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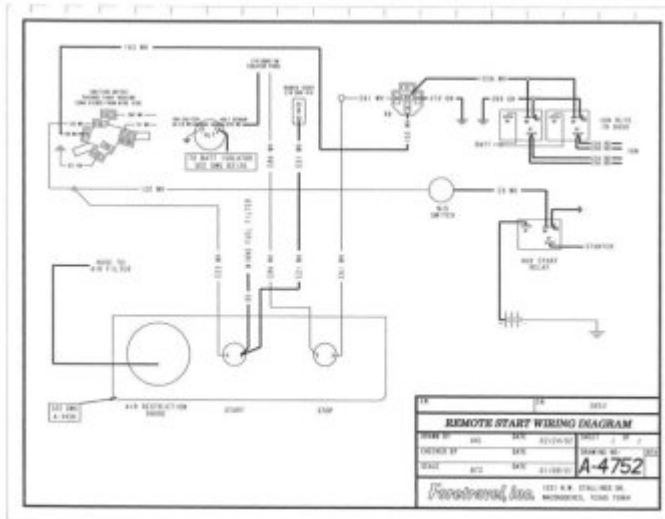
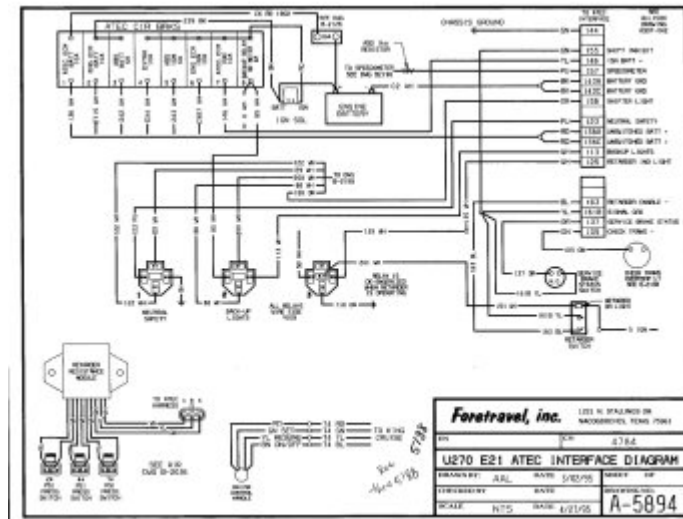


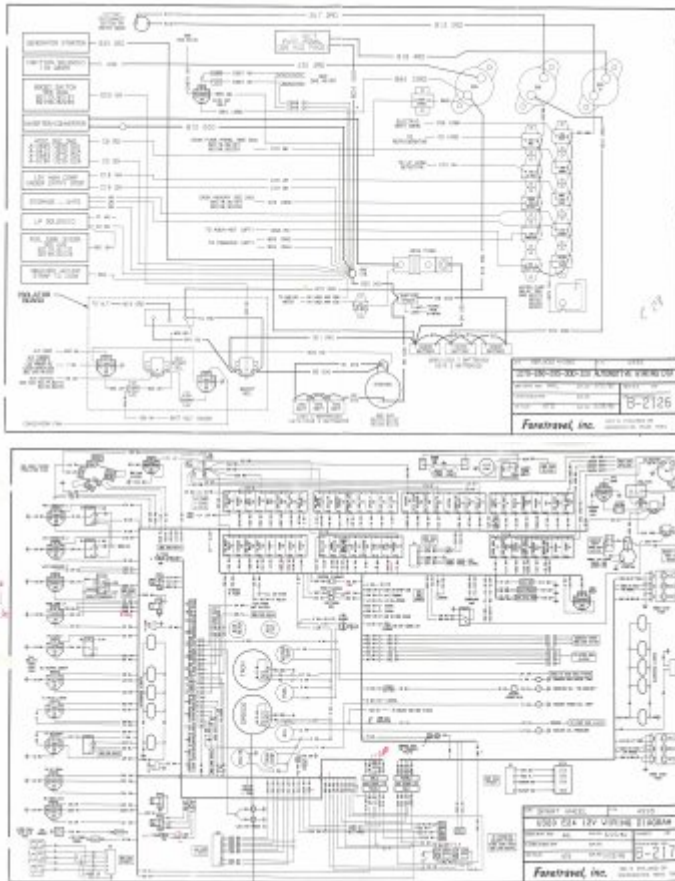
## Starter Information and Guides

Following are (2) two walk through's of the overall starting circuit and sequence.

## Starter Engage Circuit Wiring

**The following wiring diagrams were used to trace our starter circuit:**





## Start battery cable connections walk through View #1

1. Start battery positive post
2. Starter solenoid terminal
3. To boost solenoid terminal
4. Isolator terminal
5. To 90 amp circuit breaker terminal (behind white bay wall panel)

### **30 amp Allison circuit breaker (behind white bay wall panel)**

6. input B69
7. Output C6 red

### **10 amp Allison circuit breaker #1 (right-dash panel)**

8. Input ATEC-ECM C6 red
9. Output ATEC-ECM 136 white

### **Allison transmission ECM (behind lower left driver seat side kick panel)**

10. Inputs B2-136A & B11-136C - unswitched battery +
11. Output A23-123 PU Violet - neutral-start output when trans in neutral (closes relay #1 coil)

### **Ignition switch**

12. Input 91 white from 15 amp circuit breaker #28 (located on front dash breaker panel start batt buss)
13. Output 122 white start position to neutral safety relay common

### **Neutral safety Bosch relay R1 (right side of front dash CB panel)**

14. Relay 86 coil from step#11 (trans neutral closes relay) 123 purple

15. Relay 85 coil (battery negative connected to other coil terminal)
16. Relay 30 common is from ignition switch start position 122 white step#13 (or from remote start button E23)
17. Relay 87 N/O is E9 white to aux start solenoid coil (powered from ignition switch start) on isolator panel

