

Bulkhead Module

54.01

General Information

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General Information

The Bulkhead Module (BHM) is the primary module of the vehicle electrical system, and controls the operation of the other multiplex modules in the system and a variety of other vehicle components either directly or indirectly.

The Bulkhead Module is mounted in an opening on the frontwall slightly below and outboard of the steering column. It has four harness connections on the engine compartment side of the frontwall and three harness connections on the cab side. Connections on the engine side are: the forward chassis harness, the engine harness, and two to the frontwall harnesses. Connections on the cab side include up to three dash harness connectors.

For more information about the vehicle electrical system, see **Section 54.00**, Electrical System.

Bulkhead Module Replacement

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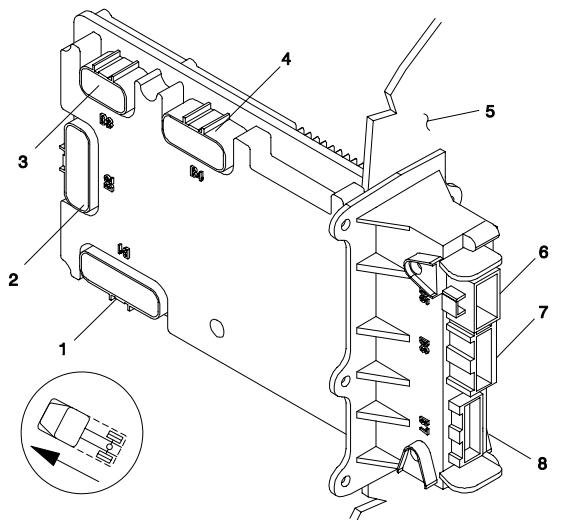
Replacement

IMPORTANT: It is normally not necessary to replace the Bulkhead Module. Removing and installing the electronic Bulkhead Module controller should be a last resort to solving electrical problems, unless the unit needs replacing due to physical damage. Follow troubleshooting procedures in this section to help solve electrical problems involving this module before replacing either the Bulkhead Module or Chassis Module. If troubleshooting indicates a malfunction of either module, try reflashing the parameters and the software before replacing the module. Check external wiring. Also see **Section 54.00**, Electrical System, for more information about the vehicle electrical system in general.

1. Tilt the hood.
2. Disconnect the negative leads from the batteries.

NOTE: The Bulkhead Module is located on the frontwall outboard of the steering column. See **Fig. 1** and **Fig. 2**.

3. Unplug bulkhead harnesses B1–B4 from the engine compartment side of the frontwall.

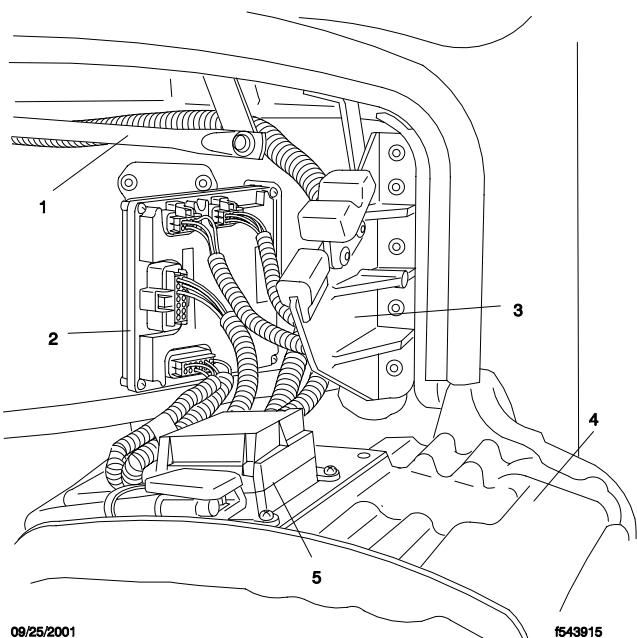


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1. Connection B1, Forward Chassis Harness
2. Connection B2, Engine Harness
3. Connection B3, Frontwall Harness
4. Connection B4, Frontwall Harness
5. Frontwall
6. Connection B5, Dash Harness
7. Connection B6, Dash Harness
8. Connection B7, Dash Harness

Figure 1 Bulkhead Module (isometric view)



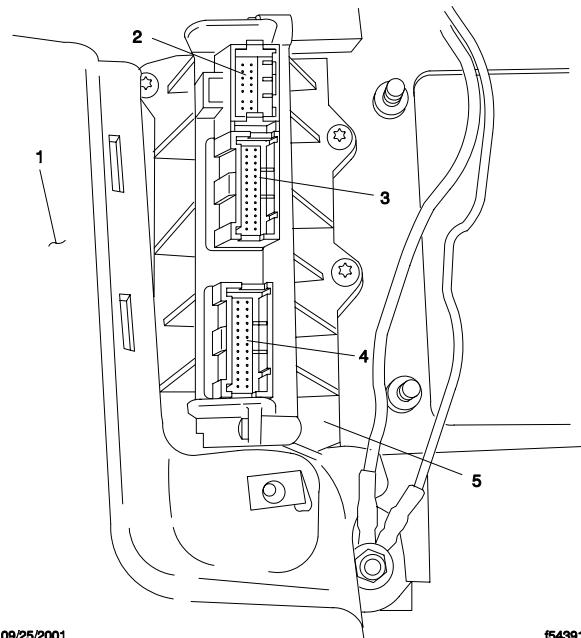
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1. Wiper Linkage Arm
2. Bulkhead Module
3. Hood Support Bracket
4. Quarter Fender
5. Power Distribution Module

Figure 2 Bulkhead Module (engine compartment side)

4. Unplug bulkhead harnesses B5–B7 from the Bulkhead Module on the cab side of the frontwall. See **Fig. 3**.



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1. Interior Cab Wall
2. Connection B5, Dash Harness
3. Connection B6, Dash Harness
4. Connection B7, Dash Harness
5. Bulkhead Module, Cab Side

Figure 3 Bulkhead Module (cab side)

5. Remove the Torx fasteners securing the Bulkhead Module to the cab side of the frontwall and remove the module by pulling it through the frontwall opening into the cab.

NOTE: Use ServiceLink to flash the Bulkhead Module for loading vehicle specific features.

6. Place the Bulkhead Module through the frontwall opening from the cab side, then install and tighten the Torx screws 48 lbf-in (540 N·cm).
7. Plug in bulkhead harnesses B5–B7 to the Bulkhead Module on the cab side of the frontwall.
8. Plug in bulkhead harnesses B1–B4 to the Bulkhead Module on the engine side of the frontwall.
9. Connect the batteries.
10. Verify correct operation of the Bulkhead Module by cycling electrical components.

