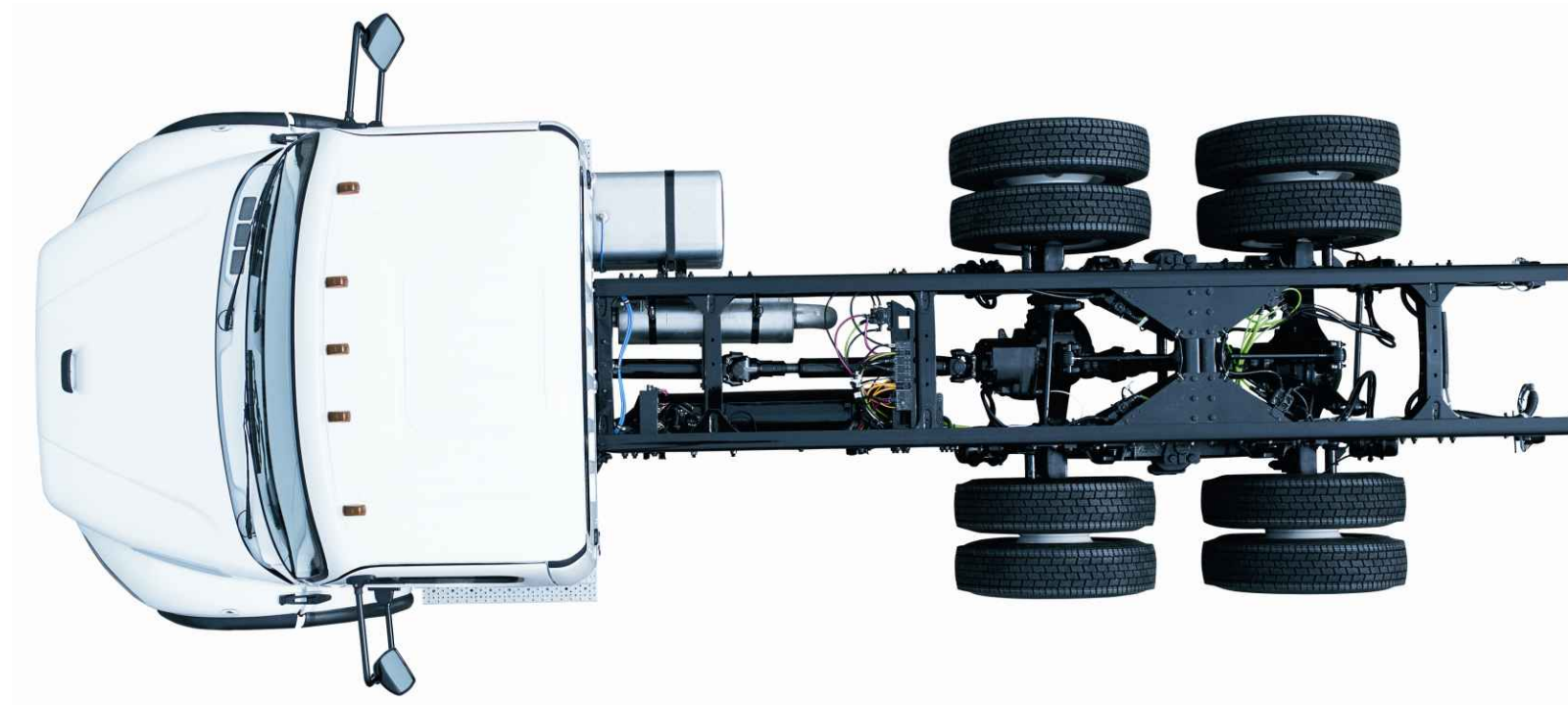




EPA 2007 Models

Electrical System Overview

2007 M2 Electrical



Body Builder Reference Guide

EPA 2007 Models

Electrical Component Overview

Body lighting Interfaces (Module 353)



Trailer Interfaces (Module 296, 297)



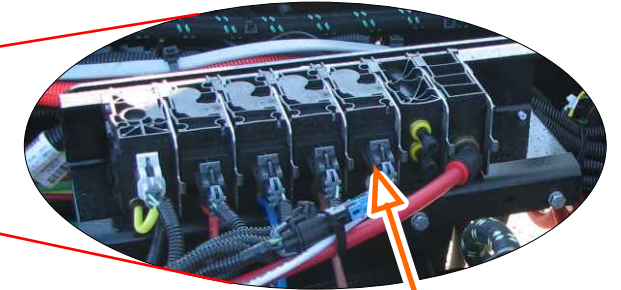
Tail Light Configurations (Module 294)



Dash Switches (Module 329)



Air Management Unit (AMU) (Multiple Modules)



Transmission Interfaces. (Grey Plug) (Plugs may also be frame located (Module , 34C)



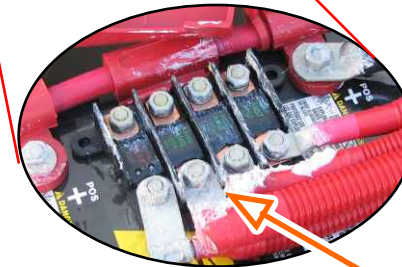
Engine Interface (Black Plug) (Plugs may also be frame located) (Module 148, 163, 87L)



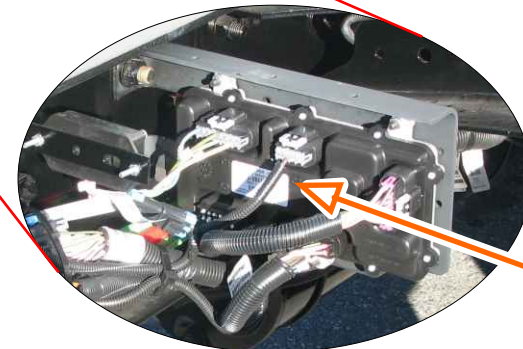
Bulk Head Module (BMH) (Module 32A)



Power Distribution (Module 285 PDM)



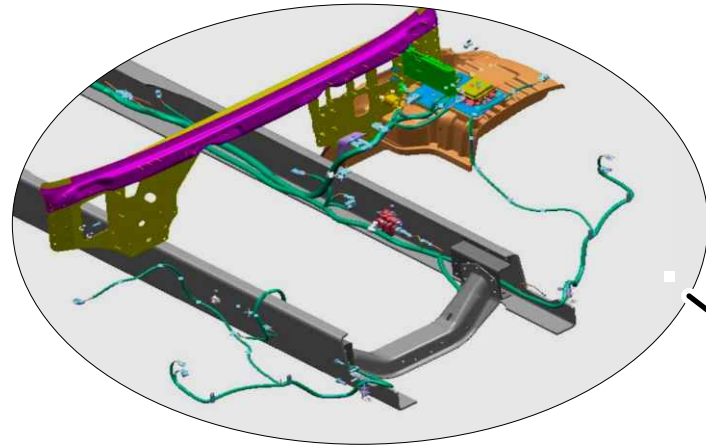
Power Supply (Module 281)



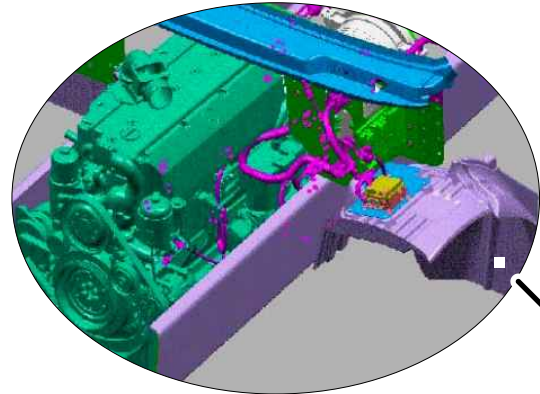
Chassis Module (CHM) (Module 335, 32K)

EPA 2007 Models

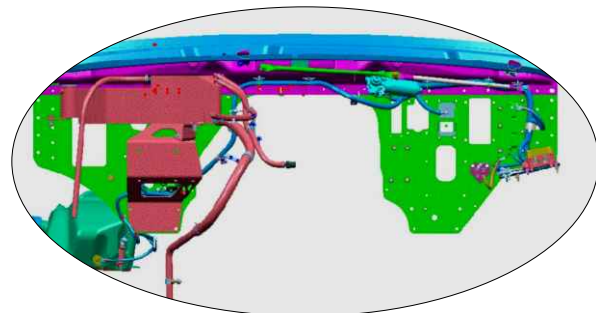
Electrical Harness Overview



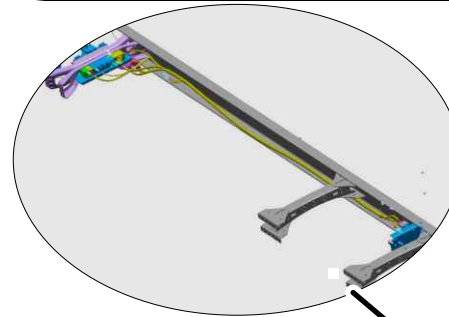
- FORWARD CHASSIS HARNESS Module 288**
- 1) Connections to Bulkhead module and Underhood PDM
 - 2) Connections to headlamps
 - 3) Connections to side marker/turn lamps
 - 4) Connections to Chassis Module



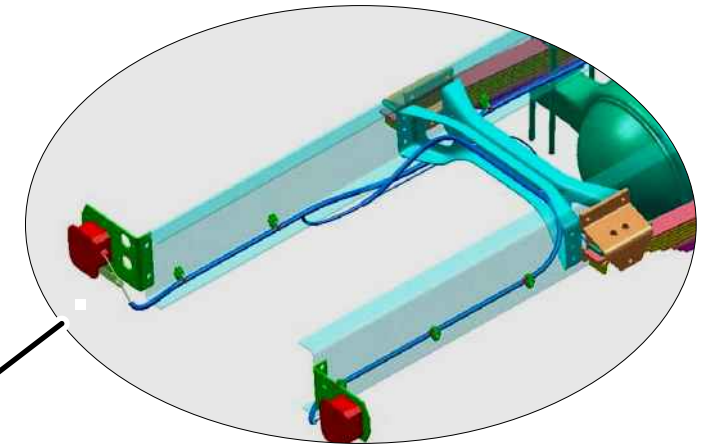
- POWERTRAIN HARNESS Module 286, 283**
- 1) Connections to the Bulkhead Module and Underhood PDM



