

# **AIRSTREAM - BATTERY CONTROL CENTER - Diesel**

## **SERVICE MANUAL**



P/N 00-00755-000

### **CAUTION:**

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 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 F9. 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*)

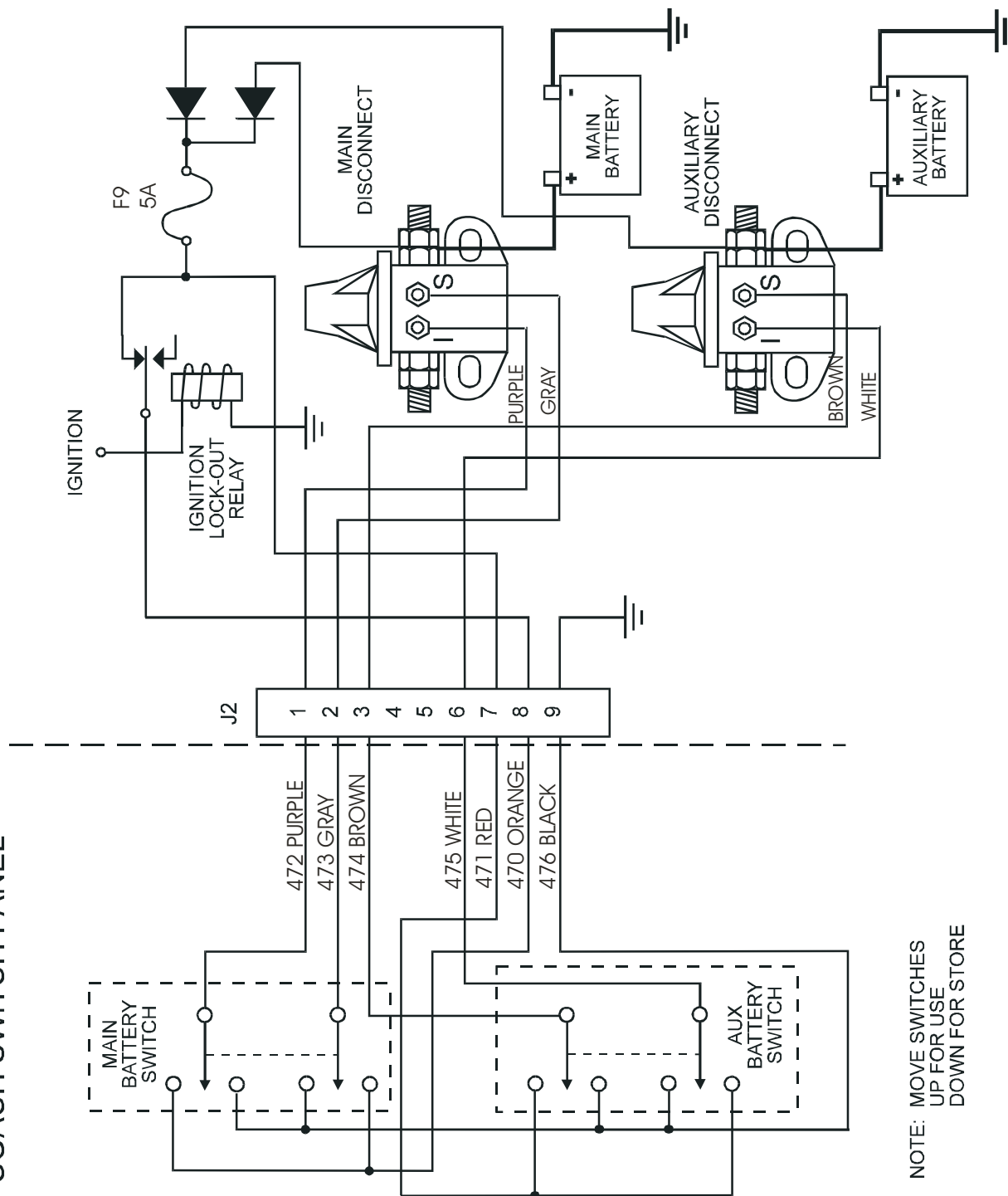
<u>Problem</u>	<u>Possible Cause/Solution</u>
Both disconnect relays fail to operate.	<p>Coach battery may be dead. Check for voltage at the top end of F9, the feed from the coach battery. F9 is located at the top, center of the printed circuit board. This voltage should be at least 11 volts. If it is less, charge the coach battery. If it is more than 11 volts, go on.</p> <p>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.</p> <p>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.</p>
One disconnect relay fails to operate.	<p>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.</p> <p>Disconnect Relay faulty. If at least 11 volts is available on "I" or "S" terminals, and relay fails to operate, replace relay.</p>
Chassis relay fails to operate.	<p>Ignition may be on. Check to be sure that the switched-ignition voltage is 0 volts.</p>
Coach functions operate when coach is plugged in, but not from battery.	<p>Interlock relay, K3, faulty. Check for 12 volt power feeding switch, at connector G, pin 2.</p> <p>No 12 volt power to switch. If there is no 12 volts, check fuse F9.</p> <p>Circuit breakers feeding converter opened. Reset circuit breakers in box.</p>