Troubleshooting

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NOTE: The output for the following functions can be controlled by optional software in addition to the functionality shown here.

Back-Up Alarm

The back-up alarm enables whenever the keyswitch is in the ignition position and activates when the transmission selector is in reverse.

The back-up alarm produces an intermittent beeping sound until the transmission selector is no longer in reverse or there is no ignition power.

Back-Up Alarm Input					
Input	Type	Function	Mux Device	Connector	Pin
Transmission in reverse	Parameter on data bus: Vehicle transmission in reverse gear	Parameter used to notify the controller that the vehicle transmission is in reverse gear	—	—	—
Ignition	Vehicle ignition switch	Notifies the controller that the ignition switch is in the ignition position.	BHM	B6	A3

Table 1 Back-Up Alarm Input

Back-Up Alarm Output				
Output	Function	Module	Connector	Pin
Back-up alarm	Body back-up alarm output	CHM	C5	J

Table 2 Back-Up Alarm Output

Rear Emergency Door

The rear emergency door enables whenever the keyswitch is in the ignition position or the accessory position.

The panel buzzer and the rear door buzzer sound when the rear door latch is opened.

The panel buzzer and the rear door buzzer turn off when the rear door latch is closed.

Rear Emergency Door Input					
Input	Type	Function	Mux Device	Connector	Pin
Rear latch switch (latch closed)	Body momentary switch located on rear emergency door latch assembly	Switch rests open and passes GND to C2 electronic components when the latch is opened	BHM	B6	A7

ACC	Vehicle ignition switch in ACC position	Notifies the controller that the ignition switch is in the ACC (accessory) position	BHM	B6	A1
IGN	Vehicle ignition switch in ON position	Notifies the controller that the ignition switch is in the ON position	BHM	B6	A3

Table 3 Rear Emergency Door Input

Rear Emergency Door Output				
Output	Function	Module	Connector	Pin
Panel buzzer	Switch panel buzzer 1	SHM	J1	D
Rear door buzzer	Rear door latch buzzer	BHM	B5	A

Table 4 Rear Emergency Door Output

Body Taillights

The body taillights output is activated when the park/headlamp switch is in the park lamp or headlamp position.

Body Taillights Input					
Input	Type	Function	Mux Device	Connector	Pin
Park lamps	Parameter on data bus: Vehicle park lamps	Parameter used to notify the controller that the park lamp circuit is active.	BHM	B6	B9
Headlamps	Parameter on data bus: Vehicle headlamps	Parameter used to notify the controller that the headlamp circuit is active.	BHM	B6	B10

Table 5 Body Taillights Input

Body Taillights Output				
Output	Function	Module	Connector	Pin
Lower left tail lamp	Body lower left tail lamp outputs	SHM	J2	E
Upper left tail lamp	Body upper left tail lamp outputs	SHM	J3	F

Lower right tail lamp	Body lower right tail lamp outputs	SHM	J2	F
Upper right tail lamp	Body upper right tail lamp outputs	SHM	J3	K

Table 6 Body Taillights Output

Right-Side Electric Entrance Door

The electric entrance door is operated by a linear actuator controlled by a momentary paddle switch (momentary/off/momentary).

The right side electric entrance door enables whenever the keyswitch is in the ON or ACC (accessory) position.

NOTE: The SSID for this function is 283.

Right-Side Electric Entrance Door Input					
Input	Type	Function	Mux Device	Connector	Pin
Entrance door switch	Rocker switch: Momentary switch rests in OFF position	ID 3—Activates electric door OPEN circuit ID 2—OFF (rest) ID 1—Activates electric door CLOSE circuit	—	—	—
ACC	Vehicle ignition switch in ACC position	Notifies the controller that the ignition switch is in the ACC (accessory) position	BHM	B6	A1
IGN	Vehicle ignition switch in the ON position	Notifies the controller that the ignition switch is in the ON position	BHM	B6	A3

Table 7 Right-Side Electric Entrance Door Input

Right-Side Electric Entrance Door Output				
Output	Function	Module	Connector	Pin
Door open	Front entrance door open circuit controlled by rocker switch located on the switch panel	SHM	J1	A
Door close	Front entrance door close circuit controlled by rocker switch located on the switch panel	SHM	J1	E

Table 8 Right-Side Electric Entrance Door Output

ID/Marker Lights

The ID and marker lights activate with the vehicle park lamp circuit.

ID/Marker Lights Input					
Input	Type	Function	Mux Device	Connector	Pin
Park lamps	Parameter on data bus: Vehicle park lamps	Parameter used to notify the controller that the park lamp circuit is active.	BHM	B6	B9
Headlamps	Parameter on data bus: Vehicle headlamps	Parameter used to notify the controller that the headlamp circuit is active.	BHM	B6	B10

Table 9 ID/Marker Lights Input

ID/Marker Lights Output				
Output	Function	Module	Connector	Pin
ID lights	Body ID light output	EXM1	C1	A, H, J
ID/Marker lights	Body marker light output	BHM	B5	F

Table 10 ID/Marker Lights Output

Passenger Dome Light

The passenger dome light system is driven by two separate circuits, one for the front and one for the rear.

The system is enabled whenever the keyswitch is in the ON or the ACC (accessory) position.

The on/off dome switch activates both circuits.

NOTE: The SSID for this function is 274.

Passenger Dome Light Input					
Input	Type	Function	Mux Device	Connector	Pin
Dome Light Switch	Rocker switch: Off/on switch rests in OFF position	ID 3—Activates front and rear dome light circuits ID 1—Turns off front and rear interior light circuits	—	—	—

ACC	Vehicle ignition switch in ACC position	Notifies the controller that the ignition switch is in the ACC (accessory) position	BHM	B6	A1
IGN	Vehicle ignition switch in the ON position	Notifies the controller that the ignition switch is in the ON position	BHM	B6	A3

Table 11 Passenger Dome Light Input

Passenger Dome Light Output				
Output	Function	Module	Connector	Pin
Front dome light	Front passenger interior light circuit	SHM	J3	G
Rear dome light	Rear passenger interior light circuit	SHM	J3	M

Table 12 Passenger Dome Light Output

Service Brake

The service brake circuit enables regardless of the ignition key switch position.