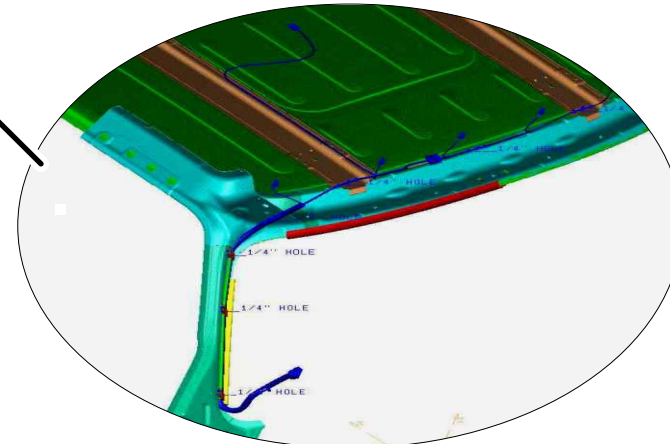
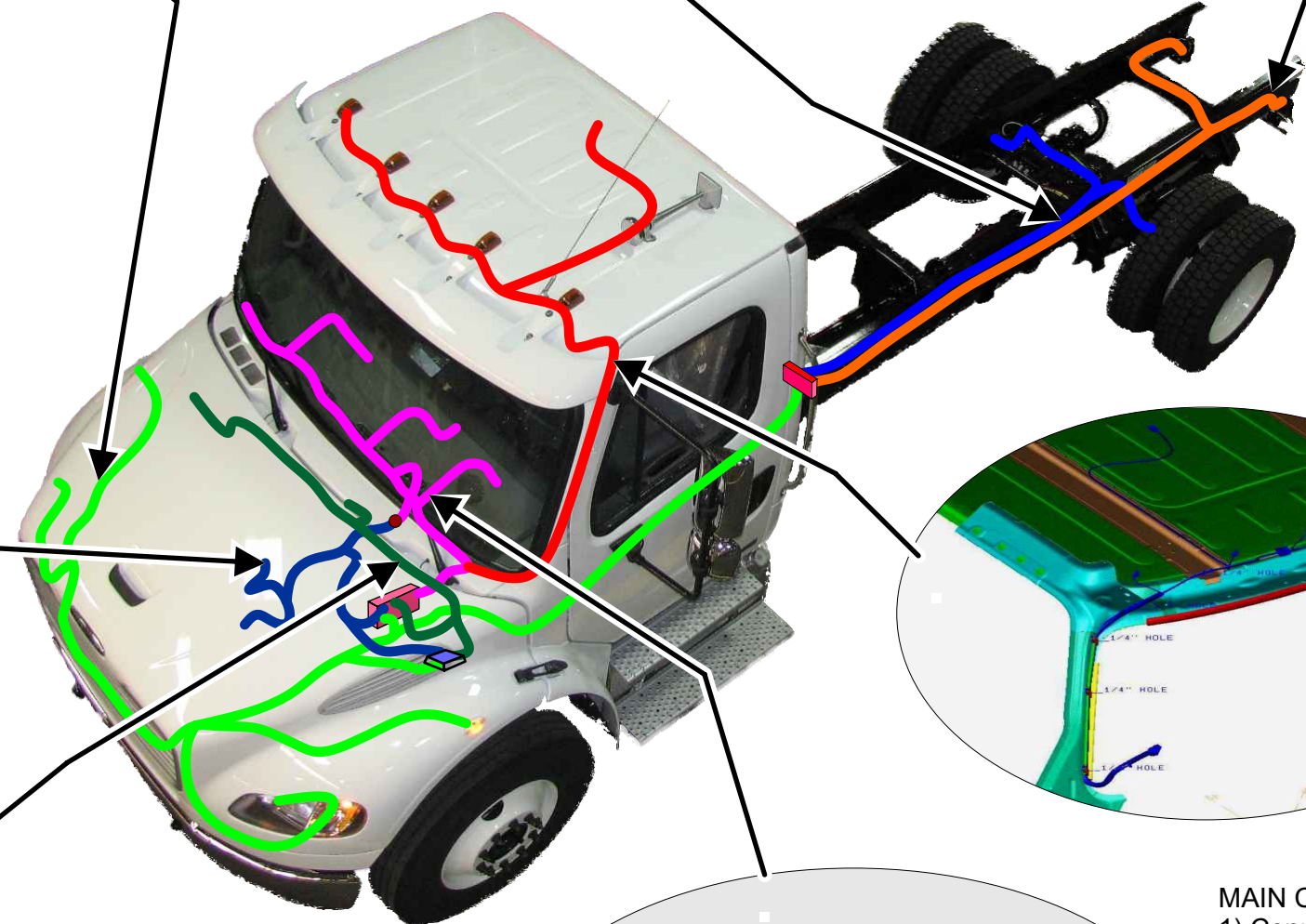
- FRONTWALL HARNESS Module 321**
- 1) Connections to Bulkhead Module and Underhood PDM
 - 2) Connection to Starter Mag Switch
 - 3) Connection to Wiper Motor
 - 4) Connection to the low coolant level sensor and horn (under surge tank)
 - 5) Connection under cab to Washer pump and level switch
 - 6) Pass-thru connector to Main Cab Harness and Powertrain Harness



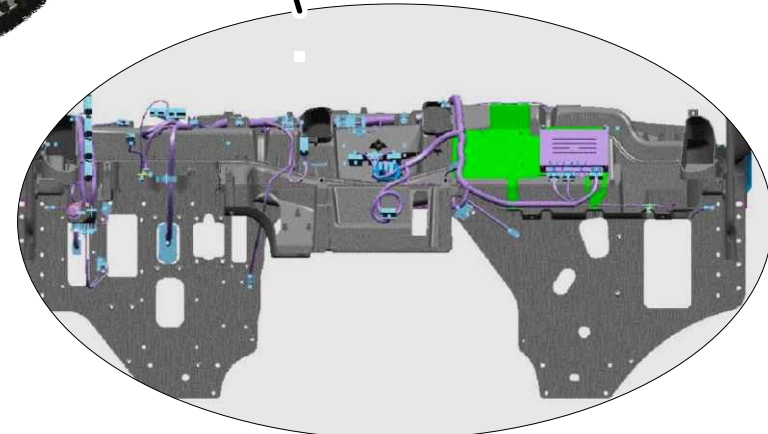
- ABS/AMU HARNESS Module 332**
- 1) Connections to Forward chassis harness and frame ground studs near Chassis module
 - 2) Connections to AMU (Mod 877 without ABS)
 - 3) Connections to Wabco ABS ECU
 - 4) Connections to rear combo valves



- AFT CHASSIS HARNESS Module 28A**
- 1) Connections to Chassis Module
 - 2) Connections to tail lamps



- OVERHEAD CAB HARNESS Module 287**
- 1) Inline connection to Main cab Harness (at bottom of A pillar)
 - 2) Connections to Marker Lamps
 - 3) Connections to Dome Lamp



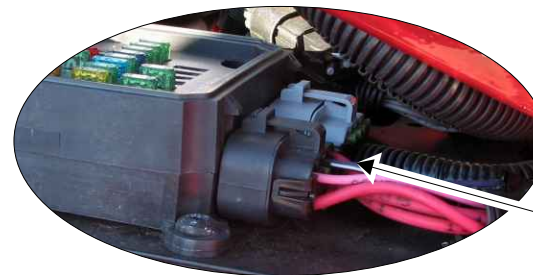
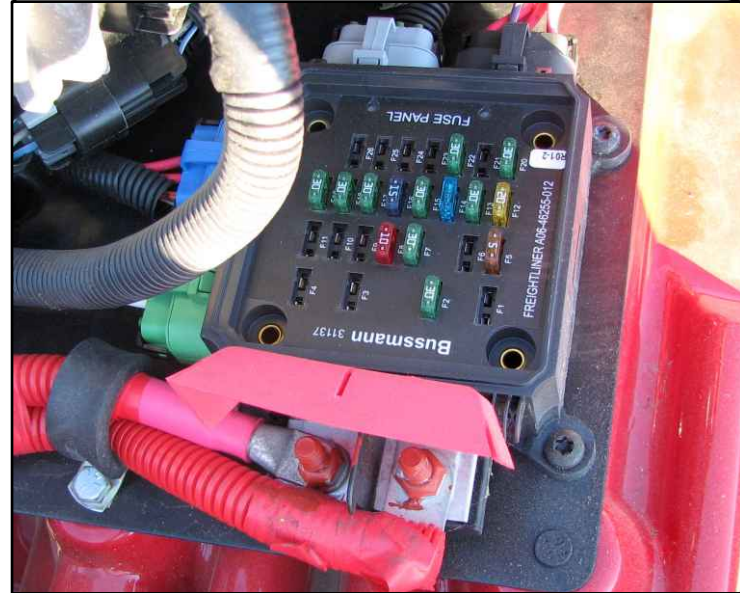
- MAIN CAB HARNESS Module 320**
- 1) Connections to bulkhead connector
 - 2) Connections to diagnostic connector (behind ignition switch)
 - 3) Connections to MBE VCU or CPC
 - 4) Pass-thru connector to engine compartment
 - 5) Gauge Cluster



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Main Power Distribution Module (PDM)

Pin part number for harness connection
 23-13213-120 TERM-FEMALE,(20-16) PAC12077411
 23-13213-121 TERM-FEMALE,(14-12) PAC12129493
 23-13213-122 TERM-FEMALE,(10) PAC12077413



PDM Plugs contain output wires

Power Distribution Module Fuse Specifications*							
Fuse Location	MEGA Fuse	Output Connection	Primary Function	VBAT Fuse	Fuse Rating	Secondary Function	Fuse Rating
F1	1	Green A	Vehicle Control Unit (MBE only)		10A	Spare	{
F2	1	Green B	Blower Motor		30A	{	{
F3	2	Green H	Engine ECU (MBE or Caterpillar C7 and C9)		20A	Engine ECU (Caterpillar 3126, C11, C13, C15 ACERT, and Cummins ISC)	30A
F4	2	Green G	Engine ECU (Caterpillar 2004 EPA)		20A	Transmission ECU	30A
F5	1	Black D	Ignition Switch		5A	{	{
F6	1	Black C	{		30A	{	{
F7	1	Gray F	Bulkhead Module	VBAT 5 BHM	30A	{	{
F8	2	Green C	ICU3-M2		10A	{	{
F9	2	Green D	Automatic Transmission ECU		10A	Eaton AutoShift Transmission ECU	30A†
F10	2	Blue G Green F	Spare		{	{	{
F11	2	Blue H	Spare		{	{	{
F12	1	Black H	Radio/Diagnostic		20A	{	{
F13	1	Grey E	Chassis Module	VBAT 3 CHM	30A	{	{
F14	1	Black B	Spare		{	{	{
F15	2	Black A	Bulkhead Module	VBAT 4 BHM	30A	{	{
F16	2	Blue A	ABS ECU (pneumatic)		15A	ABS ECU (hydraulic)	25A
F17	2	Blue C	Chassis Module	VBAT 2 CHM	30A	{	{
F18	2	Blue B	Bulkhead Module	VBAT 3 BHM	30A	{	{
F19	2	Grey G	Chassis Module	VBAT 1 CHM	30A	{	{
F20	1	Black E	Bulkhead Module	VBAT 2 BHM	30A	{	{
F21	1	Black F	Spare		{	{	{
F22	1	Black G	Bulkhead Module	VBAT 1 BHM	30A	{	{
F23	1	Grey H Blue E	Spare		{	{	{
F24	1	Grey D	Hydraulic Pump and Motor (hydraulic ABS)		25A	Spare	{
F25	2	Grey C	Spare		{	{	{
F26	2	Grey A Grey B Blue D	Spare		{	{	{

The main Power Distribution Module (PDM) distributes battery power to the various control modules on the vehicle.

