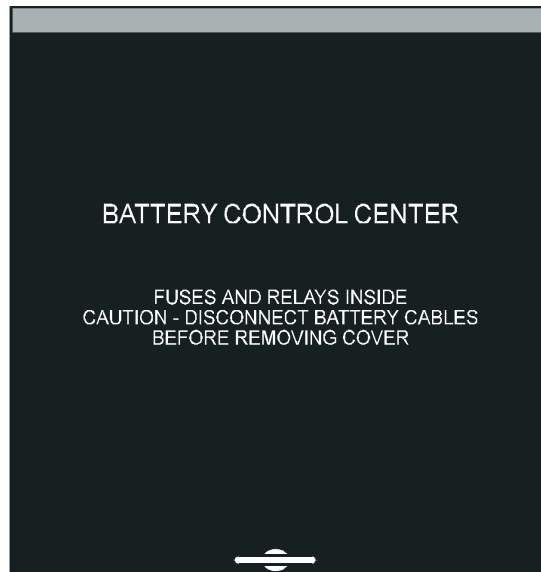


# **BATTERY CONTROL CENTER - Micro Diesel w/BD Relay**

## **SERVICE MANUAL**



P/N 00-00769-100

### **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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## **SERVICE MANUAL**

### **BATTERY DISCONNECT**

The Battery Disconnect relay is used to disconnect the coach during periods of storage, or during service. The disconnect relay operates 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 F1. It is supplied to the momentary switch mounted in the coach and then fed back to the relays in the control center.  
(See Battery Disconnect schematic, Figure 1)