Pressing the service brake pedal activates the brake pilot light and the rear brake lights.

Service Brake Input					
Input	Type	Function	Mux Device	Connector	Pin
Service brake switch	Switch located on vehicle service brake pedal mechanism	Notify system that the vehicle service brake has been pressed	SHM	J1	R

Table 13 Service Brake Input

Service Brake Output				
Output	Function	Module	Connector	Pin
Lower left brake lamps	Body lower left brake lamp output	SHM	J3	H
Upper left brake lamps	Body upper left brake lamp output	CHM	C1	N
Lower right brake lamps	Body lower right brake lamp output	SHM	J2	R
Upper right brake lamps	Body upper right brake lamp output	CHM	C1	L

Table 14 Service Brake Output

Stepwell Lights

The stepwell lights are enabled whenever the keyswitch is in the ON or the ACC (accessory) position.

The stepwell lights activate with any passenger dome light switch.

The entrance door light(s) operate in unison with the stepwell lights.

Stepwell Lights Input						
Input	Type	Function	Mux Device	Connector	Pin	
Dome Light Switch	Rocker switch: Off/on switch rests in OFF position	ID 3—Activates dome light circuits ID 1—Turns off dome light circuits	—	—	—	
ACC	Vehicle ignition switch in ACC position	Notifies the controller that the ignition switch is in the ACC (accessory) position	BHM	B6	A1	
IGN	Vehicle ignition switch in the ON position	Notifies the controller that the ignition switch is in the ON position	BHM	B6	A3	

Table 15 Stepwell Lights Input

Stepwell Lights Output				
Output	Function	Module	Connector	Pin
Stepwell light	Front entrance stepwell light circuit	BHM	B4	E, F
Entrance door light	Front entrance door light circuit Located in roof sheet above entrance door stepwell Located exterior, left of entrance door, lower side skirt to illuminate ground below steps Located exterior above entrance door to illuminate ground below steps	EXM1	C1, C2, C3	G, H, N

Table 16 Stepwell Lights Output

Fault Code Information

Fault Code Information

The information below contains all proprietary Bulkhead Module (BHM) fault codes for J1587 and J1939 data bus protocols, how to view these codes, and what they mean. The fault codes can be seen on the instrument cluster. The mode/reset switch is used to scroll through the displays on the message display screen. For more information on the mode/reset switch see

Chapter 3 of the

Saf-T-Liner C2 School Bus Driver's Manual. Each fault code contains three distinct pieces of information, as described below.

J1587 fault codes consist of the following, in this order:

In ServiceLink, J1587 fault codes are shown under J1708. J1587 and J1708 are essentially the same data bus protocol.

- Module Identifier (MID)—Identifies which Electronic Control Unit (ECU) the fault is coming from. The J1587 MID identifying all Bulkhead Information Module faults is 164.
- Subsystem Identifier (SID)—Indicates what function on the ECU has failed. All J1587 SIDs for the BHM are listed in **Table 1**.
- Failure Mode Indicator (FMI)—Indicates in what way the function failed.

References such as BHM B1.A (beginning with SID 050 in **Table 1**) indicate that the fault is sensed to be coming from the Bulkhead Module, connector B1, pin A. Similarly, CHM indicates the Chassis Module, and EXM1-5 indicates the first through fifth Expansion Module on a vehicle.

J1939 faults consist of the following, in this order:

NOTE: As the SAE J1939 subcommittee approves new SPNs for use in J1939 messaging on a continual basis, J1939 SPNs used for diagnostic messages could change when the Bulkhead Module part changes.

- Source Address (SA)—Identifies which ECU the fault is coming from. The J1939 SA identifying all Bulkhead Module faults is 33.
- Suspect Parameter Number (SPN)—Indicates what function on the ECU has failed. All J1939 SPNs for the BHM are listed in **Table 2**.
- Failure Mode Indicator (FMI)—Indicates in what way the function failed.

Also included is a reference table of all FMIs for both data bus protocols. See **Table 3**.

J1587 SIDs for Bulkhead Module (BHM) MID 164		
SID	Description	Possible FMI
000	Backlighting Dimmer Switch Fault	7
001	Clutch Switch Fault	7
002	Reserved for Future Use	—
003	Headlamp Switch Disagreement—Both Park and On Inputs are CLOSED	7
004	Stalk Switch High Beam Input Fault	2
005	Ignition Switch Fault	7

006	Marker Interrupt Switch Fault	7
007	Stalk Switch Disagreement—Both Wiper High and Wiper Low Inputs are ON	2
008	Stalk Switch Disagreement—Wiper On/Off Input is OFF and Wiper High or Low Input is ON	2
009	Wiper Park Input Fault	7
010	ICU3-M2 Hazard Switch CAN Feedback Error	2
011	Stalk Switch Left Turn Signal Input Fault	2
012	Stalk Switch Right Turn Signal Input Fault	2
013	Stalk Switch Washer Switch Input Fault	2
014	Stalk Switch Wiper On/Off Input Fault	2
015	Stalk Switch Wiper Low Input Fault	2
016	Stalk Switch Wiper High Input Fault	2
017	Wheel Based Vehicle Speed CAN Message Error	2
018	Wake-up Hardware Fault (modules are kept awake)	7
019	Unknown Keep Awake Fault (modules are kept awake)	7
020	Extra Smart Switch	7
021	Duplicate Smart Switch	7
022	Missing Smart Switch	7
025	End of Frame Air Unexpected Pressure Feedback	7
026	End of Frame Air No Pressure Feedback	7
027	Axle Lift Unexpected Pressure Feedback	7
028	Axle Lift No Pressure Feedback	7
031	Suspension Proportioning Unexpected Pressure Feedback	7
032	Suspension Proportioning No Pressure Feedback	7
033	Cigar Lighter Output Fault	7
034	BHM/ICU3-M2 Ignition Mismatch	7
035	BHM/ICU3-M2 Hazard Switch Mismatch	2
036	BHM/ICU3-M2 Wiper Park Mismatch	2
037	Missing Transmission CAN Message	9
038	Missing Chassis Module CAN Message	9
039	Remote Bucket Switch Stuck Fault	7
040	Axle Lift 2 Feedback Fault	7
041	Axle Lift 2 No Feedback Fault	7

