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1. ALLISON® MD TRANSMISSION

Discussion of the MD transmission In this section is limited to the transmission electronic control unit (ECU) power circuits and data link connectivity. For detailed information on transmission diagnostics, refer to the Allison service manual.

1.1. CIRCUIT FUNCTIONS

The MD transmission ECU interfaces with the vehicle on the Drive Train 1939 Data Link and several discrete circuits.

A backup lamp relay converts the low backup signal from the ECU to a 12 volt signal and powers the back up lamps.

The ECU receives power from a clean battery feed in the battery box.

A backup lamp relay converts the low backup signal from the ECU to a 12 volt signal and powers the back up lamps.

The neutral signal from the transmission ECU is communicated to the ESC and the engine controller.

The vehicle speed signal is provided by the ECU on circuits to the engine controller.

1.2. DIAGNOSTICS

The ESC will log a DTC and command the "CHECK TRANS" lamp on if communication with the transmission ECU is lost.

The transmission ECU has its own diagnostic system which will turn on the "CHECK TRANS" lamp when there is a detectable fault. Diagnostic codes can be read from the lamps on the transmission shift selector or with the Allison Transmission Diagnostic Tool (ATDT) software. Refer to the applicable troubleshooting manual for details. If the diagnostic software is unable to communicate with the ECU there may be circuit problems in the 1708 data link. Refer to 1708 Data Link. (See 1708 DATA LINK, page 83)

There are no diagnostic trouble codes (DTC's) associated with the back-up light circuits. A fault in the back-up light circuits will be apparent when the transmission is shifted into reverse and the lights do not come on.

Table 340 MD Preliminary Check

STEP	KEY	ACTION	SPEC.	YES-IN SPEC.	NO-OUT OF SPEC.
1.	On	Does the engine crank when the transmission is in neutral?	Engine cranks when the transmission is in neutral.	Go to next step.	Refer to Engine Cranking.
2.	On	Does the "CHECK TRANS" lamp turn off after the vehicle is started.	Lamp turns off after vehicle is started.	Go to next step.	Refer to the applicable transmission service manual.

Table 340 MD Preliminary Check (cont.)

STEP	KEY	ACTION	SPEC.	YES-IN SPEC.	NO-OUT OF SPEC.
3.	On	Are there any active DTC's associated with the transmission? Refer to Diagnostic Trouble Codes. (See DIAGNOSTIC TROUBLE CODES (DTC), page 1108)	Transmission communication DTC is not active (no codes).	Go to next step.	Go to ECU Power and Data Link Circuits. (See ECU POWER AND DATA LINK CIRCUITS, page 1109)
4.	On	Does the Check Transmission Warning Lamp remain illuminated.	Warning lamp remains on after bulb check	Refer to the applicable Allison service manual.	Go to next step.
5.	On	Does the shift selector appear to be malfunctioning?	Check shift selector for correct operation.	Go to next step.	Go to Shift Selector Circuits. (See SHIFT SELECTOR CIRCUITS, page 1116)
6.	On	Do the back-up lights come on when the transmission is shifted into reverse?	Back-up lights come on when in reverse.	Transmission circuits are functioning. Go to next step.	Go to Neutral Signal Light Circuits. (See NEUTRAL SIGNAL CIRCUITS , page 1111) Go to Back-Up Light Circuits. (See BACK-UP LIGHT CIRCUITS , page 1113)
If transmission is still not operating correctly, refer to the appropriate Allison service manual.					

1.3. DIAGNOSTIC TROUBLE CODES (DTC)

To display ESC diagnostic codes, put the vehicle in diagnostic mode. Set the parking brake and turn the Ignition key "ON". Then press the Cruise "ON" switch and the Cruise "Resume" switch. If no diagnostic trouble codes are present, the cluster odometer will display "NO FAULT". If diagnostic trouble codes are present, the gauge cluster will display the total number of faults and cycle to the next diagnostic trouble code after 10 seconds. To manually cycle through the diagnostic trouble code list, press the cluster display select/reset button. The last character of the diagnostic trouble code will end in "A" for active diagnostic trouble codes or "P" for previously active diagnostic trouble codes. Turning the ignition key off or releasing the park brake will take the ESC and the gauge cluster out of the diagnostic mode.

The previously active diagnostic trouble codes may be cleared, while in the diagnostic mode, by turning on the left turn signal and pressing the cruise on and set switches simultaneously.

Table 341 Transmission Communication Diagnostic Trouble Codes

DIAGNOSTIC TROUBLE CODE	FAULT DESCRIPTION
639 14 2 240	Electronic transmission controller communication has not been received

1.4. ECU POWER AND DATA LINK CIRCUITS

Fault Detection Management

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

A fault in the MD ECU Power & Data Link Circuits will be apparent when the instrument cluster display does not correspond to the shift selector position and the check electrical system lamp is illuminated. Problems in the power and data link circuits can be caused by open or short circuits, a blown fuse, failed switch, a problem in the ESC, a problem in circuits between the ESC and the solenoid module or a problem in the solenoid module.

Table 342 ECU Power and Data Link Checks (cont.)

TCM harness connector (7204), cavity 4 to ground	12 ± 1.5 volts	If voltage is incorrect, check for blown 10A transmission fuse or open or short to ground in circuit K#146, or A#146.
ECU Connector (7202) Power Check Check with ignition on and (7202) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals.		
Test Points	Spec.	Comments
ECU harness connector (7202), cavity 16 to ground.	12 ± 1.5 volts	If voltage is incorrect, check for blown 10A transmission feed fuse or open or short to ground in circuit N14BB, N92A, K92A or KA#136.
ECU harness connector (7202), cavity 1 to ground.	12 ± 1.5 volts	If voltage is incorrect, check for blown 10A transmission feed fuse or open or short to ground in circuit N14BB, N92A, K92A or K#136.
ECU harness connector (7202), cavity 1 to cavity 17.	12 ± 1.5 volts	If voltage is incorrect, check for open in circuit N14–GA, N92–G, K92–G or K#143.
ECU harness connector (7202), cavity 1 to cavity 32.	12 ± 1.5 volts	If voltage is incorrect, check for open in circuit N14–GA, N92–G, K92–G or KA#143.
If voltages are correct and ECU communication DTC is still active, refer to Drivetrain Data Link. (See DRIVETRAIN 1939 DATA LINK, page 73)		

Extended Description

Refer to the MD ECU Power & Data Link Circuits.

Ignition voltage is supplied to the black ECU connector (7204), terminal 4, from the 10 amp transmission fuse.

Battery voltage to the gray ECU connector (7202) cavities 1 and 16, from the 10 amp transmission feed fuse (9255) in the battery compartment.

Ground is supplied to the gray ECU connector (7202) cavities 17 and 32 from the battery negative terminal.

The drivetrain data link is connected to the black ECU connector (7204) cavities 29 and 13.

The 1708 data link is connected to the black ECU connector (7204) cavities 17 and 1.

1.5. NEUTRAL SIGNAL CIRCUITS**Fault Detection Management**

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

A fault in the Neutral Signal Circuits should be suspected when the engine will not crank. Problems in the neutral circuits can be caused by open or short circuits, a failure in the engine controller, or a failure in the ECU.

When the transmission is shifted into neutral, the ECU will apply 12 volts from the gray ECU connector (7202) terminal 6, to ECM2 connector (6020) terminal 8. The voltage will cause the engine controller to enable engine cranking as long as the engine is not already running.

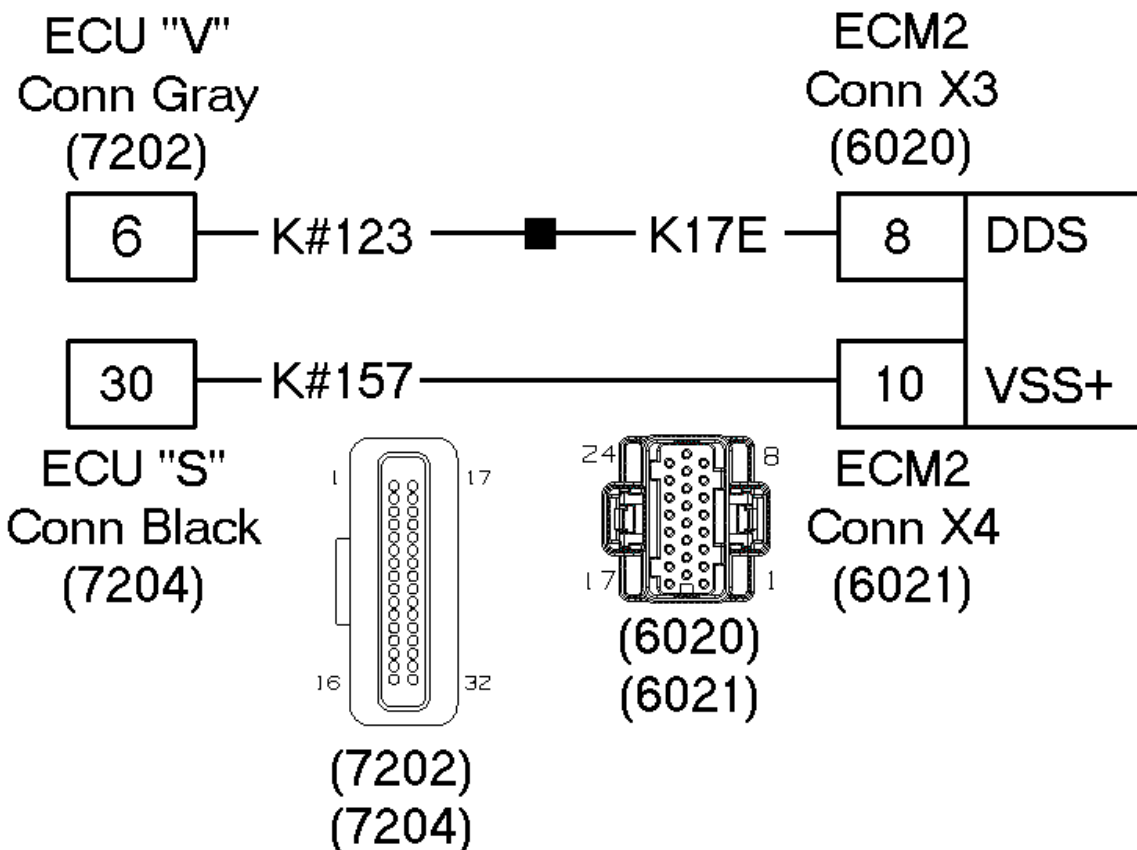


Figure 527 Neutral Signal Circuits — Always Refer to Circuit Diagram Book for Latest Circuit Information

- (6020) ECM2 CONNECTION — X3
LOCATED AT ENGINE COMPARTMENT AT ECM
- (6021) ECM2 CONNECTION — X4
LOCATED AT ENGINE COMPARTMENT AT ECM
- (7202) MD ECU "V" CONNECTOR GRAY
LOCATED AT ENGINE COMPARTMENT TRANSMISSION
- (7204) MD ECU "S" CONNECTOR BLACK
LOCATED AT ENGINE COMPARTMENT TRANSMISSION

1.6. BACK-UP LIGHT CIRCUITS

Fault Detection Management

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

A fault in the Back Up Light Relay Circuits should be suspected when the back-up lights do not come on when the transmission is shifted into reverse. Problems in the back-up light circuits can be caused by open or short circuits, a blown fuse, or a failure in the ECU.

When the transmission is shifted into reverse gear, the ECU will apply a ground from the gray ECU connector (7202) terminal 4, to the coil of the back up lamp relay causing it to energize. The energized relay will supply power to the backup lights.

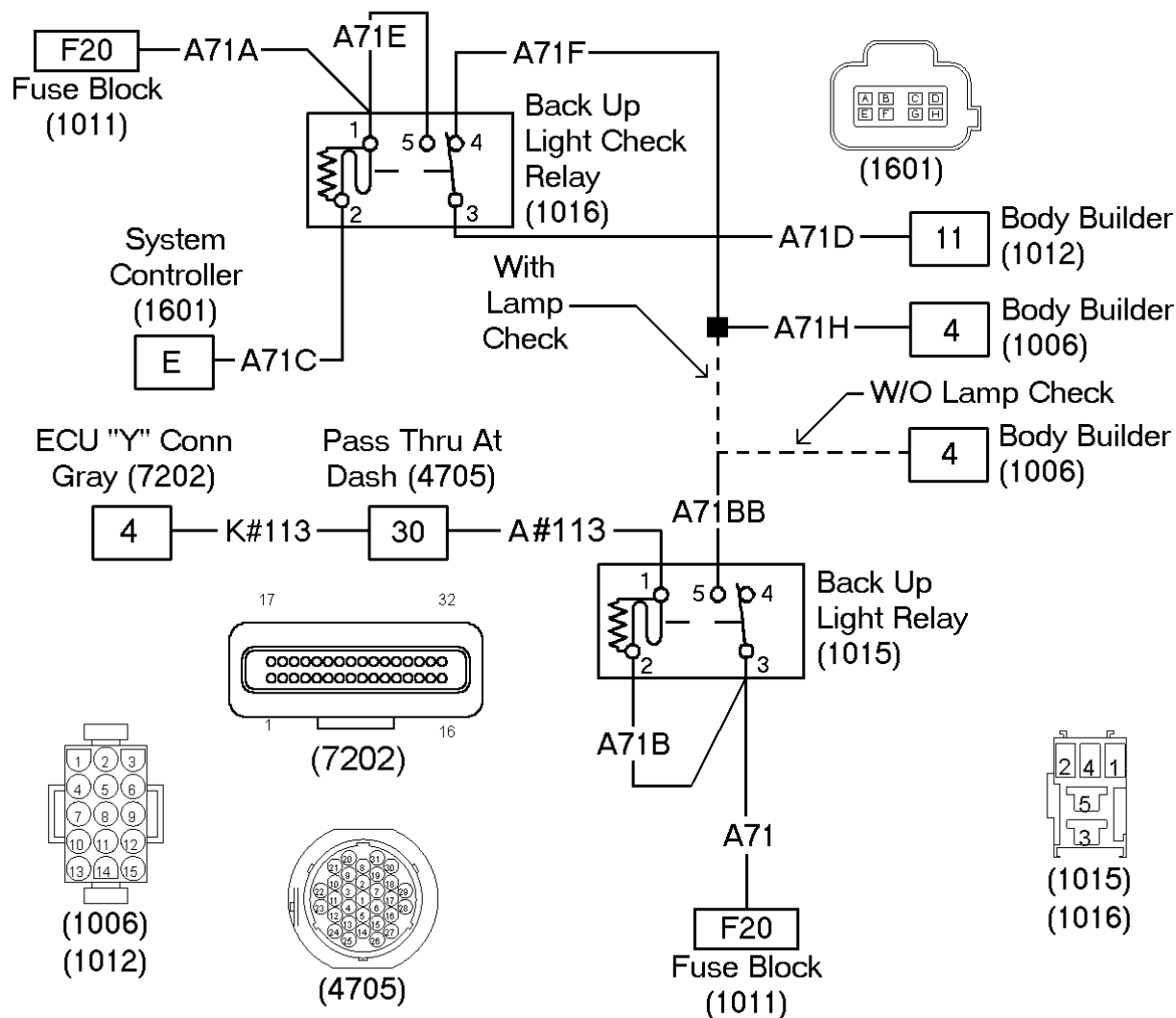


Figure 528 Back Up Light Relay Circuits — Always Refer to Circuit Diagram Book for Latest Circuit Information

- (1006) BODY BUILDER CONNECTION
LOCATED LEFT SIDE VEHICLE AT FLASHER PLATE
- (1011) FUSE BLOCK
LOCATED LEFT SIDE VEHICLE AT FLASHER PLATE
- (1012) BODY BUILDER CONNECTION
LOCATED LEFT SIDE VEHICLE AT FLASHER PLATE
- (1015) BACKUP LIGHT RELAY
LOCATED LEFT SIDE VEHICLE AT FLASHER PLATE
- (1016) BACKUP LIGHT CHECK RELAY
LOCATED LEFT SIDE VEHICLE AT FLASHER PLATE
- (1601) SYSTEM CONTROLLER
LOCATED AT INSIDE RIGHT SIDE DASH PANEL
- (4705) PASS THRU AT DASH
LOCATED AT INSIDE DASH PANEL LEFT SIDE
- (7202) MD ECU "V" CONNECTOR GRAY
LOCATED AT ENGINE COMPARTMENT TRANSMISSION

Table 343 Back-Up Light Relay Circuit Checks

Back-Up Light Relay Circuit Power Checks		
Check with ignition on and Back Up Light Relay (1015) removed.		
Bench check relay and replace if it has failed. Refer to Bench Checking Relays.		
NOTE – Always check connectors for damage and pushed-out terminals.		
Test Points	Spec.	Comments
Back Up Light Relay (1015), socket cavity 3 to ground.	12 ± 1.5 volts	If voltage is incorrect, check for blown fuse F20 or open or short to ground in circuit A71 or A71B.
Back Up Light Relay (1015), socket cavity 2 to ground.	12 ± 1.5 volts	If voltage is incorrect, check for blown fuse F20 or open or short to ground in circuit A71 or A71B.
Transmission in neutral. Back Up Light Relay (1015), socket cavity 2 to 1.	0 volts	If voltage is incorrect, check for short to ground in circuits A#113 and K#113. Also check for incorrect signal from ECU.
Transmission in reverse. Back Up Light Relay (1015), socket cavity 2 to 1.	12 ± 1.5 volts	If voltage is incorrect, check for open in circuits A#113 and K#113. Also check for incorrect signal from ECU.
Back-Up Light Check Relay Circuit Power Checks		
Check with ignition on, Back Up Light Relay (1015) installed, and Back Up Light Check Relay (1016) removed.		
Bench check relay and replace if it has failed. Refer to Bench Checking Relays.		
NOTE – Always check connectors for damage and pushed-out terminals.		
Test Points	Spec.	Comments
Back up light check relay (1016) socket cavity 1 to ground.	12 ± 1.5 volts	If voltage is incorrect, check for open or short in circuits A71E and A71A.
Back up light check relay (1016) socket cavity 1 to 2 (with transmission in neutral).	0 volts	If voltage is incorrect, check for short in circuit A71C. Also ensure no signal from ESC connector (1601) pin E.
Back up light check relay (1016) socket cavity 1 to 2 (with transmission in reverse).	12 ± 1.5 volts	If voltage is incorrect, check for open or short to high in circuit A71C. Also ensure proper ground signal from ESC connector (1601) pin E.

Table 343 Back-Up Light Relay Circuit Checks (cont.)

Body Builder Connector Voltage Checks		
Check with ignition on, Back Up Light Relay (1015) and Back Up Light Check Relay (1016) installed, transmission in reverse and body builder connectors (1006) and (1012) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals.		
NOTE – Always use breakout box ZTSE 4477 to take measurements on ESC connectors.		
Test Points	Spec.	Comments
Body builder connector (1006) cavity 4 to ground.	12 ± 1.5 volts	If voltage is incorrect, check for open or short in circuits A71H and A71BB.
Body builder connector (1012) cavity 11 to ground.	12 ± 1.5 volts	If voltage is incorrect, check for open or short in circuit A71D.

Extended Description

Refer to the Back Up Light Relay Circuits.

Power to the back up light relay coil and common contact is supply from the 10 amp fuse F20.

When the transmission is shifted into reverse, the ECU will apply a ground from the gray ECU connector (7202) terminal 4, to the coil of the back up lamp relay causing it to energize. The energized relay will supply power from the normally open contact to the back up lights.

1.7. SHIFT SELECTOR CIRCUITS**Fault Detection Management**

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

The shift selector contains the microprocessor that communicates driver input to the transmission ECU. The transmission shift selector (1829) receives battery power at all times (ignition key on or off) from the transmission ECU (7204) on pin R. The shift selector (1829) receives a ground from the transmission ECU (7204) on pin P. A chassis ground is also supplied on (1829) pins T and V. Circuits connected to shift selector connector (1829) pins A, B, C, D, and E provide signals between the shift selector and the ECU. Panel light voltage is supplied to (1829) pin U.

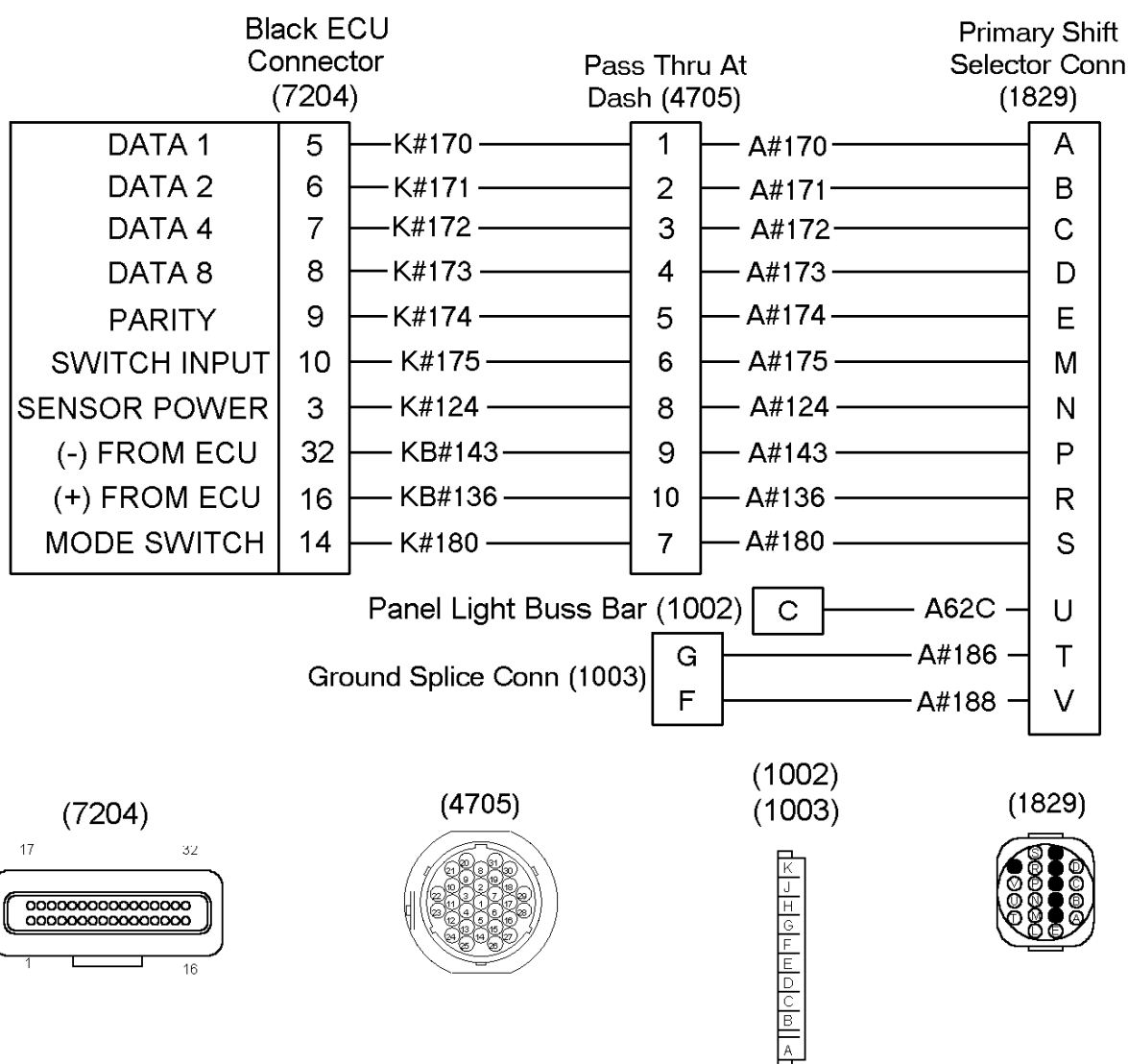


Figure 529 Shift Selector Circuits — Always Refer to Circuit Diagram Book for Latest Circuit Information

- (1002) PANEL LIGHT SPLICE CONNECTION
LOCATED LEFT SIDE INSTRUMENT PANEL
- (1003) GROUND SPLICE CONNECTION
LOCATED LEFT SIDE INSTRUMENT PANEL
- (1829) MD TRANSMISSION PRIMARY SHIFT SELECTOR
LOCATED AT INSTRUMENT WING PANEL
- (4705) PASS THRU AT DASH
LOCATED AT INSIDE DASH PANEL LEFT SIDE
- (7204) MD ECU "S" CONNECTOR BLACK
LOCATED AT ENGINE COMPARTMENT TRANSMISSION

Table 344 Shift Selector Circuit Checks

Shift Selector Circuit Checks		
Check with ignition on, transmission in neutral and shift selector connector (1829) removed.		
NOTE – Always check connectors for damage and pushed-out terminals.		
Test Points	Spec.	Comments
Harness connector (1829) cavity R to ground	12 ± 1.5 volts	If voltage is incorrect, check for open or short to ground in circuits between (1829) cavity R and black ECU connector (7204) cavity 16. If circuits check good, ECU may be malfunctioning. Refer to the applicable Allison manual.
Harness connector (1829) cavity R to P	12 ± 1.5 volts	If voltage is incorrect, check for open or short to ground in circuits between (1829) cavity P and black ECU connector (7204) cavity 32. If circuits check good, ECU may be malfunctioning. Refer to the applicable Allison manual. If voltages are correct the shift selector may need replaced.

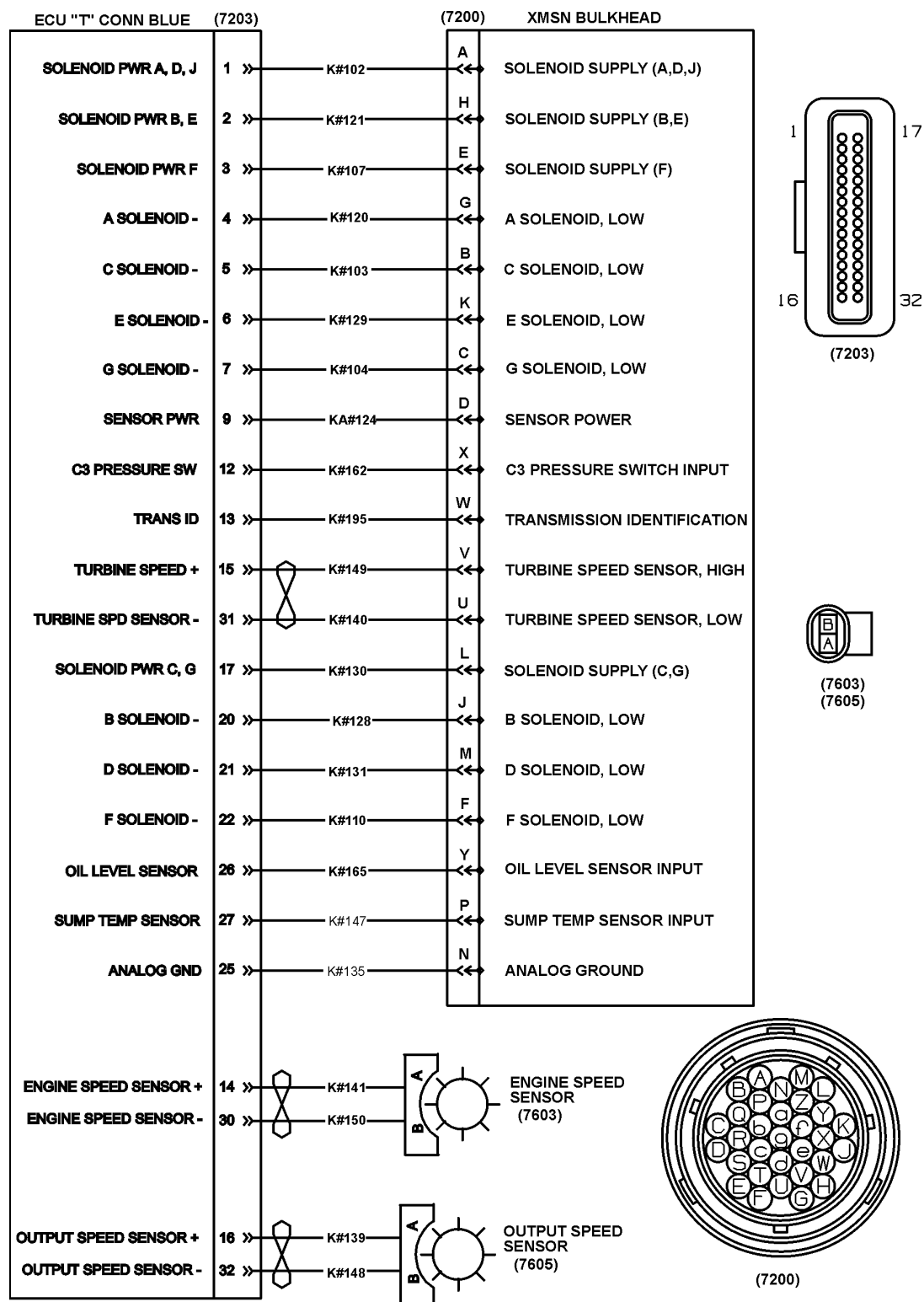


Figure 530 MD Transmission Input/Output Circuits — Always Refer to Circuit Diagram Book for Latest Circuit Information

- (7200) MD TRANSMISSION BULKHEAD
LOCATED AT ENGINE COMPARTMENT TRANSMISSION
- (7203) MD ECU "T" CONNECTOR BLUE
LOCATED AT ENGINE COMPARTMENT TRANSMISSION
- (7603) ENGINE SPEED SENSOR
LOCATED AT ENGINE COMPARTMENT TRANSMISSION
- (7605) OUTPUT SPEED SENSOR
LOCATED AT ENGINE COMPARTMENT TRANSMISSION

1.8. COMPONENT LOCATIONS

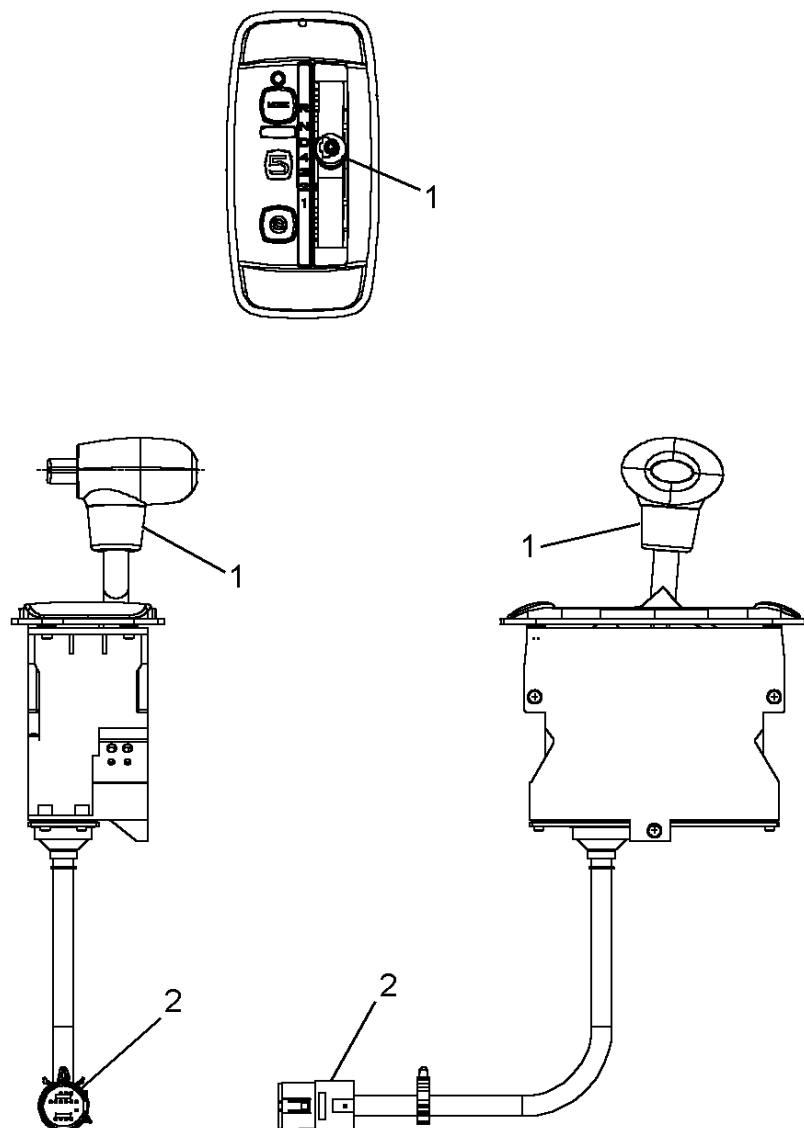


Figure 531 MD T-Bar Shift Control

- 1. SHIFT CONTROL LEVER
- 2. (1829) SHIFT SELECTOR CONNECTOR

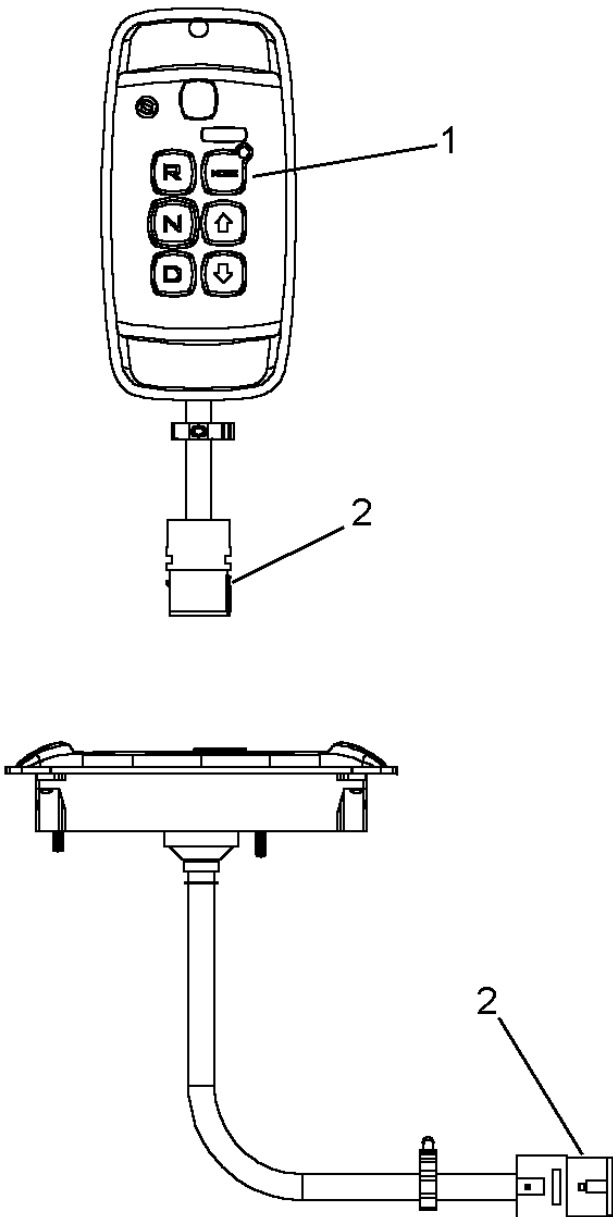


Figure 532 MD Push Button Shift Control

1. SHIFT CONTROL PUSH BUTTONS
2. (1829) SHIFT SELECTOR CONNECTOR

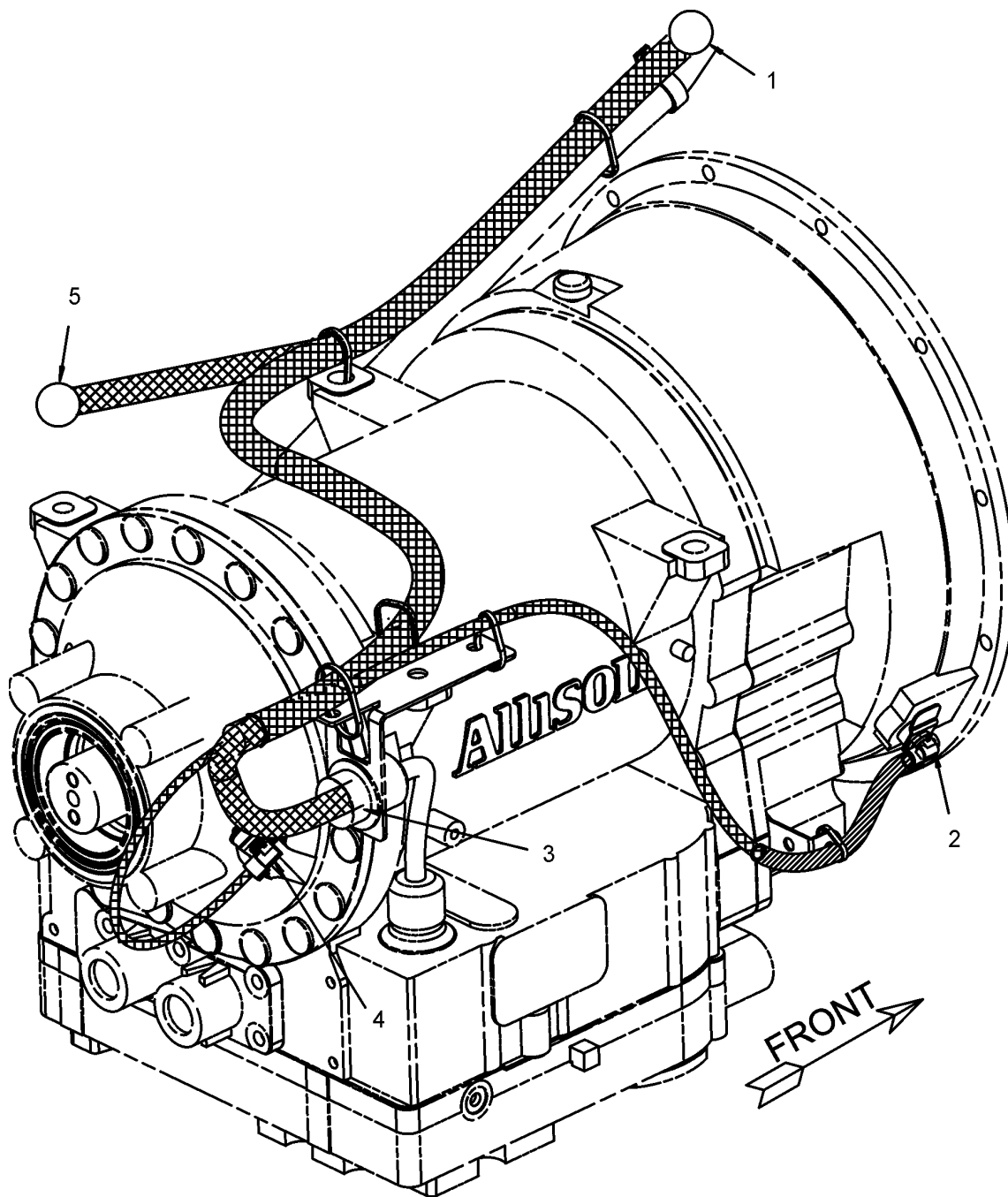


Figure 533 MD Transmission Wiring

1. TRANSMISSION HARNESS
2. ENGINE SPEED SENSOR (7603)
3. TRANSMISSION BULKHEAD CONNECTOR (7200)
4. OUTPUT SPEED SENSOR (7605)
5. TO ECU

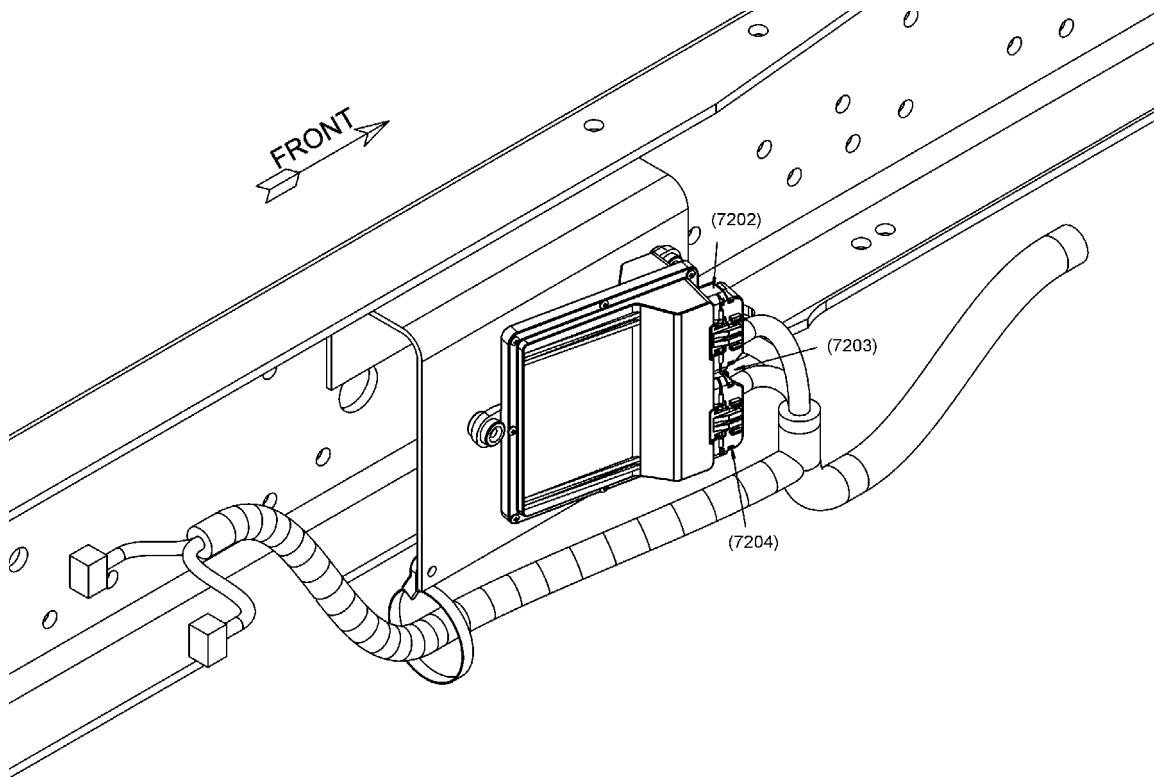


Figure 534 MD Transmission ECU Location

1. TO TRANSMISSION
2. ECU "S" CONNECTOR BLACK (7204)
3. ECU "V" CONNECTOR GREY (7202)
4. ECU "T" CONNECTOR BLUE (7203)
5. TO CHASSIS HARNESS

2. LCT TRANSMISSION

Discussion of the LCT transmission In this section is limited to the transmission control module (TCM) power circuits, data link connectivity, signals from the neutral safety back up (NSBU) switch and circuits to the shift selector control. For detailed information on transmission diagnostics, refer to the Allison service manual.

2.1. CIRCUIT FUNCTIONS

The LCT transmission interfaces with the vehicle electrical system via the transmission control module (TCM), the neutral safety back up (NSBU) switch and the shift selector control.

