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- CB-200 rev. E - part value changes-corrected silk screen - changes
- CB-200 rev. D - improved voltage sensing accuracy-mechanical chassis battery from shore power
- CB-200 rev. C - added dual voltage dropout of charging of relay-improved relay driver circuits-added charging of from both chassis and coach batteries
- CB-200 rev. B - added source power to disconnect switches
- CB-200 rev. A - initial release
- Gas (electronic board)

For each class, several revisions have been made: heavier cranking current required for the diesel engines. externally from the disconnects. This is because of the coaches have their auxiliary starting relay mounted diesel powered coaches. The basic difference is that diesel Two basic applications exist: gasoline powered coaches and

1. Disconnects both chassis and coach batteries from their loads.
2. Controls ignition switch loads.
3. Controls fog lights.
4. Allows paralleling of chassis and coach batteries for auxiliary starting and charging.
5. Protects various circuits with fuses and circuit breakers.

General

Battery Control Center
Trouble Shooting Guide

RV Custom Products
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Neither relay operates:

Both batteries must be charged and the ignition key turned off so that there is no voltage present on fuses F6 through F12.

Troubleshooting

Refer to Fig. 1, Battery Disconnects partial schematic to aid in troubleshooting. Each battery disconnect is a magnetically latched relay. Hence power is applied to its coil only momentarily to actuate the relay. Unlatching is caused by reversing the direction of current through the coil. On a panel over the coach door are two battery disconnect control switches. Each switch is double pole, double throw (DPDT) with center off (momentary action). Pushing the top of a switch engages its relay while pushing the bottom of the rocker disengages the relay. An ignition lock out relay is provided on the circuit board to prevent the chassis battery disconnect from being disengaged while the vehicle ignition switch is on:

Battery Disconnect Function

It is necessary to keep these differences in mind when troubleshooting the various models of battery control center. The various revisions of the electronic circuit boards are backward compatible. For example, a rev. D board will replace revs. A through D boards. However, the revision levels are not upward compatible. In the preceding example, a rev. D board will not directly replace a rev. B or later board.

- CB-300D rev I - does not exist
- CB-300D rev H - changed F23 from 7.5A to 10A
- CB-300D rev J - added D71 and D81 F23 changed from 10 amp to 20 amp

Changes

- CB-300D rev. G - added F18 and FF23, minor silk screen
- F19 to 7.5A
- On disconnects when ignition key is turned on - change
- CB 300D rev. F - added electronic disconnect driver to turn
- CB-300D rev. E - minor silk screed changes
- CB-300D rev. D - revised fuse use description
- 3. Ignition relay moved to electronic board.
- 2. Charging of chassis battery from shore power
- 1. Dual voltage dropout of charging relay
- CB-300D rev. C - incorporated gasoline board changes:
- CB-300D rev. B - added coach battery as second power source
- CB-300D rev. A - initial release

Diesel (Electronic board)

- CB-115 rev. H and I - does not exist
- CB-115 rev. J - added diodes D71 and D81 F23 changed from 10amp to 20 amp

Troubleshooting
No voltage on fuses F6 through F12.
 It is assumed that the chassis battery disconnect relay is engaged and the ignition switch is on.
Box mounted relay:
 There must be battery voltage on P4 #11, P1 #7 and one terminal of the ignition relay. There should be ground

Ignition Relay Functions
 The vehicle ignition switch cannot carry the additional loads added by the coach. An ignition relay, actuated by turning on the ignition key (with chassis battery disconnect relay engaged), is provide to supply the necessary current. Refer to fig. 2 (Gasoline) and fig. 3 (Diesel), Ignition relay-partial schematic, for details. There are 2 cases, ignition relay mounted on the box and relay mounted on the board.

Coach battery disconnect fails to operate:
 Battery voltage must exist on P2 #7. If not and fuse F19 is good, replace board.
 There should be continuity between P2 #3 and the brown wire terminal on the disconnect relay and continuity between P2 #6 and the other relay terminal. If not, check wiring and connectors P1 and P2.
 Pressing the top of the coach battery disconnect rocker switch should produce battery voltage on the brown wire terminal of the coach battery relay and ground on the other. Pressing the bottom of the rocker produces battery voltage on the white wire terminal and ground on the first. If so, the relay is defective. If not, check and repair coach wiring and/or switch panel.