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BATTERY CONTROL CENTER

COACH SWITCH PANEL



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

NOTE: MOVE SWITCHES  
UP FOR USE  
DOWN FOR STORE

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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*)

<u>Problem</u>	<u>Possible Cause/Solution</u>
Coach battery does not charge from alternator.	<p>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 at the J1 MAIN BAT faston, and at connector J9, pin 3. Both locations check alternator.</p> <p>If no voltage on coil, replace printed circuit board.</p> <p>If there is voltage on coil (should be approximately 4 volts), check for voltage on both main terminals of relay. If different, replace relay.</p>
Chassis battery does not charge from convertor.	<p>The isolator relay is not closing. Check for voltage on coil terminals of isolator relay (should be approximately 4 volts). With the convertor operating, check the coach battery voltage at the J11 AUX BD bolt plate. It must be at least 13.3 volts. If it is less, check convertor.</p> <p>If no voltage on coil, replace printed circuit board.</p> <p>If there is voltage on coil (should be approximately 4 volts), check for voltage on both main terminals of relay. If different, replace relay.</p>
Chassis battery continues to drain.	<p>Isolator relay not opening. Replace relay.</p>

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### IGNITION RELAY

The ignition relay, K1, turns power on with the ignition switch to feed the ignition signal, and ignition powered accessories. 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*)

<u>Problem</u>	<u>Possible Cause/Solution</u>
Ignition powered accessories do not function.	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.