### **Problem**

The disconnect relay fails to operate.

### **Possible Cause/Solution**

Coach battery may be dead. Check for voltage at the top end of F1, the feed from the coach battery. F1 is located on 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.

F1 may be blown. Using a test light, check for voltage at both ends of F1. This voltage should be at both ends of F1. If not, replace fuse F1.

Ground lead to switch 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.

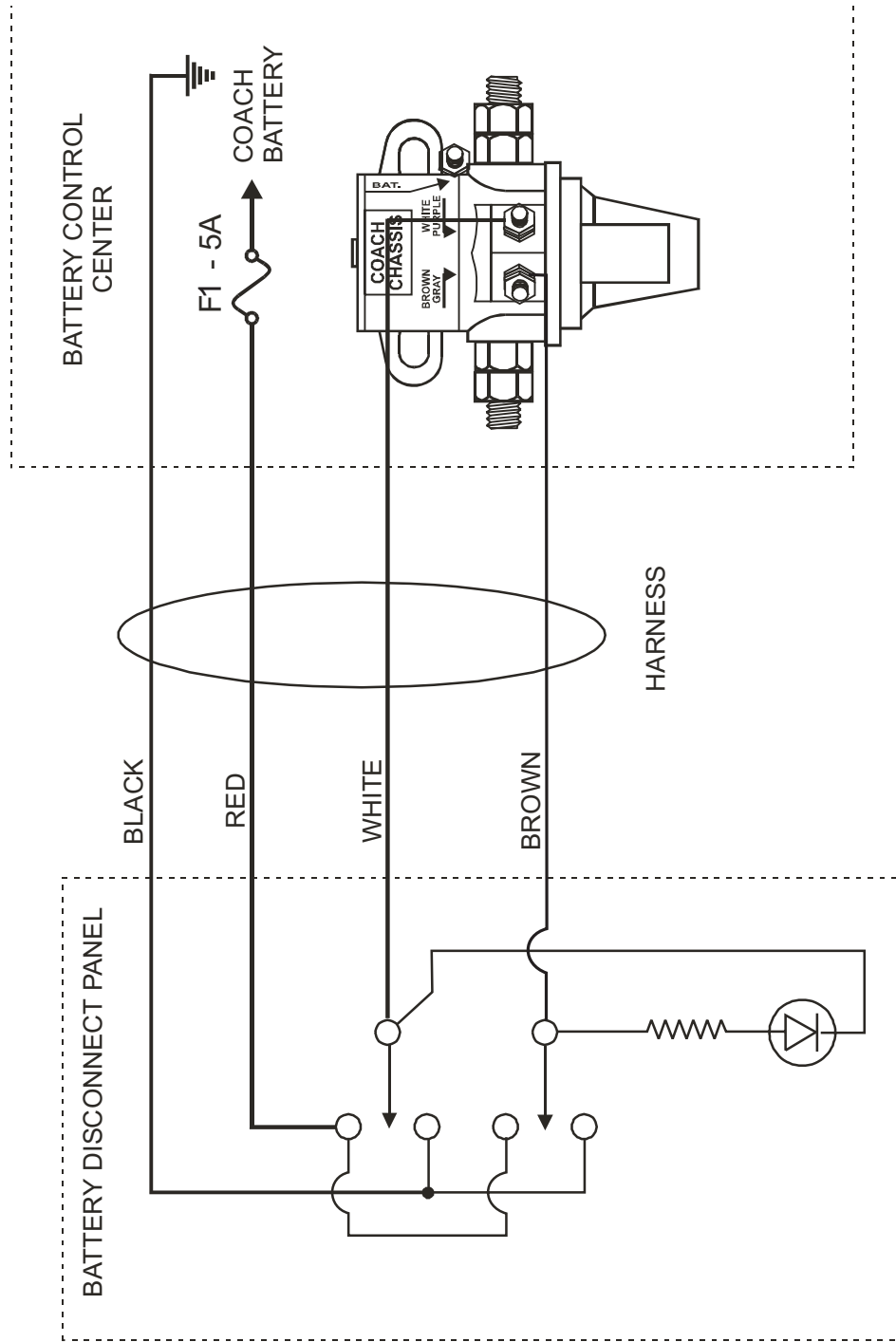
Disconnect Relay faulty. If at least 11 volts is available on "I" or "S" terminals and relay fails to operate, replace relay.