Chassis battery disconnect fails to operate:
 Battery voltage must exist on P2 #8. If not and fuse F19 is good, replace board.
 There should be continuity between P2 #1 and the purple wire terminal on the disconnect relay and continuity between P2 #2 and the gray wire relay terminal. If not, check wiring and connectors P1 and P2.
 Pressing the top of the chassis battery disconnect rocker switch should produce battery voltage on the purple wire terminal of the chassis battery relay and ground on the other. Pressing the bottom of the rocker produces battery voltage on the gray wire terminal and ground on the first. If so, the relay is defective. If not, check and repair coach wiring and/or switch panel.

Check and replace fuse F19 if necessary. If fuse F19 is good and there is no voltage on it, replace the board.

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The relay is actuated manually from the drivers console by pushing the auxiliary start switch button. Coach battery power appears at P4 #2 after passing through fuse F17 and is applied to the dash mounted auxiliary start switch. The other side of the switch is connected to P4 #10. On gasoline models, P4 #10 is wired to P1 #5 and thence to the Auxiliary Start Relay. For Diesel models, P4 #10 is routed through fuse F20 (F22 for rev. C) to P3 #1 before being wired to the Auxiliary Start Relay. The relay is mounted

Auxiliary Start and Charging Relay Functions
 The auxiliary start relay parallels the coach and chassis batteries in the event it is desired to start the vehicle with a dead chassis battery. In addition, the relay controls charging of the batteries as a set. Refer to fig. 5 (Gasoline) and fig. 6 (Diesel), Auxiliary Start Relay - partial schematic, for particulars.

If battery voltage is present on P4 #12 and fuse F13 is good and no voltage on P4 #9, replace the circuit board.

If no voltage is present on P4 #12, check wiring to the dash mounted fog light switch.

If battery voltage is present on P4 #9, check the vehicle fog light wiring and lamps.

It is assumed that the chassis battery disconnect is engaged, the ignition switch is on, the fog light switch is on, and the headlight switch is on low beam.

Troubleshooting Fog Lights

Fog Light Relay Function
 The fog light relay allows heavy lamp loads to be controlled by a small dash mounted switch. Refer to fig. 4, Fog Light Relay-partial schematic, for details. The dash mounted fog light switch applies power to the coil of the fog light relay, closing its contacts. This allows power to flow from P14 through fuse F13 to P4 #9.

Board mounted relay:
 There must be battery voltage on P4 #11 and P13. If on P1 #8 and the other terminal of the relay. If so, the relay is defective. If not, check wiring.
 so, replace the board.

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Normally, one can hear the Auxiliary Start/Charging Relay pull in when the auxiliary start switch is pressed. Battery voltage must appear at P4 #2. If not, replace fuse #17. Check pressing the auxiliary start switch energizes P4 #10. Check for a faulty switch or wiring in the coach if not. For Diesel coaches, check fuse F20(F22 for rev. C). Also, by removing the plug from P3 (Diesel), one can measure coil resistance between pins 1 and 2 to ensure that the coach wiring and relay coil is undamaged. With the relay pulled in, there should be zero volts across the load (large terminals of the relay. On Diesel coaches, this checks that

Troubleshooting Auxiliary Start/Charging Relay

charged in parallel. charging relay will pull in and both batteries will be above 13.2VDC. When these conditions are met, the auxiliary power on, converter operating, and coach battery charged conditions are: coach battery disconnect engaged, shore from the converter when on shore power. Necessary terminal. This allows the chassis battery to be charged from both the ignition terminal and coach battery disconnect Gasoline and Diesel models of rev B and later sense voltage is operating normally in closed position.

Thus, a voltmeter will read about 6VDC when the Diesel relay and then the coil is pulsed at approx. 50% duty cycle. continuously energized, full voltage is applied for 1/4 second heavier, intermittent duty coil. To enable the coil to be approx. 1/2 amp for both models. The Diesel model has a pulled in after the engine is turned off. Coil current is battery. It is normal for the charging relay to remain Auxiliary Start/Charging Relay will drop out sooner (at 12.6VDC) to retain a greater amount of charge in the chassis Thus, with later revision boards and with ignition off, the

Gas Rev A, B	13.2VDC	Relay pull-in
Diesel Rev A, B	12.2VDC	Relay drop-out(ignition on)
Gas Rev C & up	12.2VDC	Relay drop-out(ignition off)
Diesel Rev C	12.6VDC	

externally from the Battery Control Center on Diesel coaches. For battery charging service, relay behavior depends upon revision level and coach type:

Rev.10/03

Check the fuse of the affected circuit. If good, the coach wiring must be checked.