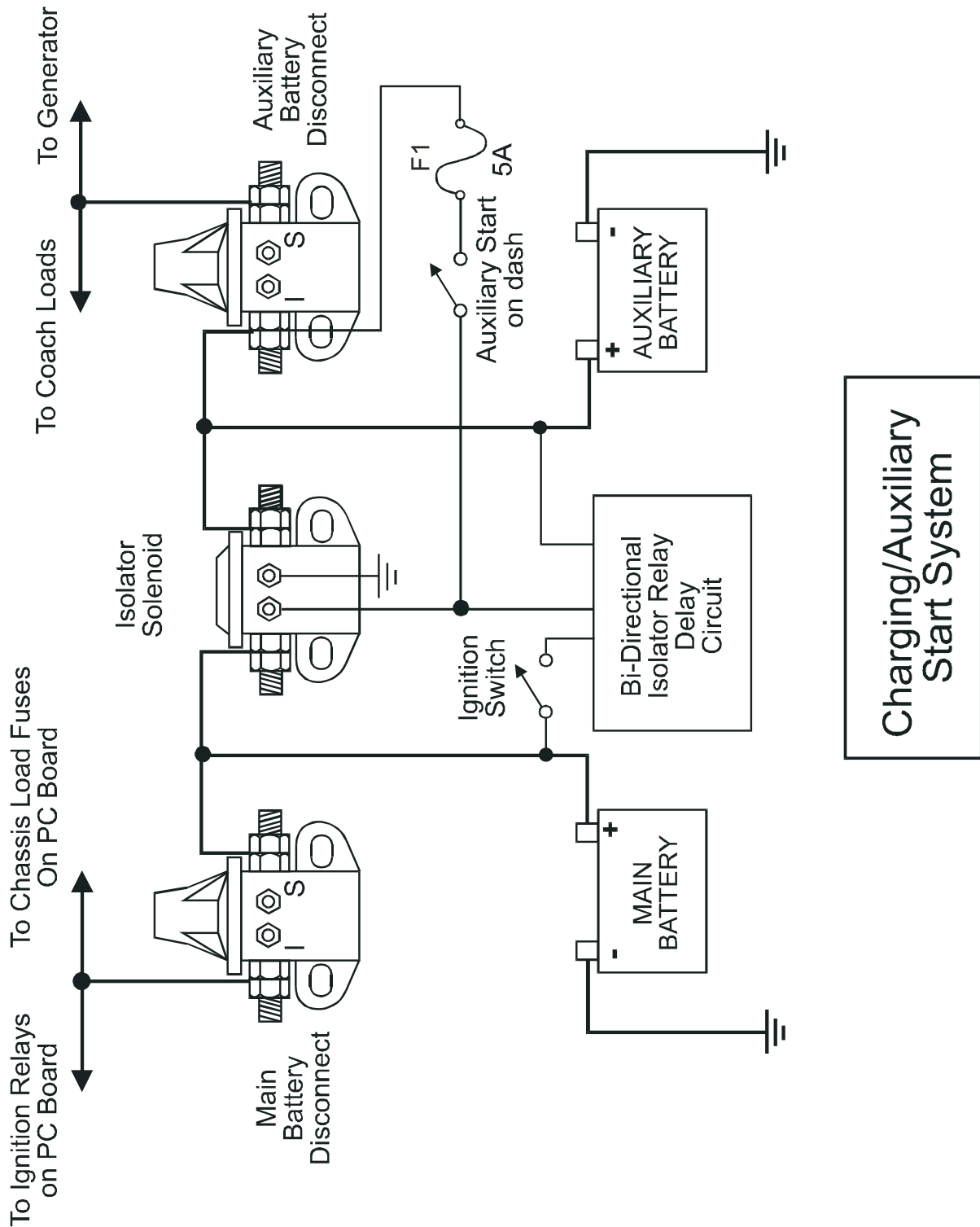
### AUXILIARY START

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. (See *Charging Circuit/Aux Start schematic, Figure 2*)

<u>Problem</u>	<u>Possible Cause/Solution</u>
Auxiliary Start fails to operate.	Bad switch. Check dash mounted switch and wiring.  Coach battery dead. Charge battery.  Isolator relay defective. Replace relay.

