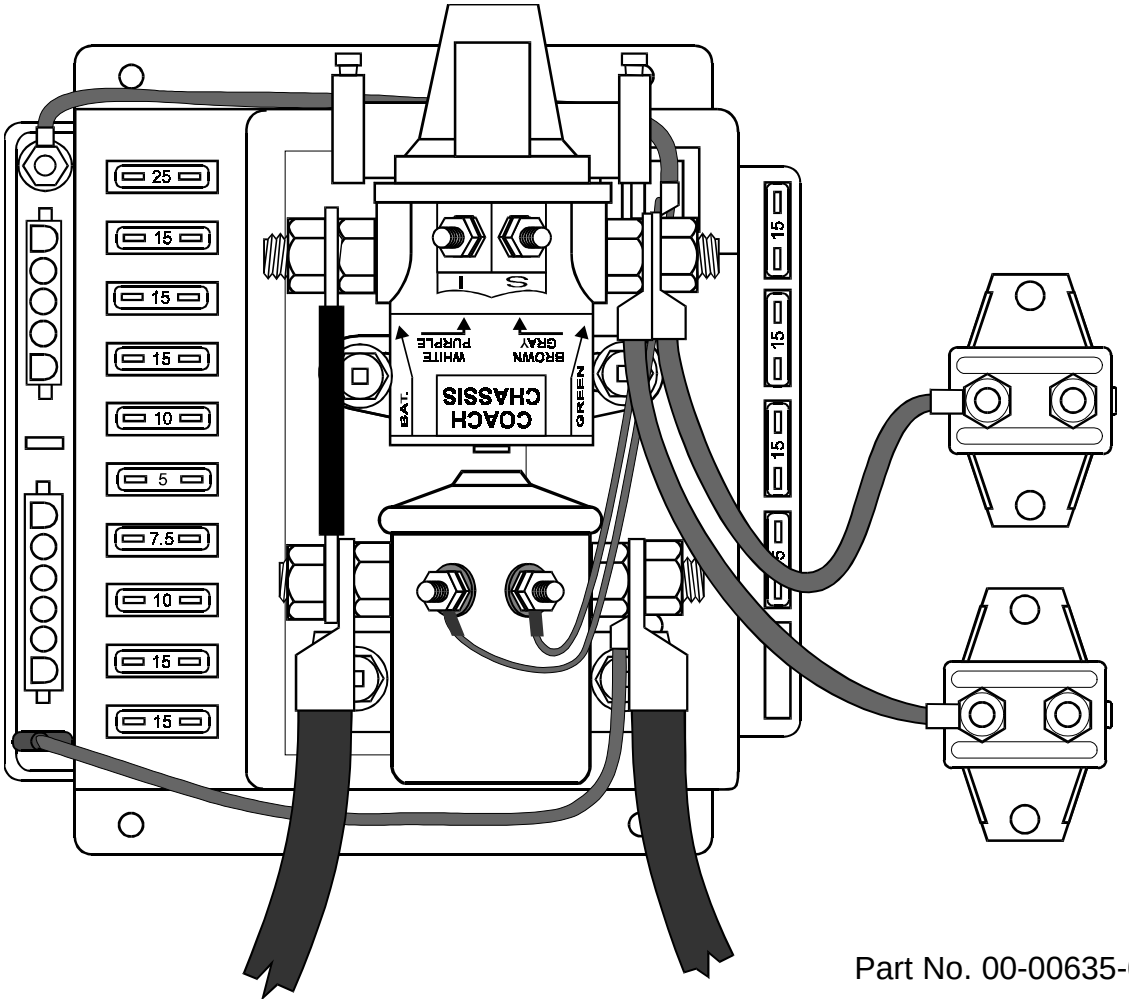
Single Disconnect Battery Control Center

Service Manual



Part No. 00-00635-000

CAUTION: All servicing of the Battery Control Center should be done only by a qualified Service Technician. Inadvertent shorts at the Battery Control Center could result in severe damage and/or injury.