The TCM communicates on the drivetrain 1939 data link to interface with the engine controller, electrical system controller and the air ABS controller.

The NSBU, mounted on the transmission, is controlled by the gear select cable. It interfaces with the vehicle electrical system to provide a neutral signal to the engine controller. It also provides voltage for the back-up lights.

The shift selector has an integral economy switch. The switch will light when economy mode is selected.

2.2. DIAGNOSTICS

The ESC will log a DTC if communication with the TCM is lost.

The transmission control unit has its own diagnostic system which will turn on the “CHECK TRANS” lamp when there is a detectable fault. Diagnostic codes can only be read with the Allison Transmission Diagnostic Tool (ATDT) software. There are no provisions for flash codes. Refer to Allison troubleshooting manual TS3192EN for details.

A problem in the neutral start circuits will prevent the engine from cranking. Refer to Engine Cranking.

There are no diagnostic trouble codes (DTC's) associated with the back-up light circuits. A fault in the back-up light circuits will be apparent when the transmission is shifted into reverse and the lights do not come on.

Table 345 LCT Preliminary Check

STEP	KEY	ACTION	SPEC.	YES-IN SPEC.	NO-OUT OF SPEC.
1.	On	Does the engine crank when the transmission is in neutral?	Engine cranks when the transmission is in neutral.	Go to next step.	Refer to Engine Cranking.
2.	On	Are there any active DTC's associated with the transmission? Refer to Diagnostic Trouble Codes. (See DIAGNOSTIC TROUBLE CODES (DTC), page 1124)	Transmission communication DTC is active.	Go to next step.	Go to TCM Power and Data Link Circuits. (See TCM POWER AND DATA LINK CIRCUITS, page 1125)
3.	On	Does the “CHECK TRANS” lamp turn off after the vehicle is started.	Lamp turns off after vehicle is started.	Go to next step.	Refer to the applicable transmission service manual.
4.	On	Do the back-up lights come on when the transmission is shifted into reverse?	Back-up lights come on when in reverse.	Go to next step.	Go to Neutral And Back-Up Light Circuits. (See NEUTRAL AND BACK-UP LIGHT CIRCUITS, page 1129)
5.	On	Is the economy mode indicator in the economy switch illuminating when economy is selected.	Economy mode indicator illuminates when economy mode is selected.	Transmission circuits are functioning.	Go to Shift Selector Circuits. (See SHIFT SELECTOR CIRCUITS , page 1131)

2.3. DIAGNOSTIC TROUBLE CODES (DTC)

To display diagnostic codes, put the vehicle in diagnostic mode. Set the parking brake and turn the Ignition key “ON”. Then press the Cruise “ON” switch and the Cruise “Resume” switch. If no diagnostic trouble codes are present, the cluster odometer will display “NO FAULT”. If diagnostic trouble codes are present,

the gauge cluster will display the total number of faults and cycle to the next diagnostic trouble code after 10 seconds. To manually cycle through the diagnostic trouble code list, press the cluster display select/reset button. The last character of the diagnostic trouble code will end in "A" for active diagnostic trouble codes or "P" for previously active diagnostic trouble codes. Turning the ignition key off or releasing the park brake will take the ESC and the gauge cluster out of the diagnostic mode.

The previously active diagnostic trouble codes may be cleared, while in the diagnostic mode, by turning on the left turn signal and pressing the cruise on and set switches simultaneously.

Table 346 Transmission Communication Diagnostic Trouble Codes

DIAGNOSTIC TROUBLE CODE	FAULT DESCRIPTION
639 14 2 240	Electronic transmission controller communication has not been received

2.4. TCM POWER AND DATA LINK CIRCUITS

Fault Detection Management

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

A fault in the TCM Power & Data Link Circuits will be apparent when the instrument cluster display does not correspond to the shift selector position and the check electrical system lamp is illuminated. Problems in the power and data link circuits can be caused by open or short circuits, a blown fuse, failed switch, a problem in the ESC, a problem in circuits between the ESC and the solenoid module or a problem in the solenoid module.

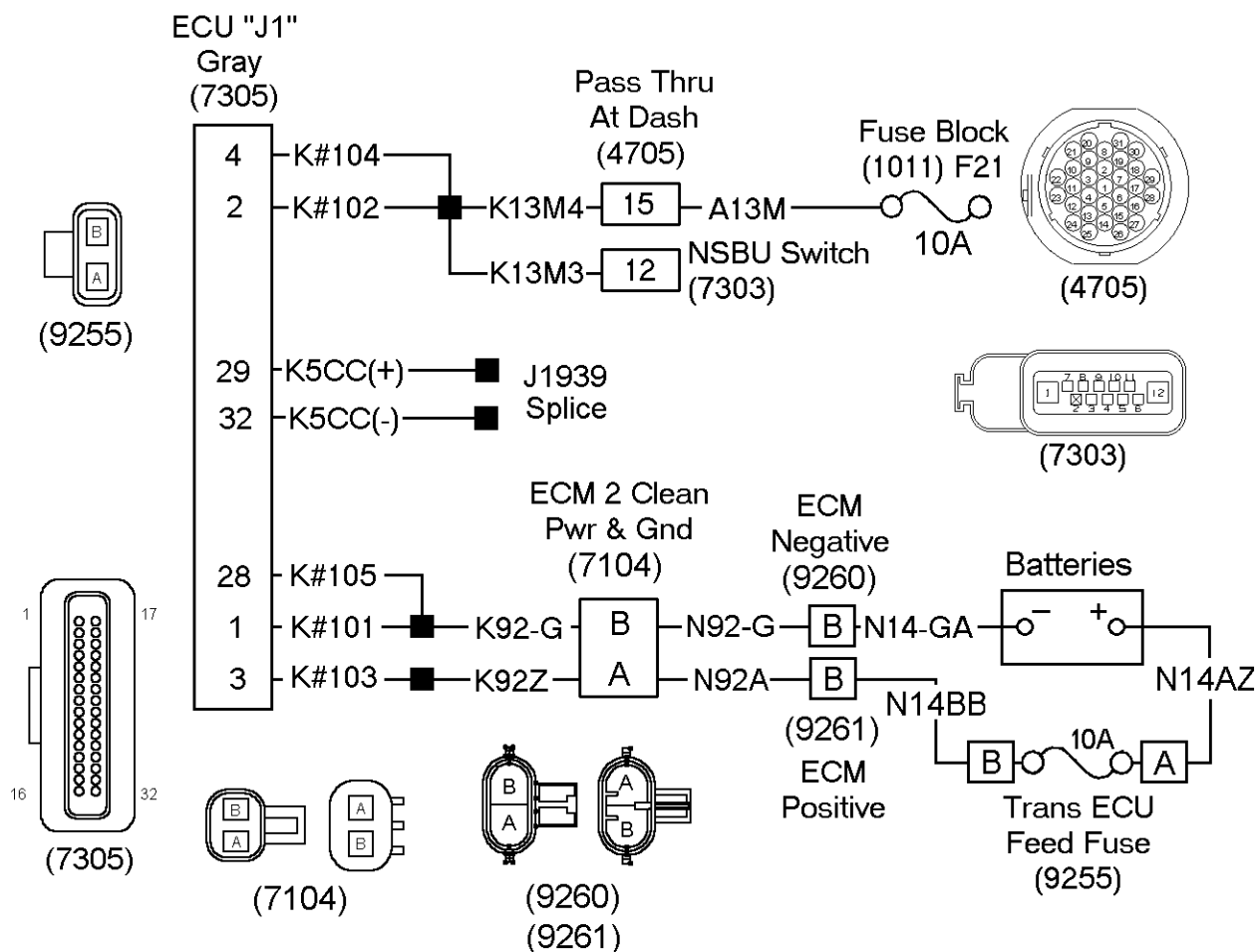


Figure 535 TCM Power and Data Link Circuits — Always Refer to Circuit Diagram Book for Latest Circuit Information

- (1011) FUSE BLOCK
LOCATED LEFT SIDE VEHICLE AT FLASHER PLATE
- (4705) PASS THRU AT DASH
LOCATED AT INSIDE DASH PANEL LEFT SIDE
- (7104) ECM2 CLEAN POWER AND GROUND
LOCATED AT BATTERY CABLES
- (7305) TCM TRANSMISSION J1 GRAY
LOCATED AT ENGINE COMPARTMENT TRANSMISSION
- (9255) TRANSMISSION ECU FEED FUSE
LOCATED AT BATTERY CABLES
- (9260) BATTERY ECM NEGATIVE
LOCATED AT BATTERY CABLES
- (9261) BATTERY ECM POSITIVE
LOCATED AT BATTERY CABLES

Table 347 TCM Power and Data Link Checks

TCM Connector (7305) Power Checks		
Check with ignition on and (7305) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals.		
Test Points	Spec.	Comments
TCM harness connector (7305), cavity 4 to ground	12 ± 1.5 volts	If voltage is incorrect, check for blown 10A fuse F21 or open or short to ground in circuit K#104, K13M4 or A13M. Also check for short to ground in circuit K13M3 to the NSBU Switch.
TCM harness connector (7305), cavity 2 to ground	12 ± 1.5 volts	If voltage is incorrect, check for blown 10A fuse F21 or open or short to ground in circuit K#104, K13M4 or A13M. Also check for short to ground in circuit K13M3 to the NSBU switch.
TCM harness connector (7305), cavity 3 to ground.	12 ± 1.5 volts	If voltage is incorrect, check for blown 10A transmission feed fuse (9255) or open or short to ground in circuit N14BB, N92A, K92Z, or K#103.
TCM harness connector (7305), cavity 3 to cavity 28.	12 ± 1.5 volts	If voltage is incorrect, check for open in circuit N14-GA, N92-G, K92-G or K#105.
TCM harness connector (7305), cavity 3 to cavity 1.	12 ± 1.5 volts	If voltage is incorrect, check for open in circuit N14-GA, N92-G, K92-G or K#101.
TCM Connector (7305) Data Link Checks		
Check with ignition on and (7305) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals.		
Test Points	Spec.	Comments
TCM harness connector (7305), cavity 29 to ground.	Approximately 2.5 volts	If voltage is missing check for open or short to ground in (+) data link circuits between harness connector and J1939 splice.
TCM harness connector (7305), cavity 32 to ground.	Approximately 2.5 volts	If voltage is missing check for open or short to ground between harness connector and J1939 splice.
If voltages are correct and TCM is not operating correctly, refer to the Allison 2000 service manual.		

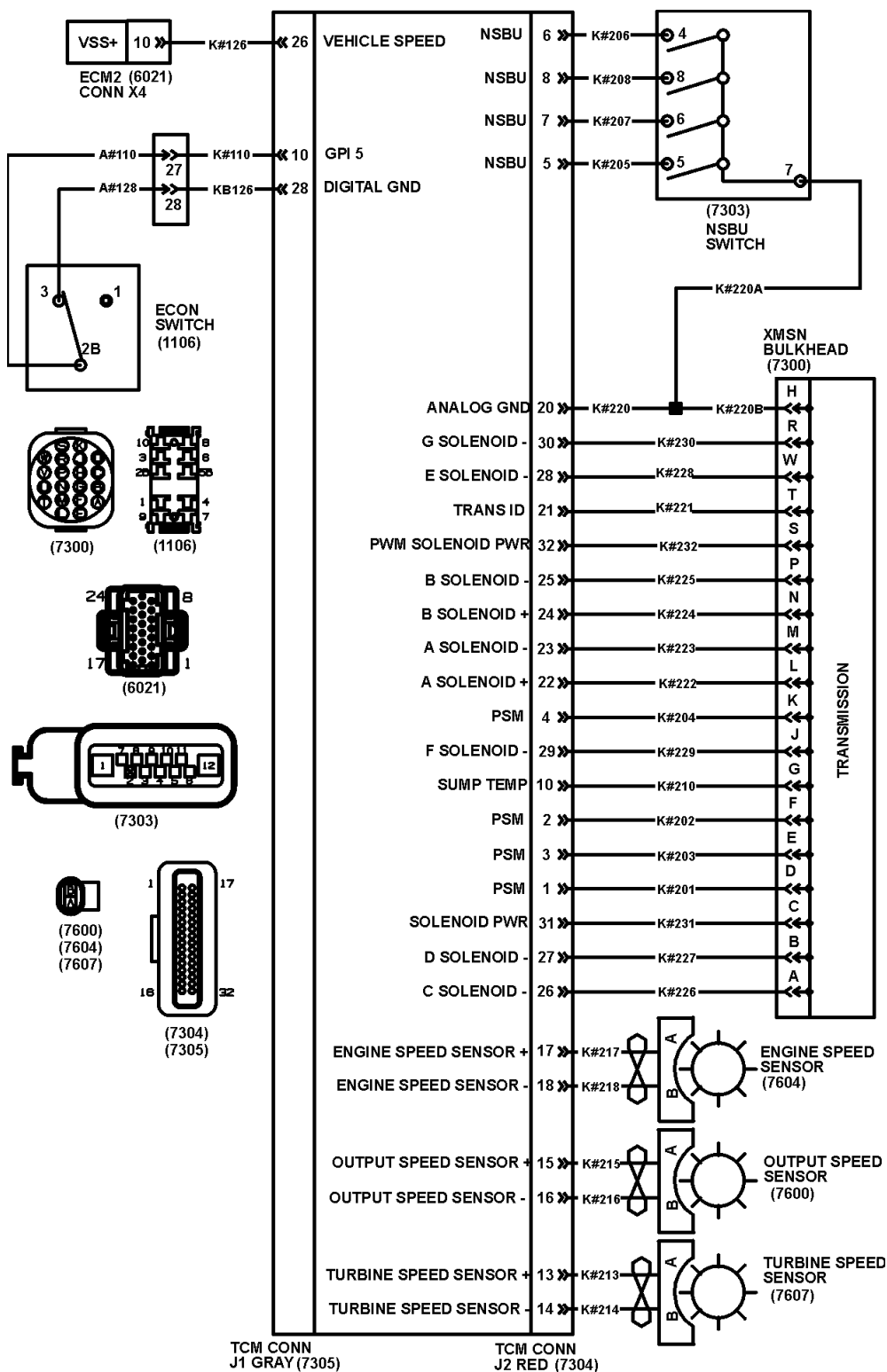


Figure 536 LCT Transmission Input/Output Circuits — Always Refer to Circuit Diagram Book for Latest Circuit Information

- (1106) ECON SWITCH
LOCATED AT INSTRUMENT CLUSTER
- (6021) ECM2 CONNECTOR — X4
LOCATED AT ENGINE COMPARTMENT AT ECM
- (7300) TRANSMISSION BULKHEAD
LOCATED AT ENGINE COMPARTMENT TRANSMISSION
- (7303) NSBU SWITCH
LOCATED AT ENGINE COMPARTMENT TRANSMISSION
- (7304) TCM TRANSMISSION J2 RED
LOCATED AT ENGINE COMPARTMENT TRANSMISSION
- (7305) TCM TRANSMISSION J1 GRAY
LOCATED AT ENGINE COMPARTMENT TRANSMISSION
- (7600) OUTPUT SPEED SENSOR
LOCATED AT ENGINE COMPARTMENT TRANSMISSION
- (7604) ENGINE SPEED SENSOR
LOCATED AT ENGINE COMPARTMENT TRANSMISSION
- (7607) TURBINE SPEED SENSOR
LOCATED AT ENGINE COMPARTMENT TRANSMISSION

Extended Description

Refer to the TCM Power & Data Link Circuits.

Ignition voltage to TCM connector (7305) cavity 4 and 2 from the 10 amp transmission fuse.

Battery voltage to TCM connector (7305) cavity 3 from the 10 amp transmission feed fuse.

Ground for the TCM is supplied to TCM connector (7305) cavities 1 and 28 from the battery negative terminal.

The drivetrain data link is connected to TCM connector (7305) cavities 29 and 32.

2.5. NEUTRAL AND BACK-UP LIGHT CIRCUITS

Fault Detection Management

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

A fault in the Neutral Safety Back Up (NSBU) Switch Circuits should be suspected when the engine will not start. Problems in the neutral circuits can be caused by open or short circuits, a blown fuse, a failed NSBU or a problem in the engine controller.

A shift cable connects the shift selector to the transmission gear select shaft. The NSBU is mounted on the shaft. When the shaft is in the neutral position the neutral contacts off the NSBU switch should close. When the shaft is in the reverse position, the back up light contacts of the NSBU should close.

A fault in the back-up circuits should be suspected when the back-up lights do not come on when the transmission is shifted into reverse. Problems in the back-up light circuits can be caused by open or short circuits, a blown fuse, or failed NSBU.

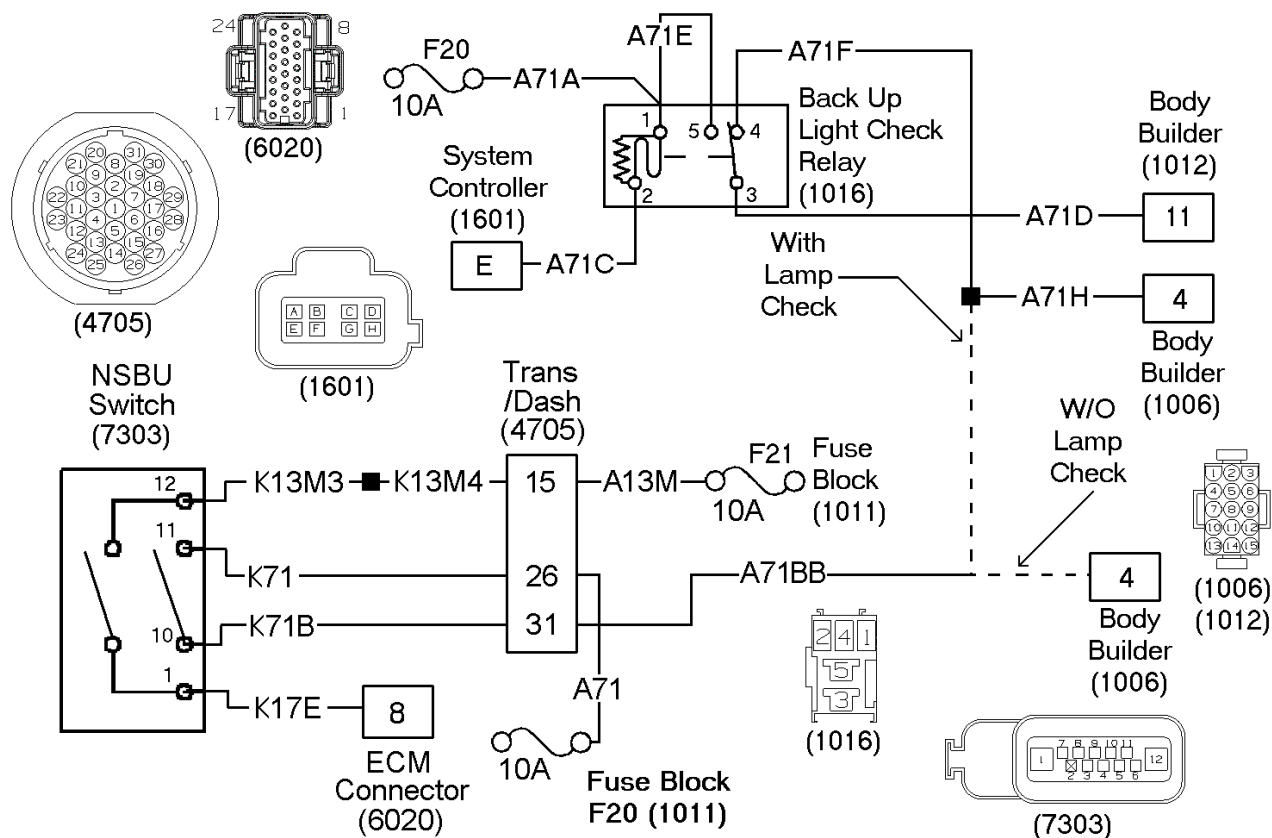


Table 348 Neutral And Back-Up Light Circuit Checks

NSBU Connector (7301) Power Checks		
Check with ignition on and (7301) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals.		
Test Points	Spec.	Comments
NSBU harness connector (7303), cavity 12 to ground.	12 ± 1.5 volts	If voltage is incorrect, check for blown 10A fuse F21 or open or short to ground in circuit A13M, K13M4 or K13M3.
NSBU harness connector (7303), cavity 12 to 1.	12 ± 1.5 volts	If voltage is incorrect, check for open in circuit L17E to the engine controller. Also check for proper signal from ECM (6020) cavity 8.
NSBU harness connector (7303), cavity 11 to ground.	12 ± 1.5 volts	If voltage is incorrect, check for blown 10A fuse F21 or open or short to ground in circuit A71 or K71.
NSBU harness connector (7303), cavity 11 to 10.	12 ± 1.5 volts	If voltage is incorrect, check for open in circuit K71B, A71BB, or A71F to the back up light check relay (1016).
If voltages are correct, consider replacing NSBU switch. Refer to the Allison 2000 Service manual		

Extended Description

Refer to the Neutral Safety Back Up (NSBU) Switch Circuits.

Ignition voltage is supplied to the NSBU switch connector (7303), terminal 12, neutral contacts from the 10 amp fuse F21.

When the transmission is shifted into neutral, the neutral switch will close supplying ignition voltage to the engine controller. The engine controller will use this signal to enable the engine to crank.

Ignition voltage is supplied to the NSBU switch connector (7303), terminal 11, back up light contacts from the 10 amp fuse F20.

When the transmission is shifted into reverse, the back up light switch will close supplying ignition voltage to power the back up lights.

2.6. SHIFT SELECTOR CIRCUITS**Fault Detection Management**

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

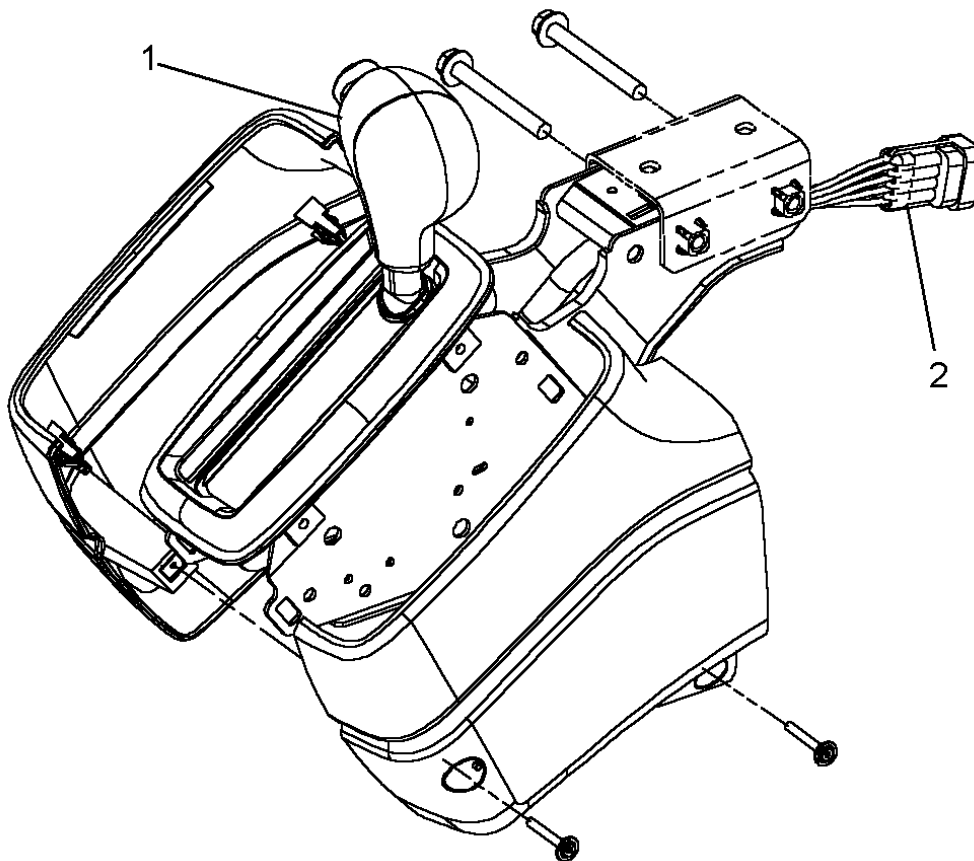


Figure 538 LCT Dash Mounted Shift Selector

1. SHIFT CONTROL LEVER
2. (1828) SHIFT SELECTOR CONNECTOR

A shift cable connects the shift selector to the transmission gear select shaft.

The Interlock for Shifter with Park Position feature will be controlled by the presence of the ignition signal, service brake applied signal, and transmission in park signal.

When the ignition signal is present, the transmission is in the 'Park' position, and the service brake is depressed, the relay driver, which sinks current through the shifter interlock solenoid, will be activated and the shifter interlock solenoid will unlock. When the shifter interlock solenoid unlocks, the transmission can be shifted out of the 'Park' position.

If the ignition signal is present and a loss of J1939 data occurs from the transmission to the ESC, then the relay driver that controls the shifter interlock solenoid will become active.

If the ignition signal is present and the service brake switch is faulty or stuck, then the relay driver that controls the shifter interlock solenoid will become active.

A fault in the Shift Selector Circuits should be suspected when the economy switch does not illuminate when it is selected. Problems in the selector circuits can be caused by open or short circuits, a blown fuse, or failure in the selector assembly.

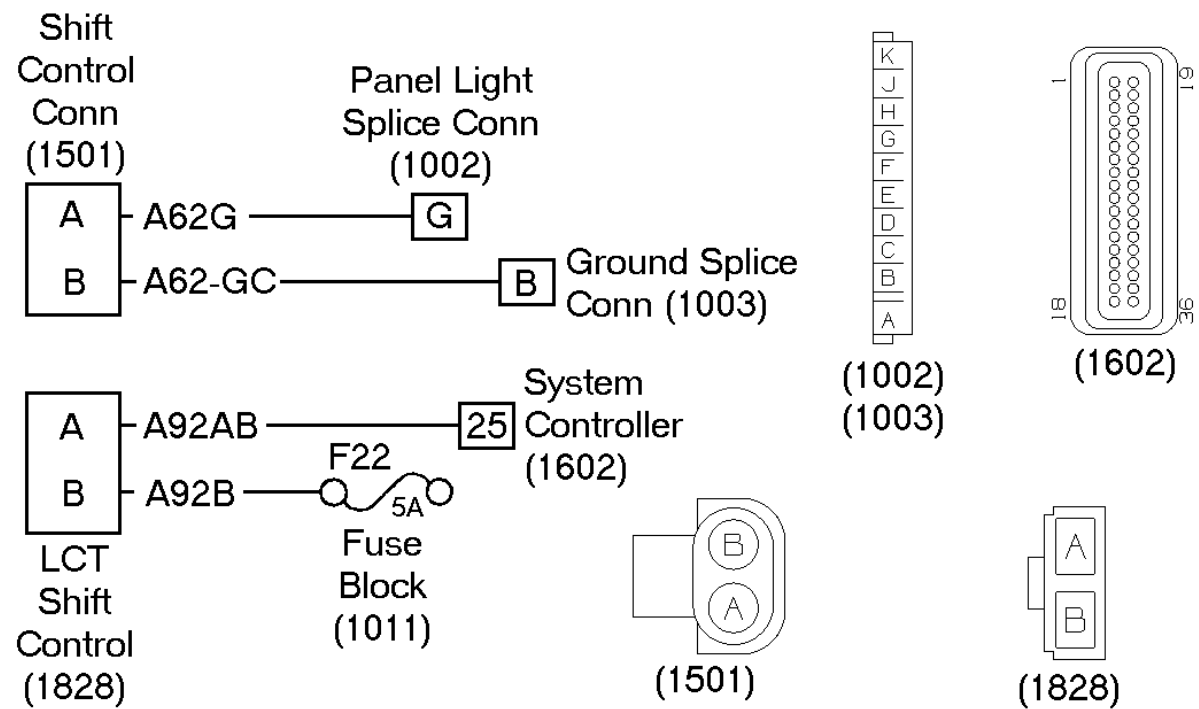


Figure 539 Shift Selector Circuits — Always Refer to Circuit Diagram Book for Latest Circuit Information

- (1002) PANEL LIGHT SPLICE CONNECTION
LOCATED LIFE SIDE INSTRUMENT PANEL
- (1003) GROUND SPLICE CONNECTION
LOCATED AT LEFT SIDE INSTRUMENT PANEL
- (1011) FUSE BLOCK
LOCATED LEFT SIDE VEHICLE AT FLASHER PLATE
- (1501) SHIFT CONTROL CONNECTION
LOCATED AT INSTRUMENT WING PANEL
- (1602) SYSTEM CONTROLLER
LOCATED AT INSIDE RIGHT SIDE DASH PANEL
- (1828) LCT SHIFT CONTROL
LOCATED AT INSTRUMENT WING PANEL

Table 349 Shift Selector Circuit Checks

LCT Shift Control Connector (1828) Power Checks
Check with ignition on and (1828) disconnected.
NOTE – Always check connectors for damage and pushed-out terminals.
NOTE – Always use breakout box ZTSE 4477 to take measurements on ESC connectors.

Table 349 Shift Selector Circuit Checks (cont.)

Test Points	Spec.	Comments
LCT shift control harness connector (1828), cavity B to ground.	12 ± 1.5 volts	If voltage is incorrect, check for blown fuse F22 or open or short to ground in circuit A92B.
LCT shift control harness connector (1828), cavity B to A.	12 ± 1.5 volts	If voltage is incorrect, check for open in circuit A92–AB to system controller (1602). Also ensure proper signal from ESC.
If voltages are correct and LCT shift control is not powered, consider replacing LCT shift control.		
<p align="center">Shift Selector Connector (1501) Power Checks</p> <p align="center">Check with ignition on, (1501) disconnected, and panel lights turned on.</p> <p>NOTE – Always check connectors for damage and pushed-out terminals.</p> <p>NOTE – Always use breakout box ZTSE 4477 to take measurements on ESC connectors.</p>		
Test Points	Spec.	Comments
Shift selector harness connector (1501), cavity A to ground.	12 ± 1.5 volts	If voltage is incorrect, check for open or short to ground in circuit A62G. Also check power circuits to panel light splice connection (1002).
Shift selector harness connector (1501), cavity A to B.	12 ± 1.5 volts	If voltage is incorrect, check for open or short to high in circuit A62–GC. Also ensure proper grounding of the ground splice connection (1003).
If voltages are correct and shift selector is not powered, consider replacing shift selector.		

Extended Description

Refer to the Shift Selector Circuits.

Power to the shift selector is provided to (1828) terminal B from fuse F22.

Ground from the ESC (1602) terminal 25 is provided to shift control (1828) terminal B, when the ignition key is on, the service brake pedal is depressed, and the transmission in park signal.

Power to the shift selector is provided to (1501) terminal A from the panel light splice connection (1002).

Ground to the shift selector is provided to (1501) terminal B from the ground splice connection (1003).

2.7. COMPONENT LOCATIONS

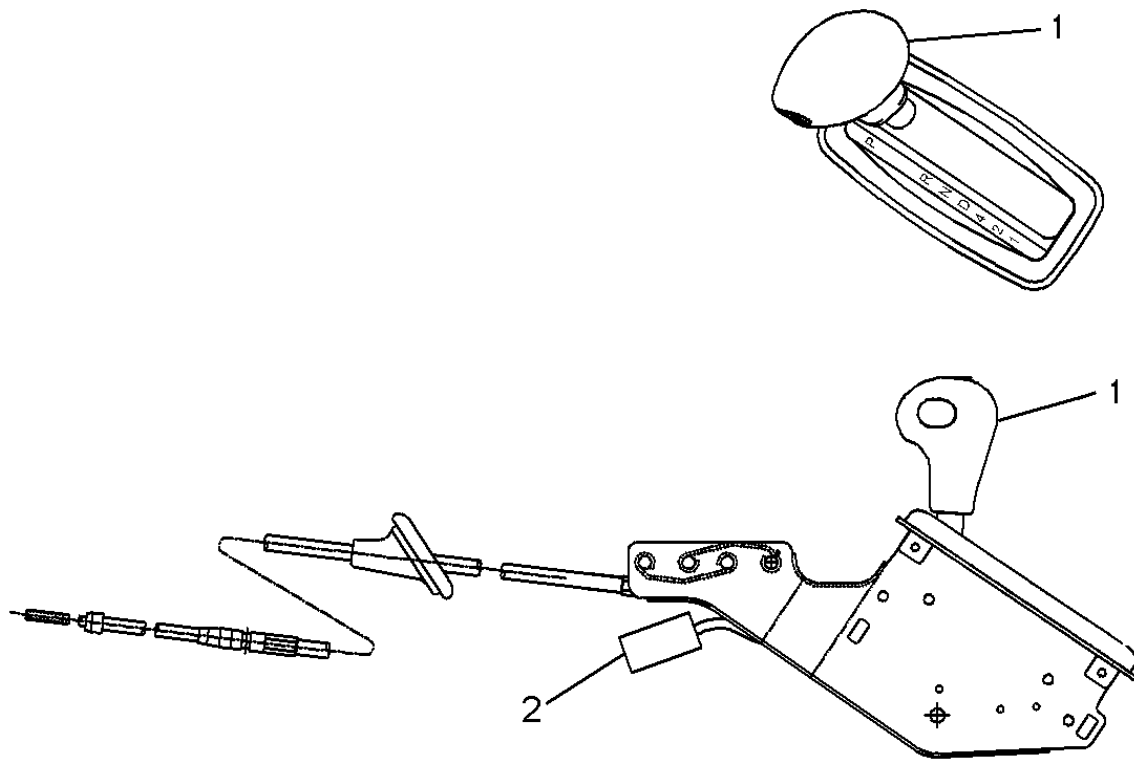


Figure 540 LCT Shift Control

1. SHIFT CONTROL LEVER
2. (1828) SHIFT SELECTOR CONNECTOR

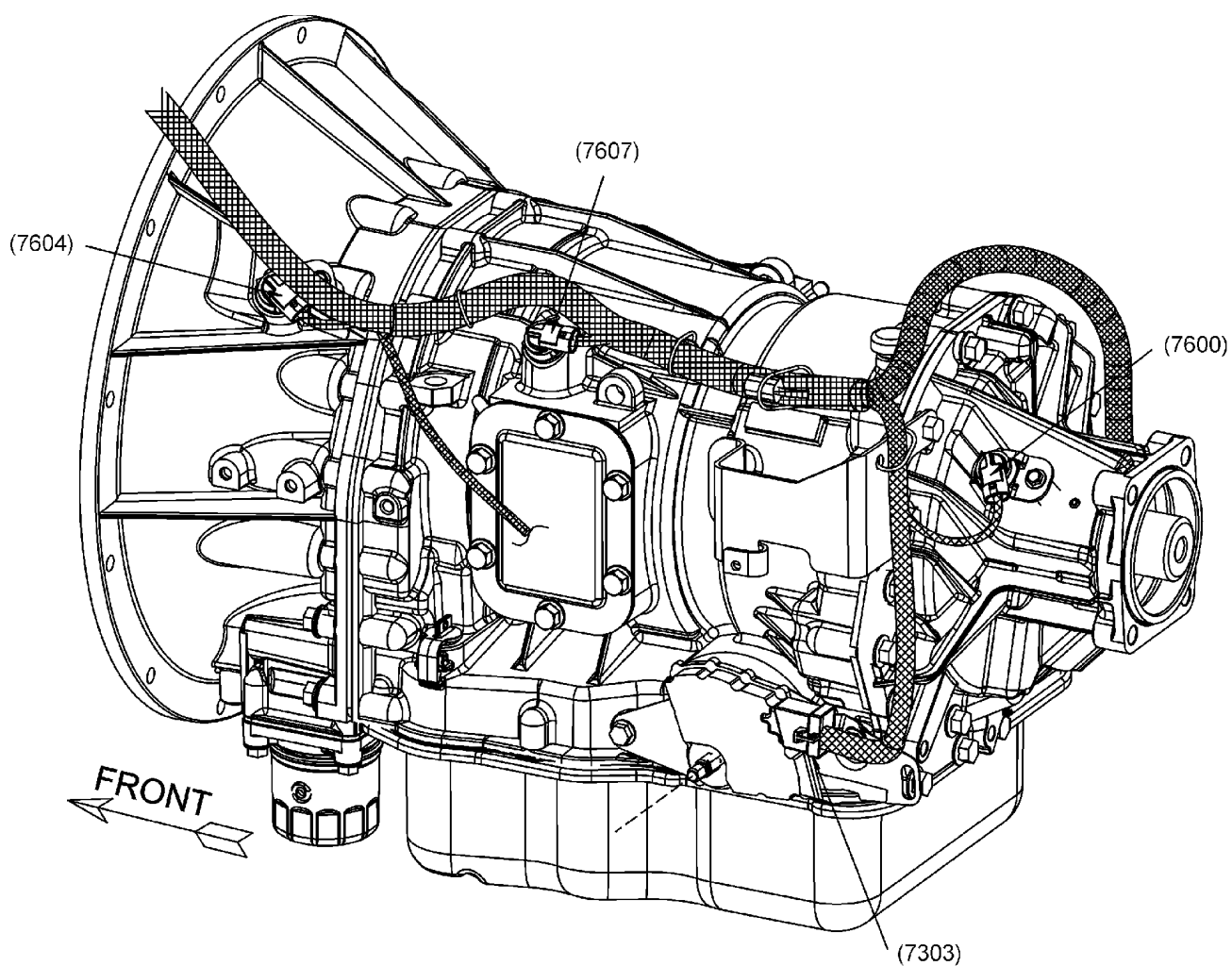


Figure 541 LCT Transmission

- (7303) NSBU SWITCH
- (7600) OUTPUT SPEED SENSOR
- (7604) ENGINE SPEED SENSOR
- (7607) TURBINE SPEED SENSOR

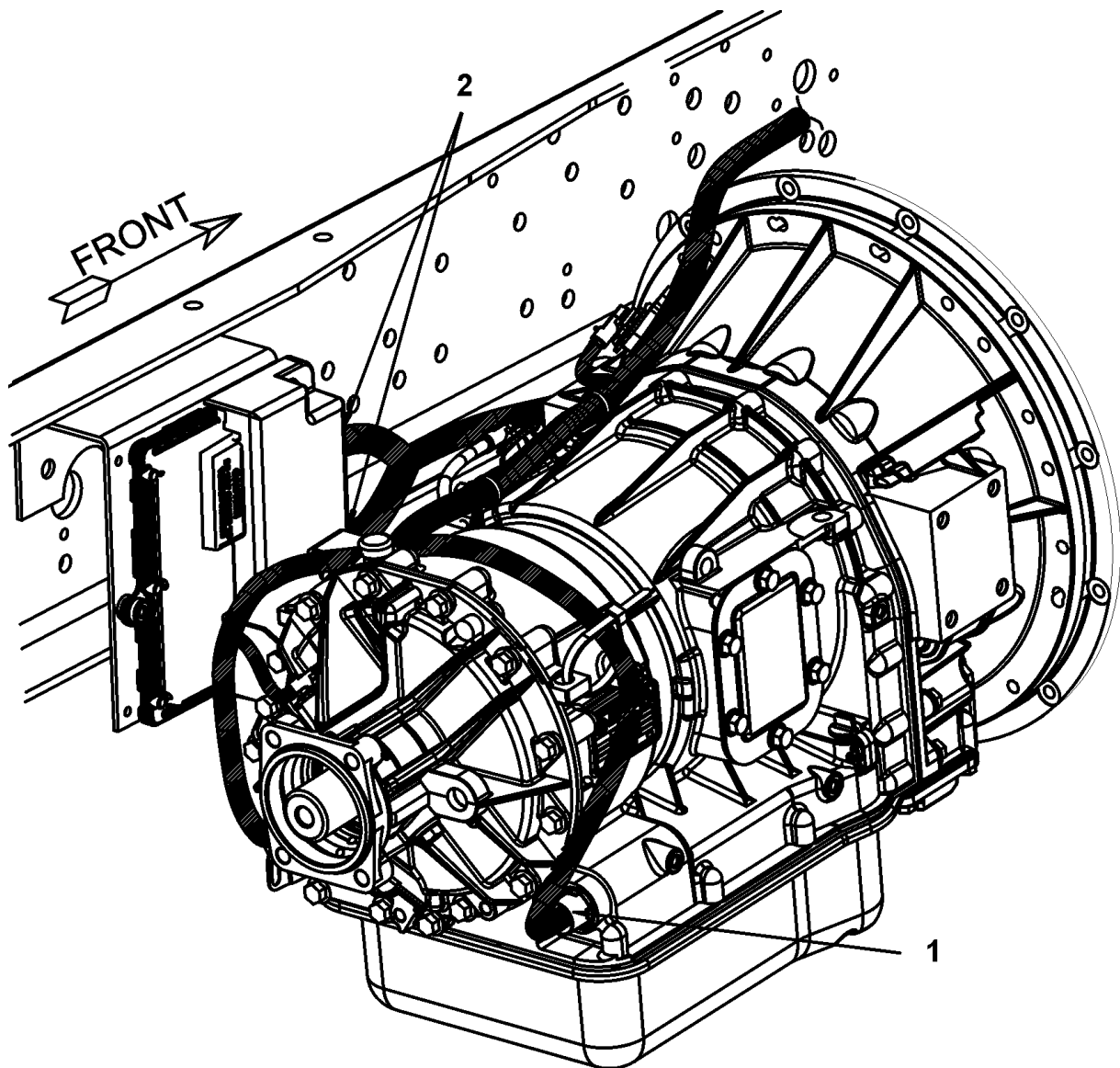


Figure 542 LCT Transmission Wiring

1. (7300) LCT TRANSMISSION BULKHEAD
2. (7304) (7305) TCM TRANSMISSION CONNECTORS

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1. HEATERS

1.1. CIRCUIT FUNCTIONS

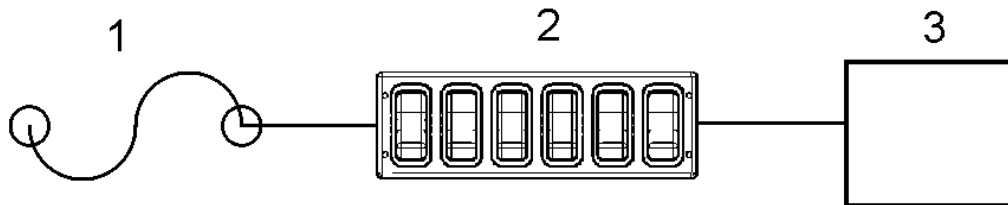


Figure 543 Heater Function Diagram

1. HEATER POWER SOURCE
2. HEATER CONTROL SWITCH
3. HEATER

There are several different heating options available on the bus. Make sure to use the appropriate section for the heating option that is being diagnosed.