The PDM contains mini fuses that protect the power feed circuits to these modules.

For most trucks there will be spare fuse slots available for customers to add additional wiring to the truck after it is purchased.

There are four Plugs attaching to the Module that supply output connections.

Common Spare fuse sockets are listed below but may vary based on the options that have been requested.

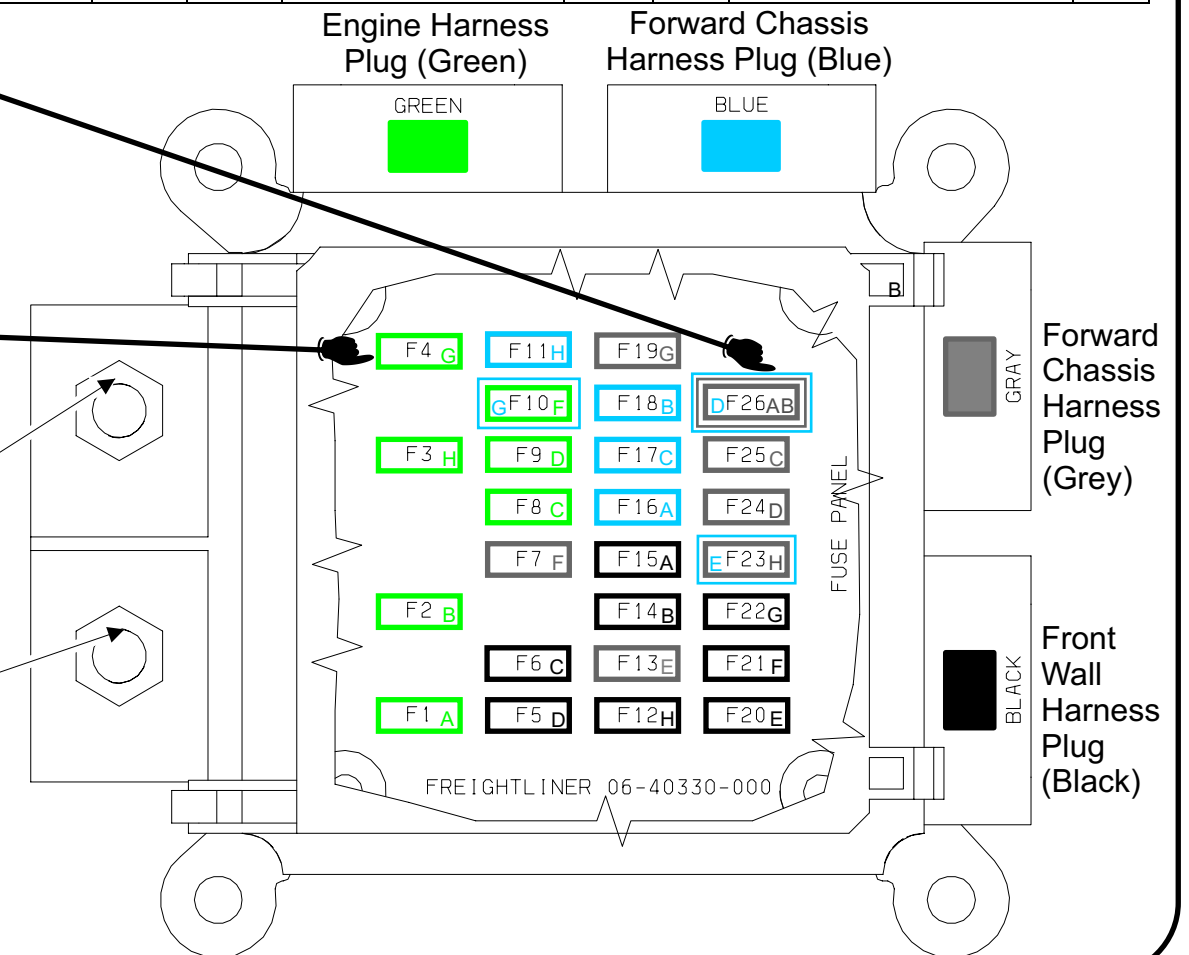
Common Spare Fuse locations
F6, F10, F11, F14, F21, F23, F25, F26

Multiple Wire output
 Pin A & B on Grey Plug and Pin D on Blue Plug

Single Wire Output found on Green Plug in Pin G

Mega Fuse 1

Mega Fuse 2





EPA 2007 Models

PDM VBAT Fuse Coverage

BMH and CHM output pins are powered by multiple VBAT fuses through the Main M2 PDM. If one of these fuses is tripped or blown then all pins in the circuit will be affected. For this reason seemingly unrelated issues can occur at the same time if a fuse is overloaded and trips.

The lists below show which pins are controlled with the VBAT fuses.

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)	Battery (dome lamps)	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)	Battery (smart switch)	B7.A12
			Accessory (HVAC)	B6.A9
			Accessory (radio)	B6.A10
			Wake Up (instrument cluster)	B5.D
			Left High Beam	B1.L
VBAT3	B1.N	Fuse 18 (30A)	Wiper High	B3.F
			Horn	B3.E
			Wiper Low	B3.H
			Spare 8.0A HSD (ignition)	B5.G
VBAT4	B4.K	Fuse 15 (30A)	Panel Lamps	B5.H
			Panel Lamps (smart switch)	B7.A1
			Clearance Lamps	B5.C
VBAT5	B1.J	Fuse 7 (30A)	Tail Lamps/License Plate Lamp/Trailer Tail Relay	B1.K*
			Washer Pump	B3.G
			12V Output (cigar lighter)	B5.F
			Spare 8.5A (utility light/spotlight)	B5.E / B4.M
			Left Heated Mirror	B4.F
			Right Heated Mirror	B4.E

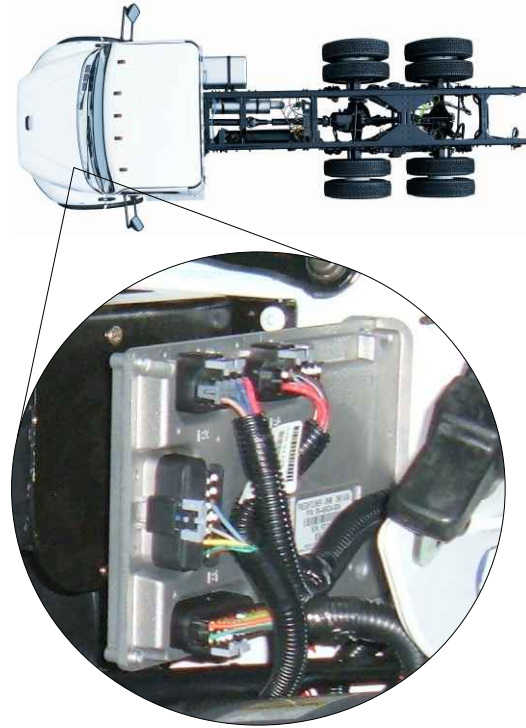
Power Supply Fuses and Associated Outputs for the Chassis Module

CHM Power Input	CHM Power Input Pin	Fuse Supplying CHM Power Input	CHM Outputs Supplied	CHM Output Pin
Power In			Power Out	
VBAT1	C4.P	Fuse 19 (30A)	Right Low Beam	C3.L
			Turn Right Front/Side	C3.R
			Turn Right Rear	C1.P
			Right Stop Lamp	C1.L
			Left Stop Lamp	C1.N
			Right DRL	C3.K
			Fog/Road Lamps	C3.C/C3.D
			Trailer Turn Right	C2.E
			Left Park Lamp	C4.C
			Right Park Lamp	C4.L
VBAT2	C3.J	Fuse 17 (30A)	Left Marker Lamp	C4.D
			Right Marker Lamp	C4.M
			Trailer Marker Relay	C2.F
			Right High Beam	C4.K
			Left Backup Lamp	C1.A
			Right Backup Lamp	C1.J
			Backup Alarm	C1.H
			Turn Left Front/Side	C3.N
			Turn Left Rear	C1.G
			Left DRL	C4.F
Trailer Turn Left	C2.H			
VBAT3	C4.J	Fuse 13 (30A)	Fuel Water Separator Heater	C3.A
			AMU Solenoid 0	C5.H
			AMU Solenoid 1	C5.J
			AMU Solenoid 2	C5.L
			AMU Solenoid 3	C5.M



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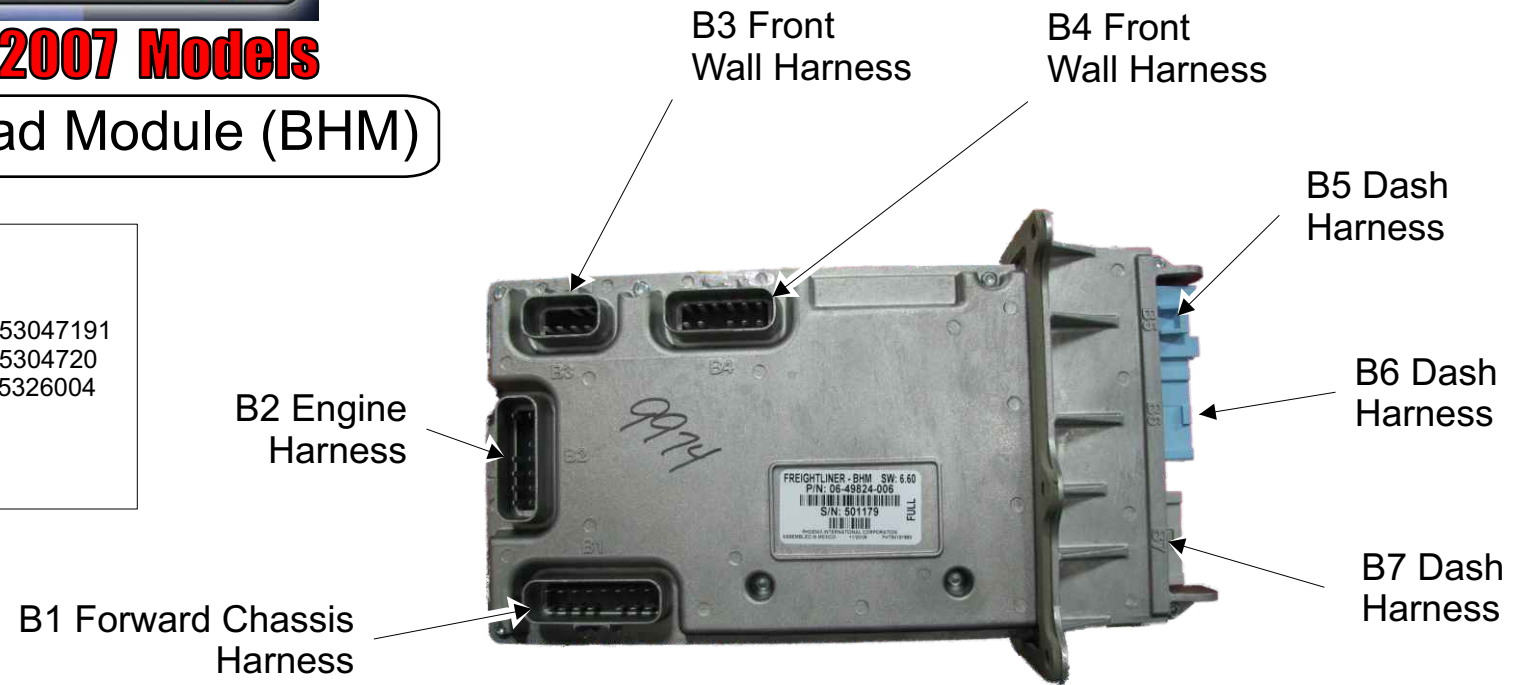
Bulk Head Module (BHM)