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## SERVICE MANUAL



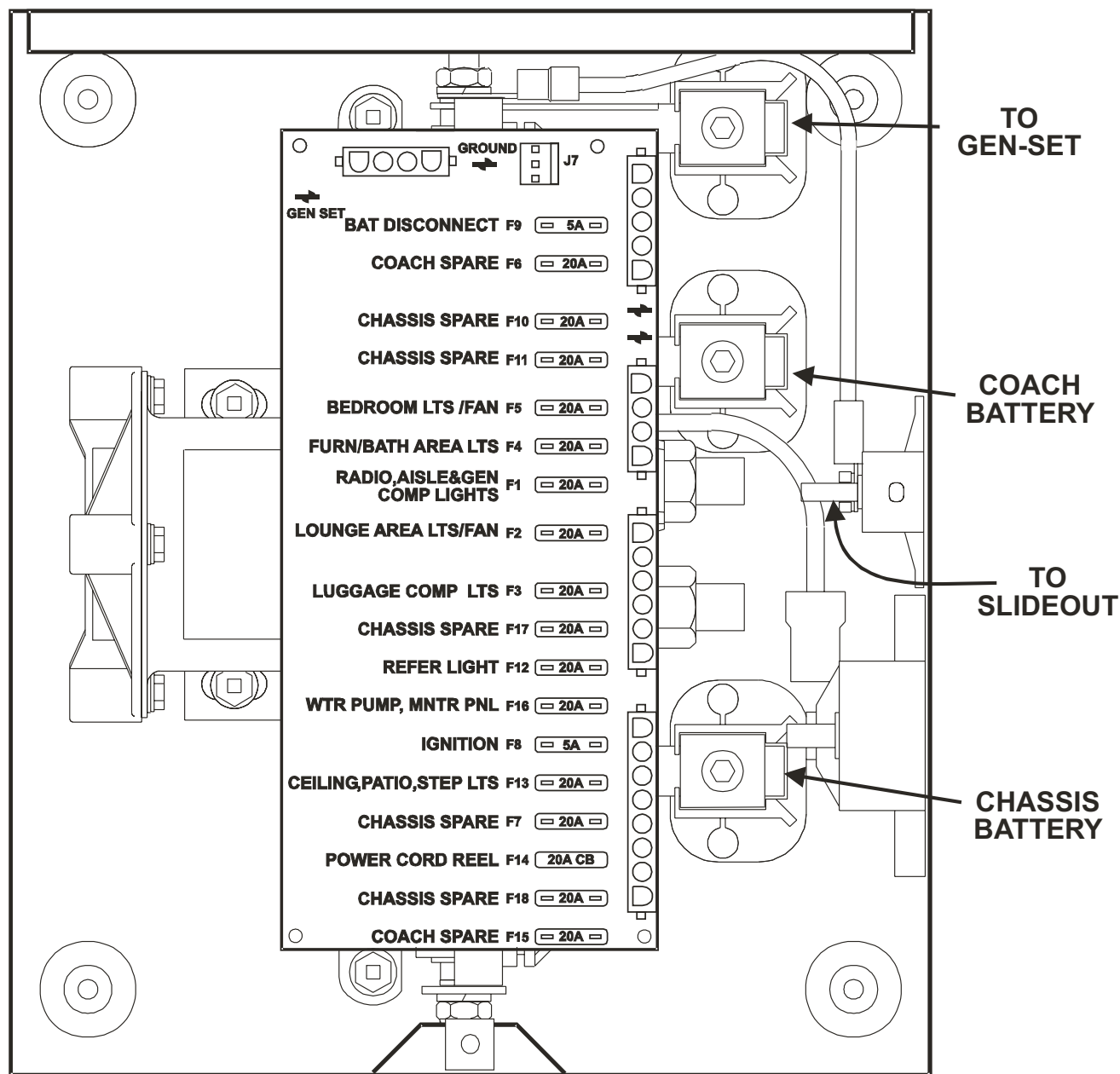
Charging/Auxiliary  
Start System

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## SERVICE MANUAL

### SOLAR CHARGER / MONITOR PANEL (OPTIONAL)

The Solar Charger is used to control the output of roof-top mounted solar panels. Depending on options, your coach is equipped with a single 10 watt panel, or a combination of a 53 watt and a 10 watt panel.

The 10 watt panel can put out up to 22 volts and as much as .75 amps of current.