1.2. DIAGNOSTICS

There are no diagnostic trouble codes associated with the heaters.

1.3. REAR HEATERS FAULT DETECTION MANAGEMENT

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

Problems in the heater circuits can be caused by a blown fuse, a short, an open, a faulty relay, or a faulty switch.

Rear Left Hand Side Single Switch Heater

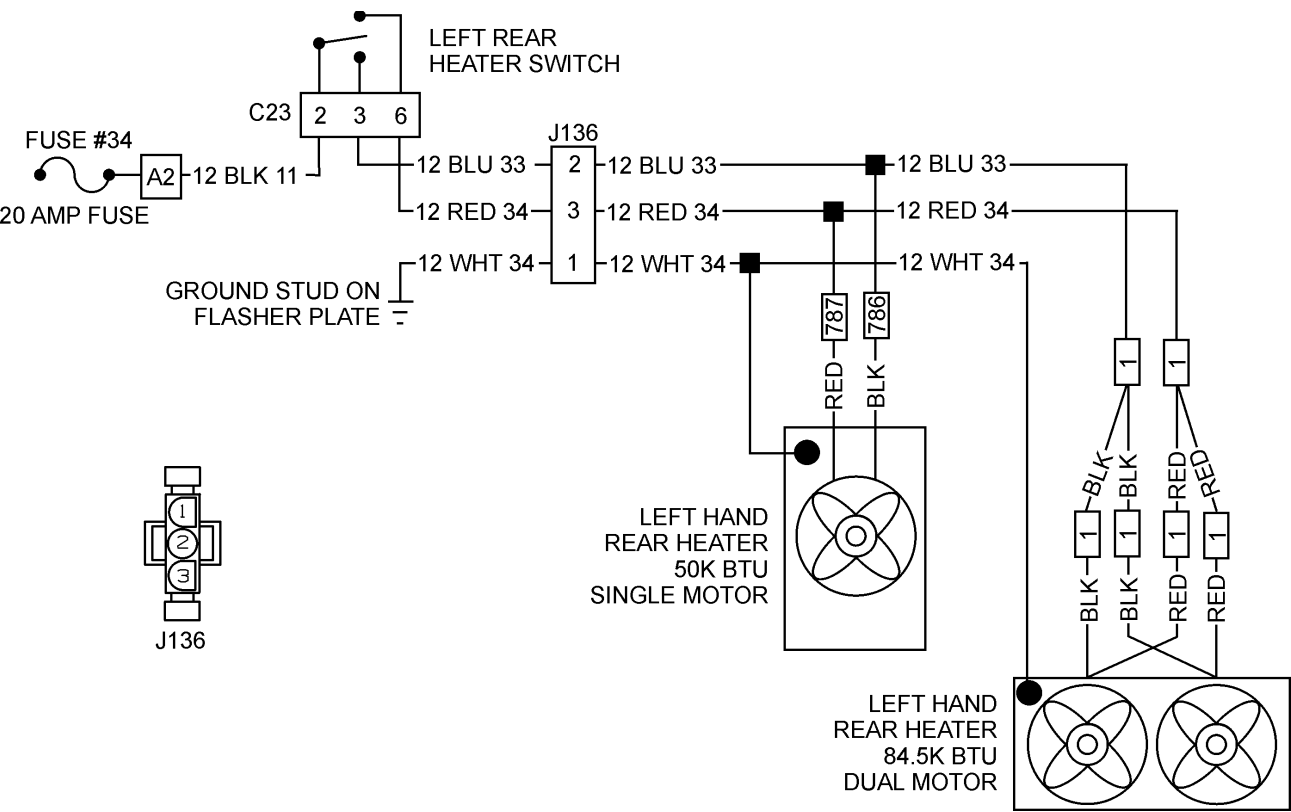


Figure 544 Rear Left Hand Side Single Switch Heater Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

J136 FLASHER PLATE TO HEATER

Table 350 Rear Left Hand Side Single Switch Heater Circuit Tests

Left Rear Heater Switch (C23) Voltage Test		
Check with ignition on, all heaters off and left rear heater switch connector (C23) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Left rear heater switch (C23) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #34, and for open or short in circuit 12 BLK 11.

Table 350 Rear Left Hand Side Single Switch Heater Circuit Tests (cont.)

Left rear heater switch (C23) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 BLU 33 and 12 WHT 34.
Left rear heater switch (C23) cavity 2 to 6.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 RED 34 and 12 WHT 34. If circuits check good and fault still exists, replace heater switch and check for faults. If switch is not faulty and heaters still do not work, replace heaters.

Rear Left Hand Side Dual Switch Heater

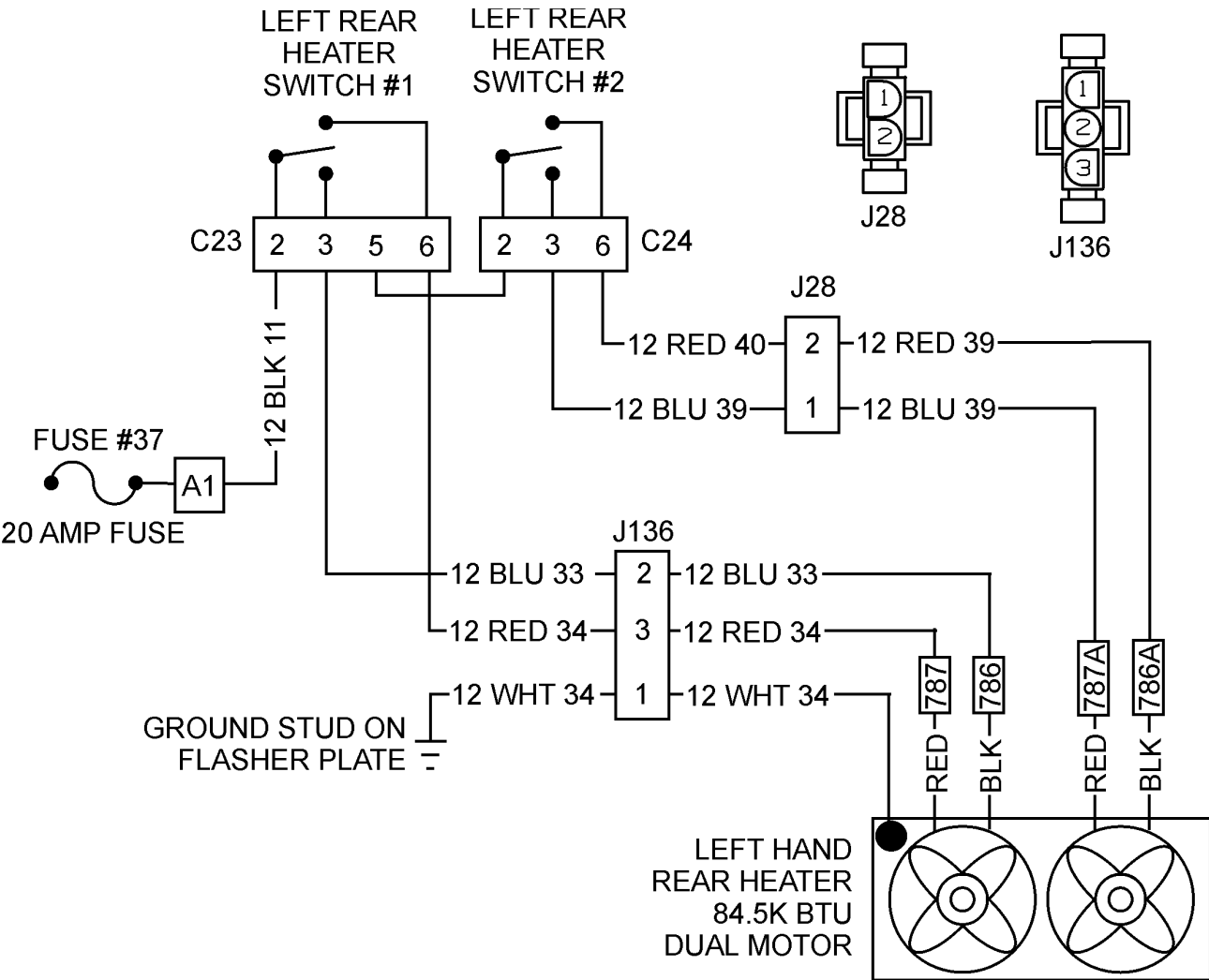


Figure 545 Rear Left Hand Side Dual Switch Heater Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

J28 FLASHER PLATE TO HEATER TRANSITION
J136 FLASHER PLATE TO HEATER

Table 351 Rear Left Hand Side Dual Switch Heater Circuit Tests

Left Rear Heater Switch #1 (C23) Voltage Test		
Check with ignition on, all heaters off and left rear heater switch connector (C23) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Left rear heater switch (C23) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #37, and for open or short in circuit 12 BLK 11.
Left rear heater switch (C23) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 BLU 33 and 12 WHT 34.
Left rear heater switch (C23) cavity 2 to 6.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 RED 34 and 12 WHT 34.
Left Rear Heater Switch #2 (C24) Voltage Test		
Check with ignition on, all heaters off and left rear heater switch connector (C24) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Left rear heater switch (C24) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #37, and for open or short in circuit 12 BLK 11.
Left rear heater switch (C24) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 BLU 39 and 12 WHT 34.
Left rear heater switch (C24) cavity 2 to 6.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 RED 40, 12 RED 39 and 12 WHT 34. If circuits check good and fault still exists, replace heater switch and check for faults. If switch is not faulty and heaters still do not work, replace heater.

Rear Right Hand Side Single Switch Heater

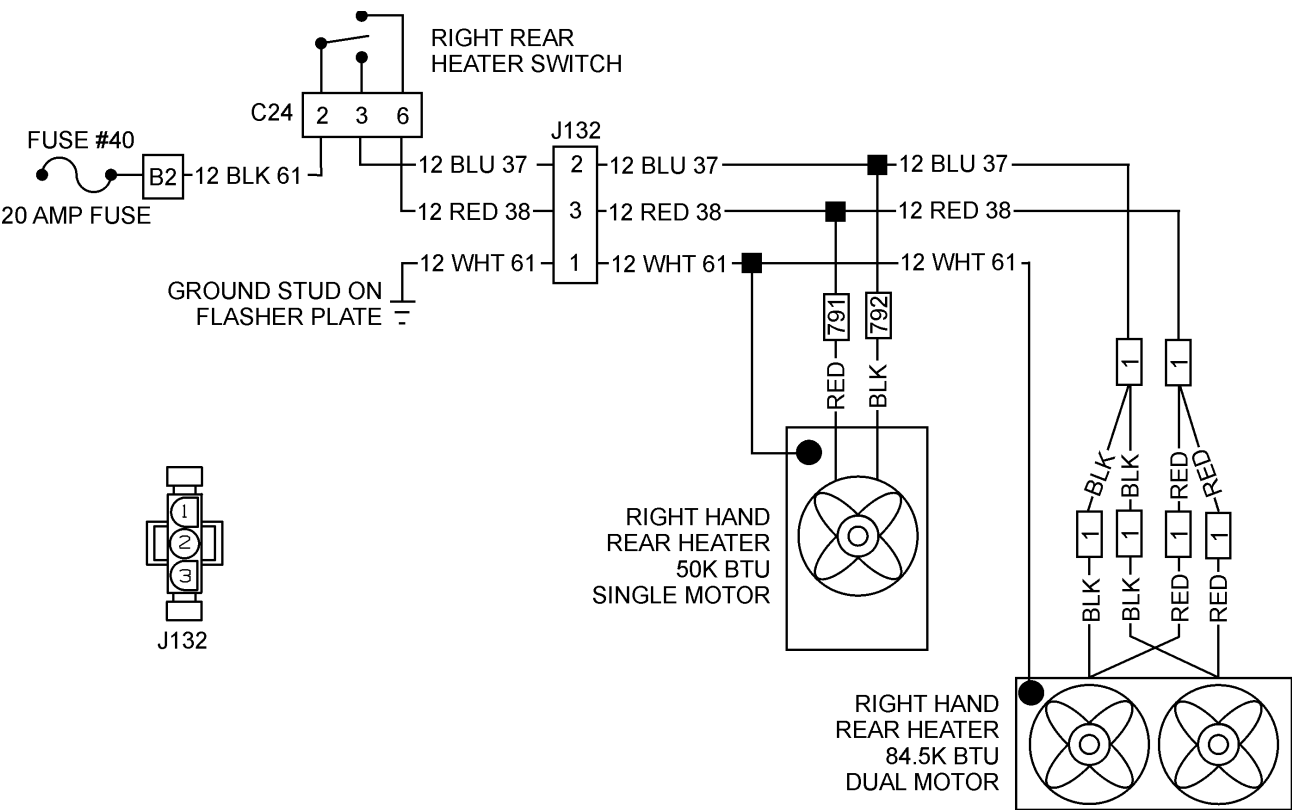


Figure 546 Rear Right Hand Side Single Switch Heater Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

J132 FLASHER PLATE TO HEATER

Table 352 Rear Right Hand Side Single Switch Heater Circuit Tests

Right Rear Heater Switch (C24) Voltage Test		
Check with ignition on, all heaters off and right rear heater switch connector (C24) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Right rear heater switch (C24) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #40, and for open or short in circuit 12 BLK 61.

Table 352 Rear Right Hand Side Single Switch Heater Circuit Tests (cont.)

Right rear heater switch (C24) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 BLU 37 and 12 WHT 61.
Right rear heater switch (C24) cavity 2 to 6.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 RED 38 and 12 WHT 61. If circuits check good and fault still exists, replace heater switch and check for faults. If switch is not faulty and heaters still do not work, replace heaters.

Rear Right Hand Side Dual Switch Heater

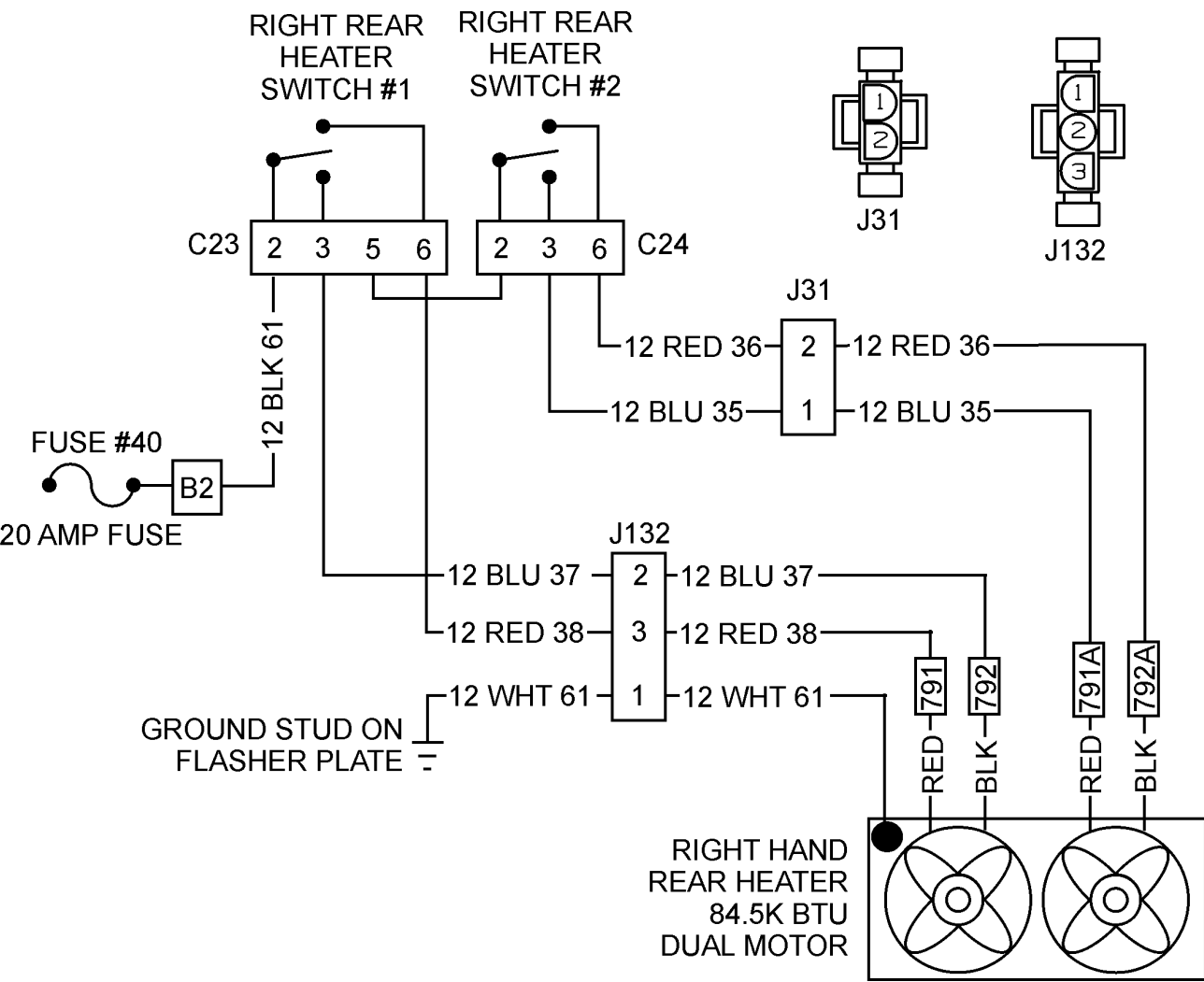


Figure 547 Rear Right Hand Side Dual Switch Heater Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

J31 FLASHER PLATE TO HEATER TRANSITION
J132 FLASHER PLATE TO HEATER

Table 353 Rear Right Hand Side Dual Switch Heater Circuit Tests

Right Rear Heater Switch #1 (C23) Voltage Test		
Check with ignition on, all heaters off and right rear heater switch connector (C23) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Right rear heater switch (C23) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #40, and for open or short in circuit 12 BLK 61.
Right rear heater switch (C23) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 BLU 37 and 12 WHT 61.
Right rear heater switch (C23) cavity 2 to 6.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 RED 38 and 12 WHT 61.
Right Rear Heater Switch #2 (C24) Voltage Test		
Check with ignition on, all heaters off and left rear heater switch connector (C24) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Right rear heater switch (C24) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #40, and for open or short in circuit 12 BLK 61.
Right rear heater switch (C24) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 BLU 35 and 12 WHT 61.
Right rear heater switch (C24) cavity 2 to 6.	12 ± 1.5 volts	<p>If voltage is missing, check for open or short in circuits 12 RED 36 and 12 WHT 61.</p> <p>If circuits check good and fault still exists, replace heater switch and check for faults.</p> <p>If switch is not faulty and heaters still do not work, replace heater.</p>

1.4. MID-SHIP AUXILIARY HEATERS FAULT DETECTION MANAGEMENT

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

Problems in the heater circuits can be caused by a blown fuse, a short, an open, a faulty relay, or a faulty switch.

Wiring diagram for the Left Hand Midship Heater. The diagram shows the electrical connections from a 20 AMP FUSE (FUSE #37) through a switch (C17) and a junction box (J135) to two heaters. The Left Hand Midship Heater is a 50K BTU Single Motor, and the Left Hand Midship Heater is an 84.5K BTU Dual Motor. The wiring includes 12 BLU 22, 12 RED 23, and 12 WHT 23 conductors. A ground stud on the flasher plate is also shown.

J135 FLASHER PLATE TO HEATER

Left Mid-Ship Heater Switch (C17) Voltage Test		
Check with ignition on, all heaters off and left mid-ship heater switch connector (C17) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Left mid-ship heater switch (C17) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #37, and for open or short in circuit 12 BLK 10.

Table 354 Mid-Ship Left Hand Side Single Switch Heater Circuit Tests (cont.)

Left mid-ship heater switch (C17) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 BLU 22 and 12 WHT 23.
Left mid-ship heater switch (C17) cavity 2 to 6.	12 ± 1.5 volts	<p>If voltage is missing, check for open or short in circuit 12 RED 23 and 12 WHT 23.</p> <p>If circuits check good and fault still exists, replace heater switch and check for faults.</p> <p>If switch is not faulty and heaters still do not work, replace heaters.</p>

Mid-Ship Left Hand Side Dual Switch Heater

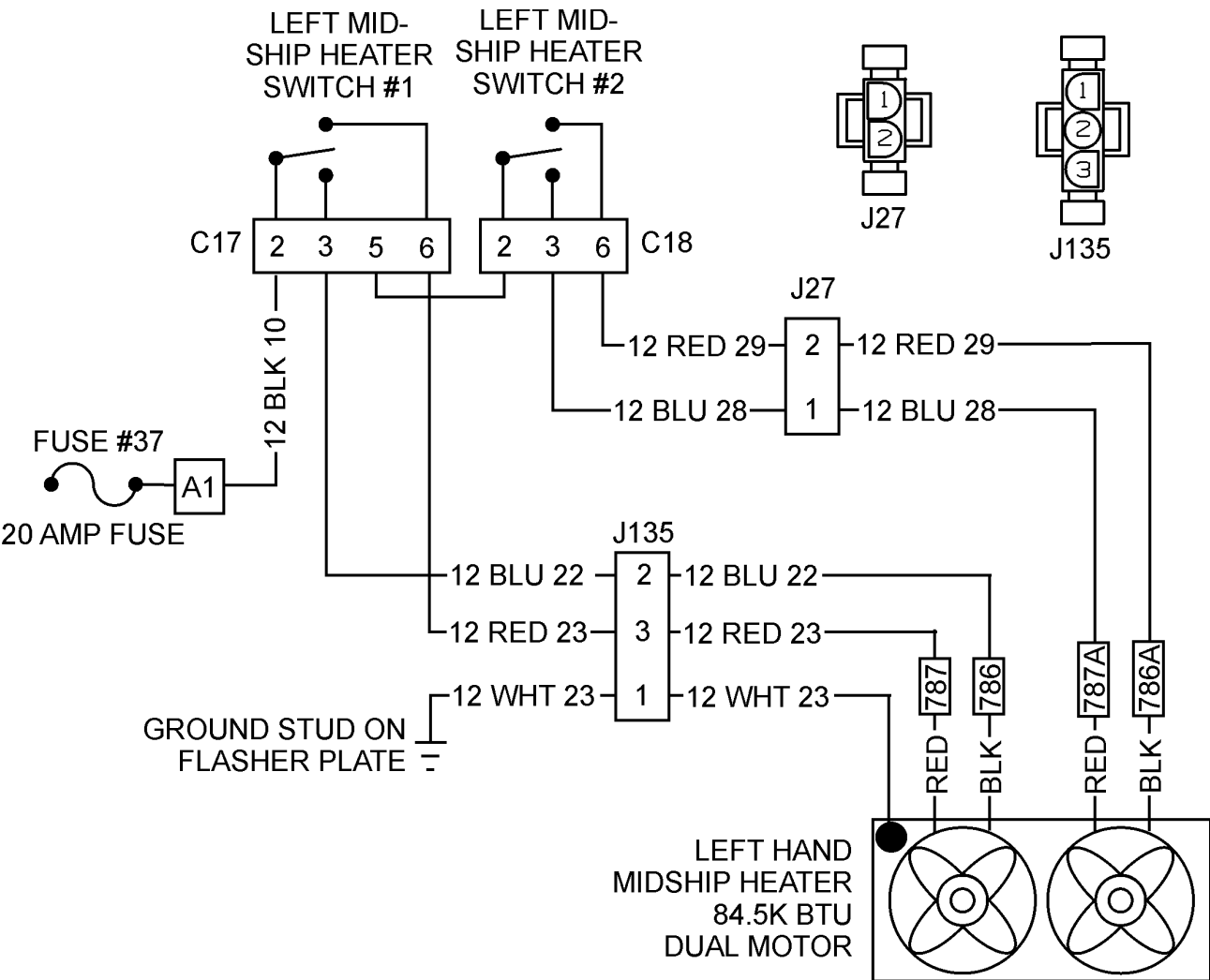


Figure 549 Mid-Ship Left Hand Side Dual Switch Heater Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

J27 FLASHER PLATE TO HEATER TRANSITION
J135 FLASHER PLATE TO HEATER

Table 355 Mid-Ship Left Hand Side Dual Switch Heater Circuit Tests

Left Mid-Ship Heater Switch #1 (C17) Voltage Test		
Check with ignition on, all heaters off and left mid-ship heater switch connector (C17) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Left mid-ship heater switch (C17) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #37, and for open or short in circuit 12 BLK 10.

Table 355 Mid-Ship Left Hand Side Dual Switch Heater Circuit Tests (cont.)

Left mid-ship heater switch (C17) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 BLU 22 and 12 WHT 23.
Left mid-ship heater switch (C17) cavity 2 to 6.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 RED 23 and 12 WHT 23.
<p align="center">Left Mid-Ship Heater Switch #2 (C18) Voltage Test</p> <p>Check with ignition on, all heaters off and left mid-ship heater switch connector (C18) disconnected.</p> <p>NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.</p>		
Test Points	Spec.	Comments
Left mid-ship heater switch (C18) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #37, and for open or short in circuit 12 BLK 10.
Left mid-ship heater switch (C18) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 BLU 28 and 12 WHT 23.
Left mid-ship heater switch (C18) cavity 2 to 6.	12 ± 1.5 volts	<p>If voltage is missing, check for open or short in circuits 12 RED 29 and 12 WHT 23.</p> <p>If circuits check good and fault still exists, replace heater switch and check for faults.</p> <p>If switch is not faulty and heaters still do not work, replace heater.</p>

Mid-Ship Right Hand Side Single Switch Heater

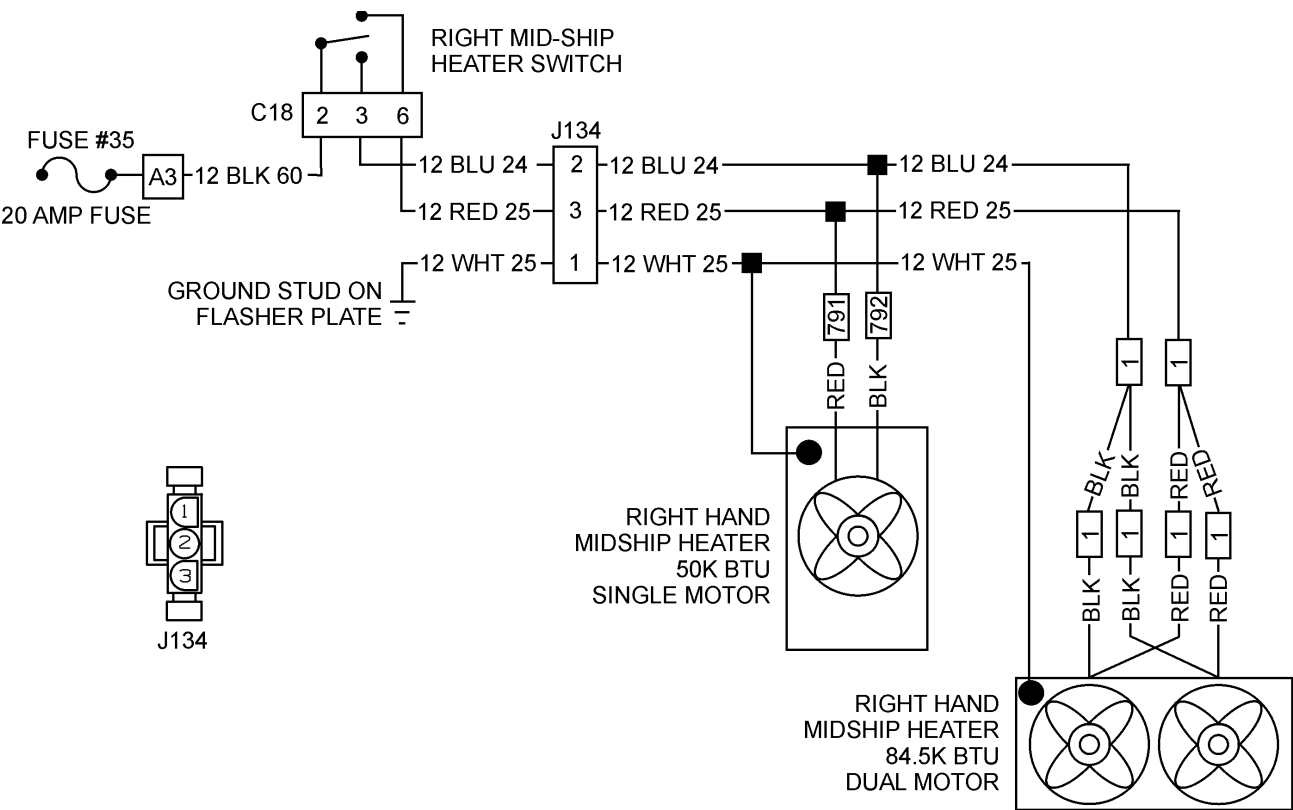


Figure 550 Mid-Ship Right Hand Side Single Switch Heater Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

J134 FLASHER PLATE TO HEATER

Table 356 Mid-Ship Right Hand Side Single Switch Heater Circuit Tests

Right Mid-Ship Heater Switch (C24) Voltage Test		
Check with ignition on, all heaters off and right mid-ship heater switch connector (C18) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Right mid-ship heater switch (C18) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #35, and for open or short in circuit 12 BLK 60.

Table 356 Mid-Ship Right Hand Side Single Switch Heater Circuit Tests (cont.)

Right mid-ship heater switch (C18) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 BLU 24 and 12 WHT 25.
Right mid-ship heater switch (C18) cavity 2 to 6.	12 ± 1.5 volts	<p>If voltage is missing, check for open or short in circuit 12 RED 25 and 12 WHT 25.</p> <p>If circuits check good and fault still exists, replace heater switch and check for faults.</p> <p>If switch is not faulty and heaters still do not work, replace heaters.</p>

RIGHT MID-SHIP HEATER SWITCH #1

RIGHT MID-SHIP HEATER SWITCH #2

C17

C18

J30

J135

FUSE #35

20 AMP FUSE

A3

12 BLK 60

12 RED 27

12 BLU 26

12 BLU 24

12 RED 25

12 WHT 25

12 BLU 22

12 RED 23

12 WHT 25

RED 791

BLK 792

RED 791A

BLK 792A

GROUND STUD ON FLASHER PLATE

RIGHT HAND MIDSHIP HEATER
84.5K BTU
DUAL MOTOR

J30 FLASHER PLATE TO HEATER TRANSITION
J135 FLASHER PLATE TO HEATER

Right Mid-Ship Heater Switch #1 (C17) Voltage Test		
Check with ignition on, all heaters off and right mid-ship heater switch connector (C17) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Right mid-ship heater switch (C17) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #35, and for open or short in circuit 12 BLK 60.

Table 357 Mid-Ship Right Hand Side Dual Switch Heater Circuit Tests (cont.)

Right mid-ship heater switch (C17) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 BLU 24, 12 BLU 22 and 12 WHT 25.
Right mid-ship heater switch (C17) cavity 2 to 6.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 RED 25, 12 RED 23 and 12 WHT 25.
<p align="center">Right Mid-Ship Heater Switch #2 (C18) Voltage Test</p> <p>Check with ignition on, all heaters off and left mid-ship heater switch connector (C18) disconnected.</p> <p>NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.</p>		
Test Points	Spec.	Comments
Right mid-ship heater switch (C18) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #35, and for open or short in circuit 12 BLK 60.
Right mid-ship heater switch (C18) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 BLU 26 and 12 WHT 25.
Right mid-ship heater switch (C18) cavity 2 to 6.	12 ± 1.5 volts	<p>If voltage is missing, check for open or short in circuits 12 RED 27 and 12 WHT 25.</p> <p>If circuits check good and fault still exists, replace heater switch and check for faults.</p> <p>If switch is not faulty and heaters still do not work, replace heater.</p>

1.5. STEPWELL HEATERS FAULT DETECTION MANAGEMENT

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

Problems in the heater circuits can be caused by a blown fuse, a short, an open, a faulty relay, or a faulty switch.

Step Warmer

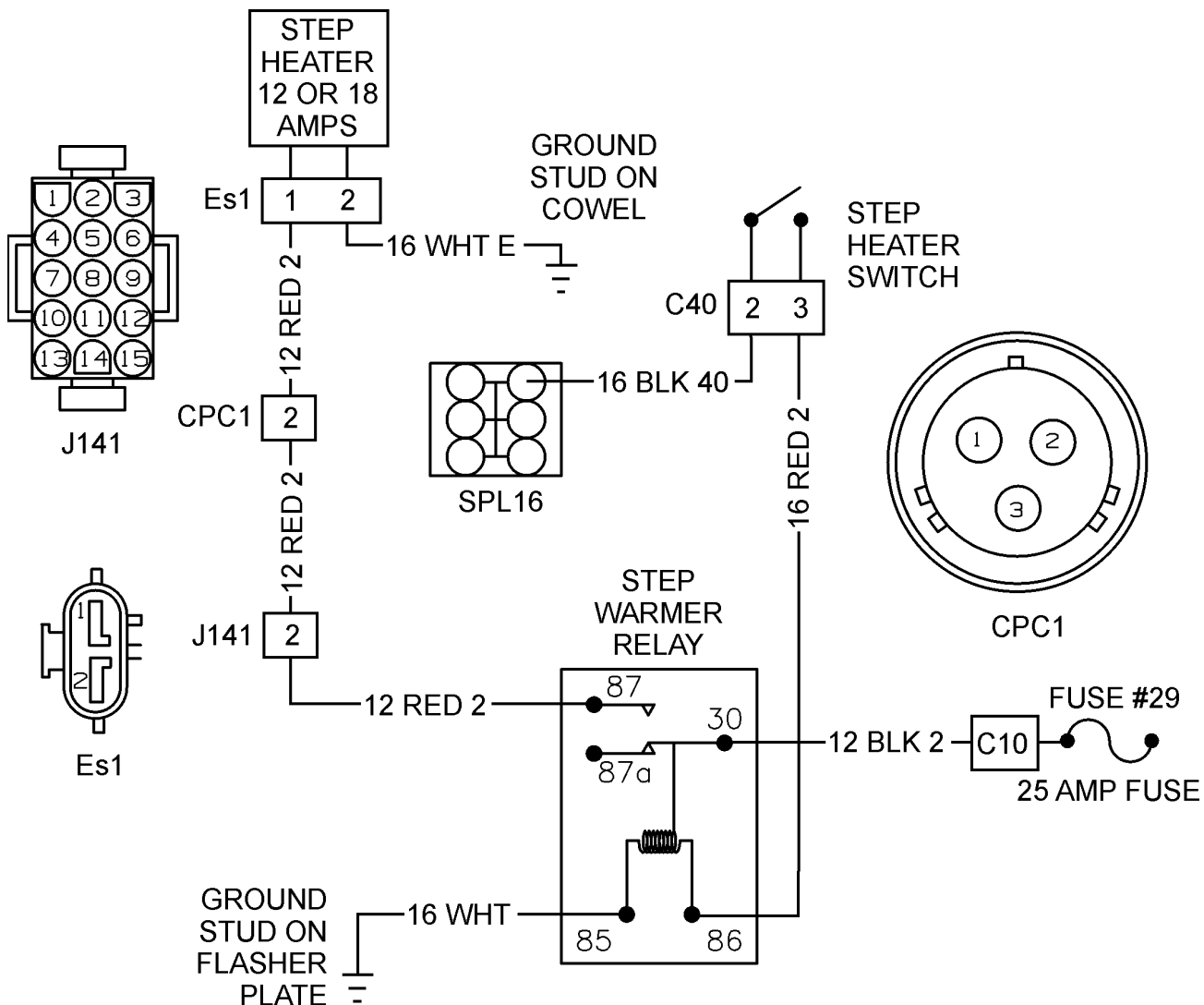


Figure 552 Step Warmer Circuit Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

CPC1 DASH AND TOE HARNESS TO SEALED ENGINE HARNESS
 ES1 SEALED ENGINE TO BOTTOM STEP WARMER
 J141 FLASHER PLATE TO DASH AND TOE
 SPL16 IGNITION ACCESSORY FEED SPLICE

Table 358 Step Warmer Circuit Tests

Step Warmer Relay Voltage Test		
Check with ignition on, step warmer off and step warmer relay removed.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Bench check relay. If relay fails, replace and check for faults.		
Test Points	Spec.	Comments
Step warmer relay cavity 86 to ground.	0 volts	If voltage is present, check for short in circuit 16 RED 2.
While meter is still connected to step warmer relay from cavity 86 to ground, activate step warmer by closing step warmer switch (C40).		
Step warmer relay cavity 86 to ground.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 16 RED 2 and 16 BLK 40. Also check for proper voltage feed to splice 16 by referring to the Accessory Power Feed section of this manual. (See ACCESSORY POWER DISTRIBUTION, page 38)
Step warmer relay cavity 86 to 85.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 16 WHT.
Step warmer relay cavity 30 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #29. Also check for open or short in circuit 12 BLK 2.
Step warmer relay cavity 30 to 87.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 RED 2.
Step Warmer Connector (ES1) Voltage Test		
Check with ignition on, step warmer off, step warmer relay installed and step warmer connector (ES1) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Step warmer connector (ES1) cavity 1 to ground.	0 volts	If voltage is present, check for short in circuit 12 RED 2.
While meter is still connected to step warmer connector (ES1) from cavity 1 to ground, activate step warmer by closing step warmer switch (C40).		
Step warmer connector (ES1) cavity 1 to ground.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 RED 2.
Step warmer connector (ES1) cavity 1 to 2.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 16 WHT E.

Stepwell Heater

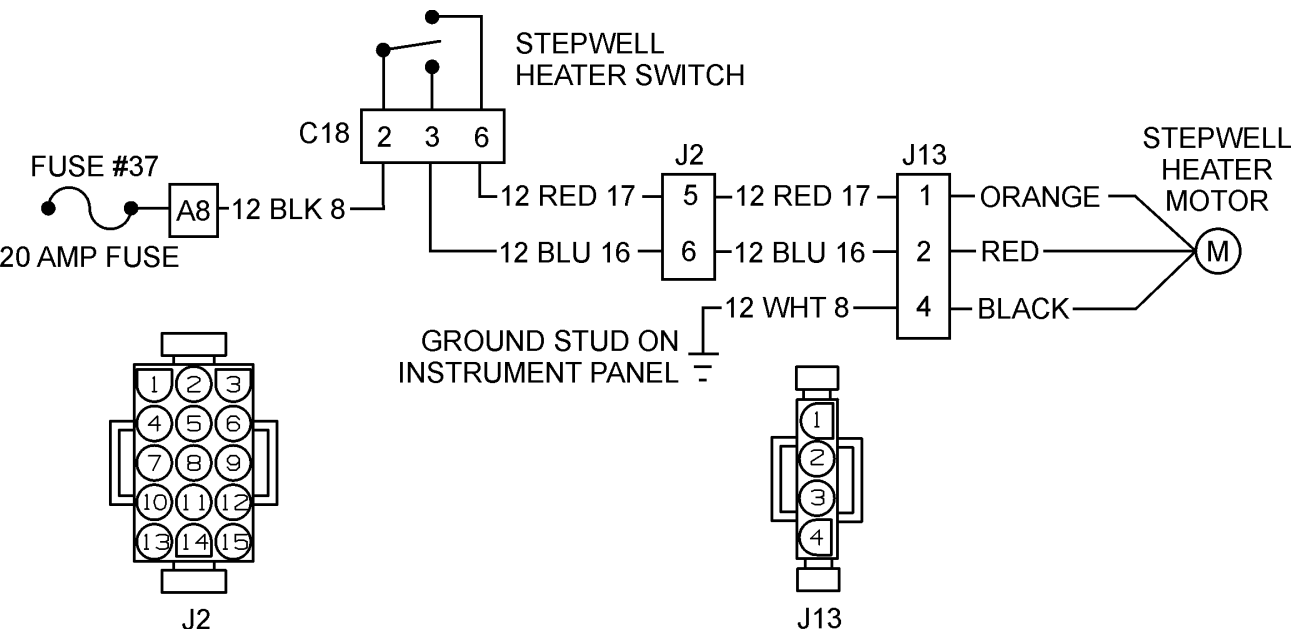


Figure 553 Stepwell Heater Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

J2 FLASHER PLATE TO DASH
J13 STEPWELL HEATER MOTOR TO DASH

Table 359 Stepwell Heater Circuit Tests

Stepwell Heater Switch (C18) Voltage Test		
Check with ignition on, all heaters off and stepwell heater switch connector (C18) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Stepwell heater switch (C18) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #37, and for open or short in circuit 12 BLK 8.
Stepwell heater switch (C18) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 12 BLU 16 and 12 WHT 8.
Stepwell heater switch (C18) cavity 2 to 6.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 RED 17 and 12 WHT 8.

Stepwell Heater Wired to Defrost Fan Switch

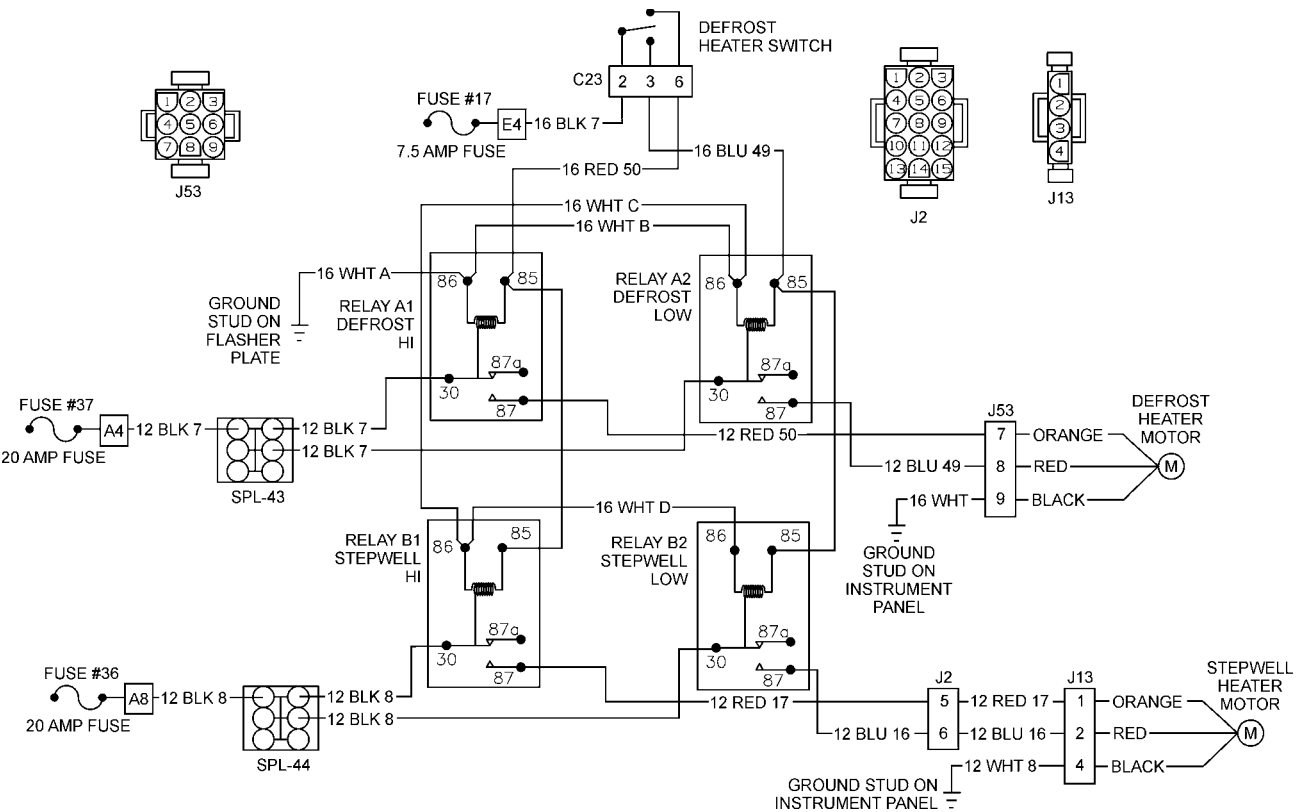


Figure 554 Stepwell Heater Wired to Defrost Fan Switch Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

- J2 FLASHER PLATE TO DASH
- J13 STEPWELL HEATER MOTOR TO DASH
- J53 DRIVER'S HEATER CABINET TO LEFT HAND SWITCH PANEL

Table 360 Stepwell Heater Wired to Defrost Fan Switch Circuit Tests

Relay A1 Defrost Hi Voltage Test		
Check with ignition on, all heaters off, relay A1 defrost HI removed and all other relays installed.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Bench check relay. If relay fails, replace and check for faults.		
Test Points	Spec.	Comments
Relay A1 defrost Hi cavity 85 to ground.	0 volts	If voltage is present, check for open or short in circuit 16 RED 50.
While meter is still connected to relay A1 defrost Hi from cavity 85 to ground, activate the hi defrost fan by closing the defrost heater switch (C23) in the hi position.		