Pin part numbers for harness connection

Outside Cab Connections:
 23-13212-120 TERM-FEMALE,(18-16) PAC153047191
 23-13212-121 TERM-FEMALE,(14-12) PAC15304720
 23-13212-122 TERM-FEMALE,(10) PAC15326004

Inside Cab Connections:
 PAC12146448 TERM-FEMALE,(18-16)



The Bulkhead Module (BHM) is **the command module** of the M2 electrical system.

As primary command the module controls the operation of the other component modules in the system either directly or indirectly using messages sent over the J1939 network.

The Bulkhead Module is mounted on the driver side of the front wall and connects to the interior wiring through an opening in the front wall.

The BHM has four harness connections on the engine side of the front wall and three harness connections to the cab interior.

The BHM Unit contains all system parameters and the unit controls power flow and circuit protection to the various components of the M2 electrical system.

The BHM unit can also directly support up to 5 smart switches. The BHM is programable and can be changed and updated by flashing the unit through service link.

Power supply for the BHM is supplied using VBAT fuses, which reside in the main PDM (see page 3)

The BHM is programmable and the feature screen in service link can be used to change or add parameters to the BHM

Key Bulkhead Module Outputs

- Bulk Head Module outputs have defined amperage limits.
- If higher loads are required, bulkhead module outputs should be used as signal power in conjunction with a relay.

20A	B5.F - Cigar Lighter Output		
12A	B3.E - Horn		
12A	B5.E - SPARE (Utility Light/Spotlight) B4.M - SPARE (Utility Light/Spotlight)	6.7A Combined	B6.A8 - Ignition (VCU) B2.K - Ignition (Engine) B1.P - Ignition (ABS) B2.L - Ignition (Trans) B1.F - Fuel Water Sensor Power
12A			
*	B5.H - Panel Lamps B7.A1 - Panel Lamps (Smart Switch)	6.7A	B5.D - Wake Up (Instrument Cluster) B5.B - Dome Lamps Switched B1.L - Left High Beam B1.R - Left Low Beam
Combined			
12A	B4.F - SPARE (Left Heated Mirror) B4.E - SPARE (Right Heated Mirror)	6.7A Combined	B5.C - Clearance Lamps B1.K - Tail/License Plate/Trailer Relay
Combined			
6.7A	B6.A9 - Accessory (HVAC) B6.A10 - Accessory (Radio)	6.7A	B3.F - Wiper High B3.H - Wiper Low B3.G - Washer Pump
Combined			
6.7A	B5.A - Battery (Dome Lamps) B7.A12 - Battery (Smart Switch)	6.7A	B2.M - AC Clutch B4.B - Starter Relay (Crank)
Combined			



EPA 2007 Models

Bulk Head Module (BHM) Detail



A B C D
E F G H

B3 Front Wall Harness

Connector B3 Frontwall Harness Pinouts		
Connector Pin	Signal Name	Signal Type
B3-A	J1939{ Datalink	Datalink
B3-B	J1939+ Datalink	Datalink
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

B4 Front Wall Harness

A B C D E F
G H J K L M

Connector B4 Frontwall Harness Pinouts		
Connector Pin	Signal Name	Signal Type
B4-A	Air Filter Restriction/Spare #9	Digital Input
B4-B	Starter Relay	Digital Output
B4-C	Ground	Ground
B4-D	Spare Digital Input 2	Digital Input
B4-E	Right Heated Mirror (spare digital output)	Digital Output
B4-F	Left Heated Mirror (spare digital output)	Digital Output
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 (spare digital input 8)	Digital Input
B4-M	Utility Light/Spotlight (spare digital output)	Digital Output

B5 Dash Harness

A B C D
H G F E

Connector B5 Dash Harness Pinouts		
Connector Pin	Signal Name	Signal Type
B5-A	Dome Lamps Battery	Digital Output
B5-B	Dome Lamps Switched	Digital Output
B5-C	Clearance Lamps (cab)	Digital Output
B5-D	Instrument Cluster Wake-Up	Digital Output
B5-E	Utility Light/Spotlight (spare digital output)	Digital Output
B5-F	Cigar Lighter	Digital Output
B5-G	Ignition Power, Other (spare digital output)	Digital Output
B5-H	Panel Lamps	Digital Output

B2 Engine Harness

A B C D E F G
H J K L M N P

Connector B2 Engine Harness Pinouts		
Connector Pin	Signal Name	Signal Type
B2-A	J1587+ Datalink	Datalink
B2-B	J1939+ Datalink	Datalink
B2-C	J1587+ Datalink	Datalink
B2-D	J1587{ Datalink	Datalink
B2-E	—	—
B2-F	—	—
B2-G	Backup Switch (spare digital input 3)	Digital Input
B2-H	J1587{ Datalink	Datalink
B2-J	J1939{ Datalink	Datalink
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

B6 Dash Harness

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
B6-A3	Ignition Switch On	Digital Input
B6-A4	—	—
B6-A5	Ignition Switch Start	Digital Input
B6-A6	Passenger Door Open (spare digital input 10)	Digital Input
B6-A7	Driver Door Open	Digital Input
B6-A8	VCU Ignition Power	Digital Output
B6-A9	HVAC Power	Digital Output
B6-A10	Radio Power	Digital Output
B6-A11	J1587{ Datalink	Datalink
B6-A12	J1587+ Datalink	Datalink
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	—	—

B7 Dash Harness

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	Smart Switch Battery Power	Digital Output
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	—	—

B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12
A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12

B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12
A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12

S R P N M L K J
H G F E D C B A

B1 Forward Chassis Harness

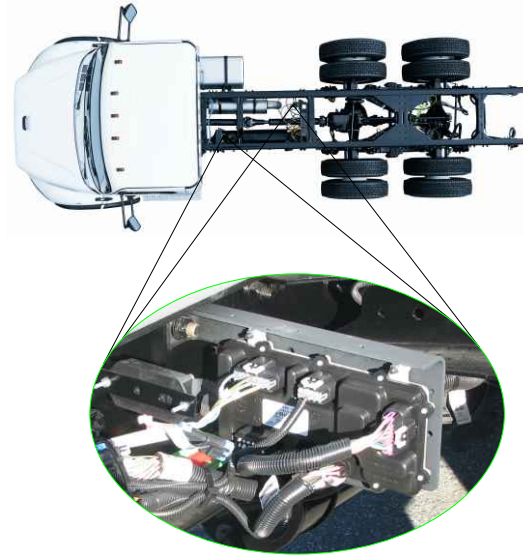
Connector B1 Forward Chassis Harness Pinouts		
Connector Pin	Signal Name	Signal Type
B1-A	—	—
B1-B	Module Wake-Up Signal	Digital Input/Output
B1-C	Spare Digital Input 4	Digital Input
B1-D	—	—
B1-E	Ground	Power Ground
B1-F	Fuel/Water Sensor Ignition Power	Digital Output
B1-G	Ground	Signal Ground
B1-H	J1587+ Datalink	Datalink
B1-J	Battery Power (VBAT5)	Power
B1-K	Tail Lamps/License Plate Lamp/Trailer Tail Relay	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{ Datalink	Datalink



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Chassis Module (CHM)

Pin part number for harness connection
 23-13212-120 TERM-FEMALE,(18-16) PAC153047191
 23-13212-121 TERM-FEMALE,(14-12) PAC15304720
 23-13212-121 TERM-FEMALE,(10) PAC15326004



General Information

The Chassis Module (CHM) and the Expansion Module (EXM) both serve the same function in the M2 electrical System by acting as slaves to the Bulkhead Module (BHM). The CHM and EXM respond to commands From the BHM and broadcast the status of the inputs And outputs that are sent to and delivered by the module.

A Business Class M2 vehicle will always have a Chassis Module, but will only have an Expansion Module when optional features require it. The CHM and EXM both have the same pin connections although They may not all be used.

Chassis Module

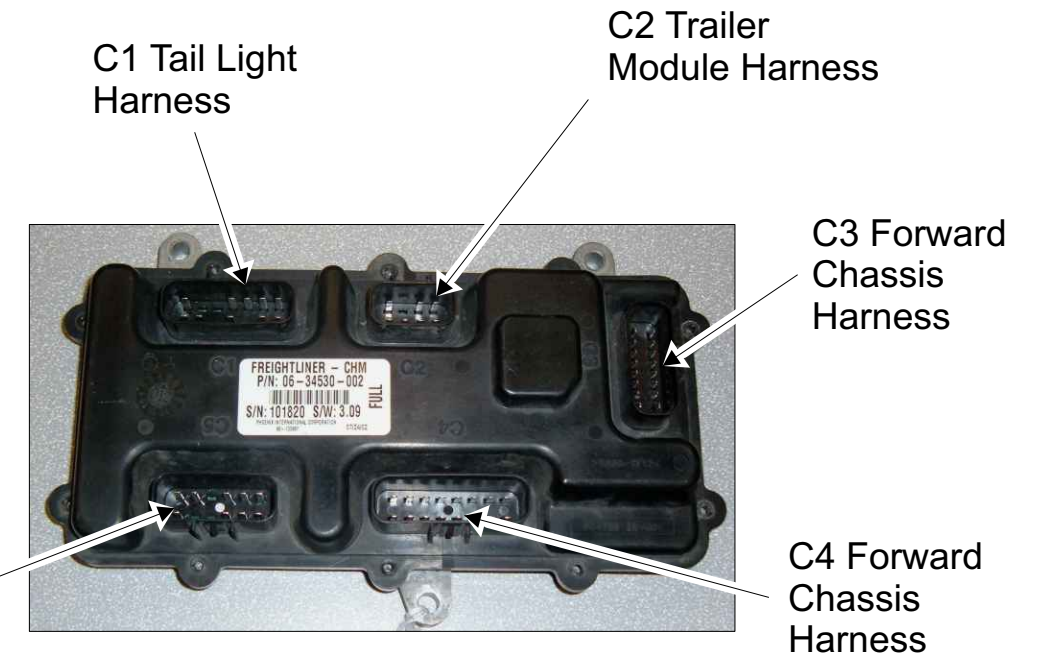
The CHM is available in two configurations depending on The vehicle options:

- Standard Chassis Module (rarely used)
- Full Chassis Module

The vehicle will have either a standard CHM or a full CHM, but not both. The standard CHM uses only the C1, C3, and C4 harness connectors. The remaining Harness connectors are sealed.

