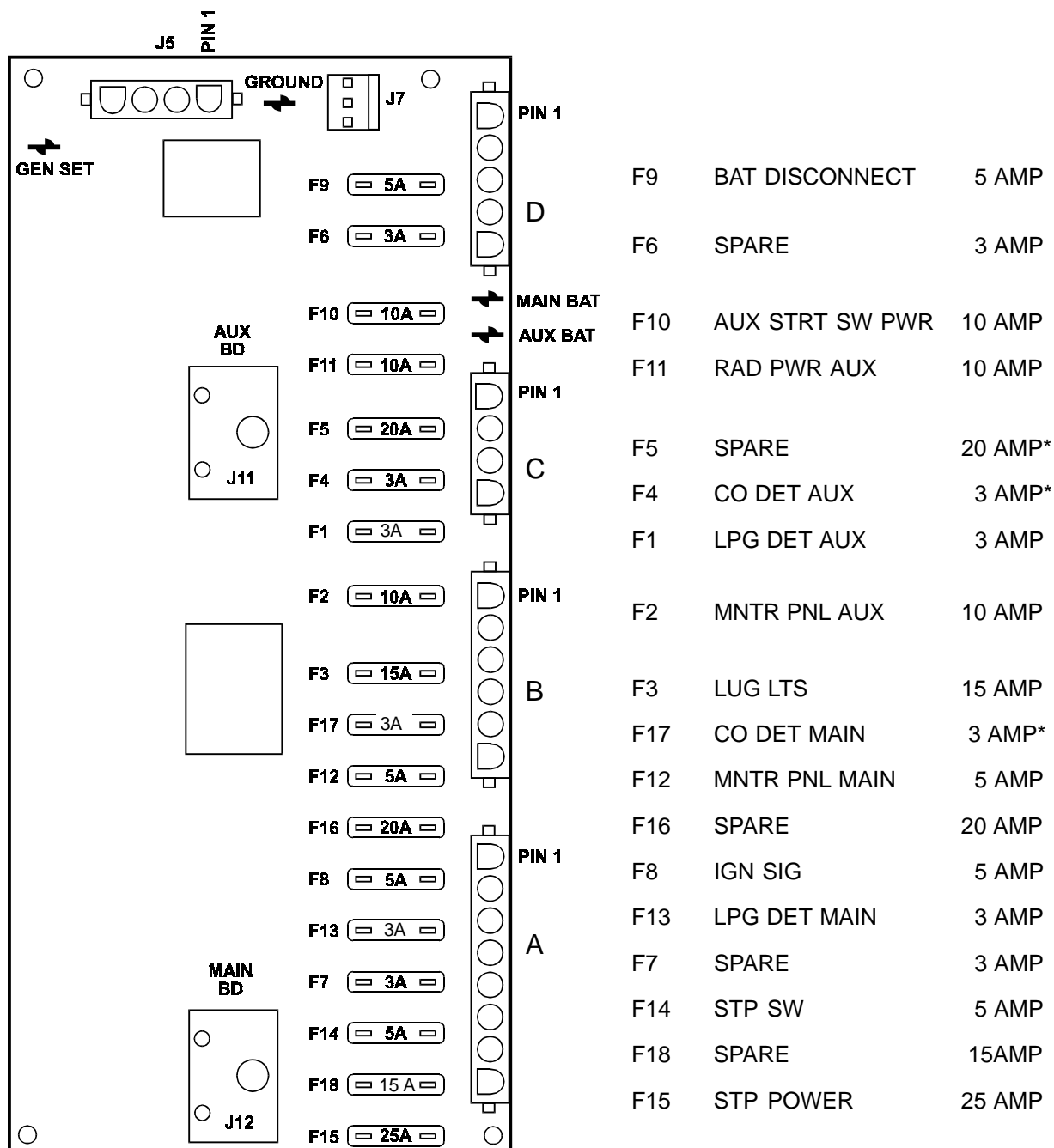


FIGURE 4

* These values may be different. See label on box for proper values.

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