Table 360 Stepwell Heater Wired to Defrost Fan Switch Circuit Tests (cont.)

Relay A1 defrost Hi cavity 85 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #17. Also check for open or short in circuits 16 RED 50 and 16 BLK 7. Also perform continuity checks on Defrost Heater Switch C23.
Leave defrost switch in hi.		
Relay A1 defrost Hi cavity 85 to 86.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 16 WHT A.
Relay A1 defrost Hi cavity 30 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #37. Also check for open or short in circuit 12 BLK 7.
Relay A1 defrost Hi cavity 30 to 87.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 RED 50.
Relay A2 Defrost Low Voltage Test Check with ignition on, all heaters off, relay A2 defrost LOW removed and all other relays installed. NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion. Bench check relay. If relay fails, replace and check for faults.		
Test Points	Spec.	Comments
Relay A2 defrost Low cavity 85 to ground.	0 volts	If voltage is present, check for open or short in circuit 16 BLU 49.
While meter is still connected to relay A2 defrost Low from cavity 85 to ground, activate the low defrost fan by closing the defrost heater switch (C23) in the low position.		
Relay A2 defrost Low cavity 85 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #17. Also check for open or short in circuits 16 BLU 49 and 16 BLK 7. Also perform continuity checks on Defrost Heater Switch C23.
Leave defrost switch in low.		
Relay A2 defrost Low cavity 85 to 86.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits 16 WHT A and 16 WHT B.
Relay A2 defrost Low cavity 30 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #37. Also check for open or short in circuit 12 BLK 7.
Relay A2 defrost Low cavity 30 to 87.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 BLU 49.
Relay B1 Stepwell Hi Voltage Test Check with ignition on, all heaters off, relay B1 stepwell HI removed and all other relays installed. NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion. Bench check relay. If relay fails, replace and check for faults.		

Table 360 Stepwell Heater Wired to Defrost Fan Switch Circuit Tests (cont.)

Test Points	Spec.	Comments
Relay B1 stepwell Hi cavity 85 to ground.	0 volts	If voltage is present, check for open or short in circuit 16 RED 50.
While meter is still connected to relay B1 stepwell Hi from cavity 85 to ground, activate the hi stepwell heater by closing the defrost heater switch (C23) in the hi position.		
Relay B1 stepwell Hi cavity 85 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #17. Also check for open or short in circuits 16 RED 50 and 16 BLK 7. Also perform continuity checks on Defrost Heater Switch C23.
Leave defrost switch in hi.		
Relay B1 stepwell Hi cavity 85 to 86.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 16 WHT A, 16 WHT B and 16 WHT C.
Relay B1 stepwell Hi cavity 30 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #36. Also check for open or short in circuit 12 BLK 8.
Relay B1 stepwell Hi cavity 30 to 87.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 RED 17.
Relay B2 Stepwell Low Voltage Test		
Check with ignition on, all heaters off, relay B2 stepwell LOW removed and all other relays installed.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Bench check relay. If relay fails, replace and check for faults.		
Test Points	Spec.	Comments
Relay B2 stepwell Low cavity 85 to ground.	0 volts	If voltage is present, check for open or short in circuit 16 BLU 49.
While meter is still connected to relay B2 stepwell Low from cavity 85 to ground, activate the low stepwell heater by closing the defrost heater switch (C23) in the low position.		
Relay B2 stepwell Low cavity 85 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #17. Also check for open or short in circuits 16 BLU 49 and 16 BLK 7. Also perform continuity checks on Defrost Heater Switch C23.
Leave defrost switch in low		
Relay B2 stepwell Low cavity 85 to 86.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 16 WHT A, 16 WHT B, 16 WHT C and 16 WHT D.
Relay B2 stepwell Low cavity 30 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #36. Also check for open or short in circuit 12 BLK 8.
Relay B2 stepwell Low cavity 30 to 87.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 BLU 16.

Table 360 Stepwell Heater Wired to Defrost Fan Switch Circuit Tests (cont.)

Defrost Heater Motor Connector (J53) Voltage Test		
Check with ignition on, all heaters off, all relays installed and defrost heater motor connector (J53) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Defrost heater motor connector (J53) cavity 7 to ground.	0 volts	If voltage is present, check for short on circuit 12 RED 50.
While meter is still connected to defrost heater motor connector (J53) from cavity 7 to ground, activate the hi defrost heater motor by closing the defrost heater switch in the hi position.		
Defrost heater motor connector (J53) cavity 7 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #37. Also check for open or short on circuits 12 RED 50 and 12 BLK 7.
Defrost heater motor connector (J53) cavity 7 to 9.	12 ± 1.5 volts	If voltage is missing, check for open or short on circuit 16 WHT.
Defrost heater motor connector (J53) cavity 8 to 9.	0 volts	If voltage is present, check for short on circuit 12 BLU 49. Also ensure defrost heater switch (C23) is NOT in the LOW position.
While meter is still connected to the defrost heater motor connector (J53) from cavity 8 to 9, activate the defrost heater motor in low by closing the defrost heater switch (C23) in the low position.		
Defrost heater motor connector (J53) cavity 8 to 9.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #37. Also check for open or short on circuits 12 BLU 49 and 12 BLK 7. If all circuits check good and defrost heater motor is still faulty, replace defrost heater motor.
Stepwell Heater Motor Connector (J13) Voltage Test		
Check with ignition on, all heaters off, all relays installed and stepwell heater motor connector (J13) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Stepwell heater motor connector (J13) cavity 1 to ground.	0 volts	If voltage is present, check for short on circuit 12 RED 17.
While meter is still connected to stepwell heater motor connector (J13) from cavity 1 to ground, activate the hi stepwell heater motor by closing the defrost heater switch in the hi position.		
Stepwell heater motor connector (J13) cavity 1 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #36. Also check for open or short on circuits 12 RED 17 and 12 BLK 8.

Table 360 Stepwell Heater Wired to Defrost Fan Switch Circuit Tests (cont.)

Stepwell heater motor connector (J13) cavity 1 to 4.	12 ± 1.5 volts	If voltage is missing, check for open or short on circuit 12 WHT 8.
Stepwell heater motor connector (J13) cavity 2 to 4.	0 volts	If voltage is present, check for short on circuit 12 BLU 16. Also ensure defrost heater switch (C23) is NOT in the LOW position.
While meter is still connected to the stepwell heater motor connector (J13) from cavity 2 to 4, activate the stepwell heater motor in low by closing the defrost heater switch (C23) in the low position.		
Stepwell heater motor connector (J13) cavity 8 to 9.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #36. Also check for open or short on circuits 12 BLU 16 and 12 BLK 8. If all circuits check good and stepwell heater motor is still faulty, replace stepwell heater motor.

1.6. CONVECTION HEATER FAULT DETECTION MANAGEMENT

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

Problems in the heater circuits can be caused by a blown fuse, a short, an open, a faulty relay, or a faulty switch.

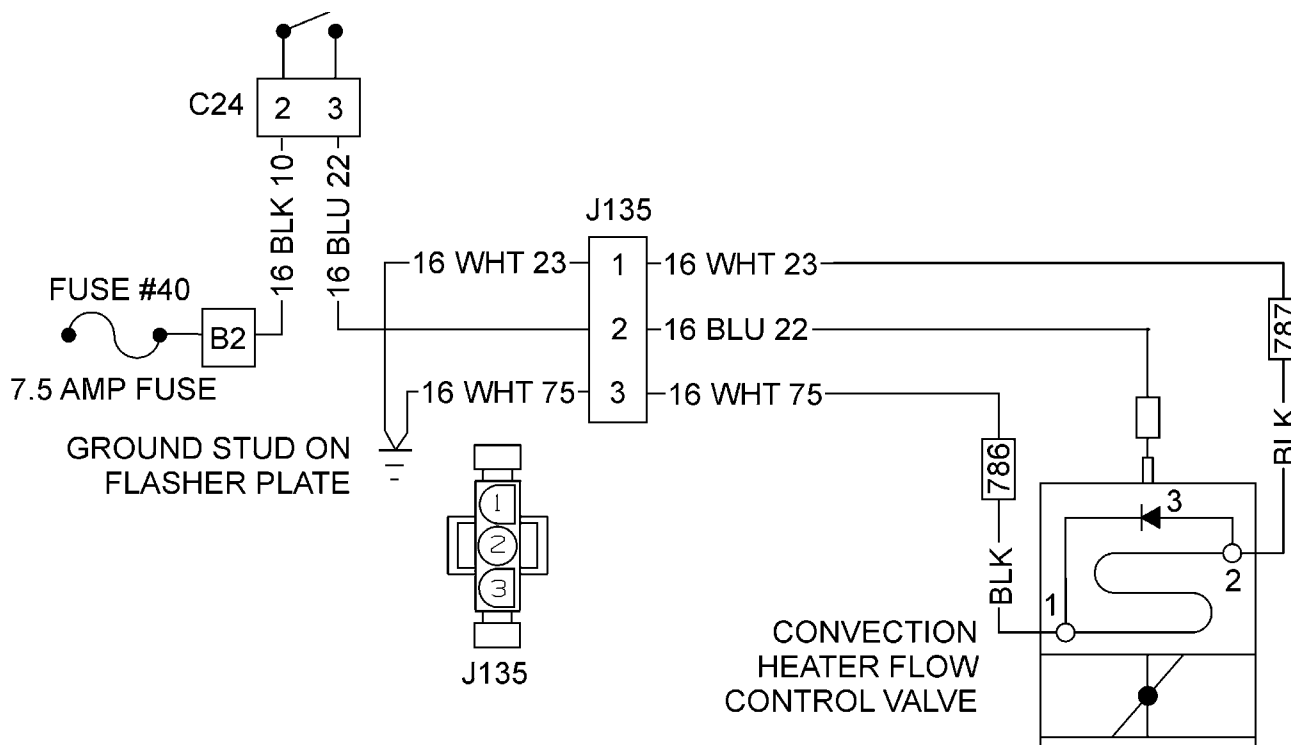


Figure 555 Convection Heater Circuit Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

J135 FLASHER PLATE TO HEATER

Table 361 Convection Heater Circuit Tests

Convection Heater Flow Control Valve Voltage Test		
Check with ignition on and convection heater off.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Convection heater flow control valve high to ground.	0 volts	If voltage is present, check for short in circuit 16 BLU 22.
While meter is still connected to the convection heater flow control valve from high to ground, activate convection heater by closing the rear heater switch (C24).		
Convection heater flow control valve high to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #40. Also check for open or short in circuits 16 BLU 22 and 16 BLK 10. Also check for continuity in rear heater switch (C24).
Convection heater flow control valve high to cavity 786.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 16 WHT 75.
Convection heater flow control valve high to cavity 787.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 16 WHT 23.

1.7. DRIVER'S HEATER W/DEFROST HEATER FAULT DETECTION MANAGEMENT

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

Problems in the heater circuits can be caused by a blown fuse, a short, an open, a faulty relay, or a faulty switch.

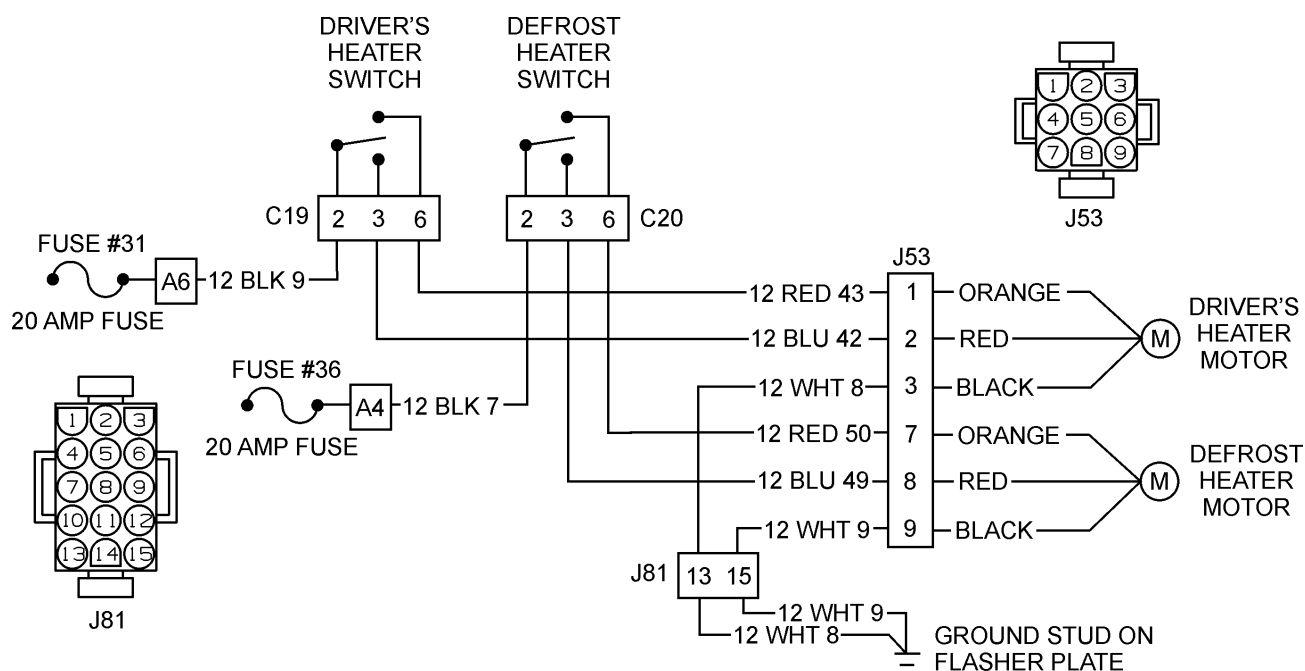


Figure 556 Driver's Heater w/Defrost Heater Circuit Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

J53 DRIVER'S HEATER CABINET TO LEFT HAND SWITCH PANEL

Table 362 Driver's Heater w/Defrost Heater Circuit Tests

Driver's Heater Cabinet Connector (J53) Voltage Test		
Check with ignition on, all heaters off and driver's heater cabinet connector (J53) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Driver's heater cabinet connector (J53) cavity 1 to ground.	0 volts	If voltage is present, check for short in circuit 12 RED 43.
While meter is still connected to the driver's heater cabinet connector (J53) from cavity 1 to ground, activate the driver's heater by closing the rear heater switch (C19) in hi position.		
Driver's heater cabinet connector (J53) cavity 1 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #31. Also check for open or short in circuits 12 RED 43 and 12 BLK 9. Also check for continuity in driver's heater switch (C19).
Driver's heater cabinet connector (J53) cavity 1 to 3.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 16 WHT 8.
Driver's heater cabinet connector (J53) cavity 2 to 3.	0 volts	If voltage is present, check for short in circuit 12 BLU 42. Also ensure that the driver's heater switch (C19) is NOT in the LOW position.

Table 362 Driver's Heater w/Defrost Heater Circuit Tests (cont.)

While meter is still connected to the driver's heater cabinet connector (J53) from cavity 2 to 3 activate the driver's heater by closing the rear heater switch (C19) in low position.		
Driver's heater cabinet connector (J53) cavity 2 to 3.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #31. Also check for open or short in circuits 12 BLU 42 and 12 BLK 9. Also check for continuity in driver's heater switch (C19). If all circuits check good and driver's heater is still faulty, replace driver's heater.
Driver's heater cabinet connector (J53) cavity 7 to ground.	0 volts	If voltage is present, check for short in circuit 12 RED 50.
While meter is still connected to the driver's heater cabinet connector (J53) from cavity 7 to ground, activate the defrost heater by closing the defrost heater switch (C20) in hi position.		
Driver's heater cabinet connector (J53) cavity 7 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #36. Also check for open or short in circuits 12 RED 50 and 12 BLK 7. Also check for continuity in driver's heater switch (C20).
Driver's heater cabinet connector (J53) cavity 7 to 9.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 16 WHT 9.
Driver's heater cabinet connector (J53) cavity 8 to 9.	0 volts	If voltage is present, check for short in circuit 12 BLU 49. Also ensure that the defrost heater switch (C20) is NOT in the LOW position.
While meter is still connected to the driver's heater cabinet connector (J53) from cavity 8 to 93 activate the defrost heater by closing the defrost heater switch (C20) in low position.		
Driver's heater cabinet connector (J53) cavity 8 to 9.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #36. Also check for open or short in circuits 12 BLU 49 and 12 BLK 7. Also check for continuity in driver's heater switch (C19). If all circuits check good and defrost heater is still faulty, replace defrost heater.

1.8. FUEL FIRED HEATER W/7 DAY TIMER FAULT DETECTION MANAGEMENT

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

Problems in the heater circuits can be caused by a blown fuse, a short, an open, a faulty relay, or a faulty switch.

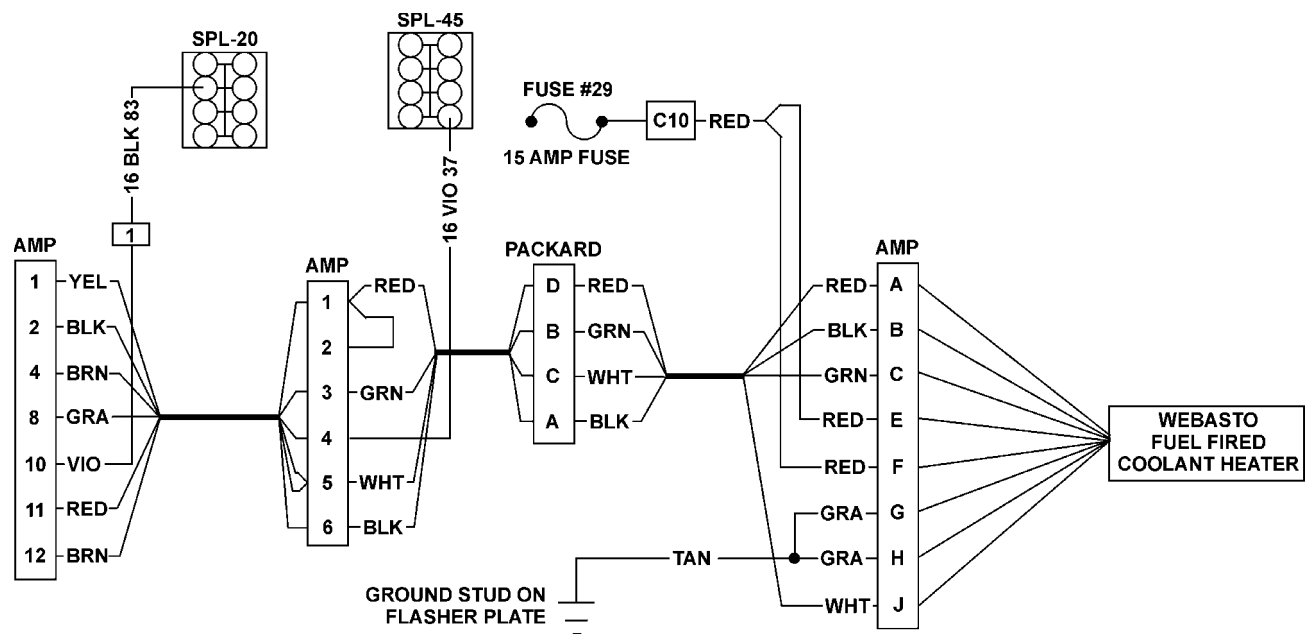


Figure 557 Fuel Fired Heater w/7 Day Timer Circuit Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

SPL-20 IGNITION ACCESSORY FEED SPLICE
SPL-45 SWITCH ILLUMINATION FEED SPLICE (RIGHT HAND SWITCH PANEL)

NOTE – Wiring between the three Amp connectors and the Packard connector is provided from Webasto. The following circuit tests do not check this wiring.

Table 363 Fuel Fired Heater w/7 Day Timer Circuit Tests

Webasto Fuel Fired Heater Power and Ground Voltage Tests		
Check with ignition on.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Amp connector cavity E to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #29. Also check for open or short in circuit RED.
Amp connector cavity F to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #29. Also check for open or short in circuit RED.
Amp connector cavity F to G.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits GRA and TAN.
Amp connector cavity F to H.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits GRA and TAN.

Table 363 Fuel Fired Heater w/7 Day Timer Circuit Tests (cont.)

Amp connector cavity 4 to ground.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 16 VIO 37. To further troubleshoot this circuit, refer to the Panel Lights section of this manual. (See PANEL LIGHTS, page 828)
Amp connector cavity 10 to ground.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 16 BLK83. To further troubleshoot this circuit, refer to the Ignition Power Feed section of this manual. (See IGNITION POWER DISTRIBUTION, page 42)

1.9. EXTENDED DESCRIPTION

Power to the heaters is supplied from the body fuse block.

Ground is supplied from the ground stud on the flasher plate.

2. DEFOG FANS

2.1. CIRCUIT FUNCTIONS

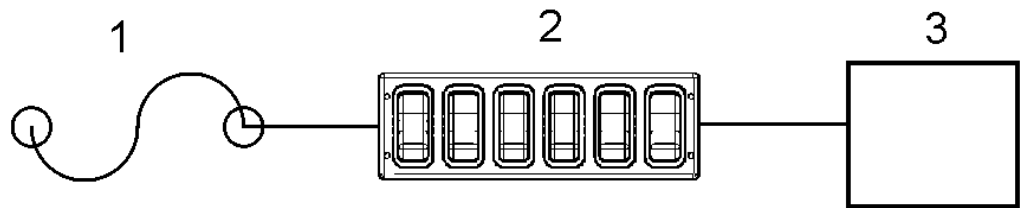


Figure 558 Defog Fan Function Diagram

- 1. DEFOG FAN POWER SOURCE
- 2. DEFOG FAN CONTROL SWITCH
- 3. DEFOG FAN

There are several different defog fan options available. Make sure to use the appropriate section for the defog fan option that is being diagnosed.

2.2. DIAGNOSTICS

There are no diagnostic trouble codes associated with the defog fans.

2.3. DEFOG FAN FAULT DETECTION MANAGEMENT

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

Problems in the defog fan circuits can be caused by a blown fuse, a short, an open, a faulty relay, or a faulty switch.

Far Left Defog Fan

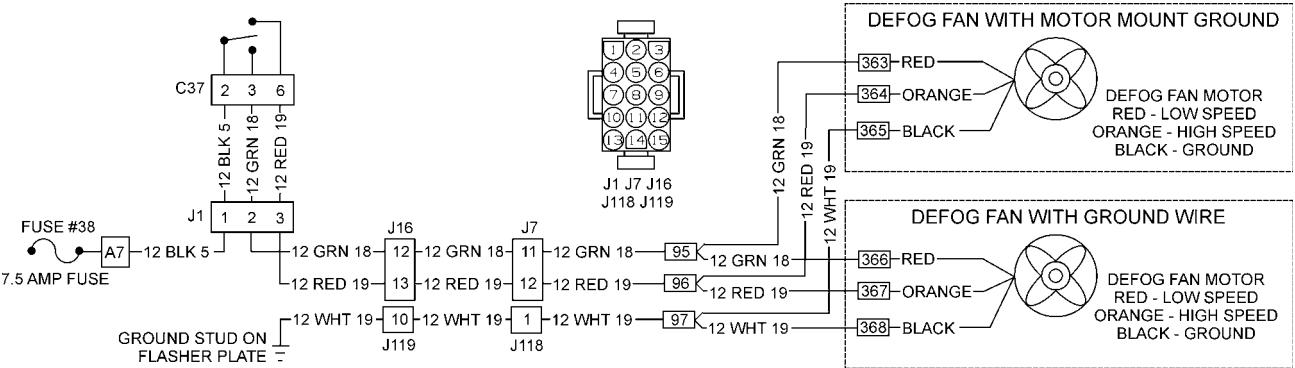


Figure 559 Far Left Defog Fan Circuit Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

- J1 FLASHER PLATE TO DASH
- J7 J118 LEFT HAND BODY TO FRONT CAP
- J16 J119 FLASHER PLATE TO LEFT HAND BODY

Table 364 Far Left Defog Fan Circuit Tests

Far Left Defog Fan Voltage Test		
Check with ignition on, all defog fans off and far left defog fan connector disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Far left defog fan connector cavity 95 to ground.	0 volts	If voltage is present, check for open or short in circuit 12 GRN 18.
While meter is still connected to the far left defog fan connector from cavity 95 to ground, activate far left defog fan by closing switch C37 in the low speed position.		
Far left defog fan connector cavity 95 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #38. Also check for open or short in circuits 12 BLK 5 and 12 GRN 18.
Far left defog fan connector cavity 95 to 97.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 WHT 19.

Table 364 Far Left Defog Fan Circuit Tests (cont.)

Far left defog fan connector cavity 96 to 97.	0 volts	If voltage is present, check for open or short in circuit 12 RED 19.
While meter is still connected to the far left defog fan connector from cavity 96 to 97, activate far left defog fan by closing switch C37 in the high speed position.		
Far left defog fan connector cavity 96 to 97.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #38. Also check for open or short in circuits 12 BLK 5 and 12 RED 19. If circuits check good and defog fan is still faulty, replace far left defog fan.

Left of Center Defog Fan

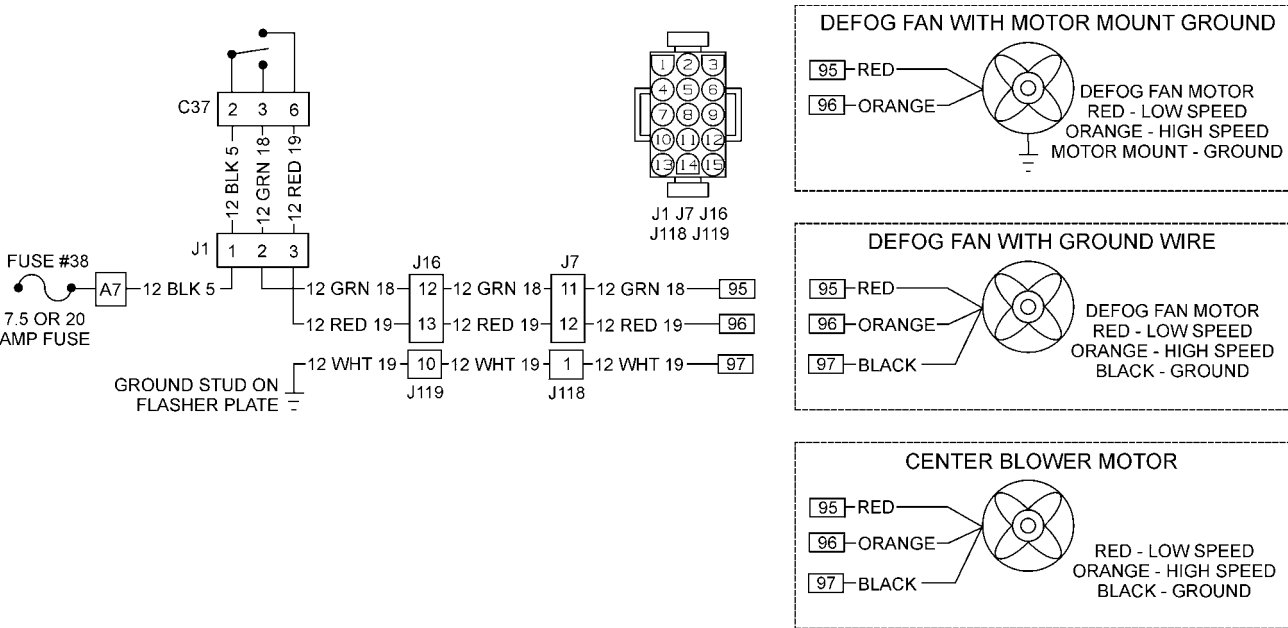


Figure 560 Left of Center Defog Fan Circuit Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

J1 FLASHER PLATE TO DASH
J7 J118 LEFT HAND BODY TO FRONT CAP
J16 J119 FLASHER PLATE TO LEFT HAND BODY

Table 365 Left of Center Defog Fan Circuit Tests

Left of Center Defog Fan Voltage Test		
Check with ignition on, all defog fans off and left of center defog fan connector disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments

Table 365 Left of Center Defog Fan Circuit Tests (cont.)

Left of center defog fan connector cavity 95 to ground.	0 volts	If voltage is present, check for open or short in circuit 12 GRN 18.
While meter is still connected to the left of center defog fan connector from cavity 95 to ground, activate left of center defog fan by closing switch C37 in the low speed position.		
Left of center defog fan connector cavity 95 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #38. Also check for open or short in circuits 12 BLK 5 and 12 GRN 18.
Left of center defog fan connector cavity 95 to 97.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 WHT 19.
Left of center defog fan connector cavity 96 to 97.	0 volts	If voltage is present, check for open or short in circuit 12 RED 19.
While meter is still connected to the left of center defog fan connector from cavity 96 to 97, activate left of center defog fan by closing switch C37 in the high speed position.		
Left of center defog fan connector cavity 96 to 97.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #38. Also check for open or short in circuits 12 BLK 5 and 12 RED 19. If circuits check good and defog fan is still faulty, replace left of center defog fan.

Right of Center Defog Fan

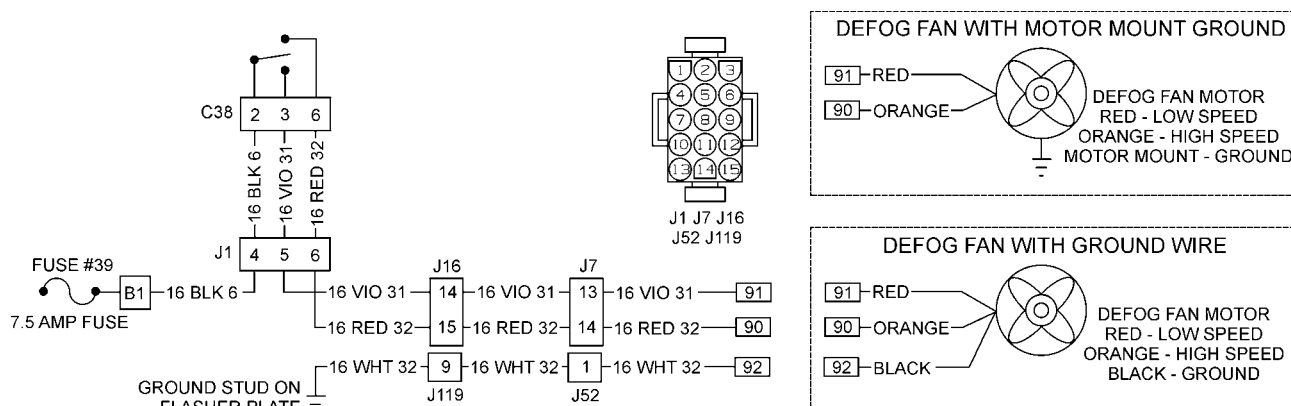


Figure 561 Right of Center Defog Fan Circuit Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

J1 FLASHER PLATE TO DASH
J7 J52 LEFT HAND BODY TO FRONT CAP
J16 J119 FLASHER PLATE TO LEFT HAND BODY

Table 366 Right of Center Defog Fan Circuit Tests

Right of Center Defog Fan Voltage Test		
Check with ignition on, all defog fans off and right of center defog fan connector disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Right of center defog fan connector cavity 91 to ground.	0 volts	If voltage is present, check for open or short in circuit 16 VIO 31.
While meter is still connected to the right of center defog fan connector from cavity 91 to ground, activate right of center defog fan by closing switch C38 in the low speed position.		
Right of center defog fan connector cavity 91 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #39. Also check for open or short in circuits 16 BLK 6 and 16 VIO 31.
Right of center defog fan connector cavity 91 to 92.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 16 WHT 32.
Right of center defog fan connector cavity 90 to 92.	0 volts	If voltage is present, check for open or short in circuit 16 RED 32.
While meter is still connected to the right of center defog fan connector from cavity 90 to 92, activate right of center defog fan by closing switch C38 in the high speed position.		
Right of center defog fan connector cavity 96 to 97.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #39. Also check for open or short in circuits 16 BLK 6 and 16 RED 32. If circuits check good and defog fan is still faulty, replace right of center defog fan.

Far Right Defog Fan

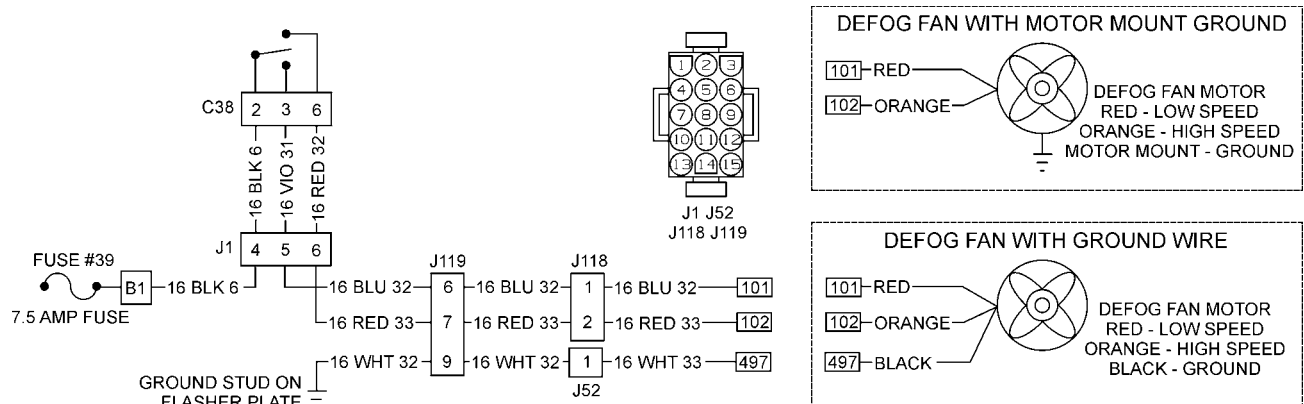


Figure 562 Far Right Defog Fan Circuit Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

J1 FLASHER PLATE TO DASH
 J52 J118 LEFT HAND BODY TO FRONT CAP
 J119 FLASHER PLATE TO LEFT HAND BODY

Table 367 Far Right Defog Fan Circuit Tests

Far Right Defog Fan Voltage Test		
Check with ignition on, all defog fans off and far right defog fan connector disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Far right defog fan connector cavity 101 to ground.	0 volts	If voltage is present, check for open or short in circuit 16 BLU 32.
While meter is still connected to the far right defog fan connector from cavity 101 to ground, activate far right defog fan by closing switch C38 in the low speed position.		
Far right defog fan connector cavity 101 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #39. Also check for open or short in circuits 16 BLK 6 and 16 BLU 32.
Far right defog fan connector cavity 101 to 497.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 16 WHT 33.
Far right defog fan connector cavity 102 to 497.	0 volts	If voltage is present, check for open or short in circuit 16 RED 33.

Table 367 Far Right Defog Fan Circuit Tests (cont.)

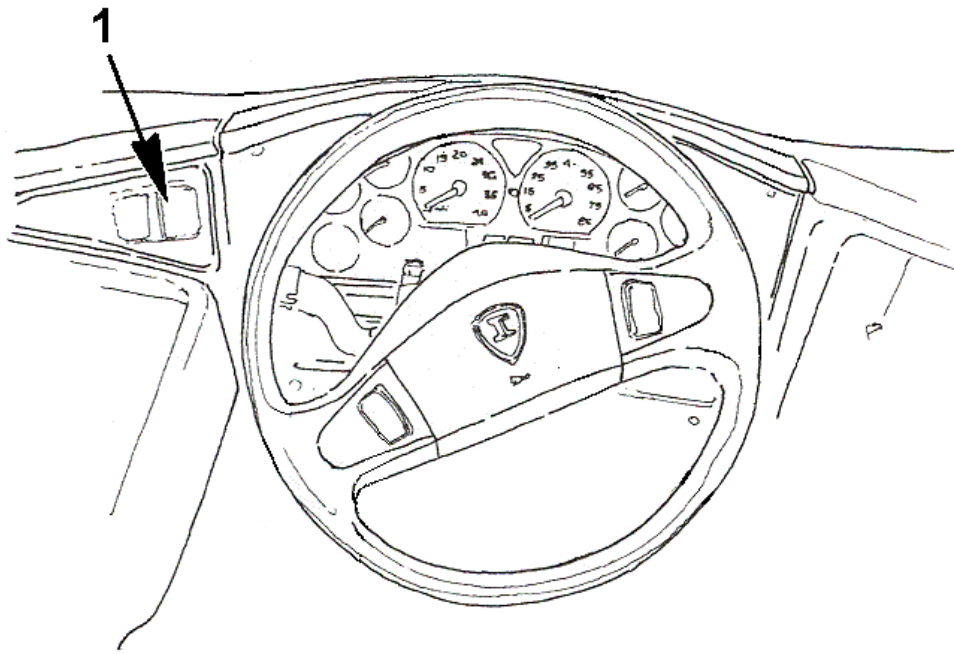
While meter is still connected to the far right defog fan connector from cavity 90 to 92, activate far right defog fan by closing switch C38 in the high speed position.		
Far right defog fan connector cavity 102 to 497.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #39. Also check for open or short in circuits 16 BLK 6 and 16 RED 33. If circuits check good and defog fan is still faulty, replace right of center defog fan.

2.4. EXTENDED DESCRIPTION

Power to the defog fans is supplied from the body fuse block.

Ground is supplied from the ground stud on the flasher plate.

2.5. COMPONENT LOCATIONS

**Figure 563 Defog Switch Panel**

1. DEFOG SWITCH PANEL

3. POWER VENTS

3.1. CIRCUIT FUNCTIONS

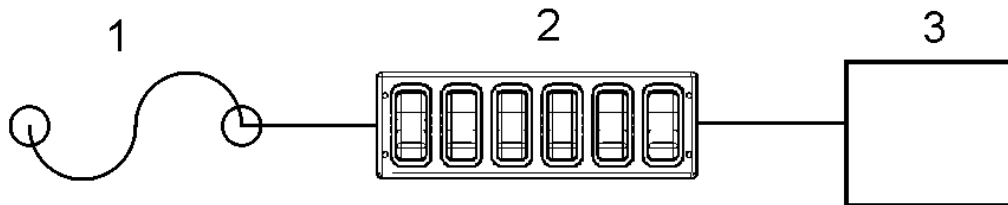


Figure 564 Power Vent Function Diagram

1. VENT POWER SOURCE
2. VENT CONTROL SWITCH
3. POWER VENT

3.2. DIAGNOSTICS

There are no diagnostic trouble codes associated with the power vents.

3.3. POWER VENTS FAULT DETECTION MANAGEMENT

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

Problems in the power vent circuits can be caused by a blown fuse, a short, an open, a faulty relay, or a faulty switch.

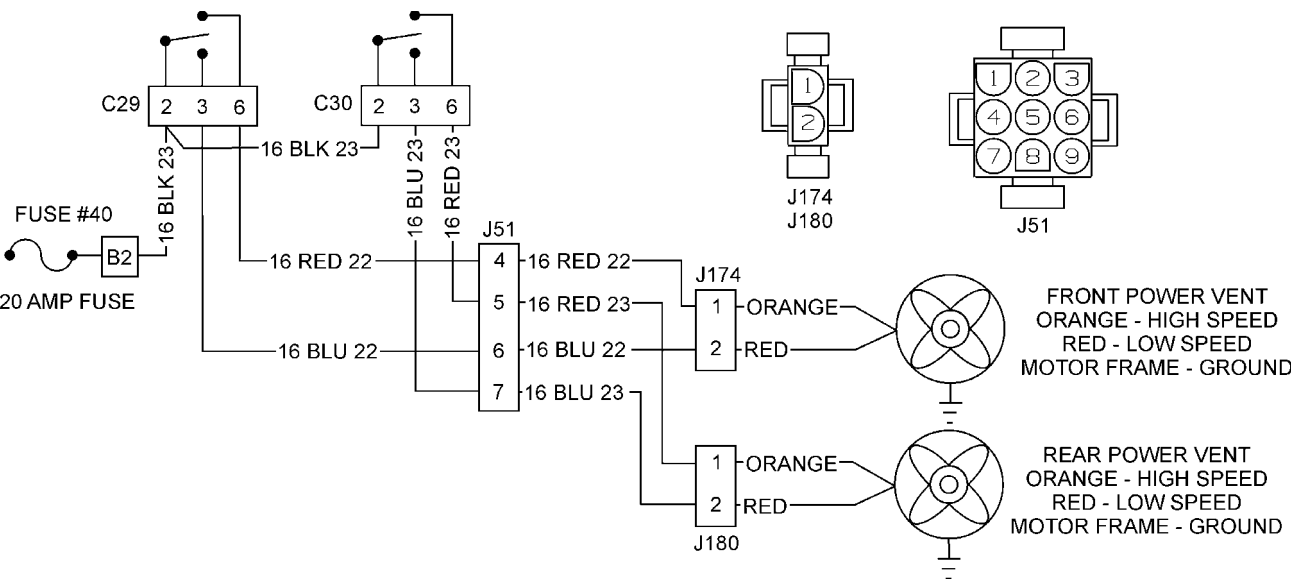


Figure 565 Power Vents Circuit Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

J51 FLASHER PLATE TO LEFT HAND BODY
 J174 LEFT HAND BODY POWER VENT — FRONT
 J180 LEFT HAND BODY POWER VENT REAR 8TH WINDOW

Table 368 Power Vent Circuit Tests

Front Power Vent (J174) Voltage Test		
Check with ignition on, power vents off and front power vent connector (J174) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Front power vent connector (J174) cavity 1 to ground.	0 volts	If voltage is present, check for open or short in circuit 16 RED 22.
While meter is still connected to the front power vent connector (J174) from cavity 1 to ground, activate front power vent by closing the front power vent switch C29 in the high speed position.		
Front power vent connector (J174) cavity 1 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #40. Also check for open or short in circuits 16 BLK 23 and 16 RED 22.
Front power vent connector (J174) cavity 2 to ground.	0 volts	If voltage is present, check for open or short in circuit 16 BLU 22.
While meter is still connected to the front power vent connector (J174) from cavity 2 to ground, activate front power vent by closing the front power vent switch C29 in the low speed position.		