Both the standard CHM and full CHM are supported

The CHM is primarily mounted BOC on the LH rail but can also be located in an under cab position for frame packaging or environmental concerns.
 Under cab data code **335-006**



Key Chassis Module Outputs

20A	C3-A Optional Fuel Water Separator Heater		
10A Combined	C4-C Left Park Lamp	Combined	C4-C Left Park Lamp
	C4-L Right Park Lamp		C4-L Right Park Lamp
	C4-D Left Marker Lamp		C4-D Left Marker Lamp
	C4-M Right Marker Lamp		C4-M Right Marker Lamp
	C2-F Trailer Marker Relay		C4-N Right Marker Lamp
7.5A* Combined	C3-N Turn Left Front/Side	7.5A* Combined	C3-N Turn Left Front/Side
	C1-G Turn Left Rear		C1-G Turn Left Rear
	C2-H TrailerTurn Left		
7.5A* Combined	C3-R Turn Right Front/Side	7.5A* Combined	C3-R Turn Right Front/Side
	C1-P Turn Right Rear		C1-P Turn Right Rear
	C2-E TrailerTurn Right		
6.7A Combined	C1-A Left Backup Lamp	6.7A Combined	C1-A Left Backup Lamp
	C1-J Right Backup Lamp		C1-J Right Backup Lamp
	C1-H Backup Alarm		C1-H Backup Alarm
	C3-L Right Low Beam	6.7A	C3-L Right Low Beam
6.7A	C4-K Right High Beam	6.7A	C4-K Right High Beam
6.7A	C1-N Left Stop Lamp	6.7A	C1-N Left Stop Lamp
6.7A	C1-L Right Stop Lamp	6.7A	C1-L Right Stop Lamp
6.7A	C3-K Right DRL		
6.7A	C4-F Left DRL		
6.7A Combined	C3-C Optional Fog/Road Lamps		
	C3-D Optional Fog/Road Lamps		
0.85A	C5-H AMU Solenoid #0		
0.85A	C5-J AMU Solenoid #1		
0.85A	C5-L AMU Solenoid #2		
0.85A	C5-M AMU Solenoid #3		
0.2A	C2-A Trailer Power Relay		

*Maximum allowable combined current load when turn Signals are flashing.



EPA 2007 Models

Chassis Module (CHM) Detail



A B C D E F G
H J K L M N P

C1 Tail Light Harness

Taillight Harness Pinouts at Connector C1				
Connector and Pin Numbers	Signal Name	Signal Type	Full	Standard
C1-A	Left Backup Lamp	Digital Output	X	X
C1-D	Left Taillight Pass-through	Pass-through	X	X
C1-E	Right Taillight Pass-through	Pass-through	X	X
C1-F	License Plate Lamp	Digital Output	X	X
C1-G	Left Rear Turn Lamp	Digital Output	X	X
C1-H	Backup Alarm	Digital Output	X	X
C1-J	Right Backup Lamp	Digital Output	X	X
C1-L	Right Stop Lamp	Digital Output	X	X
C1-N	Left Stop Lamp	Digital Output	X	X
C1-P	Right Rear Turn Lamp	Digital Output	X	X

C2 Trailer Module Harness

A B C D
E F G H

Trailer Module Harness Pinouts at Connector C2				
Connector and Pin Numbers	Signal Name	Signal Type	Full	Standard
C2-A	Trailer Power Relay	Digital Output	X	
C2-C	Ground	Power Ground	X	
C2-D	Trailer Stop Lamp Relay Pass-through	Pass-through	X	
C2-E	Trailer Right Turn Lamp	Digital Output	X	
C2-F	Trailer Marker Lamps Relay	Digital Output	X	
C2-G	Trailer Taillight Relay Pass-through	Pass-through	X	
C2-H	Trailer Left Turn Lamp	Digital Output	X	

C3 Forward Chassis Harness

H G F E D C B A
J K L M N P R S

Forward Chassis Harness Pinouts at Connector C3				
Connector and Pin Numbers	Signal Name	Signal Type	Full	Standard
C3-A	Fuel/Water Separator Heater	Digital Output	X	
C3-B	J1587{ Datalink	Datalink	X	X
C3-C	Fog/Road Lamps	Digital Output	X	
C3-D	Fog/Road Lamps	Digital Output	X	
C3-E	Low Air Pressure	Digital Input (active low)	X	X
C3-F	Park Brake	Digital Input (active low)	X	X
C3-G	Service Brake	Digital Input (active low)	X	X
C3-H	Ground	Power Ground	X	X
C3-J	Main Battery Power (VBAT2)	Power	X	X
C3-K	Right DRL	Digital Output	X	
C3-L	Right Low Beam	Digital Output	X	X
C3-M	Ignition	Digital Input (active high)	X	X
C3-N	Left Front/Side Turn Lamp	Digital Output	X	X
C3-P	Taillight/License Plate Lamps Pass-through	Pass-through	X	X
C3-R	Right Front/Side Turn Lamp	Digital Output	X	X
C3-S	J1587+ Datalink	Datalink	X	X

C5 Air Management Unit

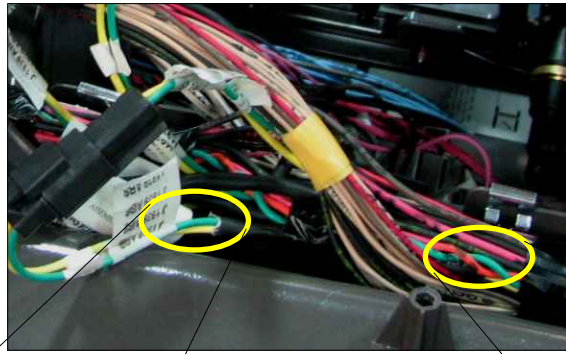
M L K J H G
F E D C B A

Connector C5 Air Management Unit (AMU) Harness Pinouts				
Connector and Pin Numbers	Signal Name	Signal Type	Full	Standard
C5-A	AMU Analog Input 0	Digital Input (active low), Analog Input	X	
C5-B	AMU Analog Input 1	Digital Input (active low), Analog Input	X	
C5-C	Ground	Signal Ground	X	
C5-F	AMU Analog Input 2	Digital Input (active low), Analog Input	X	
C5-G	AMU Analog Input 3	Digital Input (active low), Analog Input	X	
C5-H	AMU Solenoid 0	Digital Output	X	
C5-J	AMU Solenoid 1	Digital Output	X	
C5-L	AMU Solenoid 2	Digital Output	X	
C5-M	AMU Solenoid 3	Digital Output	X	

C4 Forward Chassis Harness

S R P N M L K J
H G F E D C B A

Forward Chassis Harness Pinouts at Connector C4				
Connector and Pin Numbers	Signal Name	Signal Type	Full	Standard
C4-A	Module Wake-up Signal	Digital Input/Output	X	X
C4-B	Address Identification A	Analog Input	X	X
C4-C	Left Park Lamp	Digital Output	X	X
C4-D	Left Marker Lamp	Digital Output	X	X
C4-E	Address Identification C	Analog Input	X	X
C4-F	Left DRL	Digital Output	X	
C4-G	J1939+ Datalink	Datalink	X	X
C4-H	Ground (address identification D)	Signal Ground	X	X
C4-J	Main Battery Power (VBAT3)	Power	X	
C4-K	Right High Beam	Digital Output	X	X
C4-L	Right Park Lamp	Digital Output	X	X
C4-M	Right Marker Lamp	Digital Output	X	X
C4-N	Address Identification B	Analog Input	X	X
C4-P	Main Battery Power (VBAT1)	Power	X	X
C4-R	J1939{ Datalink	Datalink	X	X
C4-S	Ground	Power Ground	X	X



J1939



J1708/1587

Multiplexing System

The term "multiplexing" describes how the Business Class® M2 electrical system works.

Multiplexing is defined as the process of sending multiple electronic messages through the same signal path at the same time—in this case, through the data link.

The system communicates using two primary forms of communication called data links: J1939 datalink (High speed) and the J1708/J1587 datalink (low speed).

J1939 (Yellow J1939+ Green J1939– In a twisted pair covered with black loom)

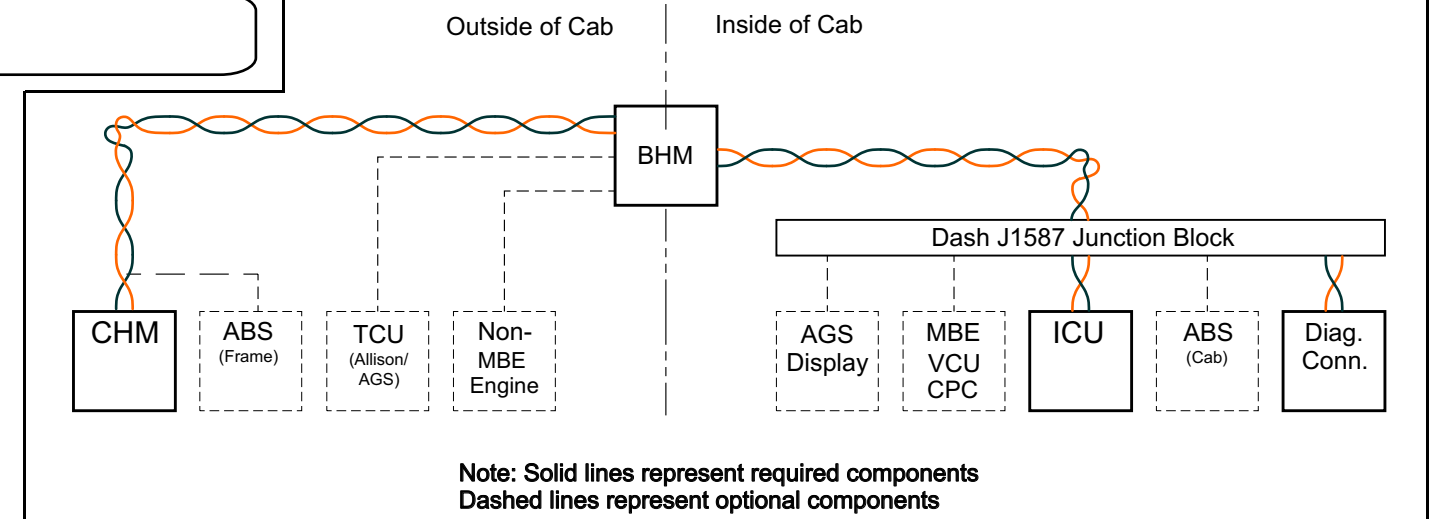
- A high speed vehicle communications network, which permits devices to broadcast requests as well as receive information from all other devices on the network.
- Each message includes an identifier much like a CB channel setting that defines the message priority, who sent it, and what data is contained within it.
- A terminating resistor is installed at each end of the network to dampen feedback signals.