***TOOLS REQUIRED*:** Low current Test Light, Accurate Voltmeter, (digital read-out preferred).

INTELLITEC

131 EISENHOWER LANE NORTH
LOMBARD, ILLINOIS 60148
630-268-0010 / 1-800-251-2408

Single Disconnect Battery Control Center

Product Description

The Battery Control Center is a centralized power switching, fusing, and distribution center. Power from the main and the auxiliary batteries is fed to the Battery Control Center. The full power of both batteries is available at the box. The system consists of a Battery Disconnect Relay, a bi-directional battery charging circuit, and an auxiliary start function to provide a "jump start" from the auxiliary battery, and ignition power switching.

How The Battery Control Center Works

Battery Disconnect

The Battery Disconnect relay is used to disconnect the auxiliary battery during periods of storage. 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 actuation voltage is supplied from the battery through the fuse on the side of the relay. The voltage is supplied to the momentary switches mounted in the coach and then fed back to the relays in the box. (See Battery Disconnect schematic, Figure 2).

Charging Circuit

The charging circuit, (which utilizes an isolator solenoid to connect the two batteries together for charging) 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 (the minimum necessary to fully charge a battery) for more than about 14 seconds, the isolator solenoid will pull in, charging both batteries. If the voltage falls below 12 volts for more than 4 seconds while the ignition is on, 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 (voltage of a fully charged battery) for 4 seconds, the isolator relay will open, preventing the coach loads from discharging the main battery. (See schematic, Figure 3).

Auxiliary Start

The Auxiliary Start function is used to provide a "jump start" from the auxiliary battery in the event that the main battery does not have sufficient charge to start the engine. It operates by momentarily connecting the main and the auxiliary batteries together through the isolator relay. This function is accomplished by pressing the dash mounted switch which applies 12 volts to the isolator relay coil. The switch power is supplied from one of the auxiliary battery fuses. (See schematic, Figure 3.)

Ignition Switched Power

The four ignition circuits are switched by a relay to supply power to accessories such as the horn, the power windows, the power seat, and the slide-out . The power for this relay coil comes from the ignition switch through J2, pin 2. Power to these loads is supplied from the main battery. (See schematic, Figure 3.) The Reverse Ignition is hot ONLY when the ignition is OFF.

Circuit Breakers

There are two 30 Amp circuit breakers connected to the disconnected auxiliary battery that are used to protect the wiring between the auxiliary battery and the converter. These breakers have manual reset buttons that pop out when they are tripped. (See schematic, Figure 3)

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Trouble Shooting

The Battery Control Center is built in two layers: the printed circuit board and the relays. The center has been designed so that nearly ALL trouble shooting can be done without the removal of the module cover. Read and understand the trouble shooting procedure first before EVER removing the printed board.

Checking Fuses

ALL the fuses at the center are located on the printed circuit board and the disconnect relay. They are easily visible for testing and replacement. The fuses can be checked either visually or with a test light. To check the fuses visually, remove the suspected fuse and examine for damage to the fusing element. To check using a test light, ground the test light to a good ground. Check for power on both sides of the fuse. To check the Battery Disconnect Relay fuses, be sure the relay is engaged.

Checking the Battery Disconnect

The Battery Disconnect relay coil terminals are accessible on the front of the relay. To engage the relay, momentarily apply +12 volts to the "I" terminal, and ground the "S" terminal. To open the relay, momentarily apply +12 volts to the "S" terminal and ground the "I" terminal.

Isolator Relay

The coach must be unplugged with the engine and generator off for at least ten minutes, to allow the isolator electronics to turn off the relay drive. Press the "Aux Start" button located on the dash. The isolator relay should close, which can be detected by the clicking sound of the relay.

Circuit Breakers

The converter circuit breakers, which are in parallel, carry the current between the auxiliary battery and the converter. If the coach is not being supplied 120 volts AC, the current is flowing from the battery to the converter. If the coach is being supplied 120 volts AC, the converter is usually charging the batteries and the current will flow from the converter to the batteries. If there is a fault or overload between the converter and the batteries, the circuit breakers will open as indicated by the reset buttons being popped out. To reset the breakers, turn off the 12 loads and push the buttons in until they latch.

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Printed Board Removal

Printed Circuit Board Removal

In the event that the printed circuit board needs to be removed, the following procedure should be followed.