Table 368 Power Vent Circuit Tests (cont.)

Front power vent connector (J174) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #40. Also check for open or short in circuits 16 BLK 23 and 16 BLU 22. If all circuits check good and front power vent is still faulty, replace front power vent.
Rear Power Vent (J180) Voltage Test Check with ignition on, power vents off and rear power vent connector (J180) disconnected. NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments
Rear power vent connector (J180) cavity 1 to ground.	0 volts	If voltage is present, check for open or short in circuit 16 RED 23.
While meter is still connected to the rear power vent connector (J180) from cavity 1 to ground, activate rear power vent by closing the rear power vent switch C30 in the high speed position.		
Rear power vent connector (J180) cavity 1 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #40. Also check for open or short in circuits 16 BLK 23 and 16 RED 23.
Rear power vent connector (J180) cavity 2 to ground.	0 volts	If voltage is present, check for open or short in circuit 16 BLU 23.
While meter is still connected to the rear power vent connector (J180) from cavity 2 to ground, activate rear power vent by closing the rear power vent switch C30 in the low speed position.		
Rear power vent connector (J180) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #40. Also check for open or short in circuits 16 BLK 23 and 16 BLU 23. If all circuits check good and rear power vent is still faulty, replace rear power vent.

3.4. EXTENDED DESCRIPTION

Power to the power vent fans is supplied from the body fuse block.

Ground is supplied at the motor frame.

3.5. COMPONENT LOCATIONS

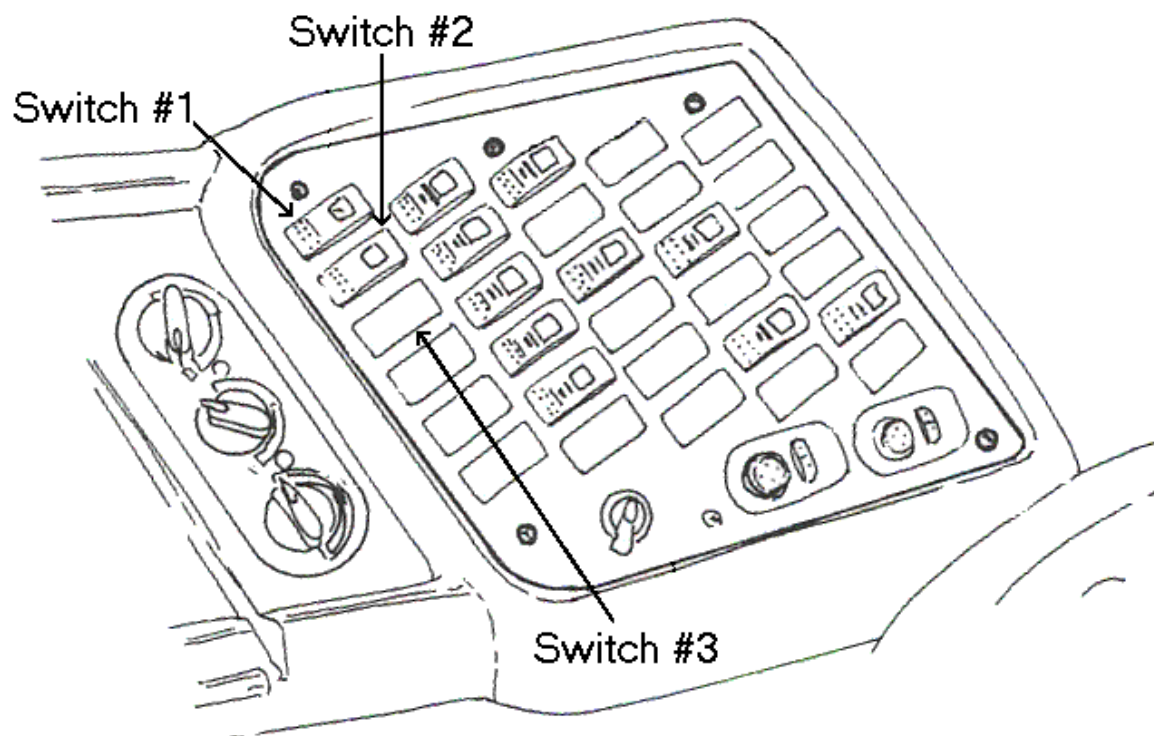


Figure 566 Left Hand Switch Panel

4. BOOSTER PUMP

4.1. CIRCUIT FUNCTIONS

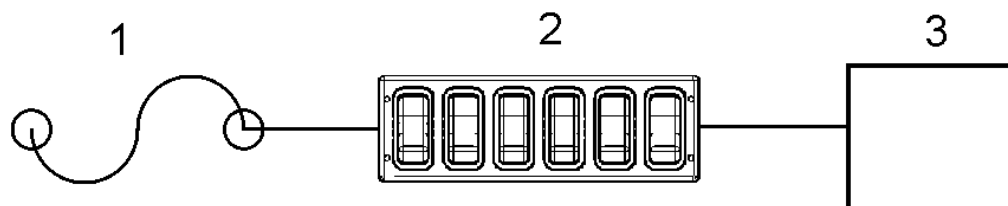


Figure 567 Booster Pump Function Diagram

1. BOOSTER PUMP POWER SOURCE
2. BOOSTER PUMP CONTROL SWITCH
3. BOOSTER PUMP MOTOR

The booster pump is an accessory to the heating system that will assist in the pump of heated antifreeze to the interior heaters of the bus. It is used when the water pump is not enough to heat the entire bus.

4.2. DIAGNOSTICS

There are no diagnostic trouble codes associated with the booster pump.

4.3. BOOSTER PUMP FAULT DETECTION MANAGEMENT

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

Problems in the booster pump circuits can be caused by a blown fuse, a short, an open, a faulty relay, or a faulty switch.

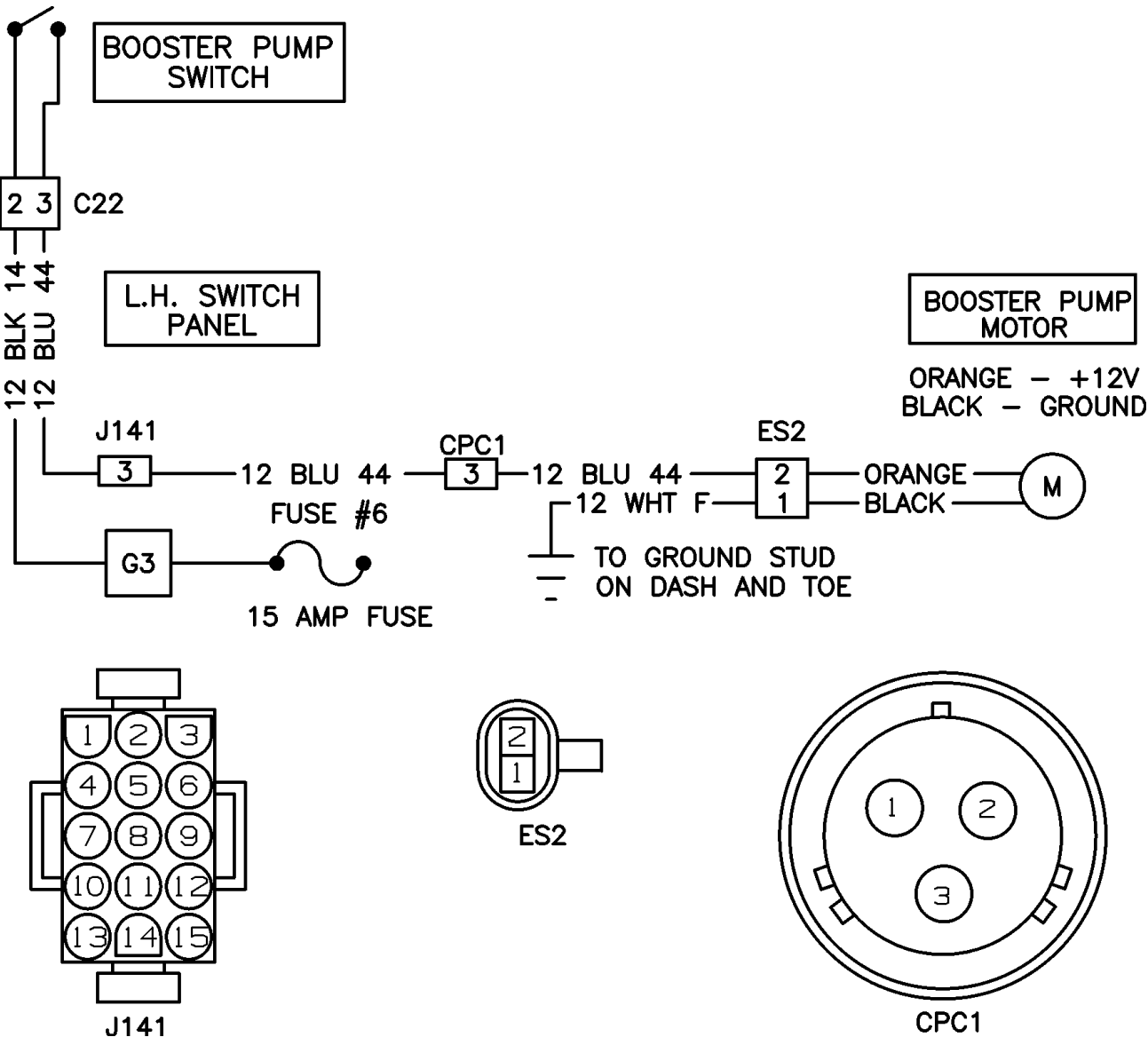


Figure 568 Booster Pump Circuit Diagram — Always Refer to the Circuit Diagram Book for Latest Circuit Information.

CPC1 DASH AND TOE HARNESS TO SEALED ENGINE HARNESS
ES2 SEALED ENGINE TO BOOSTER PUMP
J141 FLASHER PLATE TO DASH AND TOE

Table 369 **Booster Pump Circuit Tests**

Booster Pump (ES2) Voltage Test		
Check with ignition on, booster pump off and booster pump connector (ES2) disconnected.		
NOTE – Always check connectors for damage and pushed-out terminals. Also check turn signal assemblies for damage or corrosion.		
Test Points	Spec.	Comments

Table 369 Booster Pump Circuit Tests (cont.)

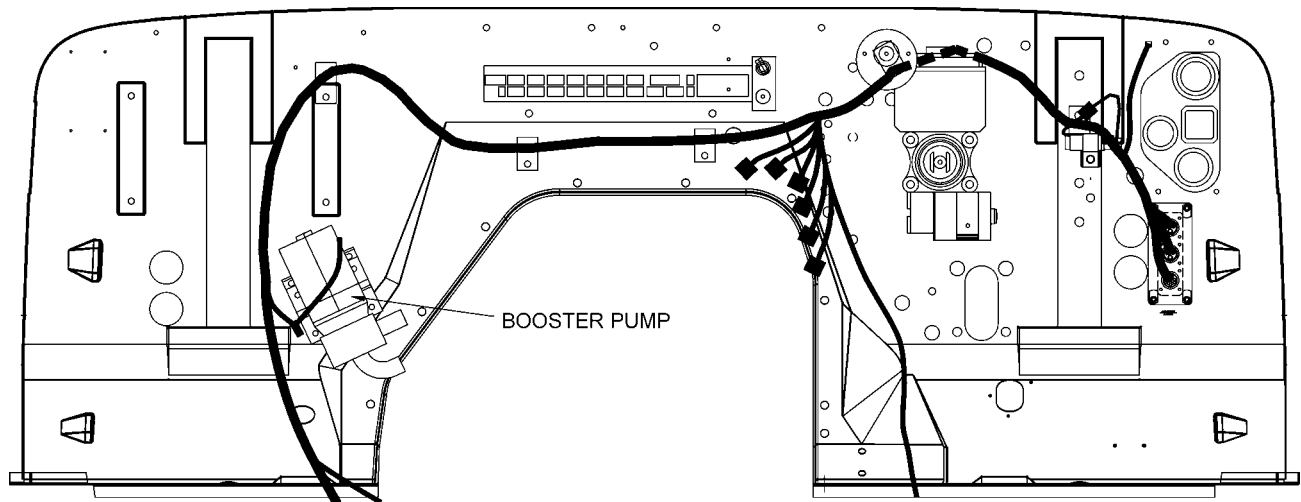
Booster pump connector (ES2) cavity 2 to ground.	0 volts	If voltage is present, check for open or short in circuit 12 BLU 44.
While meter is still connected to the booster pump connector (ES2) from cavity 2 to ground, activate the booster pump by closing the booster pump switch C22.		
Booster pump connector (ES2) cavity 2 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse #6. Also check for open or short in circuits 12 BLK 44 and 12 BLU 44.
Leave booster pump on.		
Booster pump connector (ES2) cavity 2 to 1.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit 12 WHT F. If all circuits check good and booster pump is still faulty, replace booster pump.

4.4. EXTENDED DESCRIPTION

Power to the power booster pump is supplied from the body fuse block.

Ground is supplied from the ground stud on the dash and toe panel.

4.5. COMPONENT LOCATIONS

**Figure 569 Booster Pump Location**

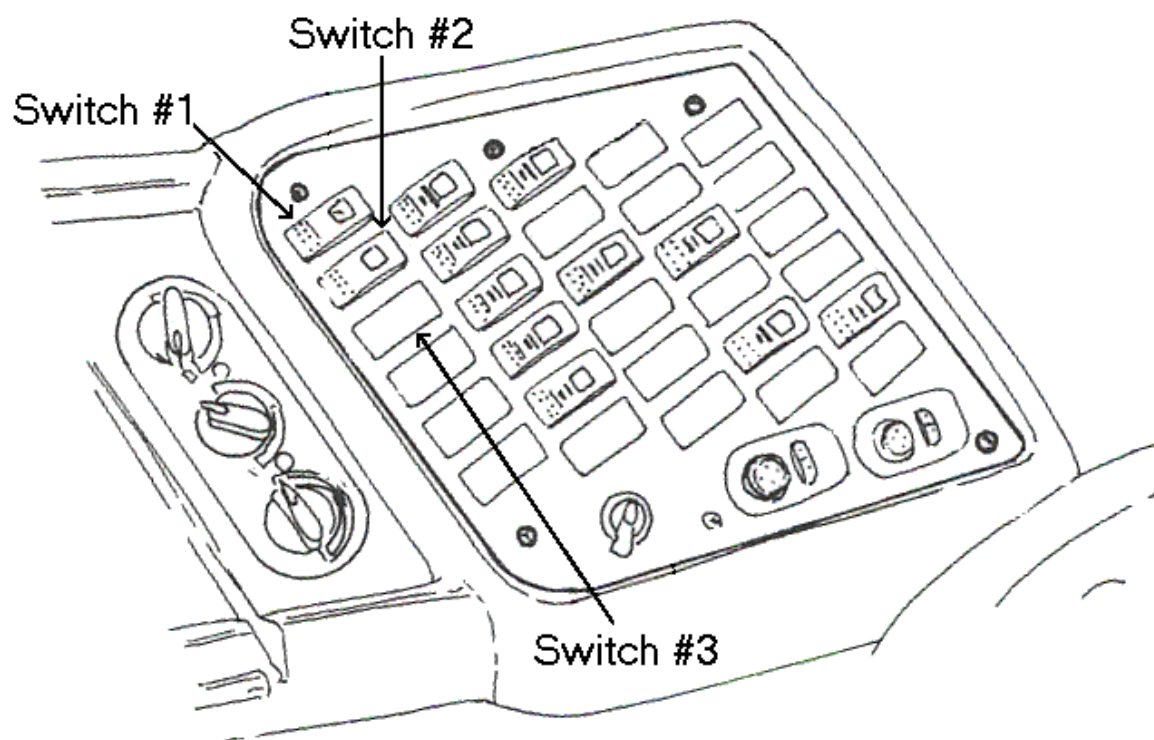


Figure 570 Left Hand Switch Panel

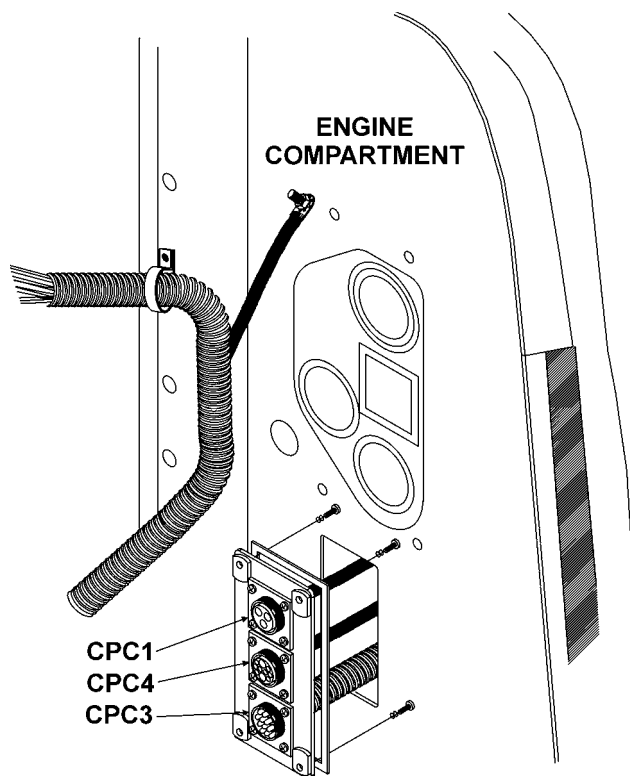


Figure 571 Engine Compartment Pass-Thru Location

5. DRIVER'S AIR CONDITIONING

5.1. CIRCUIT FUNCTIONS

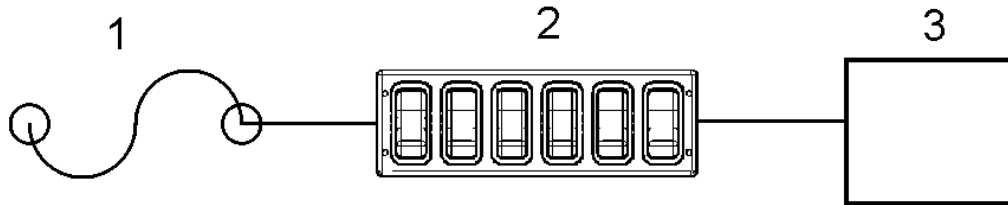


Figure 572 Driver's Air Conditioning Function Diagram

1. AIR CONDITIONING POWER SOURCE
2. AIR CONDITIONING CONTROL SWITCHES
3. AIR CONDITIONING UNIT

5.2. DIAGNOSTICS

There are no diagnostic trouble codes associated with the driver's air conditioner.

5.3. DRIVER'S AIR CONDITIONING FAULT DETECTION MANAGEMENT

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

NOTE – If blower motor in A/C unit functions while A/C blower switch (1200) is in the high position, but not in the low or medium position, check fuse in resistor & fuse assembly in A/C Unit and retest.

Problems in the driver's air conditioning circuits can be caused by a blown fuse, a short, an open, a faulty relay, or a faulty switch.

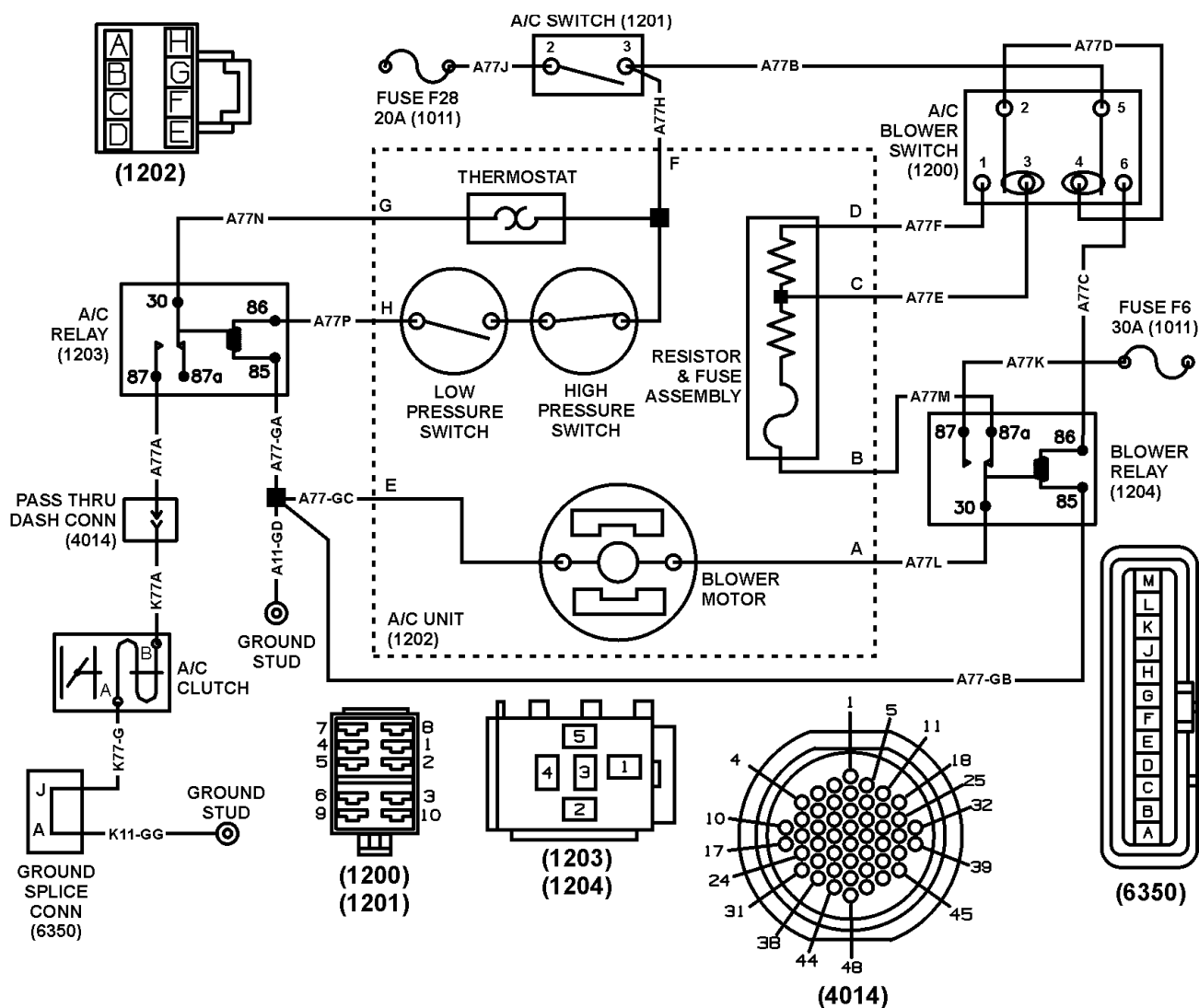


Table 370 Driver's Air Conditioning Circuit Tests

A/C Relay (1203) Voltage Test		
Check with ignition on, driver's air conditioner on, A/C unit connector (1202) disconnected, A/C relay (1203) removed and all other relays installed.		
NOTE – Always check connectors for damage and pushed-out terminals.		
Bench test relay. If relay fails bench test, replace and check for faults.		
Test Points	Spec.	Comments
Place a jumper on A/C unit connector (1202) between pins F and pin G.		
A/C relay (1203) cavity 30 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse F28. Also check for open or short in circuits A77N, A77H and A77J. Also ensure proper function of A/C switch (1201).
A/C relay (1203) cavity 30 to 87.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits A77A, K77A, K77–G and K11–GG. Also ensure proper function of A/C clutch.
Move jumper to A/C unit connector (1202) between pins F and H.		
A/C relay (1203) cavity 86 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse F28. Also check for open or short in circuits A77P, A77H and A77J. Also ensure proper function of A/C switch (1201).
A/C relay (1203) cavity 86 to 85.	12 ± 1.5 volts	If voltage is missing, check for blown fuse F28. Also check for open or short in circuits A77–GA and A11–GD.
Blower Relay (1204) Voltage Test		
Check with ignition on, driver's air conditioner on, A/C unit connector (1202) disconnected, blower relay (1204) removed and all other relays installed.		
NOTE – Always check connectors for damage and pushed-out terminals.		
Bench test relay. If relay fails bench test, replace and check for faults.		
Test Points	Spec.	Comments
Blower relay (1204) cavity 87 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse F6. Also check for open or short in circuit A77K.
Place a jumper on A/C unit connector (1202) between pins A and pin E.		
Blower relay (1204) cavity 87 to 30.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuits A77L and A77–GC.
Switch A/C blower switch (1200) into the low or medium position.		
Blower relay (1204) cavity 86 to ground.	0 volts	If voltage is present, check for short in circuits A77C. Also check for proper function of A/C blower switch (1200).
Switch A/C blower switch (1200) into the high position.		
Blower relay (1204) cavity 86 to ground.	12 ± 1.5 volts	If voltage is missing, check for blown fuse F28. Also check for open or short in circuits A77C, A77B and A77J. Also ensure proper function of A/C blower switch (1200) and A/C switch (1201).

Table 370 Driver's Air Conditioning Circuit Tests (cont.)

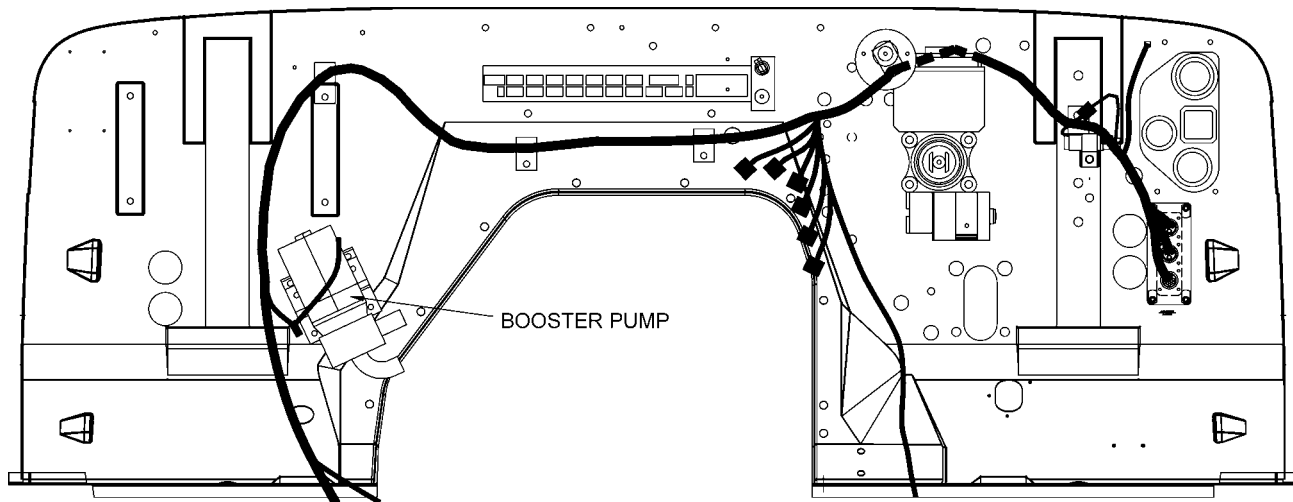
Leave A/C blower switch (1200) in the high position.		
Blower relay (1204) cavity 86 to 85.	12 ± 1.5 volts	If voltage is missing, check for open or short in circuit A77–GB.
Move jumper to A/C unit connector (1202) pins D to B. Also switch A/C blower switch (1200) to the low position.		
Blower relay (1204) cavity 87a to 85.	12 ± 1.5 volts	If voltage is missing, check for blown fuse F28. Also check for open or short in circuits A77M, A77F, A77D, A77B and A77J. Also ensure proper function of A/C blower switch (1200) and A/C switch (1201).
Move jumper to A/C unit connector (1202) pins C to B. Also switch A/C blower switch (1200) to the medium position.		
Blower relay (1204) cavity 87a to 85.	12 ± 1.5 volts	If voltage is missing, check for blown fuse F28. Also check for open or short in circuits A77M, A77E, A77D, A77B and A77J. Also ensure proper function of A/C blower switch (1200) and A/C switch (1201). If all circuits check good and A/C unit is still faulty, replace A/C unit.

5.4. EXTENDED DESCRIPTION

Power to the power booster pump is supplied from the body fuse block.

Ground is supplied from the ground stud on the dash and toe panel.

5.5. COMPONENT LOCATIONS

**Figure 574 Booster Pump Location**

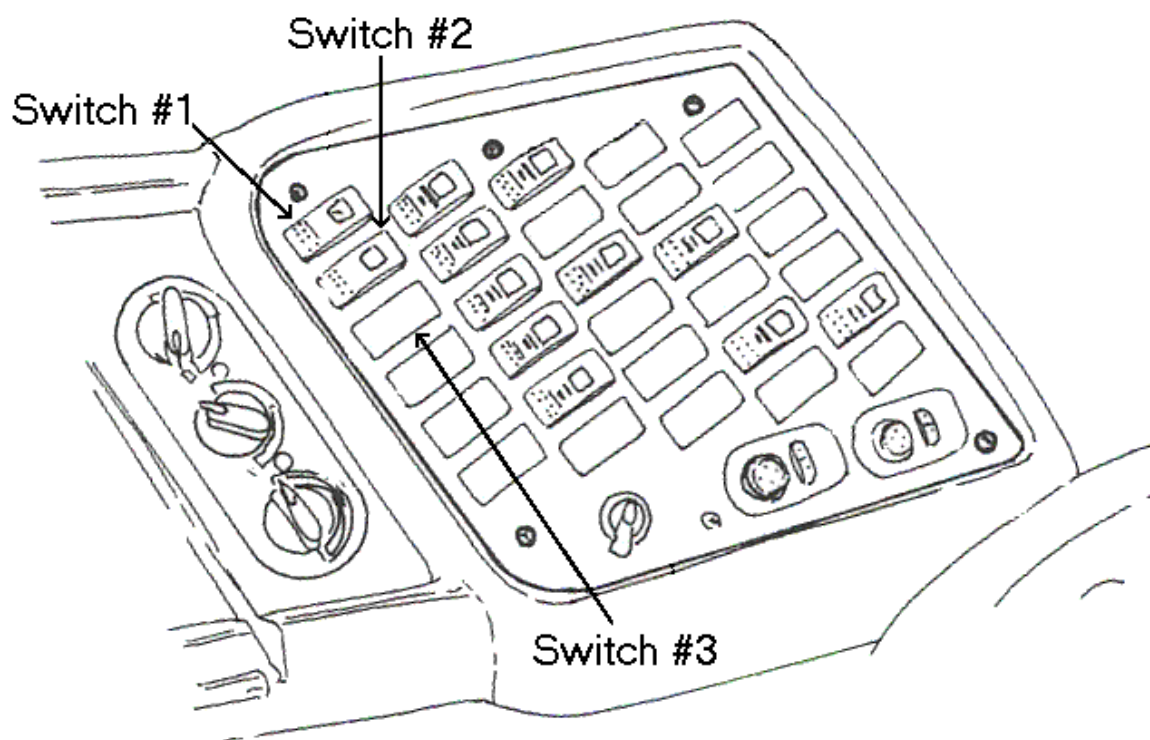


Figure 575 Left Hand Switch Panel

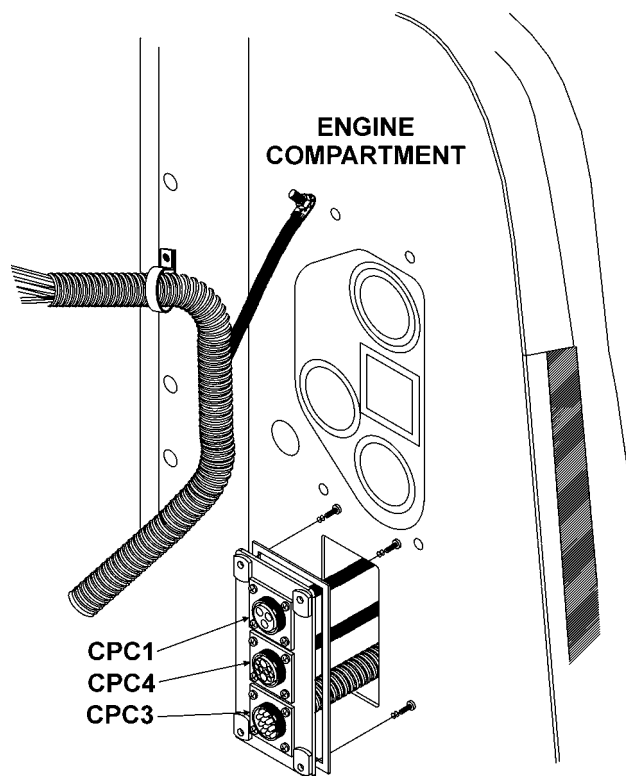


Figure 576 Engine Compartment Pass-Thru Location

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1. DIAGNOSTICS

1.1. ON-LINE DIAGNOSTICS

On-line Diagnostics are automatically performed while the key is in the accessory or ignition position. Any faults encountered will be entered in the active diagnostic trouble code list.

Check Electrical System Light

The check electrical system light will turn on for 5 seconds after the gauge sweep, on power up. If there is an active fault the light will stay on for an extra minute. If a fault occurs during operation of the vehicle the light will come on for 1 minute. This will alert the driver that an active fault exists.

If the check electrical system light comes on and stays on after the gauge sweep is completed there is an active diagnostic trouble code (DTC) or there is no communication between the EGC and ESC.

If the EGC loses communication with the ESC or engine controller the check electrical system light will turn on and stay on. The light will be accompanied by 10 short beeps from the EGC alarm.

Gauges

Gauge warning lamps will illuminate and be accompanied by the appropriate alarm when gauge readings exceed preset limits. Gauges will also respond when the ESC is not receiving input from sensors.

Flashing Switch Lamps

Several features activated by switches in the switch packs are programmed to flash the indicator lamp in the switch when there is a switch malfunction or a malfunctioning feature.

Not all switches will respond the same. Generally a malfunctioning switch will cause the indicator to flash at a slow rate. A problem with the feature will cause the indicator to flash at a fast rate. Refer to the section on the particular feature for details on how the switch indicator responds to failures.

1.2. OFF- LINE DIAGNOSTICS

NOTE – Diagnostic messages from the engine controller, antilock brake system or transmission are not displayed on the electronic gauge cluster (EGC) digital display.

Placing the electronic gauge cluster (EGC) in diagnostic mode will allow the EGC to display active and previously active diagnostic messages from the electrical system controller (ESC) or from the EGC itself.

To engage the diagnostic mode turn the Ignition key ON (or in accessory), then press the Cruise ON switch and the Cruise RESUME switch simultaneously. If no faults are present, the gauge cluster display will read NO FAULTS. If faults are present, the gauge cluster will display a message with the number of faults, followed by the diagnostic codes. Refer to Diagnostic Trouble Code Display. This procedure will also initiate the diagnostic flash codes for the engine controller and the hydraulic ABS controller. The display will show each DTC for 10 seconds, then automatically scroll to the next entry and continue to cycle through the faults. To manually cycle through the fault list, press the cluster SELECT/RESET button.

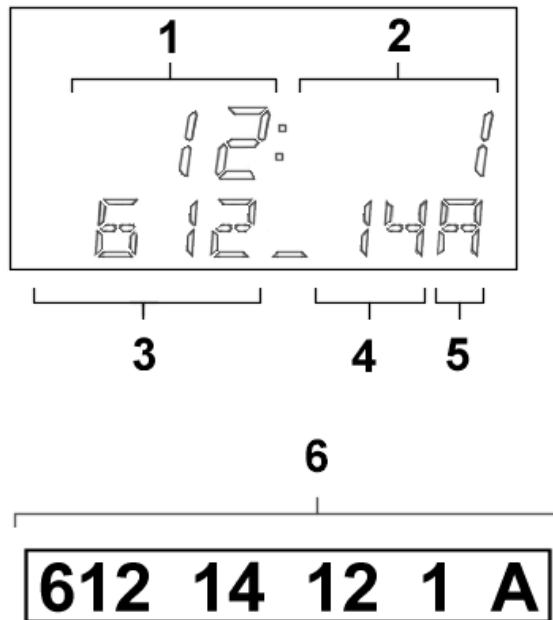


Figure 577 Diagnostic Trouble Code Display

1. BYTE 7 FIELD
2. BYTE 8 FIELD
3. SPN FIELD
4. FMI FIELD
5. ACTIVE/PREVIOUSLY ACTIVE STATUS INDICATOR
6. COMPILED FORMAT OF DIAGNOSTIC TROUBLE CODE

Diagnostic trouble codes (DTC) will end with an “A” while the code is active. The code will remain active as long as the feature affected is active and the fault is present. If the feature is turned off or the fault is removed, the trouble code will be moved to the “previously active” list and the code will end with a “P”. For example: when the work light is turned on and there is an open an active circuit fault code (611 14 11 1 A) will be logged. When the light is turned off the code will become previously active. The fault still exists, but the code will not go active until the light is turned on.

While in the diagnostic mode, previously active diagnostic trouble codes may be cleared by turning the left turn signal ON and pressing the Cruise ON switch and the Cruise SET switch simultaneously.

Diagnostic codes for the engine controller and hydraulic ABS controller will not be cleared with this procedure.

To exit the diagnostic mode, cycle the key switch or release the parking brake.

1.3. OFF-BOARD DIAGNOSTICS

The diagnostic service tool, running the Diamond Logic Builder™ software, can be used to view and clear ESC diagnostic trouble codes (DTC). Other diagnostic software can be used to view and clear engine controller, ABS and transmission diagnostic trouble codes. Refer to the applicable supplier service manual for information on their diagnostic software and tools.