042	PTO 1 Feedback Fault	7
043	PTO 1 No Feedback Fault	7
044	PTO 2 Feedback Fault	7
045	PTO 2 No Feedback Fault	7
046-049	Reserved For Future Use	—
050	BHM B1.A	3,4
051	BHM B1.F, B1.P, B2.K, B2.L, B6.A8	5,6
052	BHM B1.J	3,4
053	BHM B1.K, B5.C	5,6
054	BHM B1.L	5,6
055	BHM B1.N	3,4
056	BHM B1.R	5,6
057	BHM B2.M	5,6
058	BHM B3.D	3,4
059	BHM B3.E	3,4,5,6
060	BHM B3.F	5,6
061	BHM B3.G	5,6
062	BHM B3.H	5,6
063	BHM B4.B	5,6
064	BHM B4.E, B4.F	3,4,5,6
065	BHM B4.G	3,4
066	BHM B4.K	3,4
067	BHM B4.M, B5.E	3,4,5,6
068	BHM B5.A, B7.A12	5,6
069	BHM B6.A9, B6.A10	5,6
070	BHM B5.B	5,6
071	BHM B5.D	5,6
072	BHM B5.F	3,4,5,6
073	BHM B5.G	3,4,5,6
074	BHM B5.H, B7.A1	3,4,5,6
075	CHM C1.A, C1.H, C1.J	5,6
076	CHM C1.G, C2.H, C3.N	5,6
077	CHM C1.L	5,6
078	CHM C1.N	5,6

079	CHM C1.P, C2.E, C3.R	5,6
080	CHM C2.A	3,4
081	CHM C2.F, C4.C, C4.D, C4.L, C4.M	3,4,5,6
082	CHM C3.A	3,4,5,6
083	CHM C3.C, C3.D	5,6
084	CHM C3.E	3,4
085	CHM C3.F	3,4
086	CHM C3.J	3,4
087	CHM C3.K	5,6
088	CHM C3.L	5,6
089	CHM C4.F	5,6
090	CHM C4.J	3,4
091	CHM C4.K	5,6
092	CHM C4.P	3,4
093	CHM C5.A	3,4
094	CHM C5.B	3,4
095	CHM C5.F	3,4
096	CHM C5.G	3,4
097	CHM C5.H	3,4
098	CHM C5.J	3,4
099	CHM C5.L	3,4
100	CHM C5.M	3,4
101	EXM1 C1.A, C1.H, C1.C	5,6
101	EXM1 C4.K	5,6
101	EXM1 C3.L	5,6
101	EXM1 C2.F, C4.C, C4.D, C4.L, C4.M	3,4,5,6
101	EXM1 C1.N	5,6
101	EXM1 C1.L	5,6
101	EXM1 C1P, C2.E, C3.R	5,6
101	EXM1 C1.G, C2.H, C3.N	5,6
101	EXM1 C2.A	3,4
101	EXM1 C3.A	3,4,5,6
101	EXM1 C3.C, C3.D	5,6
101	EXM1 C3.K	5,6

101	EXM1 C4.F	5,6
101	EXM1 C5.H	3,4
101	EXM1 C5.C	3,4
101	EXM1 C5.L	3,4
101	EXM1 C5.M	3,4
101	EXM1 C3.E	3,4
101	EXM1 C3.F	3,4
101	EXM1 C3.C	3,4
101	EXM1 C4.C	3,4
101	EXM1 C4.P	3,4
101	EXM1 C5.A	3,4
101	EXM1 C5.B	3,4
101	EXM1 C5.F	3,4
101	EXM1 C5.G	3,4
102	EXM2 C1.A, C1.H, C1.C	5,6
102	EXM2 C4.K	5,6
102	EXM2 C3.L	5,6
102	EXM2 C2.F, C4.C, C4.D, C4.L, C4.M	3,4,5,6
102	EXM2 C1.N	5,6
102	EXM2 C1.L	5,6
102	EXM2 C1P, C2.E, C3.R	5,6
102	EXM2 C1.G, C2.H, C3.N	5,6
102	EXM2 C2.A	3,4
102	EXM2 C3.A	3,4,5,6
102	EXM2 C3.C, C3.D	5,6
102	EXM2 C3.K	5,6
102	EXM2 C4.F	5,6
102	EXM2 C5.H	3,4
102	EXM2 C5.C	3,4
102	EXM2 C5.L	3,4
102	EXM2 C5.M	3,4
102	EXM2 C3.E	3,4
102	EXM2 C3.F	3,4
102	EXM2 C3.C	3,4

102	EXM2 C4.C	3,4
102	EXM2 C4.P	3,4
102	EXM2 C5.A	3,4
102	EXM2 C5.B	3,4
102	EXM2 C5.F	3,4
102	EXM2 C5.G	3,4
103	EXM3 C1.A, C1.H, C1.C	5,6
103	EXM3 C4.K	5,6
103	EXM3 C3.L	5,6
103	EXM3 C2.F, C4.C, C4.D, C4.L, C4.M	3,4,5,6
103	EXM3 C1.N	5,6
103	EXM3 C1.L	5,6
103	EXM3 C1P, C2.E, C3.R	5,6
103	EXM3 C1.G, C2.H, C3.N	5,6
103	EXM3 C2.A	3,4
103	EXM3 C3.A	3,4,5,6
103	EXM3 C3.C, C3.D	5,6
103	EXM3 C3.K	5,6
103	EXM3 C4.F	5,6
103	EXM3 C5.H	3,4
103	EXM3 C5.C	3,4
103	EXM3 C5.L	3,4
103	EXM3 C5.M	3,4
103	EXM3 C3.E	3,4
103	EXM3 C3.F	3,4
103	EXM3 C3.C	3,4
103	EXM3 C4.C	3,4
103	EXM3 C4.P	3,4
103	EXM3 C5.A	3,4
103	EXM3 C5.B	3,4
103	EXM3 C5.F	3,4
103	EXM3 C5.G	3,4
104	EXM4 C1.A, C1.H, C1.C	5,6
104	EXM4 C4.K	5,6