Troubleshooting

Coach Battery Disconnect Functions:

F4 #1	F16 Radio Switch
F6	F14 Lug Light/Spare Aux BD
F16	F20 Spare (Gas CB-115 Rev A and Diesel Rev C only)
F17	F21 Spare (Gas CB-115 Rev A and Diesel Rev C only) Utility ("Lights/Spare Aux. BD" for Gas CB115 Rev C and Diesel CB300D rev. E)

Coach (Auxiliary) Battery Functions:

F4 #2	F17 Auxiliary Start Switch
F4 #3	F18 Solar Panel
2-30a circuit breakers to coach panel (local 60a)	

Ignition Functions:

F5 #4	F6 Ignition Signal
F5 #5	F7 Power Seat
F5 #6	F8 Rear Heater
F5 #7	F9 Power Window
F5 #8	F10 Horn
F11	F11 Spare
F12	F12 Dash Fan/Spare Ign.

Chassis battery disconnect functions:

F9	F1 Spare
F10	F2 Spare
F5 #1	F3 Step Motor
F5 #2	F4 Step Switch
F5 #3	F5 LR Det (Chassis)

Load Center Functions

the relay is making contact under charging conditions (relay coil being pulsed).
 Once the auxiliary start function is verified, any deviation from proper charging operation requires replacement of the electronic circuit board.

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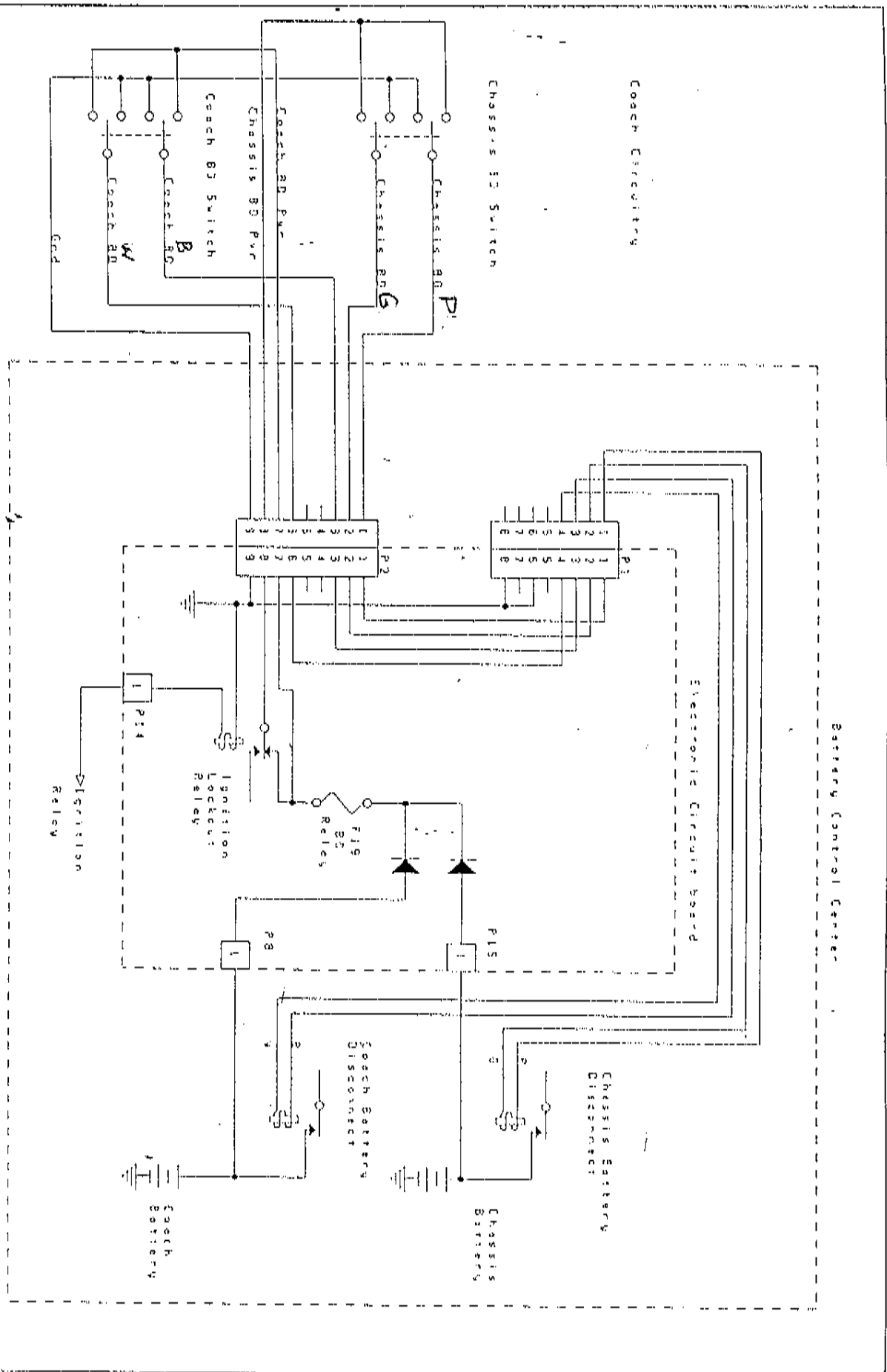