1.4. DIAGNOSTIC TROUBLE CODE (DTC) LIST

Table 371 Diagnostic Trouble Code (DTC) List

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
70	14	1	0	1600/4004/ Bus 1602 16/32/16	<p>Air Powered Park Brake is stuck.</p> <p>Occurs when the park brake switch does not match the spring apply air release (SAAR) chamber travel sensor. This indicates the park brake cannot be applied or cannot be released.</p> <p>Refer to Service Park Brake warning lamp (See SERVICE PARK BRAKE WARNING LAMP, page 202) in the Electronic Gauge Cluster section of this manual.</p> <p>Refer to Air Actuated Park Brake (See Diagnostic Trouble Codes, page 707) in the Chassis Accessories section of this manual.</p>
70	14	1	1	1600/4004/ Bus 1602 16/32/16	<p>The auto apply portion with the Air Powered Park Brake is not operating.</p> <p>Occurs when the park brake switch is not set within 5 seconds of the receipt of the Park as the requested gear. This failure would indicate a failure in the auto apply relay or in the air lines between the auto apply relay and the Park Brake switch.</p> <p>Refer to Service Park Brake warning lamp (See SERVICE PARK BRAKE WARNING LAMP, page 202) in the Electronic Gauge Cluster section of this manual.</p> <p>Refer to Air Actuated Park Brake (See Diagnostic Trouble Codes, page 707) in the Chassis Accessories section of this manual.</p>
597	14	1	0	Hyd or Air n/4091 – 1600 Air w/4091 — 4004 Bus – 1602/33	<p>Brake switch is stuck in the open or closed position</p> <p>Occurs if the wheel based vehicle speed increases from 0 kph to 72 kph two times without the brake switch opening or decreases from 72 kph to 0 kph two times without the brake switch closing.</p> <p>Faulty brake switch</p> <p>Refer to hydraulic brake switch (See HYDRAULIC BRAKE SWITCH INPUTS TO ESC, page 853) or air brake switch (See AIR BRAKE SWITCH INPUTS TO ESC, page 855) in the Light Systems section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
597	14	2	0	Hyd or Air n/4091 – 1600 Air w/4091 — 4004 Bus – 1602/33	<p>Brake switch inputs do not match</p> <p>Occurs if the comparison of the inputs indicates a mismatch in the analog and digital signals.</p> <p>Occurs if there is a high resistance in the wire harness, faulty brake switch or a faulty Electronic System Controller (ESC).</p> <p>Refer to hydraulic brake switch (See TURN SIGNAL/HAZARD SWITCH INPUTS TO ESC, page 849) or air brake switch (See AIR BRAKE SWITCH INPUTS TO ESC, page 855) in the Light Systems section of this manual.</p>
598	14	1	0	1600/17	<p>Upper Clutch Switch stuck in the open or closed position</p> <p>Occurs if the vehicle speed increases from 0 kph to 72 kph without a change in state of the clutch switch.</p> <p>Faulty upper clutch switch</p> <p>Refer to Clutch Switch (See CLUTCH SWITCH, page 446) in the Cab Features section of this manual.</p>
610	14	1	0	1600/12	<p>Ignition feed error.</p> <p>Loss of Ignition feed for 10 seconds while the engine is running</p> <p>Refer to ESC Power and Ground. (See ESC POWER AND GROUND, page 98)</p>
610	14	2	0	1600/2	<p>Accessory feed error.</p> <p>Loss of Accessory feed for 10 seconds while the engine is running</p> <p>Refer to ESC Power and Ground. (See ESC POWER AND GROUND, page 98)</p>
611	14	1	1	1601/G	<p>Connector #1601 Pin #G Bus Left Front & Rear Red Flasher under current</p> <p>The Current from this output is below 0.5 A</p> <p>Open circuit</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	1	2	1601/G	<p>Connector #1601 Pin #G Bus Left Front & Rear Red Flasher over current</p> <p>The output behaves like a 20 amp type III circuit breaker.</p> <p>Short to ground or overload</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>
611	14	1	3	1601/G	<p>Connector #1601 Pin #G Bus Left Front & Rear Red Flasher less than normal low current but more than open circuit</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>
611	14	1	4	1601/G	<p>Connector #1601 Pin #G Bus Left Front & Rear Red Flasher greater than normal high current and less than fusing current</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>
611	14	1	6	1601/G	<p>Connector #1601 Pin #G Bus Left Front & Rear Red Flasher has current flow when output commanded off</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>
611	14	2	1	4008/Bus 1604 A	<p>Connector #4008 Pin #A Solenoid power under current</p> <p>Connector # 1604 Pin #A Bus (Left Front Amber PWL) under current</p> <p>The current from this output is below 0.5 A</p> <p>Open circuit</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	2	2	4008/Bus 1604 A	<p>Connector #4008 Pin #A Solenoid power over current</p> <p>Connector # 1604 Pin #A Bus (Left Front Amber PWL) over current</p> <p>The output behaves like a 20 amp type III circuit breaker.</p> <p>Short to ground or overload</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>
611	14	2	3	4008/Bus 1604 A	<p>Connector #4008 Pin #A Solenoid power less than normal low current but more than open circuit</p> <p>Connector # 1604 Pin #A Bus (Left Front Amber PWL) less than normal low current but more than open circuit</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>
611	14	2	4	4008/Bus 1604 A	<p>Connector #4008 Pin #A Solenoid power greater than normal high current and less than fusing current</p> <p>Connector #1604 Pin #A (Left Front Amber PWL) greater than normal high current and less than fusing current</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>
611	14	2	6	4008/Bus 1604 A	<p>Connector #4008 Pin #A Solenoid power has current flow when output commanded off</p> <p>Connector #4008 Pin #A BUS (Left Front Amber PWL) has current flow when output commanded off</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>
611	14	3	1	4007/Bus 1603 A	<p>Connector #4007 Pin #A Fog light / Spare 1 under current</p> <p>Connector #1603 Pin #A Bus Right Front and Rear Red Pupil Warning Lights under current</p> <p>The Current from this output is below 0.5 A</p> <p>Open circuit</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	3	2	4007/Bus 1603 A	<p>Connector #4007 Pin #A Fog light / Spare 1 over current</p> <p>Connector #1603 Pin #A Bus Right Front and Rear Red Pupil Warning Lights over current</p> <p>The output behaves like a 20 amp type III circuit breaker.</p> <p>Short to ground or overload</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>
611	14	3	3	4007/Bus 1603 A	<p>Connector #4007 Pin #A Fog light / Spare 1 less than normal low current but more than open circuit</p> <p>Connector #1603 Pin #A Bus Right Front and Rear Red Pupil Warning Lights less than normal low current but more than open circuit</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>
611	14	3	4	4007/Bus 1603 A	<p>Connector #4007 Pin #A Fog light / Spare 1 greater than normal high current and less than fusing current</p> <p>Connector #1603 Pin #A Bus Right Front and Rear Red Pupil Warning Lights greater than normal high current and less than fusing current</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>
611	14	3	6	4007/Bus 1603 A	<p>Connector #4007 Pin #A Fog light / Spare 1 has current flow when output commanded off</p> <p>Connector #1603 Pin #A Bus Right Front and Rear Red Pupil Warning Lights has current flow when output commanded off</p> <p>Refer to the Red & Amber Pupil Warning Lights (See Red And Amber Pupil Warning Lights, page 893) section of this manual.</p>
611	14	4	1	4007/Bus 1603 H	<p>Connector #1603 Pin #H Park light under current</p> <p>The Current from this output is below 0.5 A</p> <p>Open circuit</p> <p>Refer to Marker, Park and Tail Lamps(See MARKER, PARK AND TAIL LAMPS, page 781) in the Light Systems section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	4	2	4007/Bus 1603 H	Connector #1603 Pin #H Park light over current The output behaves like a 20 amp type III circuit breaker. Short to ground or overload Refer to Marker, Park and Tail Lamps(See MARKER, PARK AND TAIL LAMPS, page 781) in the Light Systems section of this manual.
611	14	4	3	4007/Bus 1603 H	Connector #1603 Pin #H Park light less than normal low current but more than open circuit Refer to Marker, Park and Tail Lamps(See MARKER, PARK AND TAIL LAMPS, page 781) in the Light Systems section of this manual.
611	14	4	4	4007/Bus 1603 H	Connector #1603 Pin #H Park light greater than normal high current and less than fusing current Refer to Marker, Park and Tail Lamps(See MARKER, PARK AND TAIL LAMPS, page 781) in the Light Systems section of this manual.
611	14	4	6	4007/Bus 1603 H	Connector #1603 Pin #H Park light has current flow when output commanded off Refer to Marker, Park and Tail Lamps(See MARKER, PARK AND TAIL LAMPS, page 781) in the Light Systems section of this manual.
611	14	5	1	4007/Bus 1603 D	Connector #1603 Pin #D Low beam under current The current from this output is below 0.5 A Open circuit Refer to Headlight System(See HEADLIGHT SYSTEM, page 813) in the Light Systems section of this manual.
611	14	5	2	4007/Bus 1603 D	Connector #1603 Pin #D Low beam over current The output behaves like a 20 amp type I circuit breaker Short to ground or overload Refer to Headlight System(See HEADLIGHT SYSTEM, page 813) in the Light Systems section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	5	3	4007/Bus 1603 D	Connector #1603 Pin #D Low beam less than normal low current but more than open circuit Refer to Headlight System(See HEADLIGHT SYSTEM, page 813) in the Light Systems section of this manual.
611	14	5	4	4007/Bus 1603 D	Connector #1603 Pin #D Low beam greater than normal high current and less than fusing current Refer to Headlight System(See HEADLIGHT SYSTEM, page 813) in the Light Systems section of this manual.
611	14	5	6	4007/Bus 1603 D	Connector #1603 Pin #D Low beam has current flow when output commanded off Refer to Headlight System(See HEADLIGHT SYSTEM, page 813) in the Light Systems section of this manual.
611	14	6	1	4008/Bus 1604 F	Connector #4008 Pin #F Wiper power under current Connector #1604 Pin #F Bus (Wiper power) output under current The Current from this output is below 0.5 A Open circuit Refer to Wiper Motor Circuits (See WIPER MOTOR CIRCUITS, page 426) in the Cab Feature section of this manual.
611	14	6	2	4008/Bus 1604 F	Connector #4008 Pin #F Wiper power over current Connector #1604 Pin #F Bus (Wiper power) output over current The output behaves like a 20 amp type I circuit breaker Short to ground or overload Refer to Wiper Motor Circuits (See WIPER MOTOR CIRCUITS, page 426) in the Cab Feature section of this manual.
611	14	6	3	4008/Bus 1604 F	Connector #4008 Pin #F Wiper power less than normal low current but more than open circuit Connector #1604 Pin #F Bus (Wiper power) less than normal low current but more than open circuit Refer to Wiper Motor Circuits (See WIPER MOTOR CIRCUITS, page 426) in the Cab Feature section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	6	4	4008/Bus 1604 F	Connector #4008 Pin #F Wiper power greater than normal high current and less than fusing current Connector #1604 Pin #F Bus (Wiper power) greater than normal high current and less than fusing current Refer to Wiper Motor Circuits (See WIPER MOTOR CIRCUITS, page 426) in the Cab Feature section of this manual.
611	14	6	6	4008/Bus 1604 F	Connector #4008 Pin #F Wiper power has current flow when output commanded off Connector #1604 Pin #F Bus (Wiper power) has current flow when output commanded off Refer to Wiper Motor Circuits (See WIPER MOTOR CIRCUITS, page 426) in the Cab Feature section of this manual.
611	14	7	1	4007/Bus 1603 G	Connector #1603 Pin #G High beam under current The Current from this output is below 0.5 A Open circuit Refer to Headlight System(See HEADLIGHT SYSTEM, page 813) in the Light Systems section of this manual.
611	14	7	2	4007/Bus 1603 G	Connector #1603 Pin #G High beam over current The output behaves like a 20 amp type I circuit breaker Short to ground or overload Refer to Headlight System(See HEADLIGHT SYSTEM, page 813) in the Light Systems section of this manual.
611	14	7	3	4007/Bus 1603 G	Connector #1603 Pin #G High beam less than normal low current but more than open circuit Refer to Headlight System(See HEADLIGHT SYSTEM, page 813) in the Light Systems section of this manual.
611	14	7	4	4007/Bus 1603 G	Connector #1603 Pin #G High beam greater than normal high current and less than fusing current Refer to Headlight System(See HEADLIGHT SYSTEM, page 813) in the Light Systems section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	7	6	4007/Bus 1603 G	Connector #1603 Pin #G High beam has current flow when output commanded off Refer to Headlight System(See HEADLIGHT SYSTEM, page 813) in the Light Systems section of this manual.
611	14	9	1	4008/Bus 1604 G	Connector #4008 Pin #G A/C Clutch under current Connector #1604 Pin #G (Left Rear Amber Flashers) under current The Current from this output is below 0.5 A Open circuit Refer to Red & Amber Pupil Warning Lights in this manual.
611	14	9	2	4008/Bus 1604 G	Connector #4008 Pin #G A/C Clutch over current Connector #1604 Pin #G (Left Rear Amber Flashers) over current The output behaves like a 10 Amp type III circuit breaker. Short to ground or overload Refer to Red & Amber Pupil Warning Lights in this manual.
611	14	9	3	4008/Bus 1604 G	Connector #4008 Pin #G A/C Clutch less than normal low current but more than open circuit Connector #1604 Pin #G (Left Rear Amber Flashers) less than normal low current but more than open circuit Refer to Red & Amber Pupil Warning Lights in this manual.
611	14	9	4	4008/Bus 1604 G	Connector #4008 Pin #G A/C Clutch greater than normal high current and less than fusing current Connector #1604 Pin #G (Left Rear Amber Flashers) greater than normal high current and less than fusing current Refer to Red & Amber Pupil Warning Lights in this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	9	6	4008/Bus 1604 G	Connector #4008 Pin #G A/C Clutch has current flow when output commanded off Connector #1604 Pin #G (Left Rear Amber Flashers) has current flow when output commanded off Refer to Red & Amber Pupil Warning Lights in this manual.
611	14	10	1	1601/C	Connector #1601 Pin #C Dome light under current Connector #1601 Pin #C (BUS Right Rear Amber PWL) under current The Current from this output is below 0.5 A Open circuit Refer to Red & Amber Pupil Warning Lights in this manual.
611	14	10	2	1601/C	Connector #1601 Pin #C Dome light over current Connector #1601 Pin #C (BUS - Right Rear Amber PWL) over current The output behaves like a 10 Amp type III circuit breaker. Short to ground or overload Refer to Red & Amber Pupil Warning Lights in this manual.
611	14	10	3	1601/C	Connector #1601 Pin #C Dome light less than normal low current but more than open circuit Connector #1601 Pin #C (BUS - Right Rear Amber PWL) less than normal low current but more than open circuit Refer to Red & Amber Pupil Warning Lights in this manual.
611	14	10	4	1601/C	Connector #1601 Pin #C Dome light greater than normal high current and less than fusing current Connector #1601 Pin #C (BUS - Right Rear Amber PWL) greater than normal high current and less than fusing current Refer to Red & Amber Pupil Warning Lights in this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	10	6	1601/C	Connector #1601 Pin #C Dome light has current flow when output commanded off Connector #1601 Pin #C (BUS - Right Rear Amber PWL) has current flow when output commanded off Refer to Red & Amber Pupil Warning Lights in this manual.
611	14	11	1	4007/Bus 1603 F	Connector #4007 Pin #F Work light under current Connector #1603 Pin #F (Right Front Amber PWL's) under current The Current from this output is below 0.5 A Open circuit Refer to Red & Amber Pupil Warning Lights in this manual.
611	14	11	2	4007/Bus 1603 F	Connector #4007 Pin #F Work light over current Connector #1603 Pin #F (Right Front Amber PWL's) over current The output behaves like a 10 Amp type III circuit breaker. Short to ground or overload Refer to Red & Amber Pupil Warning Lights in this manual.
611	14	11	3	4007/Bus 1603 F	Connector #4007 Pin #F Work light less than normal low current but more than open circuit Connector #1603 Pin #F (Right Front Amber PWL's) less than normal low current but more than open circuit Refer to Red & Amber Pupil Warning Lights in this manual.
611	14	11	4	4007/Bus 1603 F	Connector #4007 Pin #F Work light greater than normal high current and less than fusing current Connector #1603 Pin #F (Right Front Amber PWL's) greater than normal high current and less than fusing current Refer to Red & Amber Pupil Warning Lights in this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	11	6	4007/Bus 1603 F	<p>Connector #4007 Pin #F Work light has current flow when output commanded off</p> <p>Connector #1603 Pin #F (Right Front Amber PWL's) has current flow when output commanded off</p> <p>Refer to Red & Amber Pupil Warning Lights in this manual.</p>
611	14	12	1	4007/Bus 1603 E	<p>Connector #1603 Pin #E Electric horn under current</p> <p>The Current from this output is below 0.5 A</p> <p>Open circuit</p> <p>Refer to Electric Horn (See ELECTRIC HORN CIRCUIT OUTPUTS FROM ESC, page 361) in the Cab Features section of this manual.</p>
611	14	12	2	4007/Bus 1603 E	<p>Connector #1603 Pin #E Electric horn over current</p> <p>The output behaves like a 10 Amp type III circuit breaker.</p> <p>Short to ground or overload</p> <p>Refer to Electric Horn (See ELECTRIC HORN CIRCUIT OUTPUTS FROM ESC, page 361) in the Cab Features section of this manual.</p>
611	14	12	3	4007/Bus 1603 E	<p>Connector #1603 Pin #E Electric horn less than normal low current but more than open circuit</p> <p>Refer to Electric Horn (See ELECTRIC HORN CIRCUIT OUTPUTS FROM ESC, page 361) in the Cab Features section of this manual.</p>
611	14	12	4	4007/Bus 1603 E	<p>Connector #1603 Pin #E Electric horn greater than normal high current and less than fusing current</p> <p>Refer to Electric Horn (See ELECTRIC HORN CIRCUIT OUTPUTS FROM ESC, page 361) in the Cab Features section of this manual.</p>
611	14	12	6	4007/Bus 1603 E	<p>Connector #1603 Pin #E Electric horn has current flow when output commanded off</p> <p>Refer to Electric Horn (See ELECTRIC HORN CIRCUIT OUTPUTS FROM ESC, page 361) in the Cab Features section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	13	1	4008/Bus 1604 C	<p>Connector #4008 Pin #C Left rear turn lamp under current</p> <p>Connector #1604 Pin #C (Left rear turn lamp) under current</p> <p>The Current from this output is below 0.5 A</p> <p>Blown bulb or open circuit</p> <p>Refer to Rear Stop/Turn Signal/Hazard Light Outputs From ESC (See REAR TURN SIGNAL/HAZARD LIGHT OUTPUTS FROM ESC, page 871) in the Light Systems section of this manual.</p>
611	14	13	2	4008/Bus 1604 C	<p>Connector #4008 Pin #C Left rear turn lamp over current</p> <p>Connector #1604 Pin #C (Left rear turn lamp) over current</p> <p>The output behaves like a 10 Amp type III circuit breaker.</p> <p>Short to ground or overload</p> <p>Refer to Rear Stop/Turn Signal/Hazard Light Outputs From ESC (See REAR TURN SIGNAL/HAZARD LIGHT OUTPUTS FROM ESC, page 871) in the Light Systems section of this manual.</p>
611	14	13	3	4008/Bus 1604 C	<p>Connector #4008 Pin #C Left rear turn lamp less than normal low current but more than open circuit</p> <p>Connector #1604 Pin #C (Left rear turn lamp) less than normal low current but more than open circuit</p> <p>Refer to Rear Stop/Turn Signal/Hazard Light Outputs From ESC (See REAR TURN SIGNAL/HAZARD LIGHT OUTPUTS FROM ESC, page 871) in the Light Systems section of this manual.</p>
611	14	13	4	4008/Bus 1604 C	<p>Connector #4008 Pin #C Left rear turn lamp greater than normal high current and less than fusing current</p> <p>Connector #1604 Pin #C (Left rear turn lamp) greater than normal high current and less than fusing current</p> <p>Refer to Rear Stop/Turn Signal/Hazard Light Outputs From ESC (See REAR TURN SIGNAL/HAZARD LIGHT OUTPUTS FROM ESC, page 871) in the Light Systems section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	13	6	4008/Bus 1604 C	<p>Connector #4008 Pin #C Left rear turn lamp has current flow when output commanded off</p> <p>Connector #1604 Pin #C (Left rear turn lamp) has current flow when output commanded off</p> <p>Refer to Rear Stop/Turn Signal/Hazard Light Outputs From ESC (See REAR TURN SIGNAL/HAZARD LIGHT OUTPUTS FROM ESC, page 871) in the Light Systems section of this manual.</p>
611	14	14	1	4008/Bus 1604 B	<p>Connector #4008 Pin #B Right rear turn lamp under current</p> <p>Connector #1604 Pin #B (Right rear turn lamp) under current</p> <p>The Current from this output is below 0.5 A</p> <p>Blown bulb or open circuit</p> <p>Refer to Rear Stop/Turn Signal/Hazard Light Outputs From ESC (See REAR TURN SIGNAL/HAZARD LIGHT OUTPUTS FROM ESC, page 871) in the Light Systems section of this manual.</p>
611	14	14	2	4008/Bus 1604 B	<p>Connector #4008 Pin #B Right rear turn lamp over current</p> <p>Connector #1604 Pin #B (Right rear turn lamp) over current</p> <p>The output behaves like a 10 Amp type III circuit breaker.</p> <p>Short to ground or overload</p> <p>Refer to Rear Stop/Turn Signal/Hazard Light Outputs From ESC (See REAR TURN SIGNAL/HAZARD LIGHT OUTPUTS FROM ESC, page 871) in the Light Systems section of this manual.</p>
611	14	14	3	4008/Bus 1604 B	<p>Connector #4008 Pin #B Right rear turn lamp less than normal low current but more than open circuit</p> <p>Connector #1604 Pin #B (Right rear turn lamp) less than normal low current but more than open circuit</p> <p>Refer to Rear Stop/Turn Signal/Hazard Light Outputs From ESC (See REAR TURN SIGNAL/HAZARD LIGHT OUTPUTS FROM ESC, page 871) in the Light Systems section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	14	4	4008/Bus 1604 B	<p>Connector #4008 Pin #B Right rear turn lamp greater than normal high current and less than fusing current</p> <p>Connector #1604 Pin #B (Right rear turn lamp) greater than normal high current and less than fusing current</p> <p>Refer to Rear Stop/Turn Signal/Hazard Light Outputs From ESC (See REAR TURN SIGNAL/HAZARD LIGHT OUTPUTS FROM ESC, page 871) in the Light Systems section of this manual.</p>
611	14	14	6	4008/Bus 1604 B	<p>Connector #4008 Pin #B Right rear turn lamp has current flow when output commanded off</p> <p>Connector #1604 Pin #B (Right rear turn lamp) has current flow when output commanded off</p> <p>Refer to Rear Stop/Turn Signal/Hazard Light Outputs From ESC (See REAR TURN SIGNAL/HAZARD LIGHT OUTPUTS FROM ESC, page 871) in the Light Systems section of this manual.</p>
611	14	15	1	4007/Bus 1603 C	<p>Connector #1603 Pin #C Left front turn lamp under current</p> <p>The Current from this output is below 0.5 A</p> <p>Blown bulbs or open circuit</p> <p>Refer to Front Turn Signal Outputs From ESC (See FRONT TURN SIGNAL/HAZARD AND SEPARATE TURN SIGNAL LIGHT OUTPUTS FROM ESC, page 859) in the Light Systems section of this manual.</p>
611	14	15	2	4007/Bus 1603 C	<p>Connector #1603 Pin #C Left front turn lamp over current</p> <p>The output behaves like a 10 Amp type III circuit breaker.</p> <p>Short to ground or overload</p> <p>Refer to Front Turn Signal Outputs From ESC (See FRONT TURN SIGNAL/HAZARD AND SEPARATE TURN SIGNAL LIGHT OUTPUTS FROM ESC, page 859) in the Light Systems section of this manual.</p>
611	14	15	3	4007/Bus 1603 C	<p>Connector #1603 Pin #C Left front turn lamp less than normal low current but more than open circuit</p> <p>Refer to Front Turn Signal Outputs From ESC (See FRONT TURN SIGNAL/HAZARD AND SEPARATE TURN SIGNAL LIGHT OUTPUTS FROM ESC, page 859) in the Light Systems section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	15	4	4007/Bus 1603 C	Connector #1603 Pin #C Left front turn lamp greater than normal high current and less than fusing current Refer to Front Turn Signal Outputs From ESC (See FRONT TURN SIGNAL/HAZARD AND SEPARATE TURN SIGNAL LIGHT OUTPUTS FROM ESC, page 859) in the Light Systems section of this manual.
611	14	15	6	4007/Bus 1603 C	Connector #1603 Pin #C Left front turn lamp has current flow when output commanded off Refer to Front Turn Signal Outputs From ESC (See FRONT TURN SIGNAL/HAZARD AND SEPARATE TURN SIGNAL LIGHT OUTPUTS FROM ESC, page 859) in the Light Systems section of this manual.
611	14	16	1	4007/Bus 1603 B	Connector #1603 Pin #B Right front turn lamp under current The Current from this output is below 0.5 A Blown bulb or open circuit Refer to Front Turn Signal Outputs From ESC (See FRONT TURN SIGNAL/HAZARD AND SEPARATE TURN SIGNAL LIGHT OUTPUTS FROM ESC, page 859) in the Light Systems section of this manual.
611	14	16	2	4007/Bus 1603 B	Connector #1603 Pin #B Right front turn lamp over current The output behaves like a 10 Amp type III circuit breaker. Short to ground or overload Refer to Front Turn Signal Outputs From ESC (See FRONT TURN SIGNAL/HAZARD AND SEPARATE TURN SIGNAL LIGHT OUTPUTS FROM ESC, page 859) in the Light Systems section of this manual.
611	14	16	3	4007/Bus 1603 B	Connector #1603 Pin #B Right front turn lamp less than normal low current but more than open circuit Refer to Front Turn Signal Outputs From ESC (See FRONT TURN SIGNAL/HAZARD AND SEPARATE TURN SIGNAL LIGHT OUTPUTS FROM ESC, page 859) in the Light Systems section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
611	14	16	4	4007/Bus 1603 B	Connector #1603 Pin #B Right front turn lamp greater than normal high current and less than fusing current Refer to Front Turn Signal Outputs From ESC (See FRONT TURN SIGNAL/HAZARD AND SEPARATE TURN SIGNAL LIGHT OUTPUTS FROM ESC, page 859) in the Light Systems section of this manual.
611	14	16	6	4007/Bus 1603 B	Connector #1603 Pin #B Right front turn lamp has current flow when output commanded off Refer to Front Turn Signal Outputs From ESC (See FRONT TURN SIGNAL/HAZARD AND SEPARATE TURN SIGNAL LIGHT OUTPUTS FROM ESC, page 859) in the Light Systems section of this manual.
612	14	0	1	1600/2	Connector #1600 Pin #2 Ignition out of range low Shorted to ground or open Refer to ESC Power and Ground.(See ESC POWER AND GROUND, page 98)
612	14	0	2	1600/2	Connector #1600 Pin #2 Ignition out of range high Shorted high Refer to ESC Power and Ground.(See ESC POWER AND GROUND, page 98)
612	14	1	1	1600/33	Connector #1600 Pin #33 Brake switch out of range low Shorted to ground. Refer to hydraulic brake switch (See HYDRAULIC BRAKE SWITCH INPUTS TO ESC, page 853) or air brake switch (See AIR BRAKE SWITCH INPUTS TO ESC, page 855) in this manual.
612	14	1	2	1600/33	Connector #1600 Pin #33 Brake switch out of range high Shorted high or open circuit Refer to hydraulic brake switch (See HYDRAULIC BRAKE SWITCH INPUTS TO ESC, page 853) or air brake switch (See AIR BRAKE SWITCH INPUTS TO ESC, page 855) in this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
612	14	2	1	1600/17	Connector #1600 Pin #17 Upper Clutch Switch out of range low Shorted to ground. Refer to Clutch Switch (See CLUTCH SWITCH, page 446) in this manual.
612	14	2	2	1600/17	Connector #1600 Pin #17 Upper Clutch Switch out of range high Shorted high or open circuit Refer to Clutch Switch (See CLUTCH SWITCH, page 446) in this manual.
612	14	3	1	1600/16	Connector #1600 Pin #16 Secondary Air Sensor / Spare out of range low Short to ground, open circuit Secondary Air Pressure Gauge (See SECONDARY AIR PRESSURE GAUGE, page 246) in this manual.
612	14	3	2	1600/16	Connector #1600 Pin #16 Secondary Air Sensor / Spare out of range high Shorted high Secondary Air Pressure Gauge (See SECONDARY AIR PRESSURE GAUGE, page 246) in this manual.
612	14	4	1	1600/15	Connector #1600 Pin #15 Primary Air Sensor / Auxiliary Air Sensor out of range low Short to ground, open circuit For vehicles with air brakes, refer to Primary Air Pressure Gauge (See PRIMARY AIR PRESSURE GAUGE, page 239). For vehicles with hydraulic brakes, refer to Auxiliary Air Pressure Gauge (See SECONDARY AIR PRESSURE GAUGE, page 246) in this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
612	14	4	2	1600/15	<p>Connector #1600 Pin #15 Primary Air Sensor / Auxiliary Air Sensor out of range high</p> <p>Shorted high</p> <p>For vehicles with air brakes, refer to Primary Air Pressure Gauge (See PRIMARY AIR PRESSURE GAUGE, page 239).</p> <p>For vehicles with hydraulic brakes, refer to Auxiliary Air Pressure Gauge (See SECONDARY AIR PRESSURE GAUGE, page 246) in this manual.</p>
612	14	5	1	1600/10	<p>Connector #1600 Pin #10 Analog cruise switch input out of range low</p> <p>Connector #1600 Pin #10 (Bus - Diags/flashers/Entrance Door Input) out of range low</p> <p>Shorted to ground or open circuit</p> <p>Refer to Cruise Control (See CRUISE CONTROL, page 349) or Service Door Controls section in this manual.</p> <p>The EGC cannot be put in diagnostic mode when there is a fault in these circuits. The Diamond Logic Builder™ software must be used to view this DTC.</p>
612	14	5	2	1600/10	<p>Connector #1600 Pin #10 Analog cruise switch input out of range high</p> <p>Connector #1600 Pin #10 (Bus - Diags/flashers/Entrance Door Input) out of range high</p> <p>Shorted high</p> <p>Refer to Cruise Control (See CRUISE CONTROL, page 349) or Service Door Controls section in this manual.</p> <p>The EGC cannot be put in diagnostic mode when there is a fault in these circuits. The Diamond Logic Builder™ software must be used to view this DTC.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
612	14	23	1	4004/Bus 1602 4	<p>Connector #4004/Bus 1602 Pin #4 Fuel level sensor out of range low</p> <p>Bus — Not Used</p> <p>This code is associated with a short to ground on the fuel level sensor on the storage tank for dual tank vehicles.</p> <p>Shorted to ground.</p> <p>Refer to Fuel Level Gauge (See FUEL LEVEL GAUGE, page 231) in the Electronic Gauge Cluster section of this manual.</p>
612	14	23	2	4004/Bus 1602 4	<p>Connector #4004/Bus 1602 Pin #4 Fuel level sensor out of range high</p> <p>Bus — Not Used</p> <p>This code is associated with a short to accessory or open circuit on the fuel level sensor on the storage tank for dual tank vehicles.</p> <p>Shorted high or open circuit</p> <p>Refer to Fuel Level Gauge (See FUEL LEVEL GAUGE, page 231) in the Electronic Gauge Cluster section of this manual.</p>
612	14	24	1	4004/Bus 1602 23	<p>Connector #4004 Pin #23 Hydraulic ABS warning lamp input out of range low</p> <p>Connector #1602 Pin #23 (Bus Wheel Chair Lift Solenoid) open circuit</p> <p>Open circuit</p> <p>Refer to the Wheelchair Lift Controls (See CIRCUIT FUNCTIONS, page 574) section in this manual.</p>
612	14	24	2	4004/Bus 1602 23	<p>Connector #4004 Pin #23 Hydraulic ABS warning lamp input out of range high</p> <p>Connector #1602 Pin #23 (Bus Wheel Chair Lift Solenoid) shorted to battery</p> <p>Shorted high</p> <p>Refer to the Wheelchair Lift Controls (See CIRCUIT FUNCTIONS, page 574) section in this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
612	14	25	1	4004/Bus 1602 5	<p>Connector #4004/Bus 1602 Pin #5 Fuel level sensor out of range low</p> <p>This code is associated with a short to ground on the fuel level sensor on the draw tank for both single tank and dual tank vehicles.</p> <p>Shorted to ground.</p> <p>Refer to Fuel Level Gauge (See FUEL LEVEL GAUGE, page 231) in the Electronic Gauge Cluster section of this manual.</p>
612	14	25	2	4004/Bus 1602 5	<p>Connector #4004/Bus 1602 Pin #5 Fuel level sensor out of range high</p> <p>This code is associated with a short to accessory or open circuit on the fuel level sensor on the draw tank for both single tank and dual tank vehicles.</p> <p>Shorted high or open circuit</p> <p>Refer to Fuel Level Gauge (See FUEL LEVEL GAUGE, page 231) in the Electronic Gauge Cluster section of this manual.</p>
612	14	27	1	4004/Bus 1602 6	<p>Connector #4004/Bus 1602 Pin #6 Outlet HVAC thermistor out of range low</p> <p>Bus - Not used</p> <p>Shorted to ground.</p>
612	14	27	2	4004/Bus 1602 6	<p>Connector #4004/Bus 1602 Pin #6 Outlet HVAC thermistor out of range high</p> <p>Bus - Not used</p> <p>Thermistor open circuit.</p>
612	14	29	1	4004/Bus 1602 7	<p>Connector #4004/Bus 1602 Pin #7 Inlet HVAC thermistor out of range low</p> <p>Bus - Not used</p> <p>Shorted to ground.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
612	14	29	2	4004/Bus 1602 7	Connector #4004/Bus 1602 Pin #7 Inlet HVAC thermistor out of range high Bus - Not used Thermistor open circuit.
612	14	30	1	4004/Bus 1602 27	Connector #4004/Bus 1602 Pin #27 Switched 5 volt sensor supply out of range low Bus - Not used Shorted to ground or open circuit All air gauges and air brake switches will be inoperative. Refer to ESC Switched 5 Volt Sensor Supply. (See ESC SWITCHED 5 VOLT SENSOR SUPPLY, page 100)
612	14	30	2	4004/Bus 1602 27	Connector #4004/Bus 1602 Pin #27 Switched 5 volt sensor supply out of range high Bus - Not used Shorted high All air gauges and air brake switches will be inoperative. Refer to ESC Switched 5 Volt Sensor Supply. (See ESC SWITCHED 5 VOLT SENSOR SUPPLY, page 100)
612	14	31	1	4004/Bus 1602 8	Connector #4004 Pin #8 (MD)HVAC high side pressure sensor out of range low Connector #1602 Pin #8 (Bus Crossing gate disable) out of range low Short to ground or open circuit Refer to the Crossing Gate Assembly in this manual.
612	14	31	2	4004/Bus 1602 8	Connector #4004 Pin #8 (MD)HVAC high side pressure sensor out of range high Connector #1602 Pin #8 (Bus Crossing gate disable) out of range high Shorted high Refer to the Crossing Gate Assembly in this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
612	14	32	1	4004/Bus 1602 1	Connector #4004/Bus #1602 Pin #1 Rear Axle Oil Temperature out of range low Bus - Not used Shorted to ground or open circuit.
612	14	32	2	4004/Bus 1602 1	Connector #4004/Bus #1602 Pin #1 Rear Axle Oil Temperature out of range high Bus - Not used Shorted high.
612	14	33	1	4004/Bus 1602 10	Connector #4004/Bus #1602 Pin #10 Engine Oil Temperature/Power Park Brake out of range low Bus - Not used Short to ground or open circuit
612	14	33	2	4004/Bus 1602 10	Connector #4004/Bus #1602 Pin #10 Engine Oil Temperature/Power Park Brake out of range high Bus - Not used Shorted high
612	14	34	1	4004/Bus 1602 2	Connector #4004/Bus 1602 Pin #2 Forward Rear Axle Temperature out of range low Bus - Not used Shorted to ground.
612	14	35	1	4004/Bus 1602 13	Connector #4004/Bus 1602 Pin #13 (Brake Application Air) out of range low Bus - Not used Short to ground or open circuit
612	14	35	2	4004/Bus 1602 13	Connector #4004/Bus 1602 Pin #13 (Brake Application Air) out of range high Bus - Not used Shorted high