1) Remove the negative wires from both batteries to prevent injury to individuals and the equipment. Be sure that these wires stay clear of the battery posts. Remove power to the converter.

2) Disconnect the wires from the edge of the board, including the two chassis harnesses, the ground, and the main battery feed. The auxiliary battery feed will be disconnected later.

3) Remove the four mounting screws and pull the box away from the mounting surface.

4) Pull the box cover away from the base by spreading the cover at the fuse end of the box to release the catches.

5) Remove the #10-32 screw holding the wire from the auxiliary battery disconnect.

6) Unplug the two pin plug from the isolator relay coil terminals.

7) Remove the board.

Printed Circuit Board Replacement

Replace the board in the reverse order from the removal. Be sure to tighten the #10-32 hex head bolt going through the board, for it provides the power connection to the battery feed. Failure to properly tighten this bolt will lead to failure.

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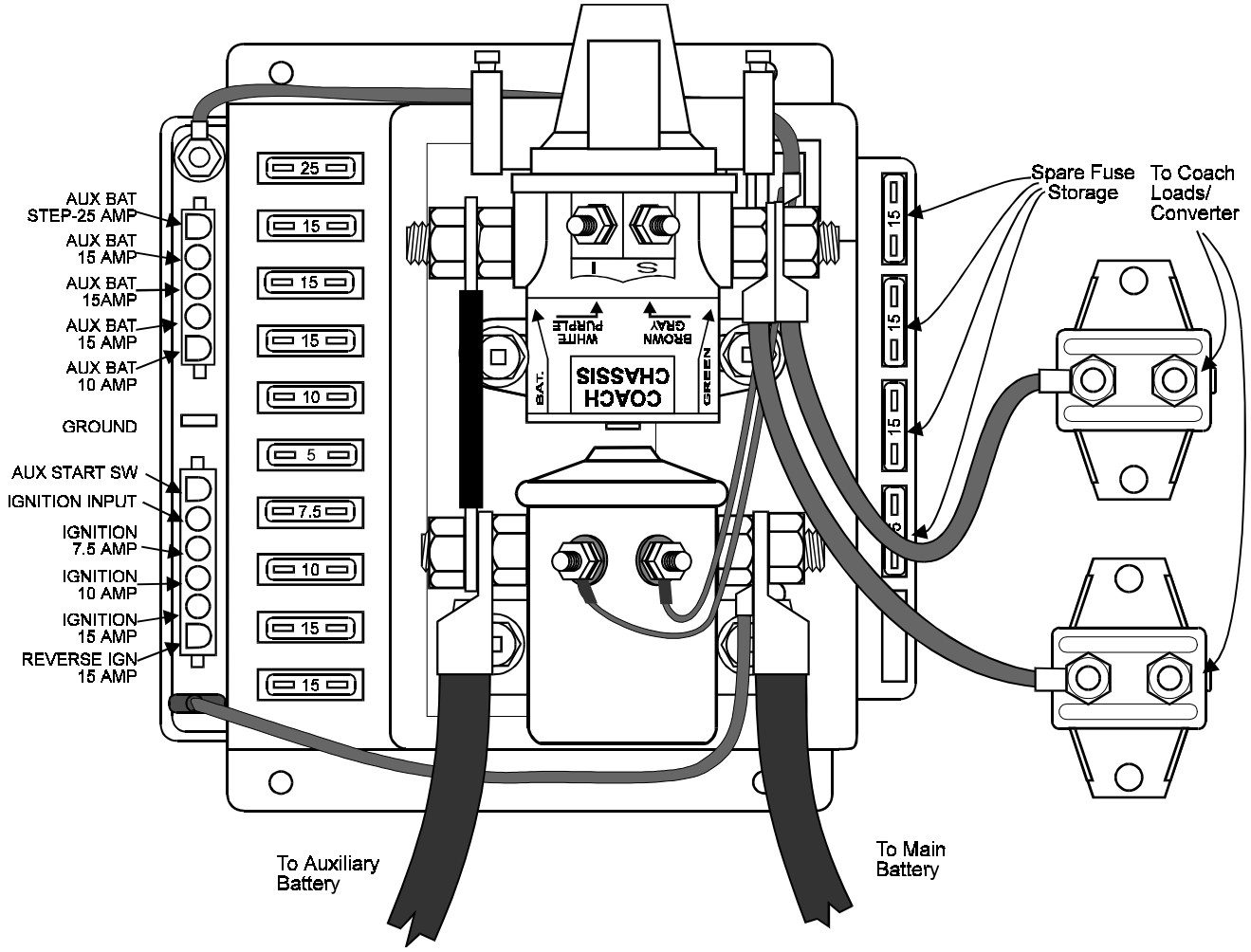