104	EXM4 C3.L	5,6
104	EXM4 C2.F, C4.C, C4.D, C4.L, C4.M	3,4,5,6
104	EXM4 C1.N	5,6
104	EXM4 C1.L	5,6
104	EXM4 C1P, C2.E, C3.R	5,6
104	EXM4 C1.G, C2.H, C3.N	5,6
104	EXM4 C2.A	3,4
104	EXM4 C3.A	3,4,5,6
104	EXM4 C3.C, C3.D	5,6
104	EXM4 C3.K	5,6
104	EXM4 C4.F	5,6
104	EXM4 C5.H	3,4
104	EXM4 C5.C	3,4
104	EXM4 C5.L	3,4
104	EXM4 C5.M	3,4
104	EXM4 C3.E	3,4
104	EXM4 C3.F	3,4
104	EXM4 C3.C	3,4
104	EXM4 C4.C	3,4
104	EXM4 C4.P	3,4
104	EXM4 C5.A	3,4
104	EXM4 C5.B	3,4
104	EXM4 C5.F	3,4
104	EXM4 C5.G	3,4
105	EXM5 C1.A, C1.H, C1.C	5,6
105	EXM5 C4.K	5,6
105	EXM5 C3.L	5,6
105	EXM5 C2.F, C4.C, C4.D, C4.L, C4.M	3,4,5,6
105	EXM5 C1.N	5,6
105	EXM5 C1.L	5,6
105	EXM5 C1P, C2.E, C3.R	5,6
105	EXM5 C1.G, C2.H, C3.N	5,6
105	EXM5 C2.A	3,4
105	EXM5 C3.A	3,4,5,6

105	EXM5 C3.C, C3.D	5,6
105	EXM5 C3.K	5,6
105	EXM5 C4.F	5,6
105	EXM5 C5.H	3,4
105	EXM5 C5.C	3,4
105	EXM5 C5.L	3,4
105	EXM5 C5.M	3,4
105	EXM5 C3.E	3,4
105	EXM5 C3.F	3,4
105	EXM5 C3.C	3,4
105	EXM5 C4.C	3,4
105	EXM5 C4.P	3,4
105	EXM5 C5.A	3,4
105	EXM5 C5.B	3,4
105	EXM5 C5.F	3,4
105	EXM5 C5.G	3,4
106	Reserved For Future Use	—
107	SHM J1.A, J1.E	6
108	SHM J3.G (PWM)	6
109	SHM J3.M(PWM)	6
110	SHM J3.F	5,6
111	SHM J3.K	5,6

Table 1 J1587 SIDs for Bulkhead Module (BHM) MID 164

J1939 SPNs for Bulkhead Module (BHM) SA 33		
SPN	Description	Possible FMI
70	Parking Brake Switch	2
80	Washer Fluid Level	2
84	Wheel Based Vehicle Speed	19
96	Fuel Level	19
97	Water In Fuel Indicator	19
163	Transmission Current Range	12,19

177	Transmission Oil Temperature Sensor	3,4
523	Transmission Current Gear	12,19
524	Transmission Selected Gear	12,19
597	ABS Service Brake Switch	2
598	Clutch Switch	7
879	Front Left Turn Signals Output Fault	5,6
881	Front Right Turn Signals Output Fault	5,6
882	Park/Marker Lights Output Fault	4,5,6
973	Engine Retarder Selection	19
1487	Backlighting Dimmer Switch Fault	7
1550	A/C Clutch Output Fault	5,6
2003	Missing Transmission CAN Message	9
2071	Missing Chassis Module CAN Message	9
6891	ID/Marker/Clearance Lamps—HW Override Output Fault	5,6
6892	Upper Right Tail Lamp Output Fault	5,6
6893	Upper Left Tail Lamp Output Fault	5,6
6894	Rear Passenger Dome Lamp Output Fault	6
6895	Front Passenger Dome Lamp Output Fault	6
6896	Right Side Air/Electric Entrance Door—Close—Output Fault	6
6897	Right Side Air/Electric Entrance Door—Open—Output Fault	6
6898	Right Side Turn Signal Output Fault	5,6
6900	Left Side Turn Signal Output Fault	5,6
6901	Stepwell Lights Output Fault	5,6
6902	Left Upper Back-up Lamp Output Fault	5,6
6903	Right Upper Back-up Lamp Output Fault	5,6
6904	Rear Right Turn Signal Output Fault	5,6
6905	Rear Left Turn Signal Output Fault	5,6
6906	PTO 2 No Feedback Fault	7
6907	PTO 2 Feedback Fault	7
6908	PTO 1 No Feedback Fault	7
6909	PTO 1 Feedback Fault	7
6910	Axle Lift 2 No Feedback Fault	7

6911	Axle Lift 2 Feedback Fault	7
6912	Remote Bucket Switch Stuck Fault	7
6915	Lamp and Gauge Ignition Output Fault	4,5,6
6916	BHM/ICU3-M2 Wiper Park CAN Message Mismatch	2
6917	BHM/ICU3-M2 Hazard Switch CAN Message Mismatch	2
6918	Missing Smart Switch	7
6919	Duplicate Smart Switch	7
6920	Extra Smart Switch	7
6921	Unknown Keep Awake Fault (modules are kept awake)	7
6922	Wake-up Hardware Fault (modules are kept awake)	7
6923	Wiper Parked Input Fault	7
6924	Stalk Switch Disagreement—Wiper On/Off Input is OFF and Wiper High or Low Input is ON	2
6925	Stalk Switch Disagreement—Both Wiper High and Wiper Low Inputs are ON	2
6926	Marker Interrupt Switch Fault	7
6927	Utility Lamp Output Fault	3,4,5,6
6928	Suspension Proportioning No AMU Pressure Feedback	7
6929	Suspension Proportioning Unexpected AMU Pressure Feedback	7
6930	Suspension Proportioning Solenoid Output Fault	3,4,5,6
6934	Spotlights Output Fault	3,4,5,6
6936	Rear 2 Differential Lock AMU Pressure Feedback Fault	7
6937	Rear 2 Differential Lock Solenoid Output Fault	3,4,5,6
6938	Rear 1 Differential Lock AMU Pressure Feedback Fault	7
6939	Rear 1 Differential Lock Solenoid Output Fault	3,4,5,6
6940	Optional Feature Output Fault	3,4,5,6
6941	Heated Mirrors Output Fault	3,4,5,6
6942	Interaxle AMU Pressure Feedback Fault	7
6943	Interaxle Solenoid Output Fault	3,4,5,6
6944	Fuel Water Separator Heater Output Fault	4,5,6
6945	Front Differential Lock AMU Pressure Feedback Fault	7
6946	Front Differential Lock Solenoid Output Fault	3,4,5,6
6947	Fog Lamp Output Fault	5,6
6954	End of Frame Air No AMU Pressure Feedback	7