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
612	14	36	1	4004/Bus 1602 3	Connector #4004/Bus 1602 Pin #3 (Transmission Oil Temp/Spare) out of range low Bus - Not used Shorted to ground.
613	14	1	1	N/A	HVAC Control Head air inlet fault This is a motor fault in the evaporator module. This motor controls the door in the evaporator module duct. Motor in the wrong position or jammed. Refer to Recirculation Motor in the HVAC service manual section S160254.
613	14	1	2	N/A	HVAC Control Head hot/cold temp. mix control fault This is a motor fault in the heater module. This motor controls the door in the heater module/blower scroll. Motor in the wrong position or jammed. Refer to Temperature Actuator in the HVAC service manual section S160254.
613	14	1	3	N/A	HVAC Control Head mode control fault. This is a motor fault in the kinematic network. This motor controls the doors in the kinematic network of the heater module. Motor in the wrong position or jammed. Refer to Mode Actuator in the HVAC service manual section S160254.
613	14	1	4	N/A	HVAC Control Head multiple motor faults. 2 or more motor faults. Motor in the wrong position or jammed. Refer to HVAC Control Head in the HVAC service manual section S160254.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
613	14	1	5	N/A	<p>HVAC Control Head diagnostic circuit loss of communication with the ESC.</p> <p>Open circuit, short to ground or shorted high.</p> <p>Refer to HVAC Control Head in the HVAC service manual section S160254.</p>
613	14	1	6	N/A	<p>AC service soon</p> <p>At the current operating ambient temperature the system has lost enough charge that service should be performed to insure continued AC performance.</p> <p>Refer to HVAC Diagnostics in the HVAC service manual section S160254.</p>
613	14	1	7	N/A	<p>AC service now - low charge</p> <p>At the current operating ambient temperature the system has lost so much charge that the compressor must be shut off to prevent damage to it or other system components.</p> <p>Refer to HVAC Diagnostics in the HVAC service manual section S160254.</p>
613	14	1	8	N/A	<p>AC service now - very low charge</p> <p>At the current operating ambient temperature the system has lost so much charge that the compressor must be shut off to prevent damage to it or other system components.</p> <p>Refer to HVAC Diagnostics in the HVAC service manual section S160254.</p>
613	14	1	9	N/A	<p>AC service now - burst pipe</p> <p>An almost complete loss of charge has occurred due to pipe or other component rupture. The compressor is shut off so that no damage will occur.</p> <p>Refer to HVAC Diagnostics in the HVAC service manual section S160254.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
613	14	1	10	N/A	<p>AC service now - fan problem/clogged pipe</p> <p>At the current operating ambient temperature the engine fan isn't working, one of the AC lines has become plugged or the system is over-charged. The compressor is shut off to prevent damage.</p> <p>Refer to HVAC Diagnostics in the HVAC service manual section S160254.</p>
613	14	1	11	N/A	<p>AC service now - compressor failure</p> <p>The compressor is not functioning</p> <p>Refer to HVAC Diagnostics in the HVAC service manual section S160254.</p>
613	14	1	12	N/A	<p>AC service now - rapid cycling</p> <p>The compressor clutch is cycling faster than once every 15 seconds. The compressor is not allowed to operate.</p> <p>Refer to HVAC Diagnostics in the HVAC service manual section S160254.</p>
614	14	1	1	1600/34,35	<p>Electronic Gauge Cluster #1 checksum error fixed by relearn.</p> <p>The configuration checksum in the cluster did not match the teach/relearn checksum in the ESC. This situation was corrected by the teach/relearn operation.</p> <p>Refer to the Electronic Gauge Cluster section (See RETARD OVERHEAT WARNING LAMP, page 212) in this manual.</p>
614	14	1	2	1600/34,35	<p>Electronic Gauge Cluster #1 checksum error could not be fixed.</p> <p>The configuration checksum in the cluster did not match the teach/relearn checksum in the ESC. This situation could not be corrected by the teach/relearn operation.</p> <p>Faulty cluster</p> <p>Refer to the Electronic Gauge Cluster section (See RETARD OVERHEAT WARNING LAMP, page 212) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
614	14	23	1	1600/ 34,35,36	Electronic Gauge Cluster #1 checksum error fixed by reteach. The configuration checksum in the cluster did not match the teach/reteach checksum in the ESC. This situation was corrected by the teach/reteach operation. Refer to the Electronic Gauge Cluster section (See RETARD OVERHEAT WARNING LAMP, page 212) of this manual.
614	14	23	2	1600/ 34,35	Electronic Gauge Cluster #1 checksum error could not be fixed. The configuration checksum in the cluster did not match the teach/reteach checksum in the ESC. This situation could not be corrected by the teach/reteach operation. Faulty cluster Refer to the Electronic Gauge Cluster section (See RETARD OVERHEAT WARNING LAMP, page 212) of this manual.
614	14	40	1	1600/ 34,35	Auxiliary Gauge Switchpack #1 checksum error fixed by reteach. The configuration checksum in the AGSP did not match the teach/reteach checksum in the ESC. This situation was corrected by the teach/reteach operation.
614	14	40	2	1600/ 34,35	Auxiliary Gauge Switchpack #1 checksum error could not be fixed. The configuration checksum in the AGSP did not match the teach/reteach checksum in the ESC. This situation could not be corrected by the teach/reteach operation. Faulty AGSP
625	14	5	0	1600/ 29,30	Switch Pack #4 not communicating with the ESC (Lower half of 12 pack) The ESC sets the status of the switches in switch pack #4 to there default values. Switch data link fault. Refer to the Switch Pack Module (See SWITCH PACK MODULES, page 126) section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	5	17	1600/29,30	<p>Switch Pack #4 Switch #1, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #4 switch #1 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	18	1600/29,30	<p>Switch Pack #4 Switch #1, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #4 switch #1 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	19	1600/29,30	<p>Switch Pack #4 Switch #1, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #4 switch #1 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	20	1600/29,30	<p>Switch Pack #4 Switch #1, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #4 switch #1 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	5	21	1600/29,30	<p>Switch Pack #4 Switch #1. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #1 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	33	1600/29,30	<p>Switch Pack #4 Switch #2, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #4 switch #2 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	34	1600/29,30	<p>Switch Pack #4 Switch #2, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #4 switch #2 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	35	1600/29,30	<p>Switch Pack #4 Switch #2, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #4 switch #2 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	5	36	1600/ 29,30	<p>Switch Pack #4 Switch #2, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #4 switch #2 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	37	1600/ 29,30	<p>Switch Pack #4 Switch #2. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #2 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	49	1600/ 29,30	<p>Switch Pack #4 Switch #3, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #3 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	50	1600/ 29,30	<p>Switch Pack #4 Switch #3, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #3 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	5	51	1600/29,30	<p>Switch Pack #4 Switch #3, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #4 switch #3 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	52	1600/29,30	<p>Switch Pack #4 Switch #3, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #3 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	53	1600/29,30	<p>Switch Pack #4 Switch #3. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #3 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	65	1600/29,30	<p>Switch Pack #4 Switch #4, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #4 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	5	66	1600/ 29,30	<p>Switch Pack #4 Switch #4, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #4 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	67	1600/ 29,30	<p>Switch Pack #4 Switch #4, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #4 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	68	1600/ 29,30	<p>Switch Pack #4 Switch #4, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #4 switch #4 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	69	1600/ 29,30	<p>Switch Pack #4 Switch #4. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #4 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	5	81	1600/29,30	<p>Switch Pack #4 Switch #5, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #5 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	82	1600/29,30	<p>Switch Pack #4 Switch #5, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #5 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	83	1600/29,30	<p>Switch Pack #4 Switch #5, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #5 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	84	1600/29,30	<p>Switch Pack #4 Switch #5, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #5 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	5	85	1600/ 29,30	<p>Switch Pack #4 Switch #5. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #5 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	97	1600/ 29,30	<p>Switch Pack #4 Switch #6, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #6 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	98	1600/ 29,30	<p>Switch Pack #4 Switch #6, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #6 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	99	1600/ 29,30	<p>Switch Pack #4 Switch #6, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #6 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	5	100	1600/29,30	<p>Switch Pack #4 Switch #6, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of Switch Pack #4 Switch #6 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	5	101	1600/29,30	<p>Switch Pack #4 Switch #6. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #4 switch #6 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	0	1600/29,30	<p>Switch Pack #3 not communicating with the ESC (Upper half of 12 pack)</p> <p>The ESC sets the status of the switches in switch pack #3 to there default values</p> <p>Switch data link fault</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	17	1600/29,30	<p>Switch Pack #3 Switch #1, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #3 switch #1 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	6	18	1600/29,30	<p>Switch Pack #3 Switch #1, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #3 switch #1 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	19	1600/29,30	<p>Switch Pack #3 Switch #1, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #3 switch #1 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	20	1600/29,30	<p>Switch Pack #3 Switch #1, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #3 switch #1 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	21	1600/29,30	<p>Switch Pack #3 Switch #1. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #3 switch #1 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	6	33	1600/29,30	<p>Switch Pack #3 Switch #2, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #3 switch #2 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	34	1600/29,30	<p>Switch Pack #3 Switch #2, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #3 switch #2 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	35	1600/29,30	<p>Switch Pack #3 Switch #2, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	36	1600/29,30	<p>Switch Pack #3 Switch #2, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	37	1600/29,30	<p>Switch Pack #3 Switch #2. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #3 switch #2 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	6	49	1600/29,30	<p>Switch Pack #3 Switch #3, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #3 switch #3 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	50	1600/29,30	<p>Switch Pack #3 Switch #3, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #3 switch #3 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	51	1600/29,30	<p>Switch Pack #3 Switch #3, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #3 switch #3 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	52	1600/29,30	<p>Switch Pack #3 Switch #3, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #3 switch #3 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	6	53	1600/29,30	<p>Switch Pack #3 Switch #3. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #3 switch #3 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	65	1600/29,30	<p>Switch Pack #3 Switch #4, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #3 switch #4 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	66	1600/29,30	<p>Switch Pack #3 Switch #4, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #3 switch #4 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	67	1600/29,30	<p>Switch Pack #3 Switch #4, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #3 switch #4 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	6	68	1600/ 29,30	<p>Switch Pack #3 Switch #4, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #3 switch #4 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	69	1600/ 29,30	<p>Switch Pack #3 Switch #4. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #3 switch #4 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	81	1600/ 29,30	<p>Switch Pack #3 Switch #5, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #3 switch #5 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	82	1600/ 29,30	<p>Switch Pack #3 Switch #5, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #3 switch #5 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	6	83	1600/29,30	<p>Switch Pack #3 Switch #5, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #3 switch #5 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	84	1600/29,30	<p>Switch Pack #3 Switch #5, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #3 switch #5 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	85	1600/29,30	<p>Switch Pack #3 Switch #5. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #3 switch #5 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	97	1600/29,30	<p>Switch Pack #3 Switch #6, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #3 switch #6 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	6	98	1600/29,30	<p>Switch Pack #3 Switch #6, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #3 switch #6 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	99	1600/29,30	<p>Switch Pack #3 Switch #6, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #3 switch #6 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	100	1600/29,30	<p>Switch Pack #3 Switch #6, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #3 switch #6 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	6	101	1600/29,30	<p>Switch Pack #3 Switch #6. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #3 switch #6 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	7	0	1600/ 29,30	<p>Switch pack #2 not communicating with the ESC</p> <p>The ESC sets the status of the switches in switch pack #2 to there default values</p> <p>Switch data link fault</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	17	1600/ 29,30	<p>Switch Pack #2 Switch #1, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #2 switch #1 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	18	1600/ 29,30	<p>Switch Pack #2 Switch #1, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #2 switch #1 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	19	1600/ 29,30	<p>Switch Pack #2 Switch #1, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #2 switch #1 to its default value.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	7	20	1600/ 29,30	<p>Switch Pack #2 Switch #1, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #2 switch #1 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	21	1600/ 29,30	<p>Switch Pack #2 Switch #1. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #2 switch #1 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	33	1600/ 29,30	<p>Switch Pack #2 Switch #2, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #2 switch #2 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	34	1600/ 29,30	<p>Switch Pack #2 Switch #2, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #2 switch #2 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	7	35	1600/29,30	<p>Switch Pack #2 Switch #2, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #2 switch #2 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	36	1600/29,30	<p>Switch Pack #2 Switch #2, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #2 switch #2 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	37	1600/29,30	<p>Switch Pack #2 Switch #2. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #2 switch #2 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	49	1600/29,30	<p>Switch Pack #2 Switch #3, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #2 switch #3 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	7	50	1600/ 29,30	<p>Switch Pack #2 Switch #3, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #2 switch #3 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	51	1600/ 29,30	<p>Switch Pack #2 Switch #3, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #2 switch #3 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	52	1600/ 29,30	<p>Switch Pack #2 Switch #3, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #2 switch #3 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	53	1600/ 29,30	<p>Switch Pack #2 Switch #3. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #2 switch #3 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	7	65	1600/29,30	<p>Switch Pack #2 Switch #4, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #2 switch #4 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	66	1600/29,30	<p>Switch Pack #2 Switch #4, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #2 switch #4 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	67	1600/29,30	<p>Switch Pack #2 Switch #4, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #2 switch #4 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	68	1600/29,30	<p>Switch Pack #2 Switch #4, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #2 switch #4 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	7	69	1600/ 29,30	<p>Switch Pack #2 Switch #4. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #2 switch #4 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	81	1600/ 29,30	<p>Switch Pack #2 Switch #5, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #2 switch #5 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	82	1600/ 29,30	<p>Switch Pack #2 Switch #5, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #2 switch #5 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	83	1600/ 29,30	<p>Switch Pack #2 Switch #5, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #2 switch #5 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	7	84	1600/ 29,30	<p>Switch Pack #2 Switch #5, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #2 switch #5 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	85	1600/ 29,30	<p>Switch Pack #2 Switch #5. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #2 switch #5 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	97	1600/ 29,30	<p>Switch Pack #2 Switch #6, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #2 switch #6 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	98	1600/ 29,30	<p>Switch Pack #2 Switch #6, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #2 switch #6 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	7	99	1600/ 29,30	<p>Switch Pack #2 Switch #6, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #2 switch #6 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	100	1600/ 29,30	<p>Switch Pack #2 Switch #6, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #2 switch #6 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	7	101	1600/ 29,30	<p>Switch Pack #2 Switch #6. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #2 switch #6 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	0	1600/ 29,30	<p>Switch pack #1 not communicating with the ESC</p> <p>The ESC sets the status of the switches in switch pack #1 to there default values</p> <p>Switch data link fault</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	15	17	1600/29,30	<p>Switch Pack #1 Switch #1, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #1 switch #1 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	18	1600/29,30	<p>Switch Pack #1 Switch #1, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #1 switch #1 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	19	1600/29,30	<p>Switch Pack #1 Switch #1, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #1 switch #1 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	20	1600/29,30	<p>Switch Pack #1 Switch #1, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #1 switch #1 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	15	21	1600/29,30	<p>Switch Pack #1 Switch #1. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #1 switch #1 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	33	1600/29,30	<p>Switch Pack #1 Switch #2, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #1 switch #2 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	34	1600/29,30	<p>Switch Pack #1 Switch #2, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #1 switch #2 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	35	1600/29,30	<p>Switch Pack #1 Switch #2, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #1 switch #2 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	15	36	1600/29,30	<p>Switch Pack #1 Switch #2, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #1 switch #2 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	37	1600/29,30	<p>Switch Pack #1 Switch #2. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #1 switch #2 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	49	1600/29,30	<p>Switch Pack #1 Switch #3, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #1 switch #3 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	50	1600/29,30	<p>Switch Pack #1 Switch #3, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #1 switch #3 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	15	51	1600/29,30	<p>Switch Pack #1 Switch #3, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #1 switch #3 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	52	1600/29,30	<p>Switch Pack #1 Switch #3, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #1 switch #3 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	53	1600/29,30	<p>Switch Pack #1 Switch #3. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #1 switch #3 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	65	1600/29,30	<p>Switch Pack #1 Switch #4, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #1 switch #4 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	15	66	1600/29,30	<p>Switch Pack #1 Switch #4, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #1 switch #4 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	67	1600/29,30	<p>Switch Pack #1 Switch #4, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #1 switch #4 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	68	1600/29,30	<p>Switch Pack #1 Switch #4, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #1 switch #4 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	69	1600/29,30	<p>Switch Pack #1 Switch #4. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #1 switch #4 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	15	81	1600/29,30	<p>Switch Pack #1 Switch #5, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #1 switch #5 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	82	1600/29,30	<p>Switch Pack #1 Switch #5, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #1 switch #5 to its default value.</p> <p>Faulty microswitch</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	83	1600/29,30	<p>Switch Pack #1 Switch #5, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #1 switch #5 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	84	1600/29,30	<p>Switch Pack #1 Switch #5, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #1 switch #5 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	15	85	1600/29,30	<p>Switch Pack #1 Switch #5. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #1 switch #5 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	97	1600/29,30	<p>Switch Pack #1 Switch #6, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of switch pack #1 switch #6 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	98	1600/29,30	<p>Switch Pack #1 Switch #6, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of switch pack #1 switch #6 to its default value.</p> <p>Faulty microswitch</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	99	1600/29,30	<p>Switch Pack #1 Switch #6, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of switch pack #1 switch #6 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	15	100	1600/ 29,30	<p>Switch Pack #1 Switch #6, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of switch pack #1 switch #6 to its default value.</p> <p>Switch actuator</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	15	101	1600/ 29,30	<p>Switch Pack #1 Switch #6. The switch should be empty but one or both microswitches is pressed.</p> <p>The ESC sets the status of switch pack #1 switch #6 to its default value.</p> <p>Switch actuator or faulty microswitch.</p> <p>Refer to the Switch Pack Module section (See SWITCH PACK MODULES, page 126) of this manual.</p>
625	14	64	0	1600/ 29,30	<p>Front passenger side Door Pod not communicating with the ESC</p> <p>The status message from the door pod has not been received by the ESC</p> <p>Switch data link fault</p> <p>Refer to the Switch Data Link section(See SWITCH DATA LINK, page 81) of this manual.</p>
625	14	64	7	1600/ 29,30	<p>Front passenger side Door Pod window motor failure</p> <p>The window motor drive circuit is not functioning</p> <p>This could be a short in the window motor, an open in the window motor or a jammed window.</p>
625	14	64	8	1600/ 29,30	<p>Front passenger side Door Pod door lock motor failure</p> <p>The Door Lock Actuation Solenoid is not functioning</p> <p>This could be a short in the solenoid, open in the solenoid, or a jammed solenoid.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	64	9	1600/ 29,30	Front passenger side Door Pod module failure A failure has occurred in the Door Pod module circuitry. Faulty door pod.
625	14	65	0	1600/ 29,30	Rear passenger side Door Pod not communicating with the ESC The status message from the door pod has not been received by the ESC Switch data link fault Refer to the Switch Data Link section(See SWITCH DATA LINK, page 81) of this manual.
625	14	65	7	1600/ 29,30	Rear passenger side Door Pod window motor failure The window motor drive circuit is not functioning This could be a short in the window motor, an open in the window motor or a jammed window.
625	14	65	8	1600/ 29,30	Rear passenger side Door Pod door lock motor failure The Door Lock Actuation Solenoid is not functioning This could be a short in the solenoid, open in the solenoid, or a jammed solenoid.
625	14	65	9	1600/ 29,30	Rear passenger side Door Pod module failure A failure has occurred in the Door Pod module circuitry. Faulty door pod.
625	14	66	0	1600/ 29,30	Rear driver side Door Pod not communicating with the ESC The status message from the door pod has not been received by the ESC Switch data link fault Refer to the Switch Data Link section(See SWITCH DATA LINK, page 81) of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
625	14	66	7	1600/ 29,30	Rear drivers side Door Pod window motor failure The window motor drive circuit is not functioning This could be a short in the window motor, an open in the window motor or a jammed window.
625	14	66	8	1600/ 29,30	Rear drivers side Door Pod door lock motor failure The Door Lock Actuation Solenoid is not functioning This could be a short in the solenoid, open in the solenoid, or a jammed solenoid.
625	14	66	9	1600/ 29,30	Rear drivers side Door Pod module failure A failure has occurred in the Door Pod module circuitry. Faulty door pod
625	14	130	0	1600/ 29,30	Front drivers side Door Pod not communicating with the ESC The status message from the door pod has not been received by the ESC Switch data link fault Refer to the Switch Data Link section(See SWITCH DATA LINK, page 81) of this manual.
625	14	130	7	1600/ 29,30	Front drivers side Door Pod window motor failure The window motor drive circuit is not functioning This could be a short in the window motor, an open in the window motor or a jammed window.
625	14	130	8	1600/ 29,30	Front drivers side Door Pod door lock motor failure The Door Lock Actuation Solenoid is not functioning This could be a short in the solenoid, open in the solenoid, or a jammed solenoid.
625	14	130	9	1600/ 29,30	Front drivers side Door Pod module failure A failure has occurred in the Door Pod module circuitry. Faulty door pod

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
627	14	1	1	4010/ A	ESC power supply #1 open circuit Open Circuit Refer to the ESC Power and Ground(See ESC POWER AND GROUND, page 98) section of this manual.
639	14	0	240	1600/ 34,35	Engine retarder torque not being communicated from the ECM or transmission retarder torque not being communicated from Allison WTEC transmission PGN 61440–SA 15 or 16 Refer to the appropriate Allison manual or engine diagnostic manual. Refer to the Transmission section of this manual.
639	14	1	240	1600/ 34,35	ABS controller not communicating with the ESC PGN 61441–SA 11 Refer to the Air ABS Power and Data Link section of this manual. (See AIR ABS POWER AND DATA LINK CIRCUITS, page 638)
639	14	2	240	1600/ 34,35	Electronic transmission controller communication has not been received PGN 61442–SA 3 Refer to the Transmission section of this manual.
639	14	4	240	1600/ 34,35	Engine speed not communicated to the ESC PGN 61444–SA 0 Refer to information for engine in this vehicle in Engine section of this manual.
639	14	5	240	1600/ 34,35	Current gear, range inhibit and check transmission lamps not communicated to the ESC. PGN 61445–SA 3 Refer to the applicable transmission manual for this vehicle. Refer to the Transmission section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
639	14	8	240	1600/ 34,35	Electronic pressure mode indicator not communicated to the ESC PGN 61448—SA 0 Refer to information for engine in this vehicle in Engine section of this manual.
639	14	33	239	1600/ 34, 35	EGC not communicating with the ESC or AGSP not communicating with the ESC PGN 61148—DA 33 —SA 23 or 40 Refer to EGC Power and Data Link Troubleshooting. (See EGC POWER AND DATA LINK CIRCUITS, page 163)
639	14	82	254	1600/ 34,35	Pyrometer Ammeter not communicating to the ESC PGN 65106—SA 10 Refer to information for Pyrometer Ammeter module (PAM) in this vehicle in Chassis Features section of this manual.
639	14	192	254	1600/ 34,35	Fuel filter status not communicated to the ESC PGN 65216—SA 00 Refer to information for the Fuel filter in this vehicle in Chassis Features section of this manual.
639	14	202	254	1600/ 34,35	Engine Lamp information not communicated to the ESC PGN 65226—SA 0 Refer to information for engine in this vehicle in Engine section of this manual.
639	14	228	254	1600/ 34,35	Wait to start lamp information not communicated to the ESC PGN 65252—SA 0 Refer to information for engine in this vehicle in Engine section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
639	14	230	253	1600/ 34,35	<p>Full Power Park Brake information not communicating to the ESC</p> <p>PGN 64998–SA 08</p> <p>Refer to information for Full Power Park Brake in this vehicle in Chassis Features section of this manual.</p> <p>Refer to Full Power Park Brake in the Full Power Park Brake Troubleshooting in S04048.</p>
639	14	241	254	1600/ 34,35	<p>Cruise control enable, active, state and vehicle speed not communicated to the ESC</p> <p>PGN 65265–SA 0</p> <p>Refer to information for engine in this vehicle in Engine section of this manual.</p>
639	14	250	254	1600/ 34,35	<p>Brake message is not being communicated to the ESC</p> <p>PGN 65274–SA 08</p> <p>Refer to information for the brake in this vehicle in Chassis Features section of this manual.</p> <p>Refer to Full Power Brake in the Full Power Brake Troubleshooting in S04048.</p>
639	14	251	254	1600/ 34,35	<p>Retarder overheat lamp information not communicated to the ESC</p> <p>PGN 65275–SA 3</p> <p>Refer to the applicable manual for the transmission on this vehicle.</p> <p>Refer to the Transmission section of this manual.</p>
639	14	255	254	1600/ 34,35	<p>Water in fuel indicator not communicating to the ESC</p> <p>PGN 65279–SA 0</p> <p>Refer to information for the Water in fuel indicator in this vehicle in Chassis Features section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
1231	14	0–255	3	4004/Bus 1602 34, 35	Unconfigured Source Address Something with the source address in Byte 7 is broadcasting on the data link and the ESC is not configured to expect it. Unexpected or incorrectly addressed module is on the data link.
1231	14	34	1	4004/Bus 1602 34, 35	RASM #1 not communicating with the ESC Failed Source Address/Message Time-out PGN 65441–SA 34 Drivetrain J1939 data link, an improperly addressed RASM module, or a missing RASM module that the ESC is expecting
1231	14	34	2	4004/Bus 1602 34, 35	More than one RASM responds back as RASM #1 Multiple Source Address PGN 65441–SA 234
1231	14	209	1	4004/Bus 1602 34, 35	Remote engine speed control module is not communicating with the ESC Failed Source Address/Message Time-out PGN 65441–SA 234 Drivetrain J1939 data link, an improperly addressed RESCM module, or a missing RESCM module that the ESC is expecting
1231	14	209	2	4004/Bus 1602 34, 35	More than one Remote engine speed control module with the same source address is responding to the ESC. Multiple Source Address PGN 65441–SA 234
1231	14	225	1	4004/Bus 1602 34, 35	RPM #1 not communicating with the ESC Failed Source Address/Message Time-out PGN 65313–SA 225 Drivetrain J1939 data link, an improperly addressed RPM module, or a missing RPM module that the ESC is expecting

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
1231	14	225	2	4004/Bus 1602 34, 35	More than one RPM responds back as RPM #1 Multiple Source Address PGN 65313–SA 225
1231	14	226	1	4004/Bus 1602 34, 35	RPM #2 not communicating with the ESC Failed Source Address/Message Time-out PGN 65313–SA 226 Drivetrain J1939 data link, an improperly addressed RPM module, or a missing RPM module that the ESC is expecting
1231	14	226	2	4004/Bus 1602 34, 35	More than one RPM responds back as RPM #2 Multiple Source Address PGN 65313–SA 226
1231	14	228	1	4004/Bus 1602 34, 35	RPM #4 not communicating with the ESC Failed Source Address/Message Time-out PGN 65313–SA 228 Drivetrain J1939 data link, an improperly addressed RPM module, or a missing RPM module that the ESC is expecting
1231	14	228	2	4004/Bus 1602 34, 35	More than one RPM responds back as RPM #4 Multiple Source Address PGN 65313–SA 228
1231	14	231	1	4004/Bus 1602 34, 35	RPM #7 not communicating with the ESC Failed Source Address/Message Time-out PGN 65313–SA 231 Drivetrain J1939 data link, an improperly addressed RPM module, or a missing RPM module that the ESC is expecting
1231	14	231	2	4004/Bus 1602 34, 35	More than one RPM responds back as RPM #7 Multiple Source Address PGN 65313–SA 231