Pictorial View

Figure 1

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Trouble Shooting

Battery Disconnect

A. Relay fails to operate.

1. Auxiliary battery may be dead. Check the voltage at the battery termianl of the relay. The voltage should be at least 11 volts. If the voltage is less, charge the battery. If the voltage is more than 11 volts, continue.

2. F11 may be blown. Check for voltage at harness side of F11, using a test light. This voltage should be the same as at the battery. Replace fuse F11, if the voltage is not the same.

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

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

1. Circuit breakers feeding converter may be open. Reset circuit breakers in box.

Charging Circuit

A. Auxiliary battery does not charge.

1. The isolator relay may not be closing. Operate the engine at a high idle for at least twenty (20) seconds and check the chassis battery voltage. The voltage must be at least 13.3 volts before the isolator activates. Check the alternator if the voltage is less than 13.3 volts.

   Check for voltage on the coil terminal of the isolator relay. If there is **no** voltage on the coil, check fuse F5. Replace if necessary. Replace the printed board. If there is voltage on the coil, check for voltage between the main and auxiliary batteries. If the voltage is more than 0.1 volts replace the relay.

   Check for ground to the module and isolator relay coil.

Trouble Shooting

B. Main battery continues to drain.

1. Isolator relay may be bad. Check for voltage on the solenoid coil lead which is available on J1-5, when the engine is off. If there is no voltage, replace the relay.

C. Main battery doesn't charge from converter.

1. The converter is not putting out at least 13.3 volts. Check converter, turn off excess 12 volt loads if necessary.

2. Converter circuit breakers in Battery Control Center open. Reset breakers are located on lower edge of box.

3. Check fuse F5. Replace if bad.

Auxiliary Start

A. Auxiliary Start fails to operate.

1. Fuse 5 may be blown. Check F5.

2. The Auxiliary battery may be dead. Charge battery.

3. Isolator relay may be defective. To test the relay, press the "AUX START" switch on the dash while measuring the voltage between the two batteries. (The isolator relay should "click" indicating that it is closing.) If the voltage is more than 0.1 volt, replace the relay.

4. Switch or wires may be faulty. Check for 12 volts at J2 pin 1, while pushing switch. If there is not 12 volts, check fuses and wiring, if OK, replace the switch.

Trouble Shooting

Ignition Relay

A. The Ignition powered accessories fail to operate.

1. Check for 12 volt ignition power coming into printed circuit board on plug J4, pin 11.
2. Check respective fuse.
3. Check for faulty wiring from the ignition switch.
4. Replace the printed circuit board.

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Fuses

The fuses used on the Battery Control Center are standard, plastic "ATO", blade (automotive) type. There are 10 positions for fuses on the board and 2 on the disconnect relay. These are fed from three main sources, the Ignition-Switched Main Battery, and the Disconnect-Switched Auxiliary Battery.

The 12 fuses and their size are as follows:

			Connector Pin-Out
Reverse Ignition			
Spare	F1	15 Amp	J2-6
Ignition-Switched Main Battery			
Spare	F2	7.5 Amp	J2-5
Spare	F3	15 Amp	J2-4
Spare	F4	10 Amp	J2-3
Isolator Relay Power			
Isolator Relay Power	F5	5 Amp	J2-1
Disconnect-Switched Auxiliary Battery			
Spare	F6	15 Amp	J4-5
LP Detector	F7	5 Amp	J4-4
Radio Switch	F8	10 Amp	J4-3
Spare	F9	15 Amp	J4-2
Step Pwer	F10	25 mp	J4-1
Battery Disconnect			
Battery Disconnect Relay	F11	5 Amp	On relay
Battery Disconnect Relay	F12	5 Amp	On relay