6955	End of Frame Air Unexpected AMU Pressure Feedback	7
6956	End of Frame Air Solenoid Output Fault	3,4,5,6
6957	Daytime Running Lights (DRL) Output Fault	5,6
6958	Brake Line Air Dryer Output Fault	3,4,5,6
6959	Axle Shift AMU Pressure Feedback Fault	7
6960	Axle Shift Solenoid Output Fault	3,4,5,6
6961	Axle Lift No AMU Pressure Feedback	7
6962	Axle Lift Unexpected AMU Pressure Feedback	7
6963	Axle Lift Solenoid Output Fault	3,4,5,6
6964	Air Horn Solenoid Output Fault	5,6
6965	BHM VBAT 5 Input Fault	3,4
6966	BHM VBAT 4 Input Fault	3,4
6967	BHM VBAT 3 Input Fault	3,4
6968	BHM VBAT 2 Input Fault	3,4
6969	BHM VBAT 1 Input Fault	3,4
6970	Wiper High Output Fault	5,6
6971	Wiper Low Output Fault	5,6
6972	Stalk Switch Wiper High Input Fault	2
6973	Stalk Switch Wiper Low Input Fault	2
6974	Stalk Switch Wiper On/Off Input Fault	2
6975	ICU3-M2 Wiper Park CAN Feedback Error	2
6976	Washer Pump Output Fault	5,6
6977	Stalk Switch Washer Switch Input Fault	2
6978	Stalk Switch Right Turn Signal Input Fault	2
6979	Stalk Switch Left Turn Signal Input Fault	2
6980	Right Stop Lamp Output Fault	5,6
6981	Left Stop Lamp Output Fault	5,6
6982	Wake-up Hardware Fault	5,6
6983	Starter Relay (Mag Switch) Output Fault	5,6
6984	Ignition System, Accessory Power Outputs Fault	5,6
6985	Ignition System, Ignition Power Outputs Fault	2,5,6
6986	Ignition Switch Fault	7
6987	Tail/Clearance/License Plate Lights Output Fault	5,6
6988	Left Low Beam Output Fault	5,6

6989	Right Low Beam Output Fault	5,6
6990	Left High Beam Output Fault	5,6
6991	Right High Beam Output Fault	5,6
6992	Stalk Switch High Beam Input Fault	2
6993	Headlamp Switch Disagreement—Both Park and On Inputs are CLOSED	7
6994	ICU3-M2 Hazard Switch CAN Feedback Error	19
6995	Horn Output Fault	3,4,5,6
6996	Dome Lamps Switched Power Output Fault	5,6
6997	Cigar Lighter Output Fault	3,4,5,6
6998	Dome Lamps Battery Power Output Fault	5,6
6999	Back-up Lamps/Alarm Output Fault	5,6
7000	Panel Lamp Backlighting PWM Output Fault	3,4,5,6

Table 2 J1939 SPNs for Bulkhead Module (BHM) SA 33

Failure Mode Identifiers		
FMI	J1939 Description	J1587 Description
00	Data valid but above normal operational range—Most severe level	Data valid but above normal operational range (engine overheating)
01	Data valid but below normal operational range—Most severe level	Data valid but below normal operational range (engine oil pressure too low)
02	Data erratic, intermittent, or incorrect	Data erratic, intermittent, or incorrect
03	Voltage above normal or shorted high	Voltage above normal or shorted high
04	Voltage below normal or shorted low	Voltage below normal or shorted low
05	Current below normal or open circuit	Current below normal or open circuit
06	Current above normal or grounded circuit	Current above normal or grounded circuit
07	Mechanical system not responding or out of adjustment	Mechanical system not responding properly
08	Abnormal frequency, pulse width, or period	Abnormal frequency, pulse width, or period
09	Abnormal update rate	Abnormal update rate
10	Abnormal rate of change	Abnormal rate of change
11	Root cause not known	Failure mode not identifiable
12	Bad intelligent device or component	Bad intelligent device or component
13	Out of Calibration	Out of Calibration

14	Special Instructions	Special Instructions
15	Data valid but above normal operational range—Least severe level	Reserved for future assignment by the SAE Subcommittee
16	Data valid but above normal operational range—Moderately severe level	—
17	Data valid but below normal operational range—Least severe level	—
18	Data valid but below normal operational range—Moderately severe level	—
19	Received network data in error	—
20	Reserved for SAE Assignment	—
21	Reserved for SAE Assignment	—
22	Reserved for SAE Assignment	—
23	Reserved for SAE Assignment	—
24	Reserved for SAE Assignment	—
25	Reserved for SAE Assignment	—
26	Reserved for SAE Assignment	—
27	Reserved for SAE Assignment	—
28	Reserved for SAE Assignment	—
29	Reserved for SAE Assignment	—
30	Reserved for SAE Assignment	—
31	Not available or condition exists	—

Table 3 Failure Mode Identifiers

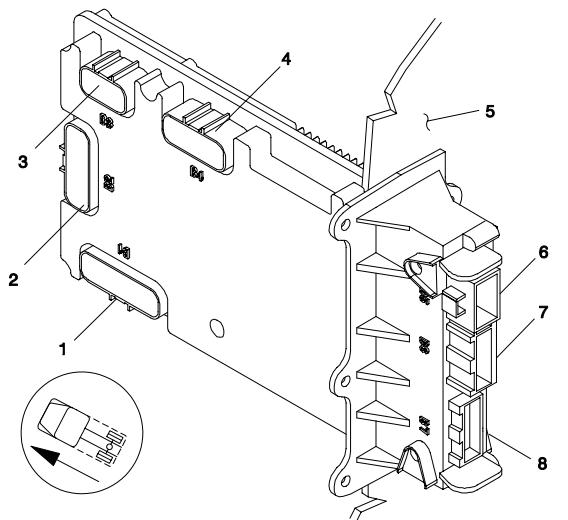
Specifications

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Specifications

For an isometric view of the Bulkhead Module, see **Fig. 1**.

For a side view of the Bulkhead Module with pinout assignments, see **Fig. 2**.