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

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

# BATTERY CONTROL CENTER - Micro Diesel w/BD Relay

## SERVICE MANUAL



**FIGURE 1**

# BATTERY CONTROL CENTER - Micro Diesel w/BD Relay

## SERVICE MANUAL

### 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. When it exceeds 13.8 volts for 30 minutes, the chassis battery will be disconnected. When the voltage on that battery drops below 12.6 volts and the coach battery is greater than 13.3 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	<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. It must be at least 13.3 volts. If it is less, 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 continues to drain.	Isolator relay not opening. Replace relay.

# BATTERY CONTROL CENTER - Micro Diesel w/BD Relay

## SERVICE MANUAL

### 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. The coach manufacturer must supply fused power (5A) through a momentary switch to connector J3, pin 4.

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

#### **Problem**

Auxiliary Start fails to operate.

#### **Possible Cause/Solution**

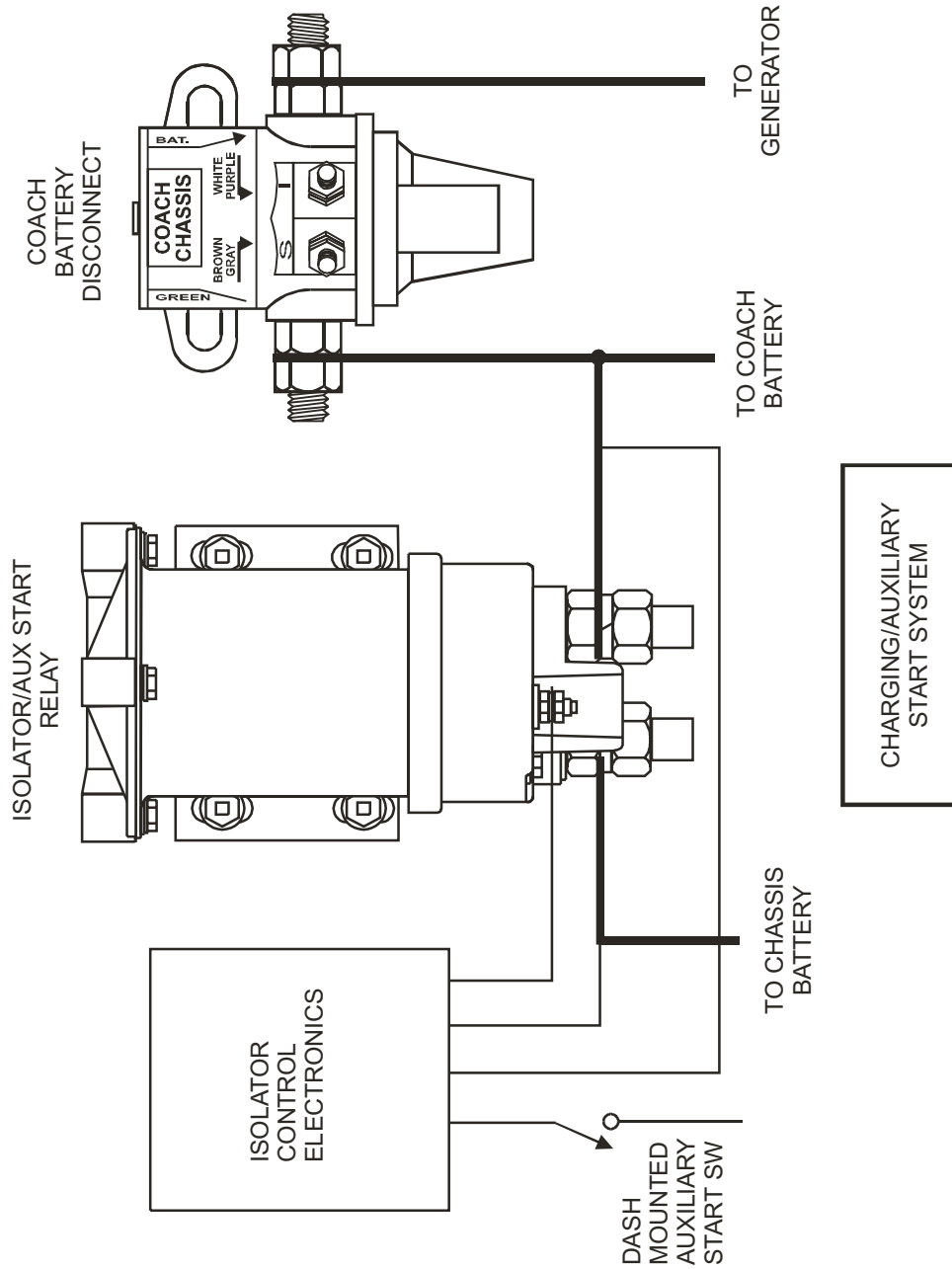
External fuse blown. Check fuse.

Coach battery dead. Charge battery.

Isolator relay defective. Replace relay.