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Circuit Breakers

There are two 30 Amp type III (manual reset) circuit breakers connected to the box. They are connected to the Auxiliary battery through the Disconnect relay. To reset the breakers, press the buttons on the ends

Plugs - Pins & Functions

J2 - 6 pin Mate-N-Lok Mating Housing Amp

Pin	Function	Fuse
1	Auxiliary Start Switch	F5
2	Ignition Input	
3	Ignition Switched	F4
4	Ignition Switched	F3
5	Ignition Switch	F2
6	Reverse Ignition	F1

J3 - Ground

J4 - 5 pin Mate-N-Lok Mating Housing Amp

Pin	Function	Fuse
1	Step Power	F10
2	Spare	F9
3	Spare	F8
4	Spare	F7
5	Spare	F6

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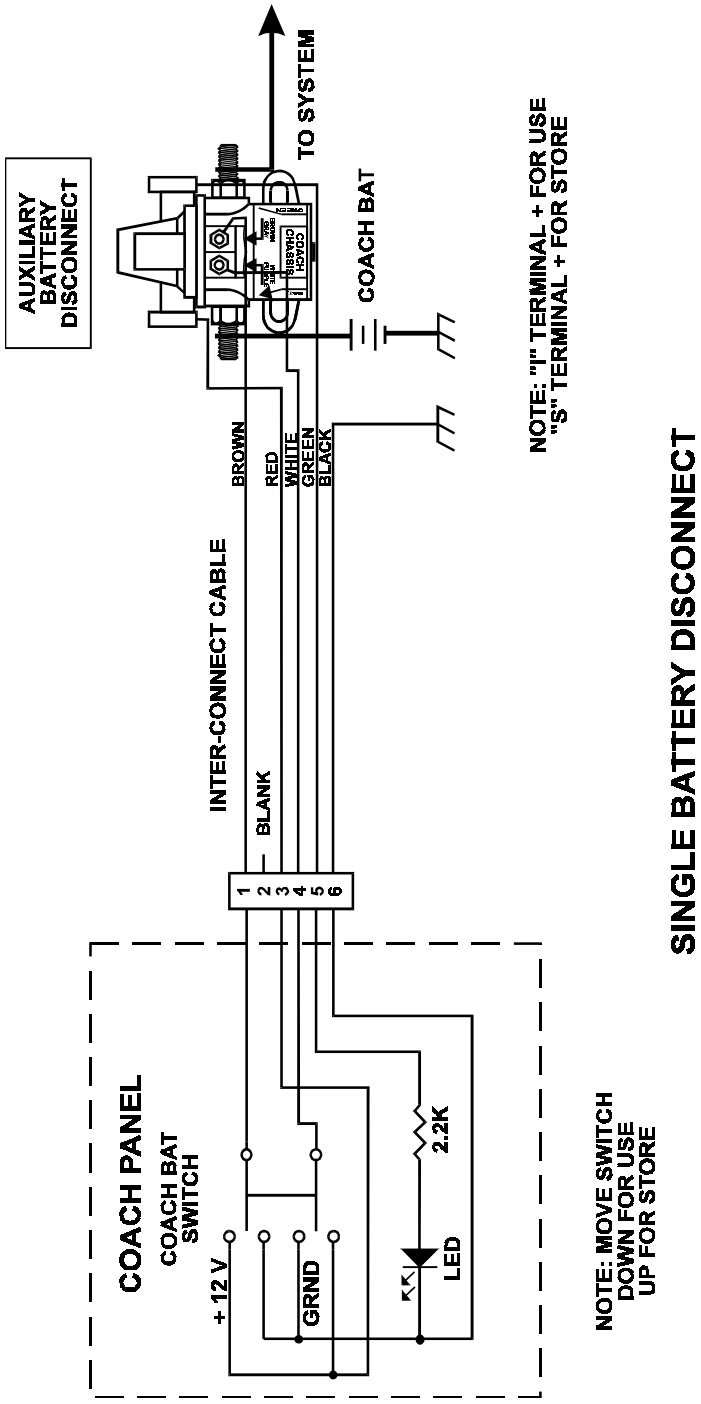