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
1231	14	234	1	4004/Bus 1602 34, 35	RASM #2 not communicating with the ESC Failed Source Address/Message Time-out PGN 65441–SA 234 Drivetrain J1939 data link, an improperly addressed RASM module, or a missing RASM module that the ESC is expecting
1231	14	234	2	4004/Bus 1602 34, 35	More than one RASM responds back as RASM #2 Multiple Source Address PGN 65441–SA 234
1542	14	1	1	4009/ A	ESC power supply #2 open circuit Open Circuit Refer to the ESC Power and Ground(See ESC POWER AND GROUND, page 98) section of this manual.
1557	0	1	1	N/A	ESC internal fault software main loop time exceeded. There are too many features and the main loop is exceeding its maximum execution time. Truck may work partially or not at all. This indicates ESC is incapable of handling this configuration. Software configuration too big. Refer to the Electrical System Controller(See ELECTRICAL SYSTEM CONTROLLER, page 93) section of this manual.
1705	14	101	3	N/A	EGC gauge location 1 (tachometer) out of range high Data for this gauge is above the value that the gauge can display. For example: a value exceeding the gauge maximum scale value. Refer to the Electronic Gauge Cluster section of this manual.
1705	14	101	4	N/A	EGC gauge location 1 (tachometer) out of range low Data for this gauge is below the minimum value the gauge can display. For example: the lowest scale value on the gauge. Refer to the Tachometer (See TACHOMETER, page 228) section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
1705	14	101	5	N/A	<p>EGC gauge location 1 (tachometer) sensor fault</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Tachometer (See TACHOMETER, page 228) of this manual.</p>
1705	14	101	6	N/A	<p>EGC gauge location 1 (tachometer) data unavailable</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Tachometer (See TACHOMETER, page 228) section of this manual.</p>
1705	14	102	3	N/A	<p>EGC gauge location 2 (speedometer) out of range high</p> <p>Data for this gauge is above the value that the gauge can display. For example: a value exceeding the gauge maximum scale value.</p> <p>Refer to the Speedometer (See SPEEDOMETER, page 224) section of this manual.</p>
1705	14	102	4	N/A	<p>EGC gauge location 2 (speedometer) out of range low</p> <p>Data for this gauge is below the minimum value the gauge can display. For example: the lowest scale value on the gauge.</p> <p>Refer to the Speedometer (See SPEEDOMETER, page 224) section of this manual.</p>
1705	14	102	5	N/A	<p>EGC gauge location 2 (speedometer) sensor fault</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Speedometer (See SPEEDOMETER, page 224) section of this manual.</p>
1705	14	102	6	N/A	<p>EGC gauge location 2 (speedometer) data unavailable</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Speedometer (See SPEEDOMETER, page 224) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
1705	14	103	3	N/A	<p>EGC gauge location 3 (engine coolant temperature) out of range high</p> <p>Data for this gauge is above the value that the gauge can display. For example: a value exceeding the gauge maximum scale value.</p> <p>Refer to the Engine Coolant Temperature Gauge (See ENGINE COOLANT TEMPERATURE GAUGE, page 218) section of this manual.</p>
1705	14	103	4	N/A	<p>EGC gauge location 3 (engine coolant temperature) out of range low</p> <p>Data for this gauge is below the minimum value the gauge can display. For example: the lowest scale value on the gauge.</p> <p>Refer to the Engine Coolant Temperature Gauge (See ENGINE COOLANT TEMPERATURE GAUGE, page 218) section of this manual.</p>
1705	14	103	5	N/A	<p>EGC gauge location 3 (engine coolant temperature) sensor fault</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Engine Coolant Temperature Gauge (See ENGINE COOLANT TEMPERATURE GAUGE, page 218) section of this manual.</p>
1705	14	103	6	N/A	<p>EGC gauge location 3 (engine coolant temperature) data unavailable</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to Engine Coolant Temperature Gauge (See ENGINE COOLANT TEMPERATURE GAUGE, page 218) section of this manual.</p>
1705	14	104	3	N/A	<p>EGC gauge location 4 out of range high</p> <p>Data for this gauge is above the value that the gauge can display. For example: a value exceeding the gauge maximum scale value.</p> <p>The gauge in this location is optional.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
1705	14	104	4	N/A	<p>EGC gauge location 4 out of range low</p> <p>Data for this gauge is below the minimum value the gauge can display. For example: the lowest scale value on the gauge.</p> <p>The gauge in this location can be any optional gauge.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
1705	14	104	5	N/A	<p>EGC gauge location 4 sensor fault</p> <p>The gauge in this location can be any optional gauge.</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
1705	14	104	6	N/A	<p>EGC gauge location 4 data unavailable</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>The gauge in this location can be any optional gauge.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
1705	14	105	3	N/A	<p>EGC gauge location 5 (oil pressure) out of range high</p> <p>Data for this gauge is above the value that the gauge can display. For example: a value exceeding the gauge maximum scale value.</p> <p>Refer to the Engine Oil Pressure Gauge (See ENGINE OIL PRESSURE GAUGE, page 221) section of this manual.</p>
1705	14	105	4	N/A	<p>EGC gauge location 5 (oil pressure) out of range low</p> <p>Data for this gauge is below the minimum value the gauge can display. For example: the lowest scale value on the gauge.</p> <p>Refer to the Engine Oil Pressure Gauge (See ENGINE OIL PRESSURE GAUGE, page 221) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
1705	14	105	5	N/A	<p>EGC gauge location 5 (oil pressure) sensor fault</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Engine Oil Pressure Gauge (See ENGINE OIL PRESSURE GAUGE, page 221) section of this manual.</p>
1705	14	105	6	N/A	<p>EGC gauge location 5 (oil pressure) data unavailable</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Engine Oil Pressure Gauge (See ENGINE OIL PRESSURE GAUGE, page 221) section of this manual.</p>
1705	14	106	3	N/A	<p>EGC gauge location 6 out of range high</p> <p>Data for this gauge is above the value that the gauge can display. For example: a value exceeding the gauge maximum scale value.</p> <p>The gauge in this location is optional.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
1705	14	106	4	N/A	<p>EGC gauge location 6 out of range low</p> <p>Data for this gauge is below the minimum value the gauge can display. For example: the lowest scale value on the gauge.</p> <p>The gauge in this location is optional.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
1705	14	106	5	N/A	<p>EGC gauge location 6 sensor fault</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>The gauge in this location is optional.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
1705	14	106	6	N/A	<p>EGC gauge location 6 data unavailable</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>The gauge in this location is optional.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
1705	14	107	3	N/A	<p>EGC gauge location 7 (fuel level) out of range high</p> <p>Data for this gauge is above the value that the gauge can display. For example: a value exceeding the gauge maximum scale value.</p> <p>Refer to the Fuel Level Gauge (See FUEL LEVEL GAUGE, page 231)</p>
1705	14	107	4	N/A	<p>EGC gauge location 7 (fuel level) out of range low</p> <p>Data for this gauge is below the minimum value the gauge can display. For example: the lowest scale value on the gauge.</p> <p>Refer to the Fuel Level Gauge (See FUEL LEVEL GAUGE, page 231) section of this manual.</p>
1705	14	107	5	N/A	<p>EGC gauge location 7 (fuel level) sensor fault</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to Fuel Level Gauge (See FUEL LEVEL GAUGE, page 231) section of this manual.</p>
1705	14	107	6	N/A	<p>EGC gauge location 7 (fuel level) data unavailable</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Fuel Level Gauge (See FUEL LEVEL GAUGE, page 231) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
1705	14	108	3	N/A	<p>EGC gauge location 8 out of range high</p> <p>On vehicles with air brakes this is the primary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>Data for this gauge is above the value that the gauge can display. For example: a value exceeding the gauge maximum scale value.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
1705	14	108	4	N/A	<p>EGC gauge location 8 out of range low</p> <p>On vehicles with air brakes this is the primary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>Data for this gauge is below the minimum value the gauge can display. For example: the lowest scale value on the gauge.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
1705	14	108	5	N/A	<p>EGC gauge location 8 sensor fault</p> <p>On vehicles with air brakes this is the primary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
1705	14	108	6	N/A	<p>EGC gauge location 8 data unavailable</p> <p>On vehicles with air brakes this is the primary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
1705	14	109	3	N/A	<p>EGC gauge location 9 (volts) out of range high</p> <p>Data for this gauge is above the value that the gauge can display. For example: a value exceeding the gauge maximum scale value.</p> <p>Refer to the Voltmeter section of this manual.</p>
1705	14	109	4	N/A	<p>EGC gauge location 9 (volts) out of range low</p> <p>Data for this gauge is below the minimum value the gauge can display. For example: the lowest scale value on the gauge.</p> <p>Refer to the Voltmeter section of this manual.</p>
1705	14	109	5	N/A	<p>EGC gauge location 9 (volts) sensor fault</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Voltmeter section of this manual.</p>
1705	14	109	6	N/A	<p>EGC gauge location 9 (volts) data unavailable</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Voltmeter section of this manual.</p>
1705	14	110	3	N/A	<p>EGC gauge location 10 out of range high</p> <p>On vehicles with air brakes this is the secondary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>Data for this gauge is above the value that the gauge can display. For example: a value exceeding the gauge maximum scale value.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
1705	14	110	4	N/A	<p>EGC gauge location 10 out of range low</p> <p>On vehicles with air brakes this is the secondary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>Data for this gauge is below the minimum value the gauge can display. For example: the lowest scale value on the gauge.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
1705	14	110	5	N/A	<p>EGC gauge location 10 sensor fault</p> <p>On vehicles with air brakes this is the secondary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
1705	14	110	6	N/A	<p>EGC gauge location 10 data unavailable</p> <p>On vehicles with air brakes this is the secondary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
1705	14	150	1	N/A	<p>ESC not communicating with the EGC.</p> <p>Loss of communication in excess of 10 seconds.</p> <p>Drivetrain J1939 data link.</p> <p>Refer to the Electrical System Controller (See ELECTRICAL SYSTEM CONTROLLER, page 93) section of this manual.</p>
1705	14	150	2	N/A	<p>Engine Controller not communicating with the EGC.</p> <p>Loss of communication in excess of 10 seconds.</p> <p>Drivetrain J1939 data link.</p> <p>Refer to the Electronic Engine Controls section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2023	14	101 or 201	5	N/A	<p>EGC gauge location 1 (tachometer) sensor fault to primary EGC (101) or secondary EGC (201)</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Tachometer (See TACHOMETER, page 228) section of this manual.</p>
2023	14	101 or 201	6	N/A	<p>EGC gauge location 1 (tachometer) data unavailable to primary EGC (101) or secondary EGC (201)</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Tachometer (See TACHOMETER, page 228) section of this manual.</p>
2023	14	101 or 201	7	N/A	<p>EGC gauge location 1 (tachometer) data missing to primary EGC (101) or secondary EGC (201)</p> <p>The data for this gauge is not being transmitted on the datalink.</p> <p>Refer to the Tachometer (See TACHOMETER, page 228) section of this manual.</p>
2023	14	102 or 202	5	N/A	<p>EGC gauge location 2 (speedometer) sensor fault to primary EGC (102) or secondary EGC (202)</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Speedometer (See SPEEDOMETER, page 224) section of this manual.</p>
2023	14	102 or 202	6	N/A	<p>EGC gauge location 2 (speedometer) data unavailable to primary EGC (102) or secondary EGC (202)</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Speedometer (See SPEEDOMETER, page 224) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2023	14	102 or 202	7	N/A	<p>EGC gauge location 2 (speedometer) data missing to primary EGC (102) or secondary EGC (202)</p> <p>The data for this gauge is not being transmitted on the datalink.</p> <p>Refer to the Speedometer (See SPEEDOMETER, page 224) section of this manual.</p>
2023	14	103 or 203	5	N/A	<p>EGC gauge location 3 (engine coolant temperature) sensor fault to primary EGC (103) or secondary EGC (203)</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Engine Coolant Temperature Gauge (See ENGINE COOLANT TEMPERATURE GAUGE, page 218) section of this manual.</p>
2023	14	103 or 203	6	N/A	<p>EGC gauge location 3 (engine coolant temperature) data unavailable to primary EGC (103) or secondary EGC (203)</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Engine Coolant Temperature Gauge (See ENGINE COOLANT TEMPERATURE GAUGE, page 218) section of this manual.</p>
2023	14	103 or 203	7	N/A	<p>EGC gauge location 3 (engine coolant temperature) data missing to primary EGC (103) or secondary EGC (203)</p> <p>The data for this gauge is not being transmitted on the datalink.</p> <p>Refer to the Engine Coolant Temperature Gauge (See ENGINE COOLANT TEMPERATURE GAUGE, page 218) section of this manual.</p>
2023	14	104 or 204	5	N/A	<p>EGC gauge location 4 sensor fault to primary EGC (104) or secondary EGC (204)</p> <p>The gauge in this location can be any optional gauge.</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2023	14	104 or 204	6	N/A	<p>EGC gauge location 4 data unavailable to primary EGC (104) or secondary EGC (204)</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>The gauge in this location can be any optional gauge.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
2023	14	104 or 204	7	N/A	<p>EGC gauge location 4 data missing to primary EGC (104) or secondary EGC (204)</p> <p>The data for this gauge is not being transmitted on the datalink.</p> <p>The gauge in this location can be any optional gauge.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
2023	14	105 or 205	5	N/A	<p>EGC gauge location 5 (oil pressure) sensor fault to primary EGC (105) or secondary EGC (205)</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Engine Oil Pressure Gauge (See ENGINE OIL PRESSURE GAUGE, page 221) section of this manual.</p>
2023	14	105 or 205	6	N/A	<p>EGC gauge location 5 (oil pressure) data unavailable to primary EGC (105) or secondary EGC (205)</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to Engine Oil Pressure Gauge (See ENGINE OIL PRESSURE GAUGE, page 221) section of this manual.</p>
2023	14	105 or 205	7	N/A	<p>EGC gauge location 5 (oil pressure) data missing to primary EGC (105) or secondary EGC (205)</p> <p>The data for this gauge is not being transmitted on the datalink.</p> <p>Refer to Engine Oil Pressure Gauge (See ENGINE OIL PRESSURE GAUGE, page 221) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2023	14	106 or 206	5	N/A	<p>EGC gauge location 6 sensor fault to primary EGC (106) or secondary EGC (206)</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>The gauge in this location is optional.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
2023	14	106 or 206	6	N/A	<p>EGC gauge location 6 data unavailable to primary EGC (106) or secondary EGC (206)</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>The gauge in this location is optional.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
2023	14	106 or 206	7	N/A	<p>EGC gauge location 6 data missing to primary EGC (106) or secondary EGC (206)</p> <p>The data for this gauge is not being transmitted on the datalink.</p> <p>The gauge in this location is optional.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
2023	14	107 or 207	5	N/A	<p>EGC gauge location 7 (fuel level) sensor fault to primary EGC (107) or secondary EGC (207)</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Fuel Level Gauge (See FUEL LEVEL GAUGE, page 231) section of this manual.</p>
2023	14	107 or 207	6	N/A	<p>EGC gauge location 7 (fuel level) data unavailable to primary EGC (107) or secondary EGC (207)</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Fuel Level Gauge (See FUEL LEVEL GAUGE, page 231) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2023	14	107 or 207	7	N/A	<p>EGC gauge location 7 (fuel level) data missing to primary EGC (107) or secondary EGC (207)</p> <p>The data for this gauge is not being transmitted on the datalink.</p> <p>Refer to the Fuel Level Gauge (See FUEL LEVEL GAUGE, page 231) section of this manual.</p>
2023	14	108 or 208	5	N/A	<p>EGC gauge location 8</p> <p>Primary/Auxiliary Air Pressure Gauge sensor fault to Primary EGC (108) or Secondary EGC (208)</p> <p>On vehicles with air brakes this is the primary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
2023	14	108 or 208	6	N/A	<p>EGC gauge location 8</p> <p>Primary/Auxiliary Air Pressure Gauge data unavailable to Primary EGC (108) or Secondary EGC (208)</p> <p>On vehicles with air brakes this is the primary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
2023	14	108 or 208	7	N/A	<p>EGC gauge location 8</p> <p>Primary/Auxiliary Air Pressure Gauge data missing to Primary EGC (108) or Secondary EGC (208)</p> <p>On vehicles with air brakes this is the primary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>The data for this gauge is not being transmitted on the datalink.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2023	14	109 or 209	5	N/A	<p>EGC gauge location 9</p> <p>Voltmeter sensor fault to primary EGC (109) or secondary EGC (209)</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Voltmeter section of this manual.</p>
2023	14	109 or 209	6	N/A	<p>EGC gauge location 9</p> <p>Voltmeter data unavailable to primary EGC (109) or secondary EGC (209)</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Voltmeter section of this manual.</p>
2023	14	109 or 209	7	N/A	<p>EGC gauge location 9</p> <p>Voltmeter data missing to primary EGC (109) or secondary EGC (209)</p> <p>The data for this gauge is not being transmitted on the datalink.</p> <p>Refer to the Voltmeter section of this manual.</p>
2023	14	110 or 210	5	N/A	<p>EGC gauge location 10</p> <p>Secondary Air Pressure Gauge sensor fault to Primary EGC (110) or Secondary EGC (210)</p> <p>On vehicles with air brakes this is the secondary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>There is a problem with the sensor that provides the data for this gauge.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2023	14	110 or 210	6	N/A	<p>EGC gauge location 10</p> <p>Secondary Air Pressure Gauge data unavailable to Primary EGC (110) or Secondary EGC (210)</p> <p>On vehicles with air brakes this is the secondary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>The data that this gauge displays should be, but is not available at this time.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
2023	14	110 or 210	7	N/A	<p>EGC gauge location 10</p> <p>Secondary Air Pressure Gauge data missing to Primary EGC (110) or Secondary EGC (210)</p> <p>On vehicles with air brakes this is the secondary air gauge.</p> <p>On vehicles with hydraulic brakes this can be any optional gauge</p> <p>The data for this gauge is not being transmitted on the datalink.</p> <p>Refer to the Electronic Gauge Cluster section of this manual.</p>
2023	14	150 or 250	1	N/A	<p>Loss of data link from ESC to primary EGC (150) or secondary EGC (250)</p> <p>Loss of communication in excess of 10 seconds.</p> <p>Drivetrain J1939 data link.</p> <p>Refer to the Electrical System Controller (See ELECTRICAL SYSTEM CONTROLLER, page 93) section of this manual.</p>
2023	14	150 or 250	2	N/A	<p>Engine Controller not communicating with the primary EGC (150) or secondary EGC (250)</p> <p>Loss of communication in excess of 10 seconds.</p> <p>Drivetrain J1939 data link.</p> <p>Refer to the Electronic Engine Controls section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2023	14	150 or 250	8	N/A	<p>ABS warning light malfunction on primary EGC (150) or secondary EGC (250)</p> <p>Refer to the ABS warning light (See ABS WARNING LAMP, page 208) section of this manual.</p>
2023	14	150 or 250	9	N/A	<p>Trailer ABS warning light malfunction on primary EGC (150) or secondary EGC (250)</p> <p>Refer to the ABS warning light (See ABS WARNING LAMP, page 208) section of this manual.</p>
2023	14	50, 40, 30, or 20	1	N/A	<p>ESC not communicating with AGSP 1 (50), AGSP 2 (20), AGSP 3 (30), or AGSP 4 (40).</p> <p>Loss of communication in excess of 10 seconds.</p> <p>Drivetrain J1939 data link.</p> <p>Refer to the Electrical System Controller (See ELECTRICAL SYSTEM CONTROLLER, page 93) section of this manual.</p>
2023	14	50, 40, 30, or 20	10	N/A	<p>Ignition signal from datalink from ESC does not match hardwired ignition signal on AGSP 1 (50), AGSP 2 (20), AGSP 3 (30), or AGSP 4 (40).</p> <p>Ignition Circuit to ESC/AGSP.</p> <p>Refer to the Electronic Engine Controls section of this manual.</p>
2023	14	1, 11, 21, 31	5	N/A	<p>Gauge location 1 sensor fault on AGSP 1 (1), AGSP 2 (11), AGSP 3 (21), or AGSP 4 (31).</p> <p>There is a problem with the sensor that provides the data for this gauge.</p>
2023	14	1, 11, 21, 31	6	N/A	<p>Gauge location 1 data unavailable on AGSP 1 (1), AGSP 2 (11), AGSP 3 (21), or AGSP 4 (31).</p> <p>The data that this gauge displays should be, but is not available at this time.</p>
2023	14	1, 11, 21, 31	7	N/A	<p>Gauge location 1 data missing on AGSP 1 (1), AGSP 2 (11), AGSP 3 (21), or AGSP 4 (31).</p> <p>The data for this gauge is not being transmitted on the datalink.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2023	14	2, 12, 22, 32	5	N/A	Gauge location 2 sensor fault on AGSP 1 (2), AGSP 2 (12), AGSP 3 (22), or AGSP 4 (32). There is a problem with the sensor that provides the data for this gauge.
2023	14	2, 12, 22, 32	6	N/A	Gauge location 2 data unavailable on AGSP 1 (2), AGSP 2 (12), AGSP 3 (22), or AGSP 4 (32). The data that this gauge displays should be, but is not available at this time.
2023	14	2, 12, 22, 32	7	N/A	Gauge location 2 data missing on AGSP 1 (2), AGSP 2 (12), AGSP 3 (22), or AGSP 4 (32). The data for this gauge is not being transmitted on the datalink.
2023	14	3, 13, 23, 33	5	N/A	Gauge location 3 sensor fault on AGSP 1 (3), AGSP 2 (13), AGSP 3 (23), or AGSP 4 (33). There is a problem with the sensor that provides the data for this gauge.
2023	14	3, 13, 23, 33	6	N/A	Gauge location 3 data unavailable on AGSP 1 (3), AGSP 2 (13), AGSP 3 (23), or AGSP 4 (33). The data that this gauge displays should be, but is not available at this time.
2023	14	3, 13, 23, 33	7	N/A	Gauge location 3 data missing on AGSP 1 (3), AGSP 2 (13), AGSP 3 (23), or AGSP 4 (33). The data for this gauge is not being transmitted on the datalink.
2033	14	1	0	1601/A	Connector 1601 pin A, ((MD), (BUS) Stop Arm Cmd). There is a load on this pin that has been configured as Unused. Connector 1601 pin A is drawing current and it is configured as Unused. An unexpected load is attached to this pin. Refer to the Stop Arm Outputs from ESC section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	1	1	1601/A	Connector 1601 pin A, ((MD), (BUS) Stop Arm Cmd). Output overloaded Connector 1601 pin A current overload. Too much load attached. Refer to the Stop Arm Outputs from ESC section of this manual.
2033	14	1	2	1601/A	Connector 1601 pin A, ((MD), (BUS) Stop Arm Cmd). Output open circuit. Connector 1601 Pin A open Open circuit. Refer to the Stop Arm Outputs from ESC section of this manual.
2033	14	1	3	1601/A	Connector 1601 pin A, ((MD), (BUS) Stop Arm Cmd). Output shorted to ground. Connector 1601 Pin A shorted to ground. Shorted to ground. Refer to the Stop Arm Outputs from ESC section of this manual.
2033	14	2	0	1601/E	Connector 1601 pin E, ((MD)/(BUS) Lamp test reverse lamps) There is a load on this pin that has been configured as Unused. Connector 1601 pin E is drawing current and it is configured as Unused. An unexpected load is attached to this pin. Refer to the Back Up Lights Section of this manual.
2033	14	2	1	1601/E	Connector 1601 pin E, ((MD)/(BUS) Lamp test reverse lamps) Output overloaded Connector 1601 pin E current overload. Too much load attached. Refer to the Back Up Lights Section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	2	2	1601/E	<p>Connector 1601 pin E, ((MD)/(BUS) Lamp test reverse lamps) Output open circuit.</p> <p>Connector 1601 Pin E open.</p> <p>Open circuit.</p> <p>Refer to the Back Up Lights Section of this manual.</p>
2033	14	2	3	1601/E	<p>Connector 1601 pin E, ((MD)/(BUS) Lamp test reverse lamps) Output shorted to ground.</p> <p>Connector 1601 Pin E shorted to ground.</p> <p>Shorted to ground.</p> <p>Refer to the Back Up Lights Section of this manual.</p>
2033	14	3	0	1600/11	<p>Connector 1600 pin 11. There is a load on this pin that has been configured as Unused.</p> <p>Connector 1600 Pin #11. Bus - Electric Door Control Open Command, there is a load on this pin that has been configured as Unused</p> <p>Connector 1600 pin 11 is drawing current and it is configured as Unused.</p> <p>Connector 1600 Pin #11. Bus - Electric Door Control Open Command, is drawing current and it is configured as unused</p> <p>An unexpected load is attached to this pin.</p> <p>Refer to the Service Door Controls section of this manual.</p>
2033	14	3	1	1600/11	<p>Connector 1600 pin 11. Output overloaded</p> <p>Connector 1600 Pin #11. BUS - Electric Door Open Output overloaded</p> <p>Connector 1600 pin 11 current overload.</p> <p>Connector 1600 Pin #11. BUS - Electric Door Open current overloaded</p> <p>Too much load attached.</p> <p>Refer to the Service Door Controls section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	3	2	1600/11	<p>Connector 1600 pin 11. Output open circuit.</p> <p>Connector 1600 Pin #11. BUS - Electric Door Open Output open circuit</p> <p>Connector 1600 Pin 11 open.</p> <p>Connector 1600 Pin #11. BUS - Electric Door Open circuit open</p> <p>Open circuit.</p> <p>Refer to the Service Door Controls section of this manual.</p>
2033	14	3	3	1600/11	<p>Connector 1600 pin 11. Output shorted to ground.</p> <p>Connector 1600 Pin #11. BUS - Electric Door Open Output shorted to ground</p> <p>Connector 1600 Pin 11 shorted to ground.</p> <p>Connector 1600 Pin #11. BUS - Electric Door Open shorted to ground</p> <p>Shorted to ground.</p> <p>Refer to the Service Door Controls section of this manual.</p>
2033	14	4	0	1600/6	<p>Connector 1600 pin 6. There is a load on this pin that has been configured as Unused.</p> <p>Connector 1600 Pin #6. BUS - Fog Light Command</p> <p>Connector 1600 pin 6 is drawing current and it is configured as Unused.</p> <p>Connector 1600 Pin #6. BUS - Fog Light Command is drawing current and it is configured as unused</p> <p>An unexpected load is attached to this pin.</p> <p>Refer to the Fog Light System section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	4	1	1600/6	<p>Connector 1600 pin 6. Output overloaded</p> <p>Connector 1600 Pin #6. BUS - Fog Light Command Output overloaded</p> <p>Connector 1600 pin 6 current overload</p> <p>Connector 1600 Pin #6, BUS - Fog Light Command Output, current overload</p> <p>Too much load attached.</p> <p>Refer to the Fog Light System section of this manual.</p>
2033	14	4	2	1600/6	<p>Connector 1600 pin 6. Output open circuit.</p> <p>Connector 1600 Pin #6. BUS - Fog Light Command Output open circuit</p> <p>Connector 1600 Pin 6 open.</p> <p>Connector 1600 Pin #6, BUS - Fog Light Command Output, open</p> <p>Open circuit.</p> <p>Refer to the Fog Light System section of this manual.</p>
2033	14	4	3	1600/6	<p>Connector 1600 pin 6. Output shorted to ground.</p> <p>Connector 1600 Pin #6. BUS - Fog Light Command Output shorted to ground</p> <p>Connector 1600 Pin 6 shorted to ground.</p> <p>Connector 1600 Pin #6, BUS - Fog Light Command Output, shorted to ground</p> <p>Shorted to ground.</p> <p>Refer to the Fog Light System section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	5	0	1600/4	<p>Connector 1600 Pin #4. There is a load on this pin that has been configured as Unused</p> <p>Bus — Not Used</p> <p>Connector 1600 pin 4 is drawing current and it is configured as Unused.</p> <p>An unexpected load is attached to this pin.</p>
2033	14	5	1	1600/4	<p>Connector 1600 Pin #4. Output overloaded</p> <p>Bus — Not Used</p> <p>Connector 1600 pin 4 current overload</p> <p>Too much load attached.</p>
2033	14	5	2	1600/4	<p>Connector 1600 Pin #4. Output open circuit</p> <p>Bus — Not Used</p> <p>Connector 1600 Pin 4 open.</p> <p>Open circuit.</p>
2033	14	5	3	1600/4	<p>Connector 1600 Pin #4. Output shorted to ground</p> <p>Bus — Not Used</p> <p>Connector 1600 Pin 4 shorted to ground.</p> <p>Shorted to ground.</p>
2033	14	6	0	4004/Bus 1602 17	<p>Connector 4004/Bus 1602 pin 17. There is a load on this pin that has been configured as Unused.</p> <p>BUS Connector 1602 Pin#17. Electric Door Control Closed, there is a load on this pin that has been configured as Unused</p> <p>Connector 4004/Bus 1602 pin 17 is drawing current and it is configured as Unused.</p> <p>Bus Connector 1602 pin 17, Bus Electric Door Control, is drawing current and it is configured as unused</p> <p>An unexpected load is attached to this pin.</p> <p>Refer to the Service Door Controls section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	6	1	4004/Bus 1602 17	<p>Connector 4004/Bus 1602 pin 17. Output overloaded</p> <p>Bus Connector 1602 pin 17, Bus Electric Door Control, is Output overloaded</p> <p>Connector 4004/Bus 1602 pin 17 current overload</p> <p>Bus Connector 1602 pin 17, Bus Electric Door Control, current overload</p> <p>Too much load attached.</p> <p>Refer to the Service Door Controls section of this manual.</p>
2033	14	6	2	4004/Bus 1602 17	<p>Connector 4004/Bus 1602 pin 17. Output open circuit.</p> <p>Bus Connector 1602 pin 17. Bus Electric Door Control, Output open circuit</p> <p>Connector 4004/Bus 1602 Pin 17 open.</p> <p>Bus Connector 1602 pin 17. Bus Electric Door Control, open</p> <p>Open circuit.</p> <p>Refer to the Service Door Controls section of this manual.</p>
2033	14	6	3	4004/Bus 1602 17	<p>Connector 4004/Bus 1602 pin 17. Output shorted to ground.</p> <p>Bus Connector 1602 pin 17. Bus Electric Door Control, Output shorted to ground.</p> <p>Connector 4004/Bus 1602 Pin 17 shorted to ground.</p> <p>Bus Connector 1602 pin 17. Bus Electric Door Control, shorted to ground</p> <p>Shorted to ground.</p> <p>Refer to the Service Door Controls section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	7	0	4004/Bus 1602 19	<p>Connector 4004/Bus 1602 pin 19. There is a load on this pin that has been configured as Unused.</p> <p>Connector #1602 Pin # 19. (Bus - Air solenoid power) There is a load on this pin that has been configured as Unused</p> <p>Connector 4004 pin 19 is drawing current and it is configured as Unused.</p> <p>An unexpected load is attached to this pin.</p> <p>Refer to the Air Solenoid Module section of this manual.</p>
2033	14	7	1	4004/Bus 1602 19	<p>Connector 4004/Bus 1602 pin 19. Output overloaded.</p> <p>Connector #1602 Pin # 19. (Bus - Air solenoid power) Output overloaded</p> <p>Connector 4004 pin 19 current overload.</p> <p>Too much load attached.</p> <p>Refer to the Air Solenoid Module section of this manual.</p>
2033	14	7	2	4004/Bus 1602 19	<p>Connector 4004/Bus 1602 pin 19. Output open circuit.</p> <p>Connector #1602 Pin # 19. (Bus - Air solenoid power) Output open circuit</p> <p>Connector 4004 Pin 19 open.</p> <p>Open circuit.</p> <p>Refer to the Air Solenoid Module section of this manual.</p>
2033	14	7	3	4004/Bus 1602 19	<p>Connector 4004/Bus 1602 pin 19. Output shorted to ground.</p> <p>Connector #1602 Pin # 19. (Bus - Air solenoid power) Output shorted to ground</p> <p>Connector 4004 Pin 19 shorted to ground.</p> <p>Shorted to ground.</p> <p>Refer to the Air Solenoid Module section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	8	0	4004/Bus 1602 20	<p>Connector 4004/Bus 1602 pin 20. There is a load on this pin that has been configured as Unused.</p> <p>Bus Connector 1602 Pin #20. Wiper high speed relay, there is a load on this pin that has been configured as Unused</p> <p>Connector 4004/Bus 1602 pin 20 is drawing current and it is configured as Unused.</p> <p>Bus Connector 1602 Pin #20. Wiper high speed relay, is drawing current and it is configured as unused</p> <p>An unexpected load is attached to this pin.</p> <p>Refer to the Windshield Wipers & Washer Pump section of this manual.</p>
2033	14	8	1	4004/Bus 1602 20	<p>Connector 4004/Bus 1602 pin 20. Output overloaded.</p> <p>Bus Connector 1602 Pin #20. Wiper high speed relay, Output overloaded</p> <p>Connector 4004/Bus 1602 pin 20 current overload.</p> <p>Bus Connector 1602 Pin #20 Wiper high speed relay current overloaded</p> <p>Too much load attached.</p> <p>Refer to the Windshield Wipers & Washer Pump section of this manual.</p>
2033	14	8	2	4004/Bus 1602 20	<p>Connector 4004/Bus 1602 pin 20. Output open circuit.</p> <p>Bus Connector 1602 Pin #20. Wiper high speed relay Output open circuit</p> <p>Connector 4004/Bus 1602 Pin 20 open.</p> <p>Bus Connector 1602 Pin #20. Wiper high speed relay Output open circuit</p> <p>Open circuit.</p> <p>Refer to the Windshield Wipers & Washer Pump section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	8	3	4004/Bus 1602 20	<p>Connector 4004/Bus 1602 pin 20. Output shorted to ground.</p> <p>Bus Connector 1602 Pin #20. Wiper high speed relay Output, Output shorted to ground</p> <p>Connector 4004/Bus 1602 Pin 20 shorted to ground.</p> <p>Bus Connector 1602 Pin #20. Wiper high speed relay Output, Output shorted to ground</p> <p>Shorted to ground.</p> <p>Refer to the Windshield Wipers & Washer Pump section of this manual.</p>
2033	14	9	0	4004/Bus 1602 21	<p>Connector 4004/Bus 1602 pin 21. There is a load on this pin that has been configured as Unused.</p> <p>Connector #1602 Pin #21 (Bus - Stop Relay) There is a load on this pin that has been configured as Unused</p> <p>Connector 4004 pin 21 is drawing current and it is configured as Unused.</p> <p>An unexpected load is attached to this pin.</p> <p>Refer to the Brake Switch/Stop Light Switch section of this manual.</p>
2033	14	9	1	4004/Bus 1602 21	<p>Connector 4004/Bus 1602 pin 21. Output overloaded.</p> <p>Connector #1602 Pin #21 (Bus - Stop Relay) Output overloaded</p> <p>Connector 4004 pin 21 current overload.</p> <p>Too much load attached.</p> <p>Refer to the Brake Switch/Stop Light Switch section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	9	2	4004/Bus 1602 21	<p>Connector 4004/Bus 1602 pin 21. Output open circuit.</p> <p>Connector #1602 Pin #21 (Bus - Stop Relay) Output open circuit</p> <p>Connector 4004 Pin 21 open.</p> <p>Open circuit.</p> <p>Refer to the Brake Switch/Stop Light Switch section of this manual.</p>
2033	14	9	3	4004/Bus 1602 21	<p>Connector 4004/Bus 1602 pin 21. Output shorted to ground.</p> <p>Connector #1602 Pin #21 (Bus - Stop Relay) Output shorted to ground</p> <p>Connector 4004 Pin 21 shorted to ground.</p> <p>Shorted to ground.</p> <p>Refer to the Brake Switch/Stop Light Switch section of this manual.</p>
2033	14	10	0	4004/Bus 1602 22	<p>Connector 4004/Bus 1602 pin 22. There is a load on this pin that has been configured as Unused. (4 Pack Air Solenoid Channel 3)</p> <p>Connector 4004/Bus 1602 pin 22 is drawing current and it is configured as Unused.</p> <p>An unexpected load is attached to this pin.</p> <p>Refer to the 4– pack air solenoid module (See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2033	14	10	1	4004/Bus 1602 22	<p>Connector 4004/Bus 1602 pin 22. Output overloaded. (4 Pack Air Solenoid Channel 3)</p> <p>Connector 4004/Bus 1602 pin 22 current overload.</p> <p>Too much load attached, faulty relay or 4 pack air solenoid module.</p> <p>Refer to the 4– pack air solenoid module (See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	10	2	4004/Bus 1602 22	<p>Connector 4004/Bus 1602 pin 22. Output open circuit. (4 Pack Air Solenoid Channel 3)</p> <p>Connector 4004/Bus 1602 Pin 22 open</p> <p>Open circuit, faulty relay or 4 pack air solenoid module.</p> <p>Refer to the 4– pack air solenoid module (See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2033	14	10	3	4004/Bus 1602 22	<p>Connector 4004/Bus 1602 pin 22. Output shorted to ground. (4 Pack Air Solenoid Channel 3)</p> <p>Connector 4004/Bus 1602 Pin 22 shorted to ground.</p> <p>Shorted to ground, faulty relay or 4 pack air solenoid module.</p> <p>Refer to the 4– pack air solenoid module (See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2033	14	10	4	4004/Bus 1602 22	<p>Connector 4004/Bus 1602 Pin 22. Power to solenoid pack has been disabled due to this solenoid being shorted to ground. This condition causes all solenoids in the solenoid pack to report as being shorted to ground. This fault indicates the true cause of the solenoid pack shut-down.</p> <p>Connector 4004/Bus 1602 Pin 22 shorted to ground.</p> <p>Power to the solenoid pack has been turned off due to a short in solenoid 3.</p> <p>Refer to the 4– pack air solenoid module (See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2033	14	11	0	4004/Bus 1602 23	<p>Connector 4004/Bus 1602 pin 23. There is a load on this pin that has been configured as Unused.</p> <p>Bus connector 1602 pin #23. Wheelchair Lift solenoid, there is a load on this pin that has been configured as Unused</p> <p>Connector 4004/Bus 1602 pin 23 is drawing current and it is configured as Unused.</p> <p>Bus connector 1602 pin #23, Wheelchair Lift solenoid, is drawing current and it is configured as unused</p> <p>An unexpected load is attached to this pin.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
					Refer to the Wheelchair Lift Controls (See CIRCUIT FUNCTIONS, page 574) section of this manual.
2033	14	11	1	4004/Bus 1602 23	<p>Connector 4004/Bus 1602 pin 23. Output overloaded.</p> <p>Bus connector 1602 pin #23, Wheelchair Lift solenoid, Output Overloaded</p> <p>Connector 4004/Bus 1602 pin 23 current overload.</p> <p>Bus connector 1602 pin #23, Wheelchair Lift solenoid, current Overloaded</p> <p>Too much load attached.</p> <p>Refer to the Wheelchair Lift Controls (See CIRCUIT FUNCTIONS, page 574) section of this manual.</p>
2033	14	11	2	4004/Bus 1602 23	<p>Connector 4004/Bus 1602 pin 23. Output open circuit.</p> <p>Bus connector 1602 pin #23, Wheelchair Lift solenoid, Out put open circuit</p> <p>Connector 4004/Bus 1602 Pin 23 open.</p> <p>Bus connector 1602 pin #23, Wheelchair Lift solenoid, open</p> <p>Open circuit.</p> <p>Refer to the Wheelchair Lift Controls (See CIRCUIT FUNCTIONS, page 574) section of this manual.</p>
2033	14	11	3	4004/Bus 1602 23	<p>Connector 4004/Bus 1602 pin 23. Output shorted to ground.</p> <p>Bus connector 1602 pin #23, Wheelchair Lift solenoid, Output shorted to ground</p> <p>Connector 4004/Bus 1602 Pin 23 shorted to ground.</p> <p>Bus connector 1602 pin #23, Wheelchair Lift solenoid, shorted to ground</p> <p>Shorted to ground.</p> <p>Refer to the Wheelchair Lift Controls (See CIRCUIT FUNCTIONS, page 574) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	12	0	4004/Bus 1602 24	<p>Connector 4004/Bus 1602 pin 24. There is a load on this pin that has been configured as Unused. (4 Pack Air Solenoid Channel 2)</p> <p>Connector 4004/Bus 1602 pin 24 is drawing current and it is configured as Unused.</p> <p>An unexpected load is attached to this pin.</p> <p>Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2033	14	12	1	4004/Bus 1602 24	<p>Connector 4004/Bus 1602 pin 24. Output overloaded. (4 Pack Air Solenoid Channel 2)</p> <p>Connector 4004/Bus 1602 pin 24 current overload.</p> <p>Too much load attached, faulty relay or 4 pack air solenoid module.</p> <p>Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2033	14	12	2	4004/Bus 1602 24	<p>Connector 4004/Bus 1602 pin 24. Output open circuit. (4 Pack Air Solenoid Channel 2)</p> <p>Connector 4004/Bus 1602 Pin 24 open</p> <p>Open circuit, faulty relay or 4 pack air solenoid module.</p> <p>Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2033	14	12	3	4004/Bus 1602 24	<p>Connector 4004/Bus 1602 pin 24. Output shorted to ground. (4 Pack Air Solenoid Channel 2)</p> <p>Connector 4004/Bus 1602 Pin 24 shorted to ground.</p> <p>Shorted to ground. Faulty relay or 4 pack air solenoid module.</p> <p>Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	12	4	4004/Bus 1602 24	<p>Connector 4004/Bus 1602 Pin 24. Power to solenoid pack has been disabled due to this solenoid being shorted to ground. This condition causes all solenoids in the solenoid pack to report as being shorted to ground. This fault indicates the true cause of the solenoid pack shut-down.</p> <p>Connector 4004/Bus 1602 Pin 24 shorted to ground.</p> <p>Power to the solenoid pack has been turned off due to a short in solenoid 2.</p> <p>Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2033	14	13	0	4004/Bus 1602 25	<p>Connector 4004/Bus 1602 pin 25. There is a load on this pin that has been configured as Unused.</p> <p>Bus connector 1602 pin #25, Park Position Unlock solenoid, there is a load on this pin that has been configured as Unused</p> <p>Connector 4004/Bus 1602 pin 25 is drawing current and it is configured as Unused.</p> <p>Bus connector 1602 pin #25, Park Position Unlock solenoid, is drawing current and it is configured as unused</p> <p>An unexpected load is attached to this pin.</p> <p>Refer to the Park Brake Switch section of this manual.</p>
2033	14	13	1	4004/Bus 1602 25	<p>Connector 4004/Bus 1602 pin 25. Output overloaded.</p> <p>Bus connector 1602 pin #25, Park Position Unlock solenoid, Output overloaded</p> <p>Connector 4004/Bus 1602 pin 25 current overload</p> <p>Bus connector 1602 pin #25, Park Position Unlock solenoid current overload</p> <p>Too much load attached.</p> <p>Refer to the Park Brake Switch section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	13	2	4004/Bus 1602 25	<p>Connector 4004/Bus 1602 pin 25. Output open circuit</p> <p>Bus connector 1602 pin #25, Park Position Unlock solenoid, Output open circuit</p> <p>Connector 4004/Bus 1602 Pin 25 open.</p> <p>Bus connector 1602 pin #25, Park Position Unlock solenoid, open</p> <p>Open circuit.</p> <p>Refer to the Park Brake Switch section of this manual.</p>
2033	14	13	3	4004/Bus 1602 25	<p>Connector 4004/Bus 1602 pin 25. Output shorted to ground.</p> <p>Bus connector 1602 pin #25, Park Position Unlock solenoid, Output Shorted to ground</p> <p>Connector 4004/Bus 1602 Pin 25 shorted to ground.</p> <p>Bus connector 1602 pin #25, Park Position Unlock solenoid, Shorted to ground</p> <p>Shorted to ground.</p> <p>Refer to the Park Brake Switch section of this manual.</p>
2033	14	14	0	4004/Bus 1602 29	<p>Connector 4004/Bus 1602 pin 29. There is a load on this pin that has been configured as Unused.</p> <p>Connector 4004/Bus 1602 pin 29 is drawing current and it is configured as Unused.</p> <p>An unexpected load is attached to this pin.</p> <p>Refer to the Windshield Wipers & Washer Pump section of this manual.</p>
2033	14	14	1	4004/Bus 1602 29	<p>Connector 4004/Bus 1602 pin 29. Output overloaded.</p> <p>Connector 4004/Bus 1602 pin 29 current overload.</p> <p>Too much load attached.</p> <p>Refer to the Windshield Wipers & Washer Pump section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	14	2	4004/Bus 1602 29	Connector 4004/Bus 1602 pin 29. Output open circuit. Connector 4004/Bus 1602 Pin 29 open. Open circuit. Refer to the Windshield Wipers & Washer Pump section of this manual.
2033	14	14	3	4004/Bus 1602 29	Connector 4004/Bus 1602 pin 29. Output shorted to ground Connector 4004/Bus 1602 Pin 29 shorted to ground. Shorted to ground. Refer to the Windshield Wipers & Washer Pump section of this manual.
2033	14	15	0	4004/Bus 1602 30	Connector 4004/Bus 1602 pin 30. There is a load on this pin that has been configured as Unused. (4 Pack Air Solenoid Channel 4) Connector 4004/Bus 1602 pin 30 is drawing current and it is configured as Unused. An unexpected load is attached to this pin. Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.
2033	14	15	1	4004/Bus 1602 30	Connector 4004/Bus 1602 pin 30. Output overloaded. (4 Pack Air Solenoid Channel 4) Connector 4004/Bus 1602 pin 30 current overload. Too much load attached, faulty relay or 4 pack air solenoid module. Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.
2033	14	15	2	4004/Bus 1602 30	Connector 4004/Bus 1602 pin 30. Output open circuit. (4 Pack Air Solenoid Channel 4) Connector 4004/Bus 1602 Pin 30 open Open circuit, faulty relay or 4 pack air solenoid module. Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	15	3	4004/Bus 1602 30	<p>Connector 4004/Bus 1602 pin 30. Output shorted to ground. (4 Pack Air Solenoid Channel 4)</p> <p>Connector 4004/Bus 1602 Pin 30 shorted to ground.</p> <p>Shorted to ground, faulty relay or 4 pack air solenoid module.</p> <p>Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2033	14	15	4	4004/Bus 1602 30	<p>Connector 4004/Bus 1602 Pin 30. Power to solenoid pack has been disabled due to this solenoid being shorted to ground. This condition causes all solenoids in the solenoid pack to report as being shorted to ground. This fault indicates the true cause of the solenoid pack shut-down.</p> <p>Connector 4004/Bus 1602 Pin 30 shorted to ground.</p> <p>Power to the solenoid pack has been turned off due to a short in solenoid 4.</p> <p>Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2033	14	16	0	4004/Bus 1602 31	<p>Connector 4004/Bus 1602 pin 31. There is a load on this pin that has been configured as Unused. (4 Pack Air Solenoid Channel 1)</p> <p>Connector 4004/Bus 1602 pin 31 is drawing current and it is configured as Unused.</p> <p>An unexpected load is attached to this pin.</p> <p>Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2033	14	16	1	4004/Bus 1602 31	<p>Connector 4004/Bus 1602 pin 31. Output overloaded. (4 Pack Air Solenoid Channel 1)</p> <p>Connector 4004/Bus 1602 pin 31 current overload.</p> <p>Too much load attached, faulty relay or 4 pack air solenoid module.</p> <p>Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2033	14	16	2	4004/Bus 1602 31	<p>Connector 4004/Bus 1602 pin 31. Output open circuit. (4 Pack Air Solenoid Channel 1)</p> <p>Connector 4004/Bus 1602 Pin 31 open.</p> <p>Open circuit, faulty relay or 4 pack air solenoid module.</p> <p>Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2033	14	16	3	4004/Bus 1602 31	<p>Connector 4004/Bus 1602 pin 31. Output shorted to ground. (4 Pack Air Solenoid Channel 1)</p> <p>Connector 4004/Bus 1602 Pin 31 shorted to ground.</p> <p>Shorted to ground, faulty relay or 4 pack air solenoid module.</p> <p>Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2033	14	16	4	4004/Bus 1602 31	<p>Connector 4004/Bus 1602 Pin 31. Power to solenoid pack has been disabled due to this solenoid being shorted to ground. This condition causes all solenoids in the solenoid pack to report as being shorted to ground. This fault indicates the true cause of the solenoid pack shut-down.</p> <p>Connector 4004/Bus 1602 Pin 31 shorted to ground.</p> <p>Power to the solenoid pack has been turned off due to a short in solenoid 1.</p> <p>Refer to the 4– pack air solenoid module(See AIR SOLENOID MODULE (4–PACK), page 683) section of this manual.</p>
2034	14	1	1	N/A	<p>Remote Air Solenoid Module #1 - Output #1 - Valve ON when commanded OFF.</p> <p>Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.</p>
2034	14	1	2	N/A	<p>Remote Air Solenoid Module #1 - Output #1 - Valve OFF when commanded ON.</p> <p>Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2034	14	1	3	N/A	Remote Air Solenoid Module #1 - Output #1 - Open Circuit coil or valve not installed. Install solenoid or refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	1	4	N/A	Remote Air Solenoid Module #1 - Output #1 - Unknown remote air solenoid. An air Solenoid is installed in this position but is not configured. Remove solenoid or reprogram ESC to recognize the solenoid. Refer to the Air Solenoid (4-Pack)(See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.
2034	14	2	1	N/A	Remote Air Solenoid Module #1 - Output #2 - Valve ON when commanded OFF. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	2	2	N/A	Remote Air Solenoid Module #1 - Output #2 - Valve OFF when commanded ON. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	2	3	N/A	Remote Air Solenoid Module #1 - Output #2 - Open Circuit coil or valve not installed. Install solenoid or refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	2	4	N/A	Remote Air Solenoid Module #1 - Output #2 - Unknown remote air solenoid. An air Solenoid is installed in this position but is not configured. Remove solenoid or reprogram ESC to recognize the solenoid. Refer to the Air Solenoid (4-Pack)(See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.
2034	14	3	1	N/A	Remote Air Solenoid Module #1 - Output #3 - Valve ON when commanded OFF. Refer to the Testing Individual Solenoids(See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2034	14	3	2	N/A	Remote Air Solenoid Module #1 - Output #3 - Valve OFF when commanded ON. Refer to the Testing Individual Solenoids(See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	3	3	N/A	Remote Air Solenoid Module #1 - Output #3 - Open Circuit coil or valve not installed. Refer to the Testing Individual Solenoids(See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	3	4	N/A	Remote Air Solenoid Module #1 - Output #3 - Unknown remote air solenoid. An air Solenoid is installed in this position but is not configured. Remove solenoid or reprogram ESC to recognize the solenoid. Refer to the Air Solenoid (4-Pack) (See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.
2034	14	4	1	N/A	Remote Air Solenoid Module #1 - Output #4 - Valve ON when commanded OFF. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	4	2	N/A	Remote Air Solenoid Module #1 - Output #4 - Valve OFF when commanded ON. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	4	3	N/A	Remote Air Solenoid Module #1 - Output #4 - Open Circuit coil or valve not installed. Install solenoid or refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	4	4	N/A	Remote Air Solenoid Module #1 - Output #4 - Unknown remote air solenoid. An air Solenoid is installed in this position but is not configured. Remove solenoid or reprogram ESC to recognize the solenoid. Refer to the Air Solenoid (4-Pack) (See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2034	14	5	1	N/A	Remote Air Solenoid Module #1 - Output #5 - Valve ON when commanded OFF. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	5	2	N/A	Remote Air Solenoid Module #1 - Output #5 - Valve OFF when commanded ON. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	5	3	N/A	Remote Air Solenoid Module #1 - Output #5 - Open Circuit coil or valve not installed. Install solenoid or refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	5	4	N/A	Remote Air Solenoid Module #1 - Output #5 - Unknown remote air solenoid. An air Solenoid is installed in this position but is not configured. Remove solenoid or reprogram ESC to recognize the solenoid. Refer to the Air Solenoid (4-Pack) (See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.
2034	14	6	1	N/A	Remote Air Solenoid Module #1 - Output #6 - Valve ON when commanded OFF. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	6	2	N/A	Remote Air Solenoid Module #1 - Output #6 - Valve OFF when commanded ON. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2034	14	6	3	N/A	Remote Air Solenoid Module #1 - Output #6 - Open Circuit coil or valve not installed. Install solenoid or refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2034	14	6	4	N/A	<p>Remote Air Solenoid Module #1 - Output #6 - Unknown remote air solenoid.</p> <p>An air Solenoid is installed in this position but is not configured.</p> <p>Remove solenoid or reprogram ESC to recognize the solenoid.</p> <p>Refer to the Air Solenoid (4-Pack) (See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.</p>
2034	14	7	1	N/A	<p>Remote Air Solenoid Module #1 - Output #7 - Valve ON when commanded OFF.</p> <p>Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.</p>
2034	14	7	2	N/A	<p>Remote Air Solenoid Module #1 - Output #7 - Valve OFF when commanded ON.</p> <p>Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.</p>
2034	14	7	3	N/A	<p>Remote Air Solenoid Module #1 - Output #7 - Open Circuit coil or valve not installed.</p> <p>Install solenoid or refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.</p>
2034	14	7	4	N/A	<p>Remote Air Solenoid Module #1 - Output #7 - Unknown remote air solenoid.</p> <p>An air Solenoid is installed in this position but is not configured.</p> <p>Remove solenoid or reprogram ESC to recognize the solenoid.</p> <p>Refer to the Air Solenoid (4-Pack) (See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.</p>
2040	14	1	1	N/A	<p>AGSP #1 Switch #1, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #1 to the default value.</p> <p>Replace switch actuator</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2040	14	1	2	N/A	<p>AGSP #1 Switch #1, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #1 to the default value.</p> <p>Replace faulty microswitch</p>
2040	14	1	3	N/A	<p>AGSP #1 Switch #1, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #1 to the default value.</p> <p>Replace switch actuator</p>
2040	14	1	4	N/A	<p>AGSP #1 Switch #1, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #1 to the default value.</p> <p>Replace switch actuator</p>
2040	14	1	5	N/A	<p>AGSP #1 Switch #1, This switch should be empty but one or both of the microswitches is pressed.</p> <p>The ESC sets the status of AGSP #1 Switch #1 to the default value.</p> <p>Replace switch actuator or faulty microswitch</p>
2040	14	2	1	N/A	<p>AGSP #1 Switch #2, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #2 to the default value.</p> <p>Replace switch actuator</p>
2040	14	2	2	N/A	<p>AGSP #1 Switch #2, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #2 to the default value.</p> <p>Replace faulty microswitch</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2040	14	2	3	N/A	<p>AGSP #1 Switch #2, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #2 to the default value.</p> <p>Replace switch actuator</p>
2040	14	2	4	N/A	<p>AGSP #1 Switch #2, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #2 to the default value.</p> <p>Replace switch actuator</p>
2040	14	2	5	N/A	<p>AGSP #1 Switch #2, This switch should be empty but one or both of the microswitches is pressed.</p> <p>The ESC sets the status of AGSP #1 Switch #2 to the default value.</p> <p>Replace switch actuator or faulty microswitch</p>
2040	14	3	1	N/A	<p>AGSP #1 Switch #3, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #3 to the default value.</p> <p>Replace switch actuator</p>
2040	14	3	2	N/A	<p>AGSP #1 Switch #3, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #3 to the default value.</p> <p>Replace faulty microswitch</p>
2040	14	3	3	N/A	<p>AGSP #1 Switch #3, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #3 to the default value.</p> <p>Replace switch actuator</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2040	14	3	4	N/A	<p>AGSP #1 Switch #3, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #3 to the default value.</p> <p>Replace switch actuator</p>
2040	14	3	5	N/A	<p>AGSP #1 Switch #3, This switch should be empty but one or both of the microswitches is pressed.</p> <p>The ESC sets the status of AGSP #1 Switch #3 to the default value.</p> <p>Replace switch actuator or faulty microswitch</p>
2040	14	4	1	N/A	<p>AGSP #1 Switch #4, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #4 to the default value.</p> <p>Replace switch actuator</p>
2040	14	4	2	N/A	<p>AGSP #1 Switch #4, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #4 to the default value.</p> <p>Replace faulty microswitch</p>
2040	14	4	3	N/A	<p>AGSP #1 Switch #4, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #4 to the default value.</p> <p>Replace switch actuator</p>
2040	14	4	4	N/A	<p>AGSP #1 Switch #4, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #4 to the default value.</p> <p>Replace switch actuator</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2040	14	4	5	N/A	<p>AGSP #1 Switch #4, This switch should be empty but one or both of the microswitches is pressed.</p> <p>The ESC sets the status of AGSP #1 Switch #4 to the default value.</p> <p>Replace switch actuator or faulty microswitch</p>
2040	14	5	1	N/A	<p>AGSP #1 Switch #5, microswitch inputs are in an invalid state. Both microswitches are not depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #5 to the default value.</p> <p>Replace switch actuator</p>
2040	14	5	2	N/A	<p>AGSP #1 Switch #5, microswitch inputs are in an invalid state. Both microswitches are depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #5 to the default value.</p> <p>Replace faulty microswitch</p>
2040	14	5	3	N/A	<p>AGSP #1 Switch #5, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #5 to the default value.</p> <p>Replace switch actuator</p>
2040	14	5	4	N/A	<p>AGSP #1 Switch #5, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed.</p> <p>The ESC sets the status of AGSP #1 Switch #5 to the default value.</p> <p>Replace switch actuator</p>
2040	14	5	5	N/A	<p>AGSP #1 Switch #5, This switch should be empty but one or both of the microswitches is pressed.</p> <p>The ESC sets the status of AGSP #1 Switch #5 to the default value.</p> <p>Replace switch actuator or faulty microswitch</p>

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2040	14	6	1	N/A	AGSP #1 Switch #6, microswitch inputs are in an invalid state. Both microswitches are not depressed. The ESC sets the status of AGSP #1 Switch #6 to the default value. Replace switch actuator
2040	14	6	2	N/A	AGSP #1 Switch #6, microswitch inputs are in an invalid state. Both microswitches are depressed. The ESC sets the status of AGSP #1 Switch #6 to the default value. Replace faulty microswitch
2040	14	6	3	N/A	AGSP #1 Switch #6, microswitch inputs are in an invalid state. Top microswitch depressed, bottom microswitch not depressed. The ESC sets the status of AGSP #1 Switch #6 to the default value. Replace switch actuator
2040	14	6	4	N/A	AGSP #1 Switch #6, microswitch inputs are in an invalid state. Top microswitch not depressed, bottom microswitch depressed. The ESC sets the status of AGSP #1 Switch #6 to the default value. Replace switch actuator
2040	14	6	5	N/A	AGSP #1 Switch #6, This switch should be empty but one or both of the microswitches is pressed. The ESC sets the status of AGSP #1 Switch #6 to the default value. Replace switch actuator or faulty microswitch
2209	14	1	1	N/A	Remote Engine Speed Control Module Digital Output #1 - Output failure
2209	14	1	4	N/A	Remote Engine Speed Control Module Digital Output #1 - Data mismatch
2209	14	2	1	N/A	Remote Engine Speed Control Module Digital Output #2 - Output failure
2209	14	2	4	N/A	Remote Engine Speed Control Module Digital Output #2 - Data mismatch

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2209	14	3	1	N/A	Remote Engine Speed Control Module Digital Output #3 - Output failure
2209	14	3	4	N/A	Remote Engine Speed Control Module Digital Output #3 - Data mismatch
2209	14	4	2	N/A	Remote Engine Speed Control Module Analog Input #1 - Shorted to Battery
2209	14	4	3	N/A	Remote Engine Speed Control Module Analog Input #1 - shorted to ground.
2209	14	5	2	N/A	Remote Engine Speed Control Module Analog Input #2 - Shorted to Battery
2209	14	5	3	N/A	Remote Engine Speed Control Module Analog Input #2 - shorted to ground.
2209	14	5	4	N/A	Remote Engine Speed Control Module Analog Input #2 - Data mismatch
2209	14	6	1	N/A	Remote Engine Speed Control Module Vbat Supply-Output Failure
2225	14	1	1	N/A	RPM #1 output pin A over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - open circuit, MS1 - connected to zero volt reference) Short to ground or overload
2225	14	2	1	N/A	RPM #1 output pin B over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - open circuit, MS1 - connected to zero volt reference) Short to ground or overload
2225	14	3	1	N/A	RPM #1 output pin C over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - open circuit, MS1 - connected to zero volt reference) Short to ground or overload

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2225	14	4	1	N/A	RPM #1 output pin D over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - open circuit, MS1 - connected to zero volt reference) Short to ground or overload
2225	14	5	1	N/A	RPM #1 output pin E over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - open circuit, MS1 - connected to zero volt reference) Short to ground or overload
2225	14	6	1	N/A	RPM #1 output pin H over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - open circuit, MS1 - connected to zero volt reference)
2226	14	1	1	N/A	RPM #2 output pin A over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - connected to zero volt reference, MS1 - open circuit) Short to ground or overload
2226	14	2	1	N/A	RPM #2 output pin B over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - connected to zero volt reference, MS1 - open circuit) Short to ground or overload
2226	14	3	1	N/A	RPM #2 output pin C over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - connected to zero volt reference, MS1 - open circuit) Short to ground or overload

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2226	14	4	1	N/A	RPM #2 output pin D over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - connected to zero volt reference, MS1 - open circuit) Short to ground or overload
2226	14	5	1	N/A	RPM #2 output pin E over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - connected to zero volt reference, MS1 - open circuit) Short to ground or overload
2226	14	6	1	N/A	RPM #2 output pin H over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - connected to zero volt reference, MS1 - open circuit) Short to ground or overload
2228	14	1	1	N/A	RPM #4 output pin A over current The output behaves like a 20 amp type III circuit breaker. (MS3 - connected to zero volt reference, MS2 - open circuit, MS1 - open circuit) Short to ground or overload
2228	14	2	1	N/A	RPM #4 output pin B over current The output behaves like a 20 amp type III circuit breaker. (MS3 - connected to zero volt reference, MS2 - open circuit, MS1 - open circuit) Short to ground or overload
2228	14	3	1	N/A	RPM #4 output pin C over current The output behaves like a 20 amp type III circuit breaker. (MS3 - connected to zero volt reference, MS2 - open circuit, MS1 - open circuit) Short to ground or overload

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2228	14	4	1	N/A	RPM #4 output pin D over current The output behaves like a 20 amp type III circuit breaker. (MS3 - connected to zero volt reference, MS2 - open circuit, MS1 - open circuit) Short to ground or overload
2228	14	5	1	N/A	RPM #4 output pin E over current The output behaves like a 20 amp type III circuit breaker. (MS3 - connected to zero volt reference, MS2 - open circuit, MS1 - open circuit) Short to ground or overload
2228	14	6	1	N/A	RPM #4 output pin H over current The output behaves like a 20 amp type III circuit breaker. (MS3 - connected to zero volt reference, MS2 - open circuit, MS1 - open circuit) Short to ground or overload
2231	14	1	1	N/A	RPM #7 output pin A over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - open circuit, MS1 - open circuit) Short to ground or overload
2231	14	2	1	N/A	RPM #7 output pin B over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - open circuit, MS1 - open circuit) Short to ground or overload
2231	14	3	1	N/A	RPM #7 output pin C over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - open circuit, MS1 - open circuit) Short to ground or overload
2231	14	4	1	N/A	RPM #7 output pin D over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - open circuit, MS1 - open circuit) Short to ground or overload

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2231	14	5	1	N/A	RPM #7 output pin E over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - open circuit, MS1 - open circuit) Short to ground or overload
2231	14	6	1	N/A	RPM #7 output pin H over current The output behaves like a 20 amp type III circuit breaker. (MS3 - open circuit, MS2 - open circuit, MS1 - open circuit) Short to ground or overload
2234	14	1	1	N/A	Remote Air Solenoid Module #2 - Output #1 - Valve ON when commanded OFF. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	1	2	N/A	Remote Air Solenoid Module #2 - Output #1 - Valve OFF when commanded ON. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	1	3	N/A	Remote Air Solenoid Module #2 - Output #1 - Open Circuit coil or valve not installed. Install solenoid or refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	1	4	N/A	Remote Air Solenoid Module #2 - Output #1 - Unknown remote air solenoid. An air Solenoid is installed in this position but is not configured. Refer to the Air Solenoid (4-Pack) (See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.
2234	14	2	1	N/A	Remote Air Solenoid Module #2 - Output #2 - Valve ON when commanded OFF. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2234	14	2	2	N/A	Remote Air Solenoid Module #2 - Output #2 - Valve OFF when commanded ON. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	2	3	N/A	Remote Air Solenoid Module #2 - Output #2 - Open Circuit coil or valve not installed. Install solenoid or refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	2	4	N/A	Remote Air Solenoid Module #2 - Output #2 - Unknown remote air solenoid. An air Solenoid is installed in this position but is not configured. Refer to the Air Solenoid (4-Pack) (See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.
2234	14	3	1	N/A	Remote Air Solenoid Module #2 - Output #3 - Valve ON when commanded OFF. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	3	2	N/A	Remote Air Solenoid Module #2 - Output #3 - Valve OFF when commanded ON. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	3	3	N/A	Remote Air Solenoid Module #2 - Output #3 - Open Circuit coil or valve not installed. Install solenoid or refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	3	4	N/A	Remote Air Solenoid Module #2 - Output #3 - Unknown remote air solenoid. An air Solenoid is installed in this position but is not configured. Refer to the Air Solenoid (4-Pack) (See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2234	14	4	1	N/A	Remote Air Solenoid Module #2 - Output #4 - Valve ON when commanded OFF. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	4	2	N/A	Remote Air Solenoid Module #2 - Output #4 - Valve OFF when commanded ON. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	4	3	N/A	Remote Air Solenoid Module #2 - Output #4 - Open Circuit coil or valve not installed. Install solenoid or refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	4	4	N/A	Remote Air Solenoid Module #2 - Output #4 - Unknown remote air solenoid. An air Solenoid is installed in this position but is not configured. Refer to the Air Solenoid (4-Pack) (See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.
2234	14	5	1	N/A	Remote Air Solenoid Module #2 - Output #5 - Valve ON when commanded OFF. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	5	2	N/A	Remote Air Solenoid Module #2 - Output #5 - Valve OFF when commanded ON. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	5	3	N/A	Remote Air Solenoid Module #2 - Output #5 - Open Circuit coil or valve not installed. Install solenoid or refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2234	14	5	4	N/A	Remote Air Solenoid Module #2 - Output #5 - Unknown remote air solenoid. An air Solenoid is installed in this position but is not configured. Refer to the Air Solenoid (4-Pack) (See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.
2234	14	6	1	N/A	Remote Air Solenoid Module #2 - Output #6 - Valve ON when commanded OFF. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	6	2	N/A	Remote Air Solenoid Module #2 - Output #6 - Valve OFF when commanded ON. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	6	3	N/A	Remote Air Solenoid Module #2 - Output #6 - Open Circuit coil or valve not installed. Install solenoid or refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	6	4	N/A	Remote Air Solenoid Module #2 - Output #6 - Unknown remote air solenoid. An air Solenoid is installed in this position but is not configured. Refer to the Air Solenoid (4-Pack) (See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.
2234	14	7	1	N/A	Remote Air Solenoid Module #2 - Output #7 - Valve ON when commanded OFF. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	7	2	N/A	Remote Air Solenoid Module #2 - Output #7 - Valve OFF when commanded ON. Refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.

Table 371 Diagnostic Trouble Code (DTC) List (cont.)

SPN	FMI	Byte 7	Byte 8	ESC Connector and Pin #	Condition Description/Comments/Probable Cause(s)
2234	14	7	3	N/A	Remote Air Solenoid Module #2 - Output #7 - Open Circuit coil or valve not installed. Install solenoid or refer to the Testing Individual Solenoids (See TESTING INDIVIDUAL SOLENOIDS, page 690) section of this manual.
2234	14	7	4	N/A	Remote Air Solenoid Module #2 - Output #7 - Unknown remote air solenoid. An air Solenoid is installed in this position but is not configured. Refer to the Air Solenoid (4-Pack) (See AIR SOLENOID MODULE (4-PACK), page 683) section of this manual.

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