J1708/1587 (Dark green J1587+ Orange J1587– in a twisted pair to reduce interference)

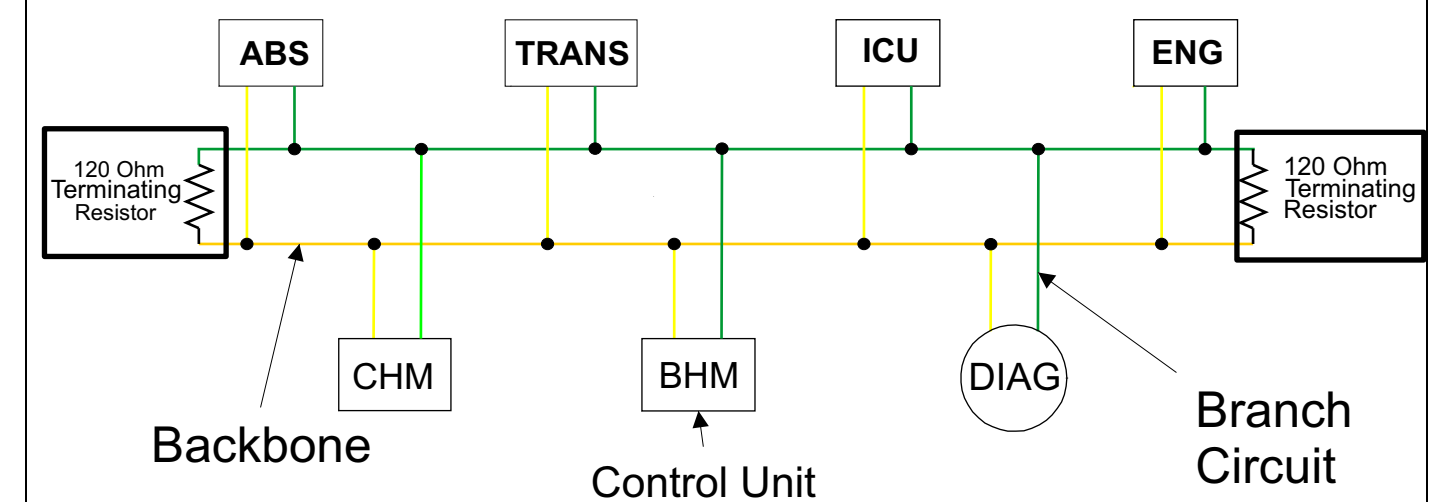
The J1587 datalink is a low-speed vehicle datalink that communicates network protocol and provides simple information exchange, including diagnostic data between electronic control devices.

Multiplexing System Backbone

The J1708/1587 Datalink



The J1939 Datalink



Terminology

Backbone The main J1939 datalink wiring that lies between the two terminating resistors. It does not include the branch circuits to each ECU or to the diagnostic connector.

* Maximum recommended length between any 2 nodes = 3 meters

* Maximum recommended branch length = 1 meter

* Maximum recommended total backbone length = 30 meters

Branch Circuit The section of J1939 datalink between the backbone and each control unit that has J1939, and between the backbone and the diagnostic connector.

Diagnostic Connector a 9-pin diagnostic connector is used for troubleshooting the electrical system.

Control Unit connects to the J1939 datalink via a branch circuit.

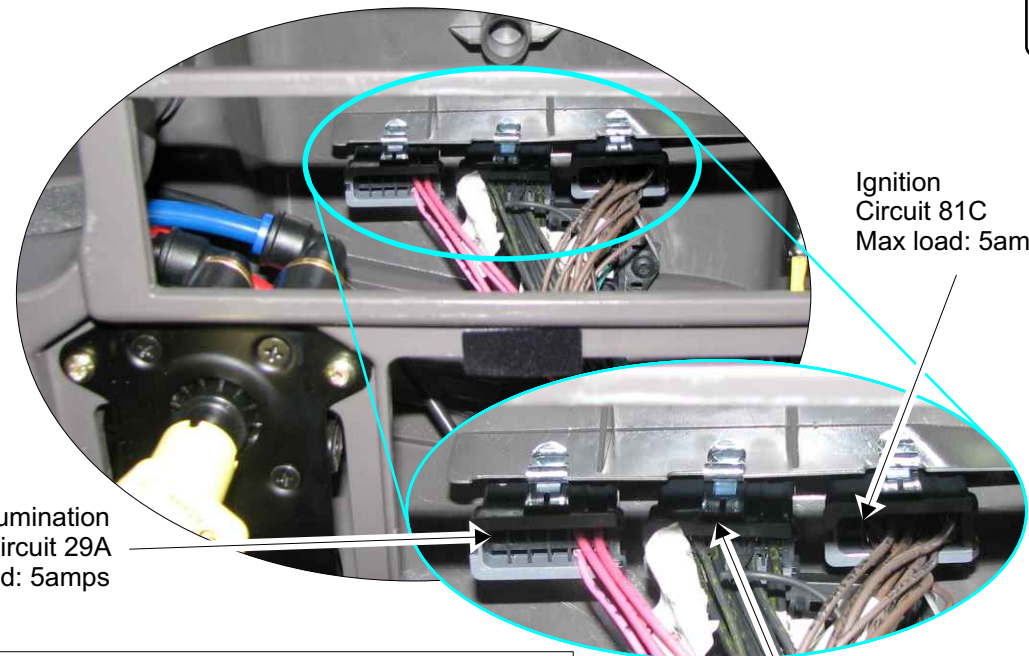


EPA 2007 Models

System Tap Points

Dash Tap Points Ignition Accessory Power, Ground and Dash Illumination

(accessory power from this location dims out during engine cranking)

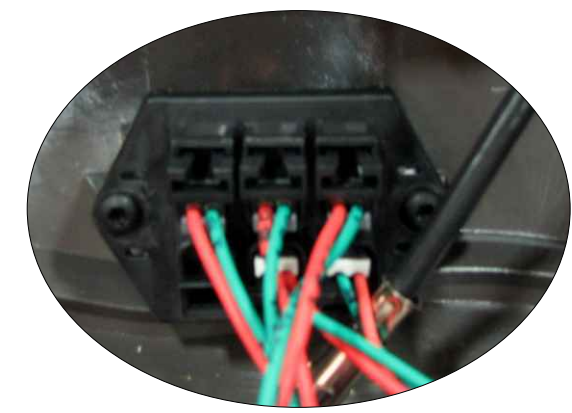


Illumination
Circuit 29A
Max load: 5amps

Ignition
Circuit 81C
Max load: 5amps

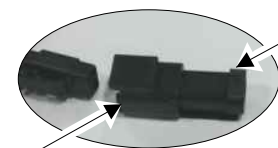
Ground
Circuit GND
Max load: 10amps

Pin part number for harness connection
TERM-FEMALE,(18-16) PAC12110844
TERM-FEMALE,(14-12) PAC12110842

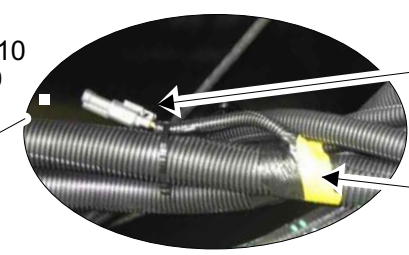
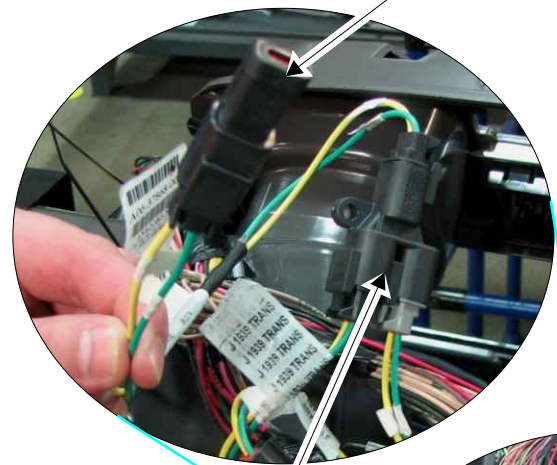


The J1587 datalink
G06-43822 found in Module 160 is the drawing
number of the J1587 wiring schematic.
The dash J1587 junction block (shown above) is
located behind the center dash panel.

Resistor Receptor
Part FTL# DUFDM04 2P EP10
Deutsch # DTM04 - 2P - EP10



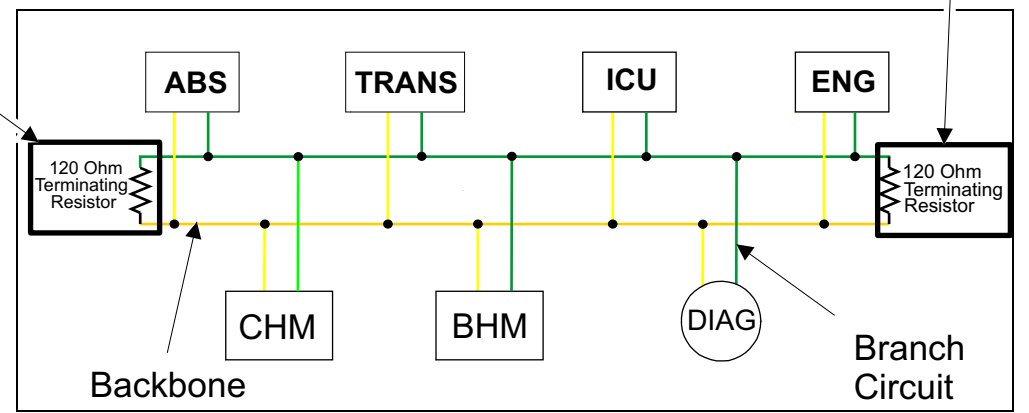
Cab resistor
located in dash
behind ICU panel



Chassis resistor
located in chassis
frame rear of cab

Look for Yellow or
Red tape located
at breakout point
under cab Drivers side

The J1939 Datalink



J1939 Multiplexing System connections

Tying into the J1939 backbone is accomplished by tapping into the system using the terminating resistor tee's located at each end of the backbone

The Chassis terminating resistor is located in a tee long the left frame rail, usually behind the cab.