The 53 watt panel can put out up to 22 volts and as much as 3.3 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 panel(s) 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 for voltage coming from anel CNE1. If low, check panel wiring.
"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 sunlight. 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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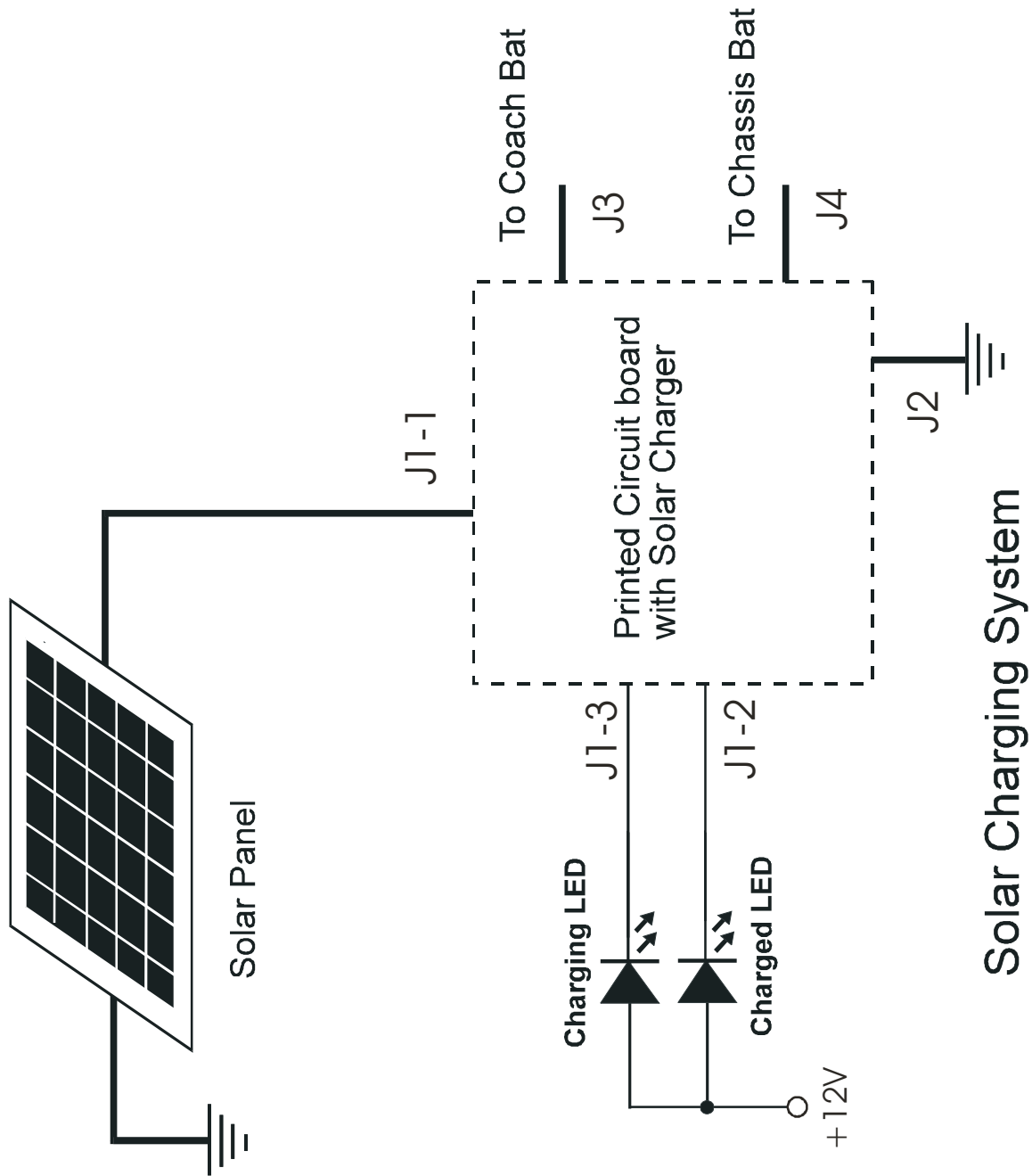
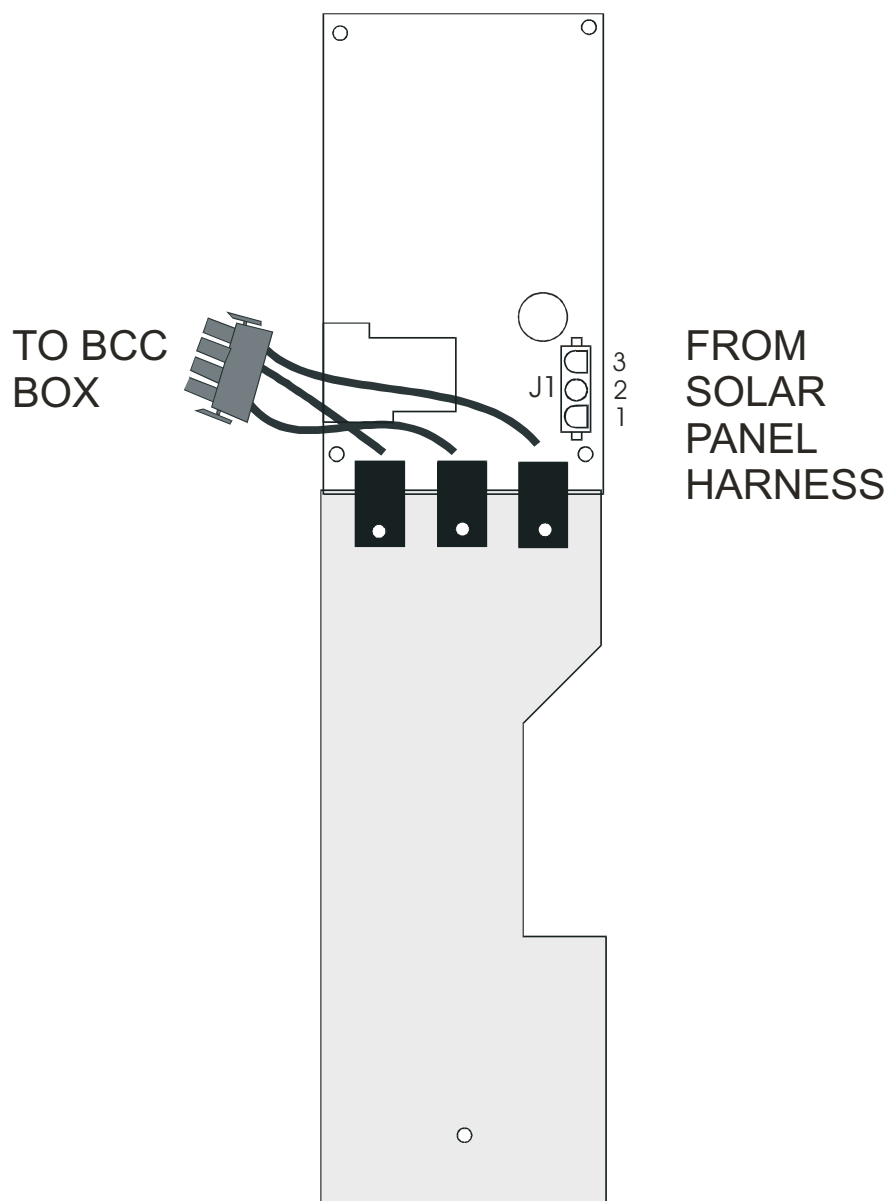