# BATTERY CONTROL CENTER - Micro Diesel w/BD Relay

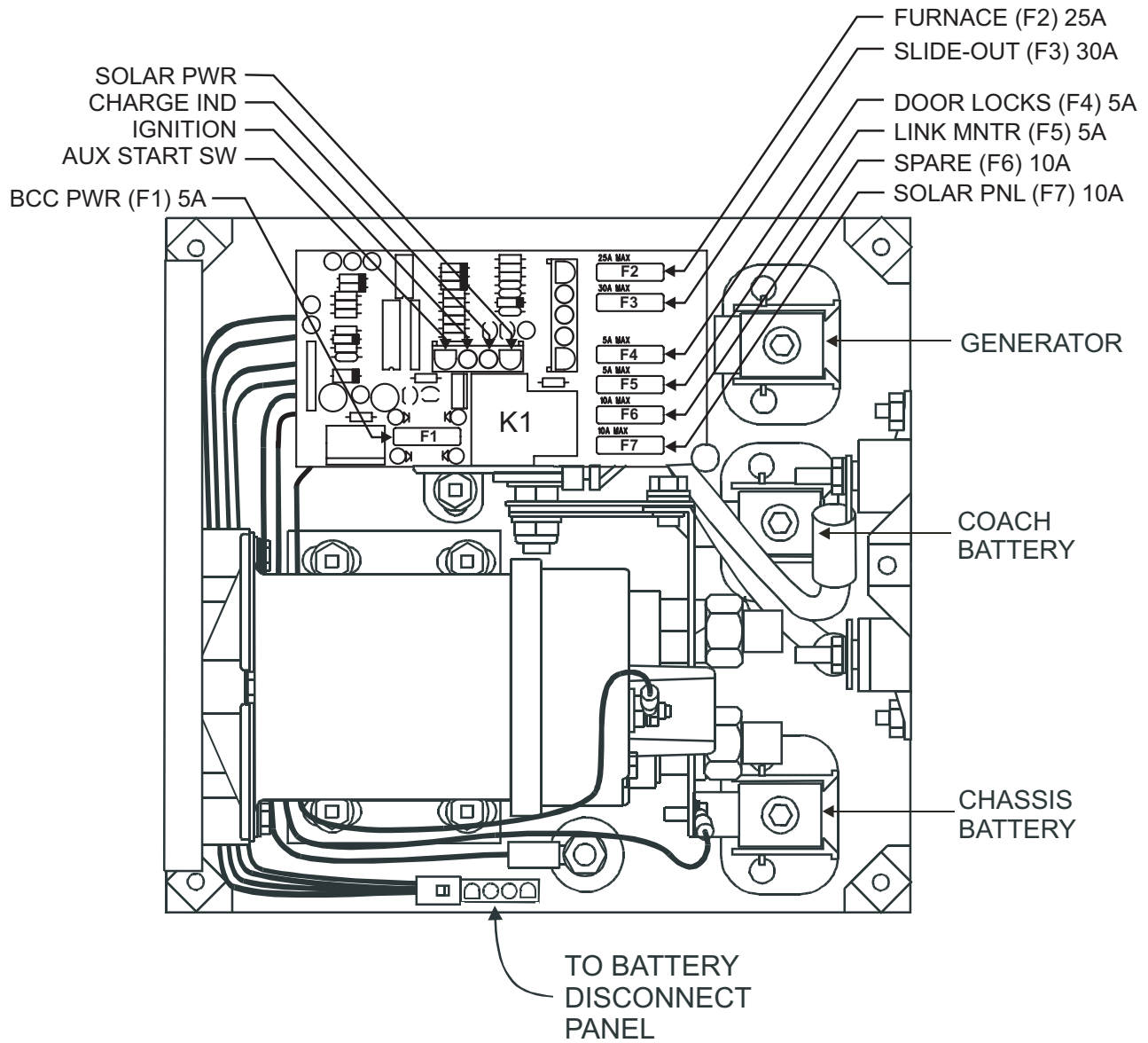
## SERVICE MANUAL



**FIGURE 2**

# BATTERY CONTROL CENTER - Micro Diesel w/BD Relay

## SERVICE MANUAL



# BATTERY CONTROL CENTER - Micro Diesel w/BD Relay

## SERVICE MANUAL

### SOLAR CHARGER

The Solar Charger is used to control the output of roof-top mounted solar panels to the coach battery. When the ignition is off, the battery is below 12.8 volts and there is more than 14.0 volts output from the panels, the controller will close the board-mounted charging relay, tying the solar panel to the coach battery for 30 minutes. The controller will turn the charging relay off for a 2-minute resting period and then check the coach battery voltage. If the voltage is less than 12.8 volts, the cycle will repeat. (See *Solar Charging Schematic, Figure 3*)

#### Problem

Batteries not charging.

#### Possible Cause/Solution

Ignition key is on, locking out solar panel.

Check voltage from solar panel when in sunlight. Should be more than 14 volts. If less, check solar panel for damage.