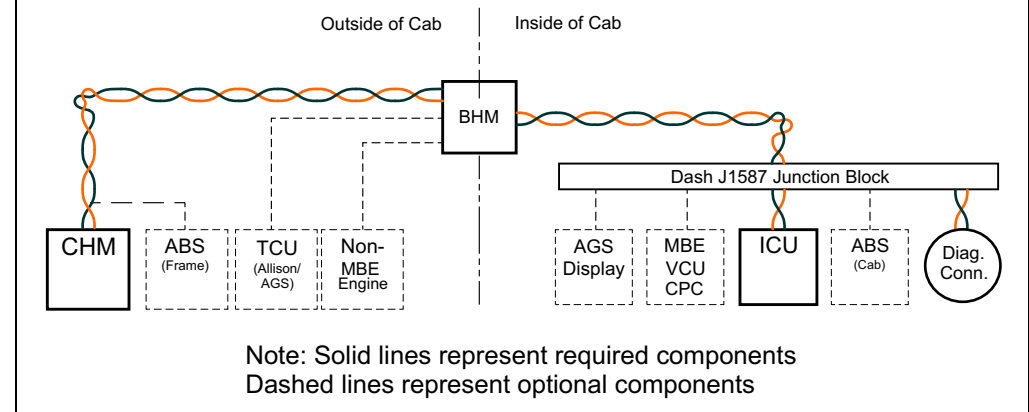
The cab terminating resistor is located in the dash tucked up above the dash tap points for the J1587
The correct datalink resistance measured at any device, or at the diagnostic plug should be 60ohms with the battery disconnected.

IMPORTANT:

- It is essential that both terminating resistors remain connected to the ends of the J1939 backbone to dampen feedback signals. Numerous J1939 problems can be attributed when terminating resistors are missing or disconnected.
- If connections under dash become disconnected. Connections should never be connected back together IE ABS with ABS as this creates an independent circuit in the system that is not connected to the backbone

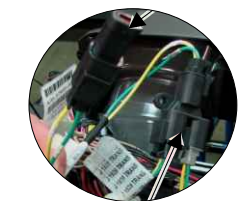
J1939 Tee connection is used for Switch Expansion Modules only and is not used on std assemblies (FTL # A06-37868-000)

The J1708/1587 Datalink



Note: Solid lines represent required components
Dashed lines represent optional components

Dash Tap point



J1939 Connections for Body Builders

To connect easily to J1939 at dash or chassis locations order the following parts:

- (1) Tee and Jumper FTL# A06-37868-000
- (1) Jumper Plug FTL# DUFDTM06 2S E004
- (2) Female Pins DUFWM2SB

Component Module Locations

Component	Module Number
General J1939 harness drawings, schematics, and installation drawings	160
Engine harness and installation drawings and wiring diagrams	283 and 286
Transmission harness and installation drawings and wiring diagrams	34A, 34B and 343
ABS harness and installation drawings	330, 332, and 333



EPA 2007 Models

Low Current Smart Switches

Smart switches:

Smart switches are low current switches that use signals to communicate with the Bulk Head Module to tell what function they effect and what state they are in (on or off etc.). There are two primary types of Smart Switch

Two position switch: Supplies an on or off signal to the BHM

Three position switch: allows for an up down off signal to the BHM
(Used in applications where more than one input is required.)

Smart switches identify themselves by two voltage signals to the bulkhead module. Each switch has a unique combination of resistors that control the voltage system to the BHM allowing it to identify the switch.

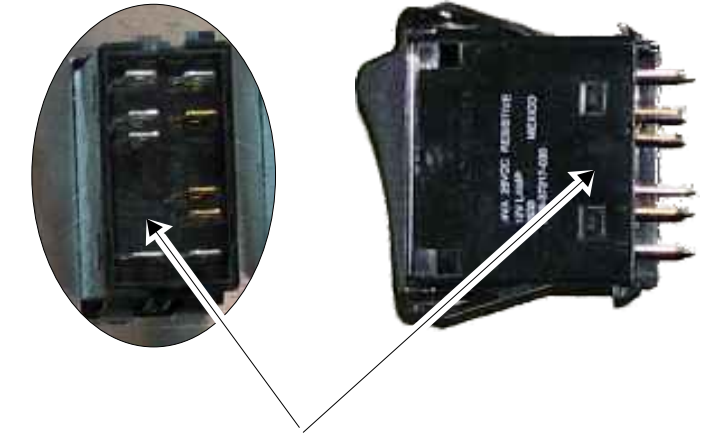
Each channel can talk independently to the Bulkhead module at the same time. In order for a smart switch to work on the vehicle the Bulk head module must be trained to hear it, this is done through the features screen using service link. Accessing the features screen can be accomplished on sight at the body builder if they are set up with Freightliner Service link and the data link harness.

Three common faults can occur with Smart Switches

Extra Smart Switch fault indicates that a smart switch has been installed that the vehicle is not programmed to utilize.

Duplicate Smart Switch fault indicates that there are two or more identical smart switches connected to either the BHM or SEM smart switch ports. To fix this error the duplicate smart switches must be removed from the system.

Missing Smart Switch fault indicates that a smart switch has been programmed but is not installed.



Low Current Smart Switch

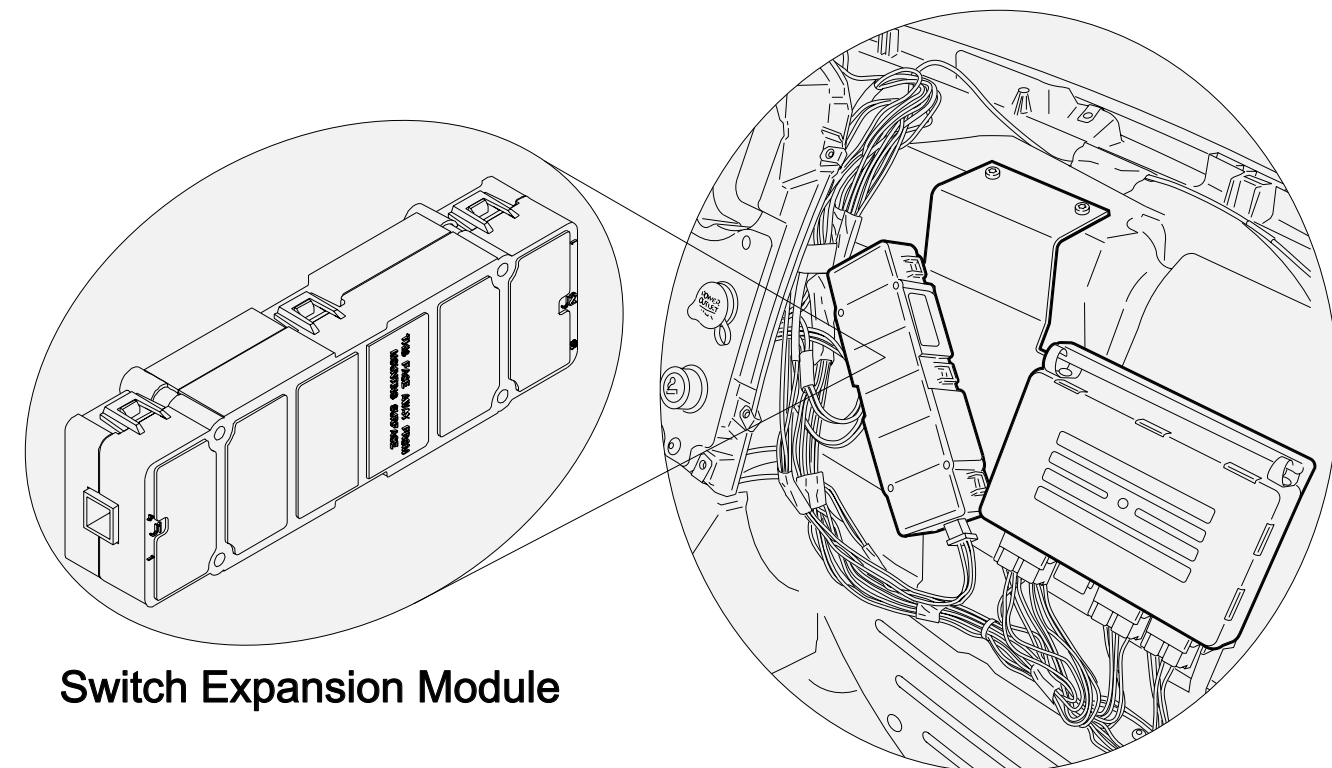
Easily identified by the **Black** backing on the switch

860-004 SMART SWITCH EXPANSION MODULE (SEM)

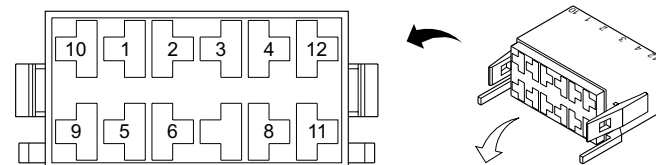
A Switch Expansion Module (SEM) is available for the Business Class® M2 vehicle when more than five smart switches are installed on the vehicle. Each adds up to 6 Smart Switches (beyond the standard 5 supported directly by BHM). System can handle up to 4 expansion modules on the M2 (Currently only one SEM is released)

The function of the SEM is to:

Read all smart switch IDs and positions; Transmit the smart switch IDs and position data on the J1939 datalink; Turn on the smart switch indicator lights when commanded to do so by the Bulkhead Module (BHM).