FIGURE 3

# **AIRSTREAM - BATTERY CONTROL CENTER - Diesel**

## **SERVICE MANUAL**



## **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, Chassis Battery, and Ignition Switched Chassis Battery.

The 18 fuses and their size are as listed\*

#### Disconnect-Switched Coach Battery - (All Fuses 20A)

Radio, Aisle/Gen Comp Lights	F1	Refer Light	F12
Lounge Area Lights / Fan	F2	Ceiling, Patio, Step Lights	F13
Luggage Comp Lights	F3	Pwr. Cord Reel	F14
Furnace/Bath Area Lights	F4	Spare	F15
Bedroom Lights /Fan	F5	Water Pump, Monitor Panel, Galley Locker Light	F16

#### Coach Battery

Spare	F6	20 Amp
Bat Disconnect Pwr	F9	5 Amp

#### Chassis Battery

Spare	F10	20 Amp
Spare	F11	20 Amp
Spare	F17	20 Amp

#### Ignition Switched Chassis Battery

Spare	F7	20 Amp
Ignition Signal	F8	5 Amp
Spare	F18	20 Amp

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

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### CIRCUIT BREAKERS

There is one 135 Amp and one 30 Amp, type III (manual reset), circuit breaker mounted in the box. The 135 Amp breaker is connected to the Coach battery. This breaker is connected to the Secondary BCC fuse panel within the coach. The 30 Amp unit is connected to the disconnect-switched Coach battery. This breaker feeds 12 volt power to the slide-out room.

### 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	Refer Light	F12
2	Water Pump, Monitor Panel, Galley Locker Lights	F16
3	Ignition Signal	F8
4	Ceiling, Patio, Step Lights	F13
5	Spare	F7
6	Pwr. Cord Reel	F14
7	Spare	F18
8	Spare	F15

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

<u>Pin</u>	<u>Function</u>	<u>Fuse</u>
1	Spare	
2	Lounge Area Lights and Fan	F2
3	Spare	F2
4	Spare	
5	Spare	F17
6	Luggage Comp Lights	F3

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

<u>Pin</u>	<u>Function</u>	<u>Fuse</u>
1	Spare	F11
2	Bedroom Lights and Fan	F5
3	Furnace, Bath Area Lights	F4
4	Radio, Aisle/Gen Comp Lights	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	Spare	
4	Spare	
5	Spare	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>
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	Red
8	Chassis BD Power (ign switched)	F9	Orange
9	BD Relay Ground		Black