SINGLE BATTERY DISCONNECT
MODELS BD0 & BD1
FIGURE 2

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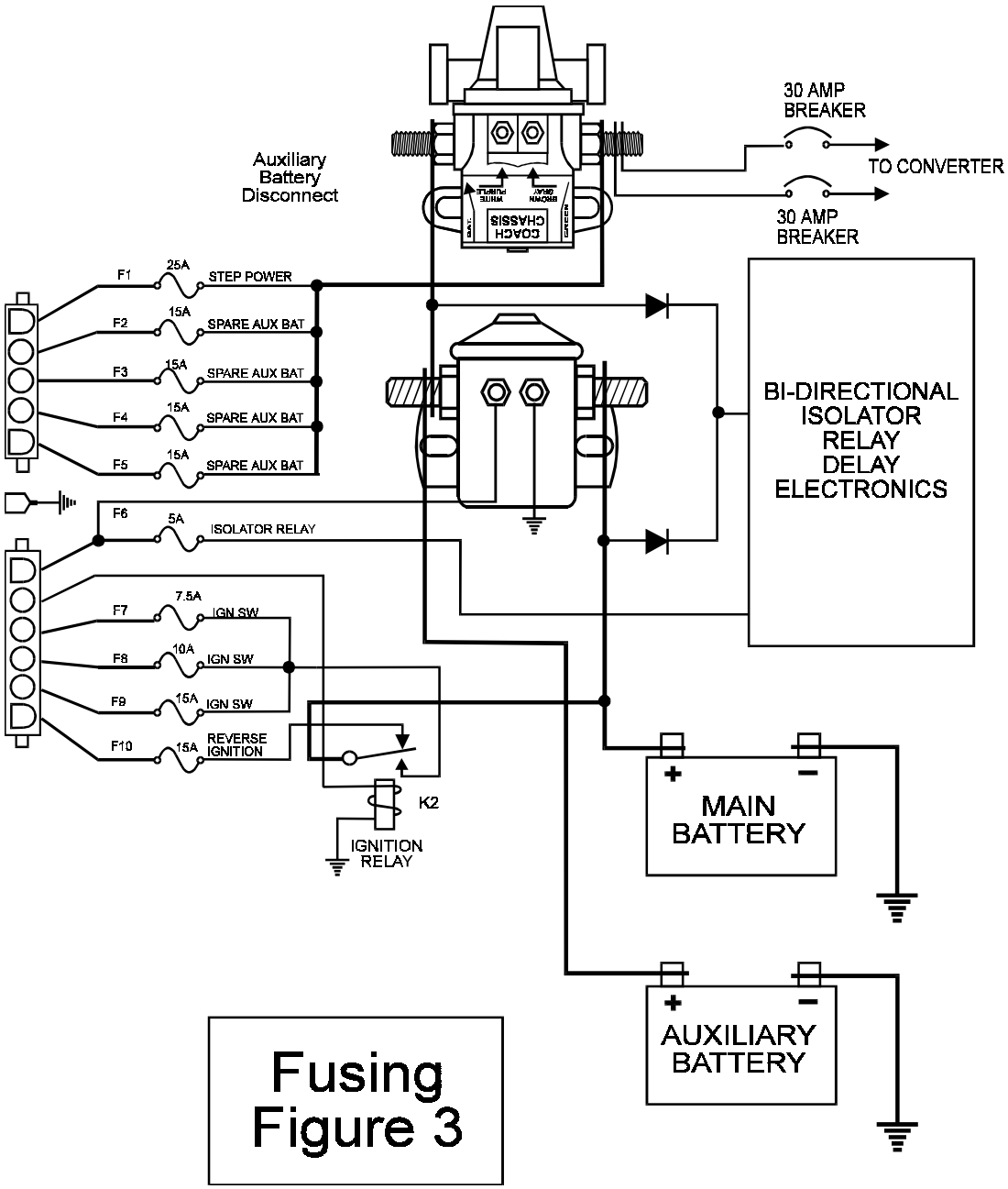

Fusing
Figure 3

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