Fig. 1

LINK
 Manual 1.1.sch
 Manual 1.2.sch
 Manual 1.3.sch
 Manual 1.4.sch
 Manual 1.5.sch
 Manual 1.6.sch

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Title	Battery Disconnects-Partial schematic
Size	Document Number
Date:	February 13, 2022
Sheet	5
of	

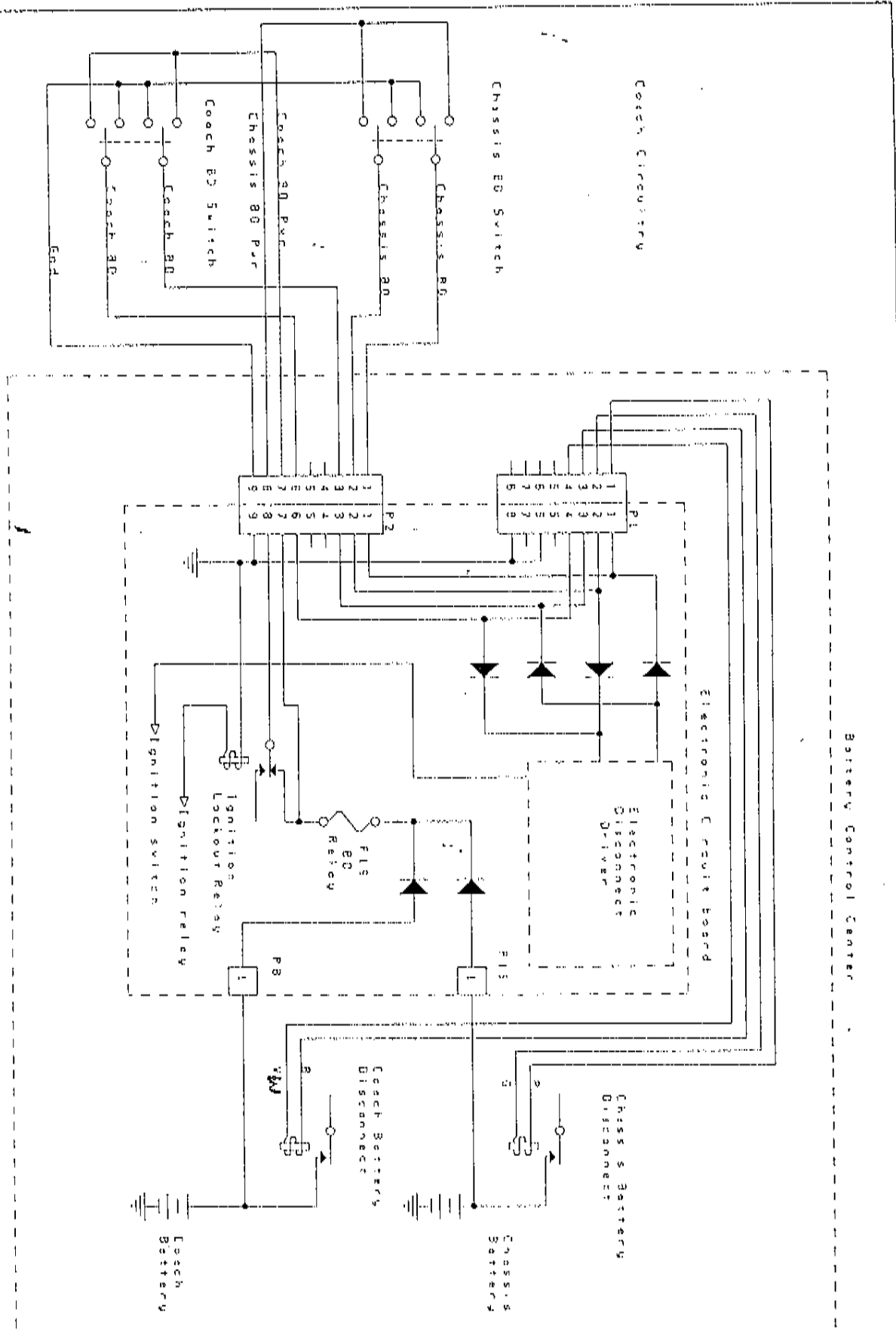


FIG. 2

RV Custom Products	
Title	Battery Disconnects-Relays Schematic
Size/Document Number	F
Date	February 13, 2022 Sheet 01

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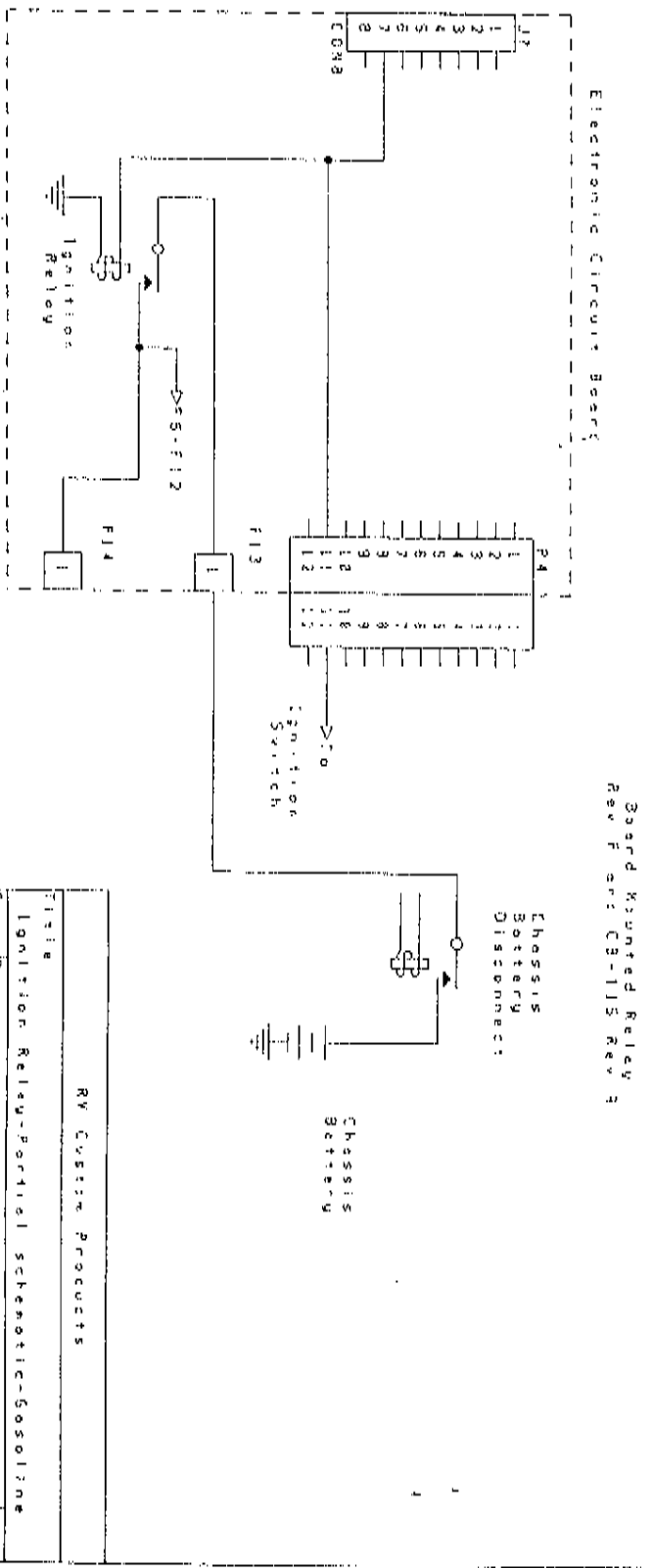
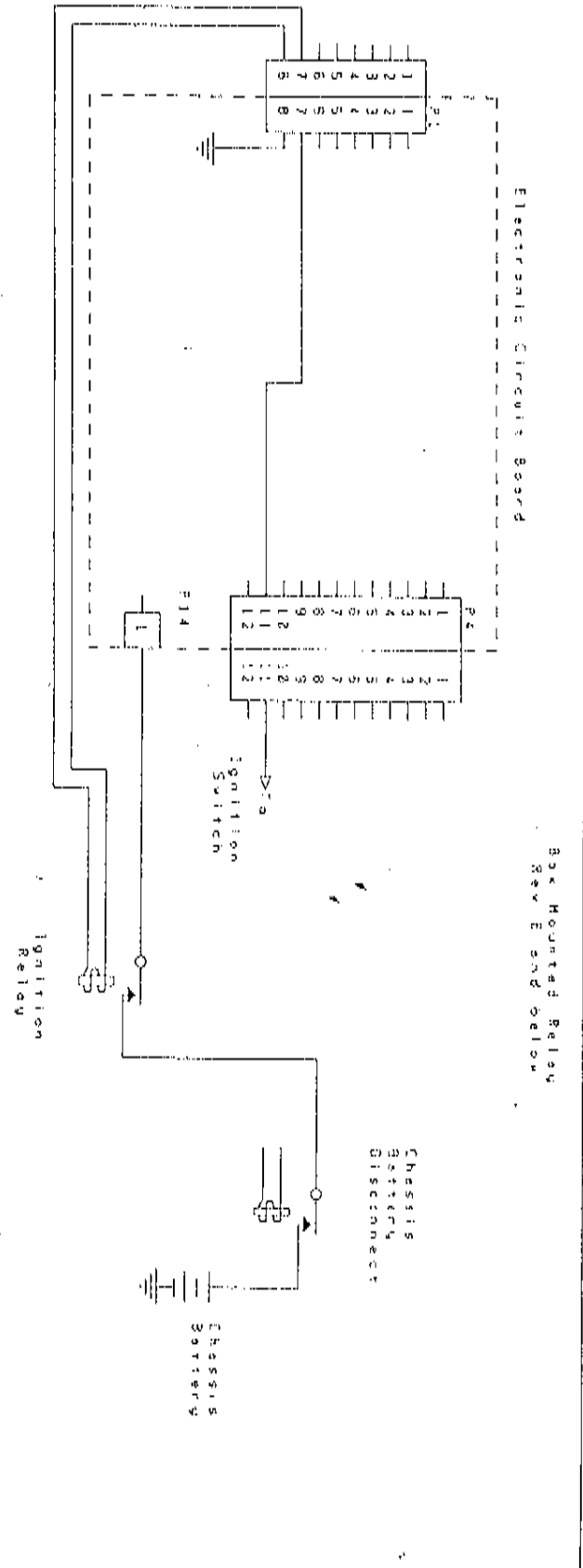