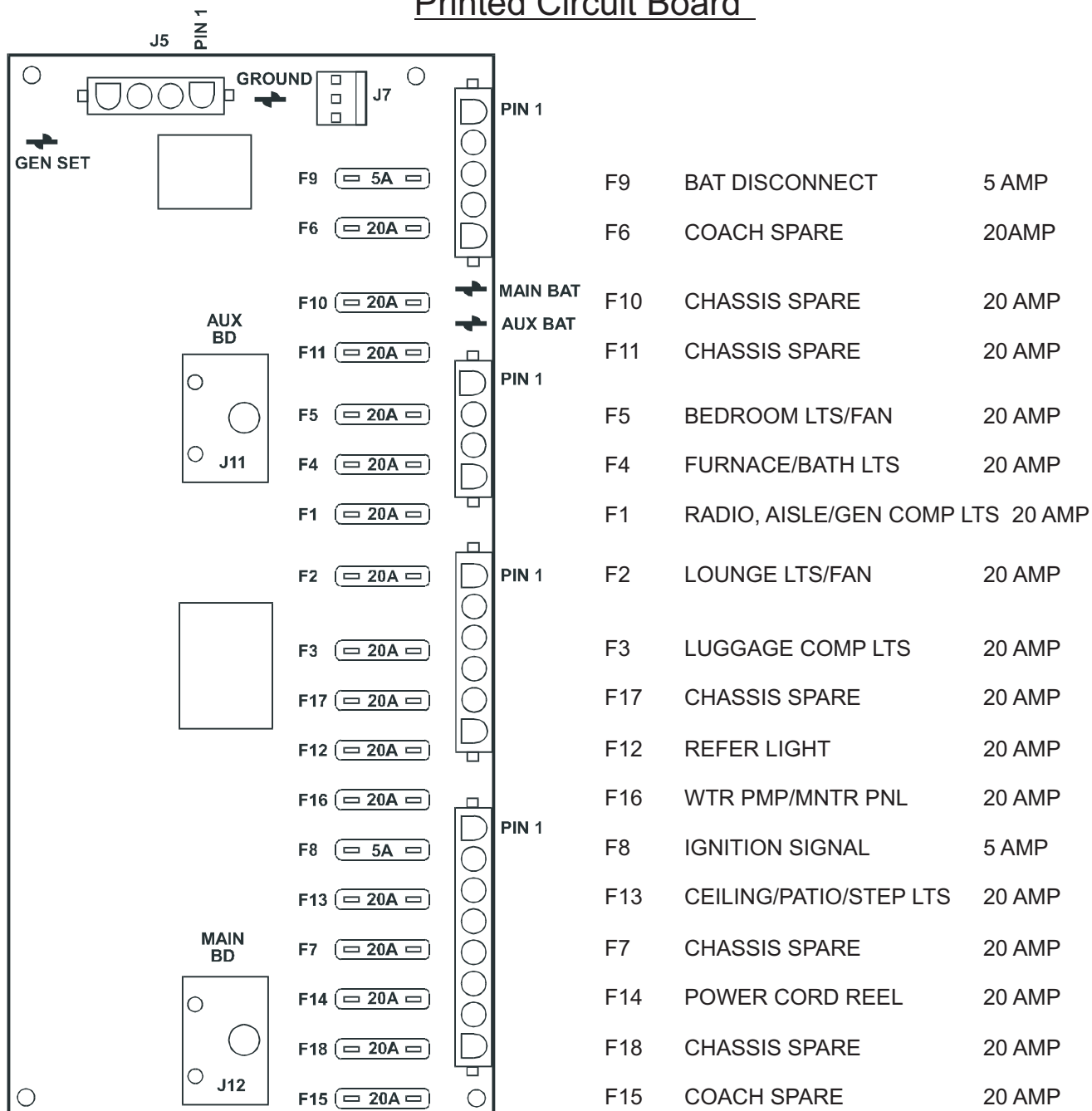
**J7** - 3 pin Molex KK156

<u>Pin</u>	<u>Function</u>	<u>Wire Color</u>
1	Isolator relay coil	Violet
2	Coach BD Power	Red
3	Chassis BD Power	Orange

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## SERVICE MANUAL

### Printed Circuit Board\*



\* Fuse values may be different.  
See label on cover for proper values.

**FIGURE 4**

# ***AIRSTREAM - BATTERY CONTROL CENTER - Diesel***

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