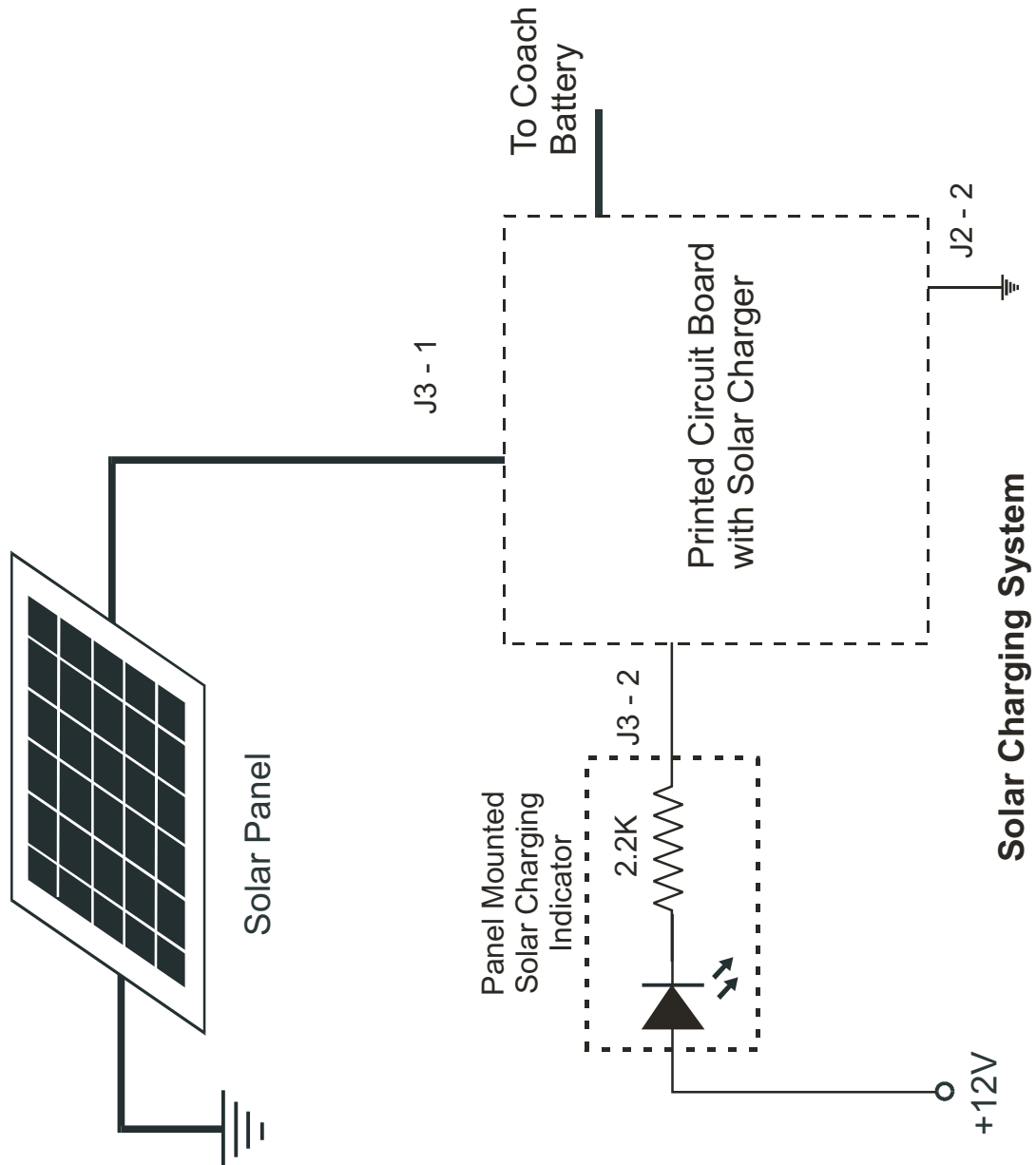
Check wiring from panel. Relay K1 on board, should be closed. If not, replace board.

Check for excessive drain on batteries. Turn off Battery Disconnect relays to see if charging occurs.



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## SERVICE MANUAL

### FUSES

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

There are 7 positions for fuses on the board (See Figure 4).

These are fed from two main sources: Disconnect-Switched Coach Battery and Coach Battery.

The 7 fuses and their size are as listed below:

<u>Disconnect-Switched Coach Battery</u>			<u>Connector Pin-Out</u>
Furnace	F2	25 Amp	J1 -1
Slide Out	F3	30 Amp	J1 - 2
<u>Coach Battery</u>			
Door Locks	F4	5 Amp	J1 -3
Link Mon & Batt Dis.	F5	5 Amp	J1 - 4
Spare	F6	10 Amp	J1 - 5
<u>Coach Battery &amp; Chassis Battery</u>			
Disconnect Switch Power	F1	5 Amp	J4 - 4
Solar Panel Input	F7	10 Amp	J3 - 1

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## SERVICE MANUAL

### CIRCUIT BREAKERS

There are two 50 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.

#### **Plugs - Pins & Functions**

**J1** 5 pin in-line Mate-N-Lock (Mating Housing AMP 1-480763-0)

<u>Pin</u>	<u>Function</u>	<u>Fuse</u>
1	Furnace	F2
2	Slide Out	F3
3	Door Locks	F4
4	Link Monitor & Battery Disconnect	F5
5	Spare	F6

**J2** 4 pin in-line Molex KK156

<u>Pin</u>	<u>Function</u>	<u>Fuse</u>
1	Chassis Battery	
2	Ground	
3	Ground	
4	Isolator Solenoid Coil	