Fig. 3

RV Custom Products	
Part #	Ignition Relay-Partial Schematic-Gosoline
Size Document Number	REV

01

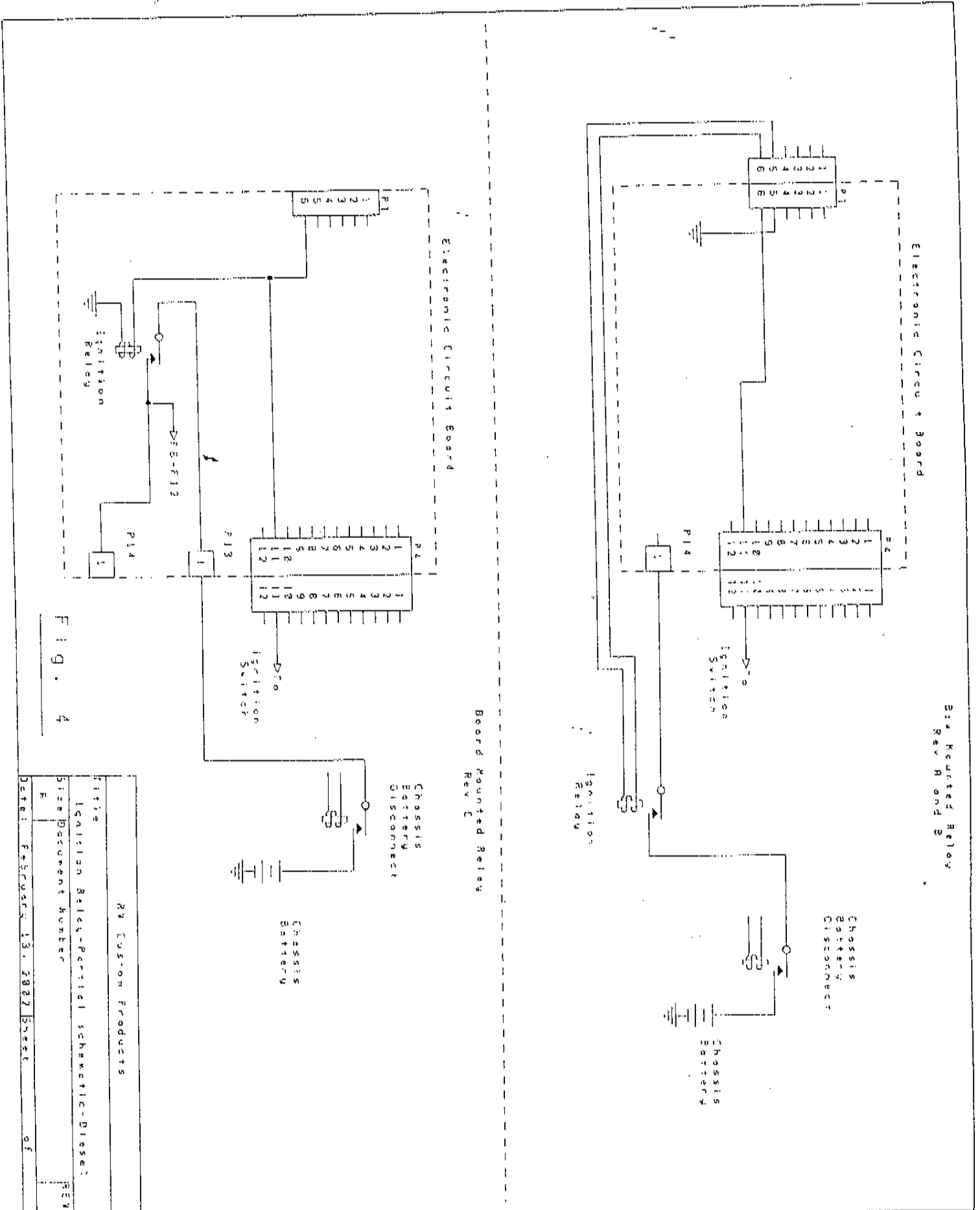


Fig. 4

2x Keutect Relay
Rev. A and B

Electronic Circuit Board

Electronic Circuit Board

Board Mounted Relay
Rev. C

CHASSIS
BATTERY
DISCONNECT

CHASSIS
BATTERY

Ignition
Relay