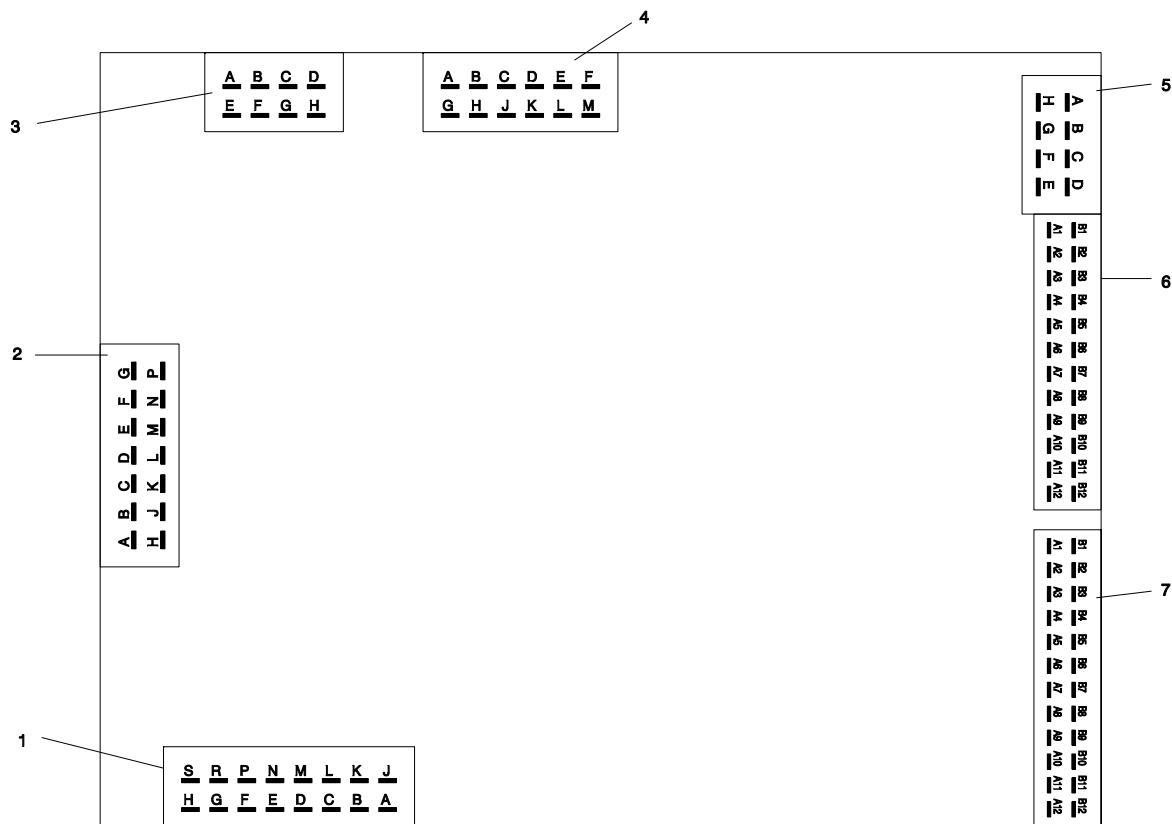


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1. Connection B1, Forward Chassis Harness
2. Connection B2, Engine Harness
3. Connection B3, Frontwall Harness
4. Connection B4, Frontwall Harness
5. Frontwall
6. Connection B5, Dash Harness
7. Connection B6, Dash Harness
8. Connection B7, Dash Harness

Figure 1 Bulkhead Module (isometric view)



03/31/2004

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1. Connection B1, Forward Chassis Harness
2. Connection B2, Engine Harness
3. Connection B3, Frontwall Harness
4. Connection B4, Frontwall Harness
5. Connection B5, Dash Harness
6. Connection B6, Dash Harness
7. Connection B7, Dash Harness

Figure 2 Bulkhead Module (side view) With Pinout Assignments

For connector B1 forward chassis harness pinouts, see **Table 1**.

For connector B2 engine harness pinouts, see **Table 2**.

For connector B3 frontwall harness pinouts, see **Table 3**.

For connector B4 frontwall harness pinouts, see **Table 4**.

For connector B5 dash harness pinouts, see **Table 5**.

For connector B6 dash harness pinouts, see **Table 6**.

For connector B7 dash harness pinouts, see **Table 7**.

For power supply fuses and associated outputs for the Bulkhead Module, see **Table 8**.

Connector B1 Forward Chassis Harness Pinouts

Connector Pin	Signal Name	Signal Type
B1-A	Fuel Level Sensor Input	Analog Input
B1-B	Module Wake-up Signal	Digital Input/Output
B1-C	Driver's Side Window Sash Input	Digital Input
B1-D	—	—
B1-E	Ground	Power Ground
B1-F	Fuel/Water Sensor Ignition Power	Digital Output
B1-G	Fuel Level Sensor Ground	Signal Ground
B1-H	J1587+ Data Bus	Data Bus
B1-J	Battery Power (VBAT5)	Power
B1-K	Heater Booster Pump	Digital Output
B1-L	Left High Beam	Digital Output
B1-M	Fuel/Water Separator (Spare Digital Input 5)	Digital Input
B1-N	Battery Power (VBAT3)	Power
B1-P	ABS Ignition Power	Digital Output
B1-R	Left Low Beam	Digital Output
B1-S	J1587– Data Bus	Data Bus

Table 1 Connector B1 Forward Chassis Harness Pinouts

Connector B2 Engine Harness Pinouts		
Connector Pin	Signal Name	Signal Type
B2-A	J1587+ Data Bus	Data Bus
B2-B	J1939+ Data Bus	Data Bus
B2-C	J1587+ Data Bus	Data Bus
B2-D	J1587– Data Bus	Data Bus
B2-E	—	—
B2-F	—	—
B2-G	Neutral Signal from Transmission	Digital Input
B2-H	J1587– Data Bus	Data Bus
B2-J	J1939– Data Bus	Data Bus
B2-K	Engine ECU Ignition Power	Digital Output
B2-L	Transmission ECU Ignition Power	Digital Output

B2-M	A/C Clutch	Digital Output
B2-N	—	—
B2-P	Alternator Charging	Digital Input

Table 2 Connector B2 Engine Harness Pinouts

Connector B3 Frontwall Harness Pinouts		
Connector Pin	Signal Name	Signal Type
B3-A	J1939– Data Bus	Data Bus
B3-B	J1939+ Data Bus	Data Bus
B3-C	Wiper Parked Position	Digital Input
B3-D	Main Battery Power (VBAT1)	Power
B3-E	Horn	Digital Output
B3-F	Wiper Motor High Speed	Digital Output
B3-G	Washer Pump	Digital Output
B3-H	Wiper Motor Low Speed	Digital Output