**J3** 4 pin Mate-N-Lok (Mating Housing AMP 1-480702-0)

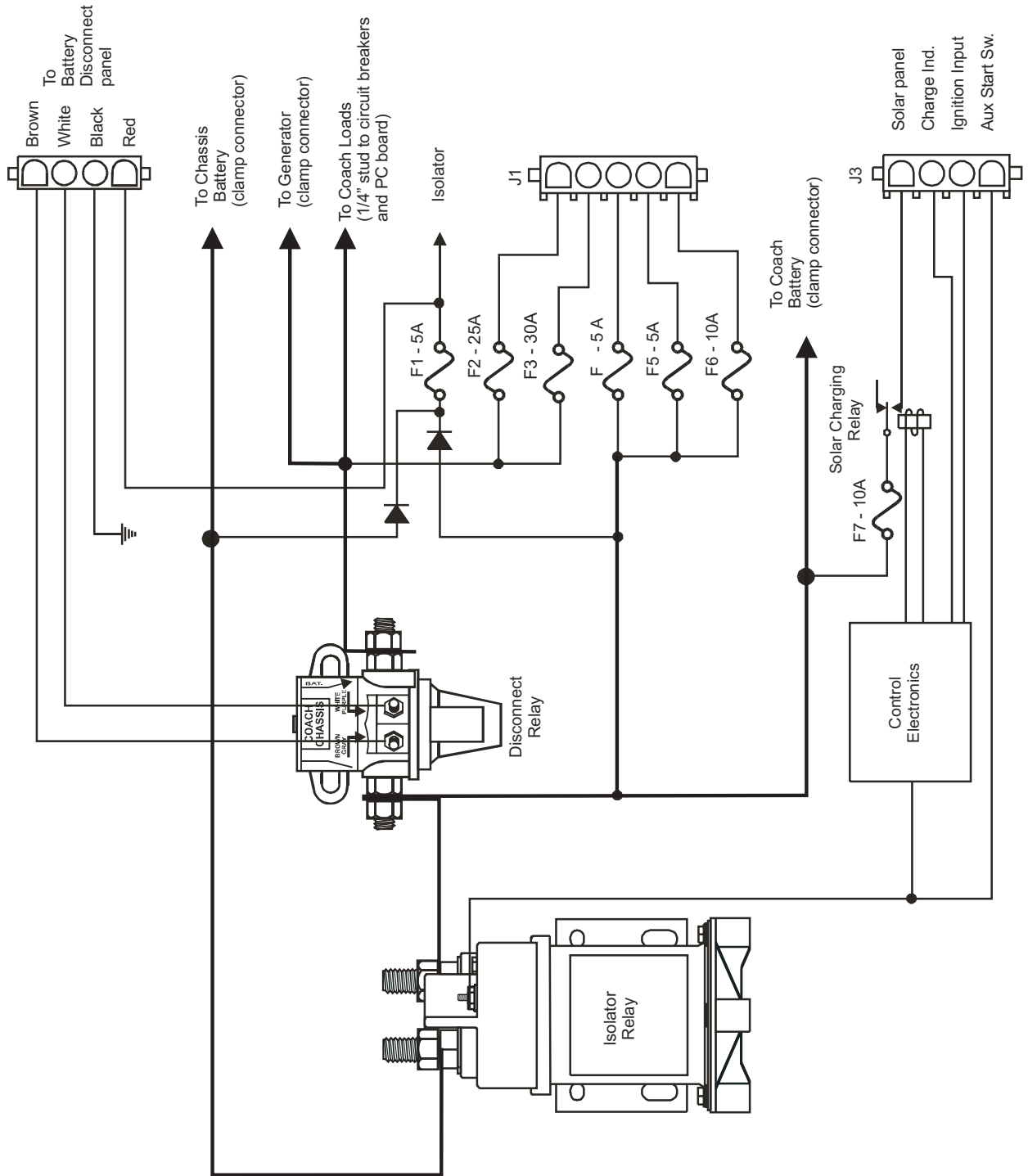
<u>Pin</u>	<u>Function</u>	<u>Fuse</u>
1	Solar Panel Input	F7
2	Solar Charge Indicator	
3	Ignition Input	
4	Auxiliary Start Switch Input	

**J4** 4 pin in-line Mate-N-Lock (Mating Housing AMP 1-480702-0)

<u>Pin</u>	<u>Function</u>	<u>Fuse</u>
1	Battery Disconnect Relay "S" terminal	
2	Battery Disconnect Relay "I" terminal	
3	Ground	
4	+ 12 Volts	F1

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