Ignition
Switch

CHASSIS
BATTERY

Ignition
Switch

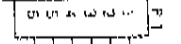
CHASSIS
BATTERY
DISCONNECT

Ignition
Relay

D1E-F12

P14

P13



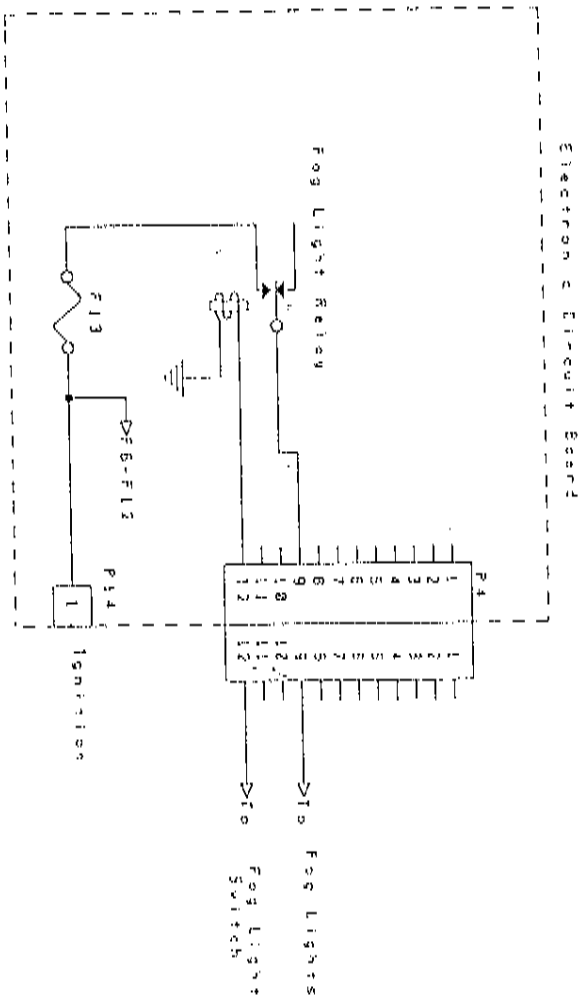


FIG. 5

RV Custom Products	
TITLE Fog Light Relay-Part of schematic	
SIZE Document Number	
REV	
Notes February 13, 2002 Sheet 5 of 5	