\* aux start sol below closes when when trans in neutral & ign key in start position

\* and aux start solenoid coil is powered from ignition key start position

### Auxiliary start solenoid (located on inverter panel)

18. Coil small wire from step#17 (battery positive closes relay)
19. Input large side post from start battery positive step#4 B26 red
20. Output large side post to starter solenoid coil B25 red

## Starter Circuit View #2



The NS switch is a neutral start relay on our coach. From the circuit description, you will see a dedicated circuit breaker behind the white bay breaker panel the flows start battery current directly to Allison through another breaker by the front door panel. Allison flows current to neutral start relay coil, to close relay points when ignition is on and transmission is in neutral. The ignition key start position flows current through close relay points to the aux start solenoid that you manually tripped to run starter.

STARTER	
Wire Code	Description
B5 000	Big cable from battery to starter solenoid large terminal
B14 2RD	Big cable on start solenoid goes to rightmost isolator terminal
ISOLATOR	
Wire Code	Description
B14 2RD	Big cable from starter solenoid
B15 2RD	Large cable to 90-amp circuit breaker on bay wall panel
B26 RD	Wire to aux start solenoid on isolator panel aux start solenoid
BAY WALL PANEL BREAKER	
Wire Code	Description
B15 2RD	Large cable from isolator to leftmost 90-amp big round start battery circuit breaker's lower terminal
B69	Wire from 90-amp breaker to 30-amp ATEC circuit breaker on bay wall panel
C6 RD	10-gauge wire from 30-amp ATEC breaker to front door panel
FRONT DOOR PANEL BREAKER	
Wire Code	Description
C6 RD	Wire from bay wall panel to leftmost 10-amp ATEC-ECM circuit breaker located on top-row
136 WH	Wire from 10-amp breaker to Allison ECM interface-plug RD# 136A & 136C, "unswitched batt +"
ALLISON ECM COMPUTER	
ECM computer is located behind carpeted side panel to the left of driver's left foot	
Wire Code	Description
136 WH	Wire from 10-amp breaker to both terminals RD# 136A & 136C, labeled "unswitched batt +"

123 PU	Wire from ECM terminal PU# 123, labeled "neutral safety", indicating transmission is in neutral, to neutral safety relay
<b>FRONT DOOR PANEL RELAY</b>	
<b>Wire Code</b>	<b>Description</b>
123 PU	12-volt positive from Allison, when transmission is in neutral will close #86 coil on neutral safety relay
Green ground	Completes #85 coil circuit on neutral safety relay located 2nd from bottom on right side of panel
122 WH	Ignition key momentary start position flows start battery current to neutral start relay #30 common terminal
E9 WH	Ignition key current flows from N/O #87 relay terminal to aux start solenoid located on isolator panel
<b>ISOLATOR PANEL SOLENOID</b>	
AUX START solenoid is leftmost of the two solenoids and is located in center of isolator panel above air cleaner	
<b>Wire Code</b>	<b>Description</b>
E9 WH	Ignition key current flows through neutral start relay to small coil terminal on the aux start solenoid, coil is internally grounded to case
B26 RD	Start battery current flows from isolator terminal through aux start solenoid when solenoid is closed (by ignition momentary start)
B25 RD	When aux start solenoid is closed start battery current flow to starter solenoid coil to activate engine starter, coil is internally grounded
<b>IGNITION RELAYS</b>	
IGNITION DUAL-RELAYS are large cube-shaped and are mounted to lower center of front door panel REMOTE STOP RELAY is positioned lying loose in bottom center of front door panel	
<b>Wire Code</b>	<b>Description</b>
103 WH	When ignition key is turned on, 103 WH flows start battery current through secure-switch to remote-stop relay #30 common terminal and through NORMALLY-CLOSED #87A terminal
103A WH	To dual-ignition-solenoid coils to close ignition relays, which allows start battery current to flow to ALL ignition circuits
<b>REAR ENGINE REMOTE START PANEL</b>	
<b>Wire Code</b>	<b>Description</b>
E21 WH	Ignition circuit breaker #19 located in front door panel powers remote start system start & stop momentary push button switches
E23 WH	Pushing remote start switch powers ignition key start wire E22-WH to turn starter on (same as turning ignition key to start position)
E61 WH	Pushing remote stop switch powers remote stop relay #86 coil, opening relay and turning 103A-WH power off to ignition dual-relays
Green ground	Completes #85 coil circuit on remote stop relay

When remote stop relay is powered, 103A-WH power from ignition key is disrupted, turning off ALL ignition circuits MOMENTARILY, which kills power to engine fuel shut-off solenoid, thus stopping engine letting up on remote stop switch allows ignition dual-relays to again close, as ignition key is still on.

by **Barry and Cindy** [Original Topic](#)

## Starting Troubleshooting

First thing I would do, with ignition key off, is to put 12-volts to the small control terminal on the start-solenoid mounted near the isolator. This will close the start solenoid which will send power to the control terminal on the starter-mounted solenoid, which lets very high current to flow from start battery bank to starter motor. (12 volt source is available on isolator side terminal)

If this works, it does not indicate what the problem is, it just tells you all is well with your starter, Foretravel start solenoid, start battery bank and heavy battery cables. This is a simple and important test which tells you if the problem is in the low-current up front section or in the heavy current back section.

From my engine start wiring flow write-up you will find that there is a relay on the front panel that sends voltage to the isolator-panel start solenoid when Allison is in neutral and ignition key is in start position. A meter on the relay wires will indicate if Allison is sending its neutral voltage and if ignition key is sending its start position voltage.

- Overview/Troubleshooting of the Starting System

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