Table 3 Connector B3 Frontwall Harness Pinouts

Connector B4 Frontwall Harness Pinouts		
Connector Pin	Signal Name	Signal Type
B4-A	Air Filter Restriction/Spare Digital Input 9	Digital Input
B4-B	Starter Relay	Digital Output
B4-C	Ground	Ground
B4-D	Hydraulic Brake Lamp Signal	Digital Input
B4-E	Stepwell Light, Front Entrance Door	Digital Output
B4-F	—	—
B4-G	Main Battery Power (VBAT2)	Power
B4-H	Module Wake-up Signal	Digital Input/Output
B4-J	—	—
B4-K	Main Battery Power (VBAT4)	Power
B4-L	Washer Fluid Level	Digital Input

	(Spare Digital Input 8)	
B4-M	—	—

Table 4 Connector B4 Frontwall Harness Pinouts

Connector B5 Dash Harness Pinouts		
Connector Pin	Signal Name	Signal Type
B5-A	Buzzer, Rear Emergency Door	Digital Output
B5-B	Dome Lamps (PWM)	Digital Output
B5-C	—	—
B5-D	Instrument Cluster Wake-up	Digital Input/Output
B5-E	Left Rear Turn Lamp	Digital Output
B5-F	ID/Marker Lights	Digital Output
B5-G	Right Rear Turn Lamp	Digital Output
B5-H	Panel Lamp Backlighting (PWM)	Digital Output

Table 5 Connector B5 Dash Harness Pinouts

Connector B6 Dash Harness Pinouts		
Connector Pin	Signal Name	Signal Type
B6-A1	Ignition Switch ACCESSORY Position	Digital Input
B6-A2	Module Wake-up Signal	Digital Input/Output
B6-A3	Ignition Switch ON	Digital Input
B6-A4	—	—
B6-A5	Ignition Switch CRANK	Digital Input
B6-A6	Warning System Activation	Digital Input
B6-A7	Rear Emergency Door Latch	Digital Input
B6-A8	VCU Ignition Power	Digital Output
B6-A9	HVAC/Radio Accessory Power	Digital Output
B6-A10	Radio Accessory Power	Digital Output
B6-A11	J1587– Data Bus	Data Bus
B6-A12	J1587+ Data Bus	Data Bus

B6-B1	Horn Switch	Digital Input
B6-B2	Top of Clutch Switch (Spare Digital Input 7)	Digital Input
B6-B3	Bottom of Clutch Switch (Spare Digital Input 6)	Digital Input
B6-B4	—	—
B6-B5	Panel Lamps Increase	Digital Input
B6-B6	Panel Lamps Decrease	Digital Input
B6-B7	A/C Clutch Request	Digital Input
B6-B8	Hazard Switch	Digital Input
B6-B9	Headlamp Switch PARK Position	Digital Input
B6-B10	Headlamp Switch ON Position	Digital Input
B6-B11	Headlamp Switch ON 2 Position	Digital Input
B6-B12	—	—

Table 6 Connector B6 Dash Harness Pinouts

Connector B7 Dash Harness Pinouts		
Connector Pin	Signal Name	Signal Type
B7-A1	Panel Lamps (Smart Switch)	Digital Output
B7-A2	Smart Switch 3 ID 1	Analog Input
B7-A3	Smart Switch 3 ID 2	Analog Input
B7-A4	Smart Switch 3 Input	Analog Input
B7-A5	Smart Switch 3 Indicator	Digital Output
B7-A6	Smart Switch 4 ID 1	Analog Input
B7-A7	Smart Switch 4 ID 2	Analog Input
B7-A8	Smart Switch 4 Input	Analog Input
B7-A9	Smart Switch 4 Indicator	Digital Output
B7-A10	Smart Switch 5 ID 1	Analog Input
B7-A11	Smart Switch 5 ID 2	Analog Input
B7-A12	—	—
B7-B1	Smart Switch 1 ID 1	Analog Input
B7-B2	Smart Switch 1 ID 2	Analog Input
B7-B3	Smart Switch 1 Input	Analog Input

B7-B4	Smart Switch 1 Indicator	Digital Output
B7-B5	Smart Switch 2 ID 1	Analog Input
B7-B6	Smart Switch 2 ID 2	Analog Input
B7-B7	Smart Switch 2 Input	Analog Input
B7-B8	Smart Switch 2 Indicator	Digital Output
B7-B9	Ground	Signal Ground
B7-B10	Smart Switch 5 Indicator	Digital Output
B7-B11	Smart Switch 5 Input	Analog Input
B7-B12	—	—

Table 7 Connector B7 Dash Harness Pinouts

Power Supply Fuses and Associated Outputs for the Bulkhead Module				
BHM Power Input	BHM Power Input Pin	Fuse Supplying BHM Power Input	BHM Outputs Supplied	BHM Output Pin
Power In			Power Out	
VBAT1	B3.D	Fuse 22 (30A)	Buzzer for Emergency Doors	B5.A
			Battery (Smart Switches)	B7.A12
			Ignition (VCU)	B6.A8
			Ignition (Engine)	B2.K
			Ignition (ABS)	B1.P
			Ignition (Trans)	B2.L
			Fuel Water Sensor Power	B1.F
			Dome Lamps Switched	B5.B
			Left Low Beam	B1.R
			A/C Clutch	B2.M
			Smart Switch 1 Indicator	B7.B4
			Smart Switch 2 Indicator	B7.B8
			Smart Switch 3 Indicator	B7.A5
			Smart Switch 4 Indicator	B7.A9
			Smart Switch 5 Indicator	B7.B10
VBAT2	B4.G	Fuse 20 (30A)	Accessory (HVAC)	B6.A9
			Accessory (Radio)	B6.A10

			Wake-up (Instrument Cluster)	B5.D
			Left High Beam	B1.L
			Wiper High	B3.F
			Horn	B3.E
VBAT3	B1.N	Fuse 18 (30A)	Wiper Low	B3.H
			Right Rear Turn Lamp	B5.G
			Panel Lamps	B5.H
			Panel Lamps (Smart Switch)	B7.A1
VBAT4	B4.K	Fuse 15 (30A)	Clearance Lamps	B5.C
			Heater Booster Pump	B1.K [FOOTNOTE: This output supplies power to the Chassis Module pass-through for the tail lamps, license plate lamp, and trailer tail lamp relay.]
			Washer Pump	B3.G
			ID/Marker/Clearance Lights	B5.F
VBAT5	B1.J	Fuse 7 (30A)	Left Rear Turn Lamp	B5.E / B4.M
			Stepwell Light, Front Entrance Door	B4.F
			Stepwell Light, Front Entrance Door	B4.E

Table 8 Power Supply Fuses and Associated Outputs for the Bulkhead Module