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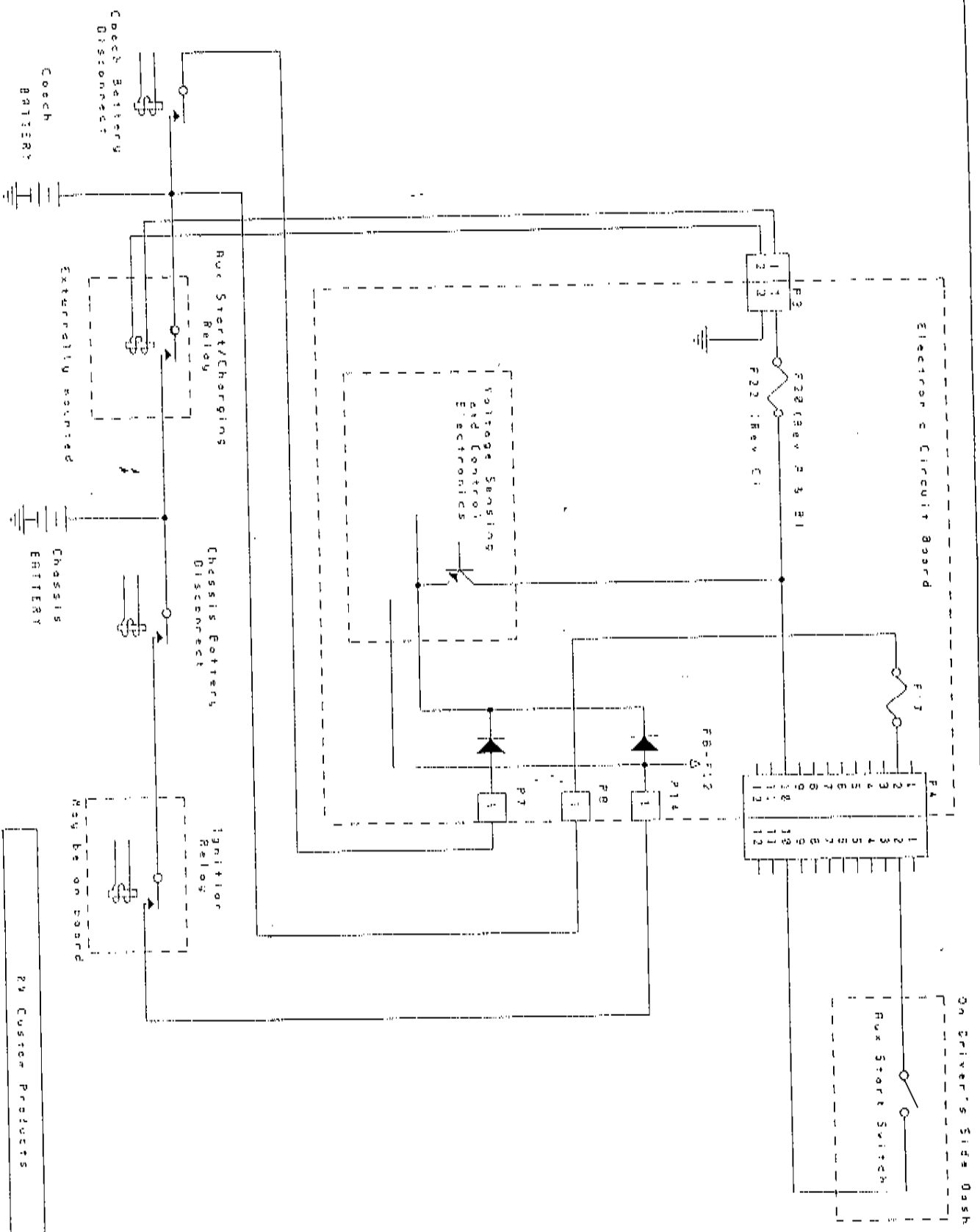


Fig. 7

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Rux Start Relay/Relay: schematic-01a	
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A	
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