Switch Expansion Module



Smart Switch Pinout for Two Position Switch Pins

Pin	Circuit Number	Circuit Description
2	474B	Switch Position Input
7	474C	Switch Function ID 1 Input
8	474D	Switch Function ID 2 Input
9	GND	Ground
10	14E	Indicator (+)
11	29A	Backlighting (+)
12	474A	Indicator (I)

Smart Switch Pinout for a 3 position Switch Pins

Pin	Circuit Number	Circuit Description
2	474B	Switch Position Input
7	474C	Switch Function ID 1 Input
8	474D	Switch Function ID 2 Input
9	GND	Ground
11	29A	Backlighting (+)

Low Current Smart Switch Socket



EPA 2007 Models

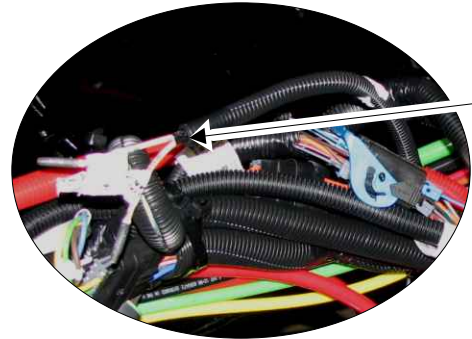
High Current Switches

High current Switch:

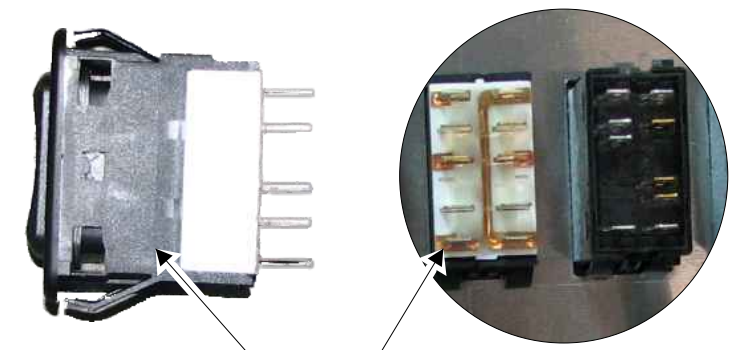
- Optional power switches are factory-installed, switch controlled power provisions that can be ordered for a Business Class® M2 vehicle.
- Optional switches can be ordered in a one-, two-, or four-switch configuration.
- All optional high current switches mount on the dash, provide fuse protected battery power, and route to a customer access point ending in blunt cut wires.
- Optional switches are commonly used to provide battery-powered lighting, such as dome, spot, or beacon lights. Other applications include using the optional switch as a triggering mechanism to enable other features, such as hydraulic lift operations or access panel locks.

Module 329 Options:

- 329-007** ILLUMINATED ROCKER SWITCH WITH WIRE TO BACK OF CAB AND MARKER LIGHT CIRCUIT TO JUNCTION BLOCK ON FRAME BACK OF CAB
- 329-010** TWO EXTRA SWITCHES IN DASH WITH INDICATOR LAMP AND WIRE TO CHASSIS AT BACK OF CAB/SLEEPER
- 329-012** FOUR EXTRA SWITCHES IN DASH WITH INDICATOR LAMP AND WIRE TO CHASSIS AT BACK OF CAB/SLEEPER
- 329-015** ONE ILLUMINATED ROCKER SWITCH WITH WIRE TO CHASSIS AT BACK OF CAB
- 329-077** (8) EXTRA SWITCHES IN DASH; (4) WITH INDICATOR LAMPS AND WIRES TO CHASSIS AT BACK OF CAB, (4) WIRED BY BODY BUILDER
- 329-082** (7) EXTRA SWITCHES IN DASH; (4) WITH INDICATOR LAMPS AND WIRES TO CHASSIS AT BACK OF CAB, (3) WIRED BY BODY BUILDER
- 329-083** (6) EXTRA SWITCHES IN DASH; (4) WITH INDICATOR LAMPS AND WIRES TO CHASSIS AT BACK OF CAB, (2) WIRED BY BODY BUILDER



Blunt cut power wires from opt high current power switches located in frame BOC.



High Current Switch

Easily identified by the **White** backing on the switch

Optional power switches:

Extra switches can be ordered and come mounted on the dash to the right of the steering column. Each switch is equipped with two LED lights; one LED provides switch illumination and on position indication. Constant fused power up to m15A is supplied to each switch from the Power Distribution Module (PDM).

Extra dash switches are not connected and require a customer supplied mating plug and pins to connect the switches to additional wiring. (See plug part numbers on this page)

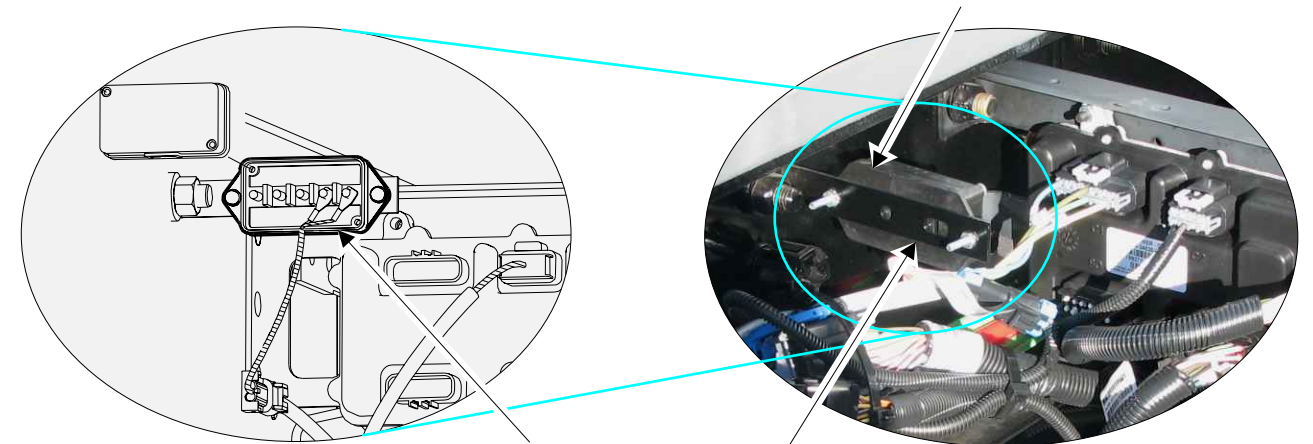
Connecting a switch using a chassis Junction Block:

Ref service bulletin Power Switches and Connections # **SB-54.39**
Switches will be pre-wired to a Junction block attached to the frame rail near the Chassis Module (CHM.)

The red wire in the junction block receives power from the output circuit of the optional switch.

IMPORTANT: The power distribution module (PDM) fuse supplying power to the optional switch is rated for 15 amps and this load should not be exceeded by the combined current load of the circuit.

Ordered using Option 329-007



Junction Block

Optional-switch Current Capacity

No. of Switches	PDM Fuse F25		PDM Fuse F26		Switch Output Current Capacity
	Rating	Switch Protected	Rating	Switch Protected	
1	15A	Switch 1			15A
2	30A	Shared by switch 1 and 2			15A
4	20A	Shared by switch 1 and 2	20A	Shared by switch 3 and 4	10A

Optional Switch Connector

Connector Pin	Signal Name	Signal Type	Circuit Color	Circuit Number
		FTL Switch Socket PN Socket 06-42557-000	Terminal Pin 23-13213-400 (20-18) Terminal Pin 23-13213-401 (16-14) Terminal Pin 23-13213-402 (12-10)	
1				
2B	Fused Battery Power	Input	T	399 for optional switches 1 and 2. 399B for optional switches 3 and 4.
3	Optional Switch Output	Output	T	399A for optional switch 1. 399C for optional switch 2. 399E for optional switch 3. 399G for optional switch 4.
4				
5B				
6				
7				
8	Ground	Ground	BK	GND
9				
10	Illumination Feed	Input	BR	29A

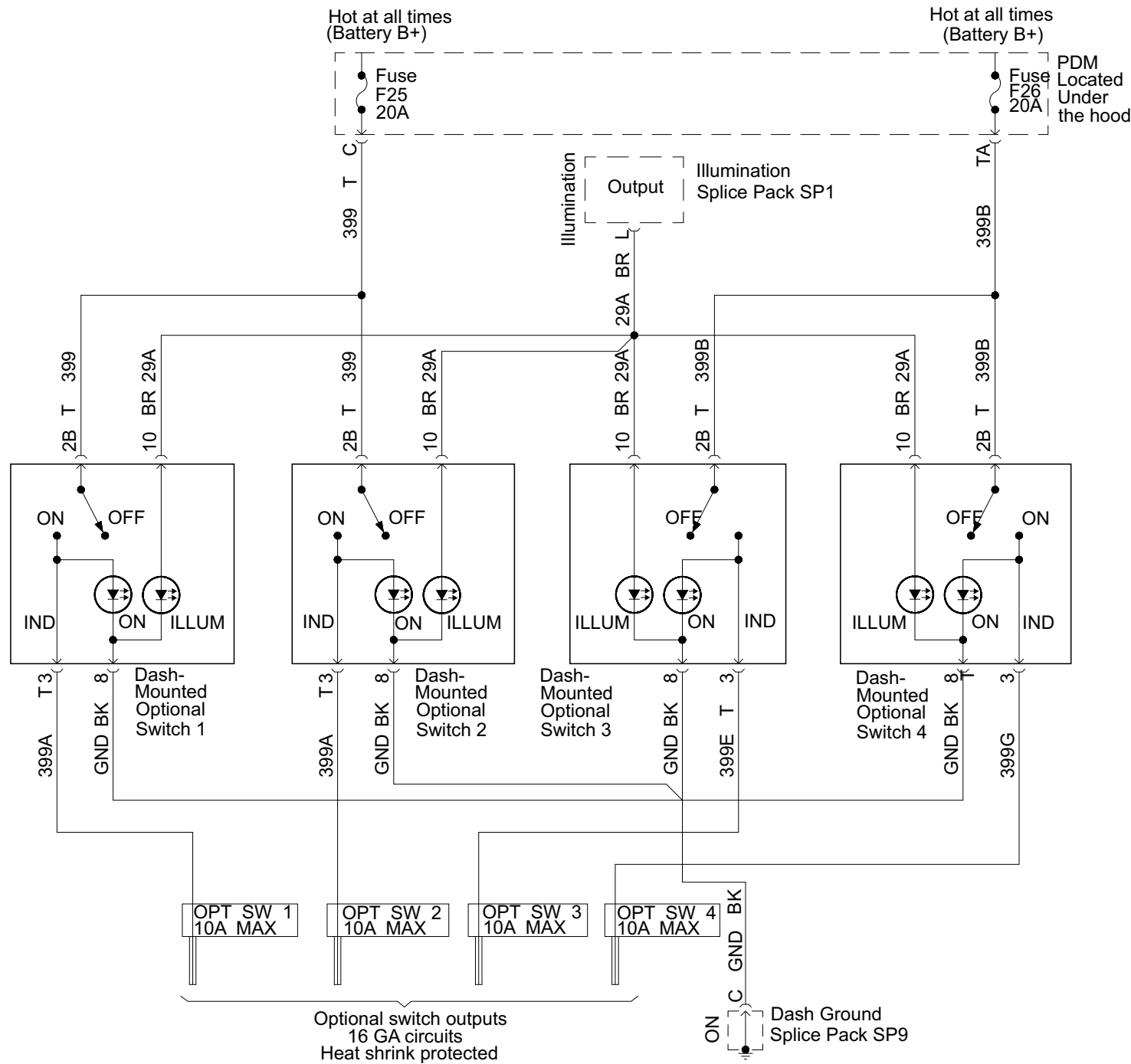


EPA 2007 Models

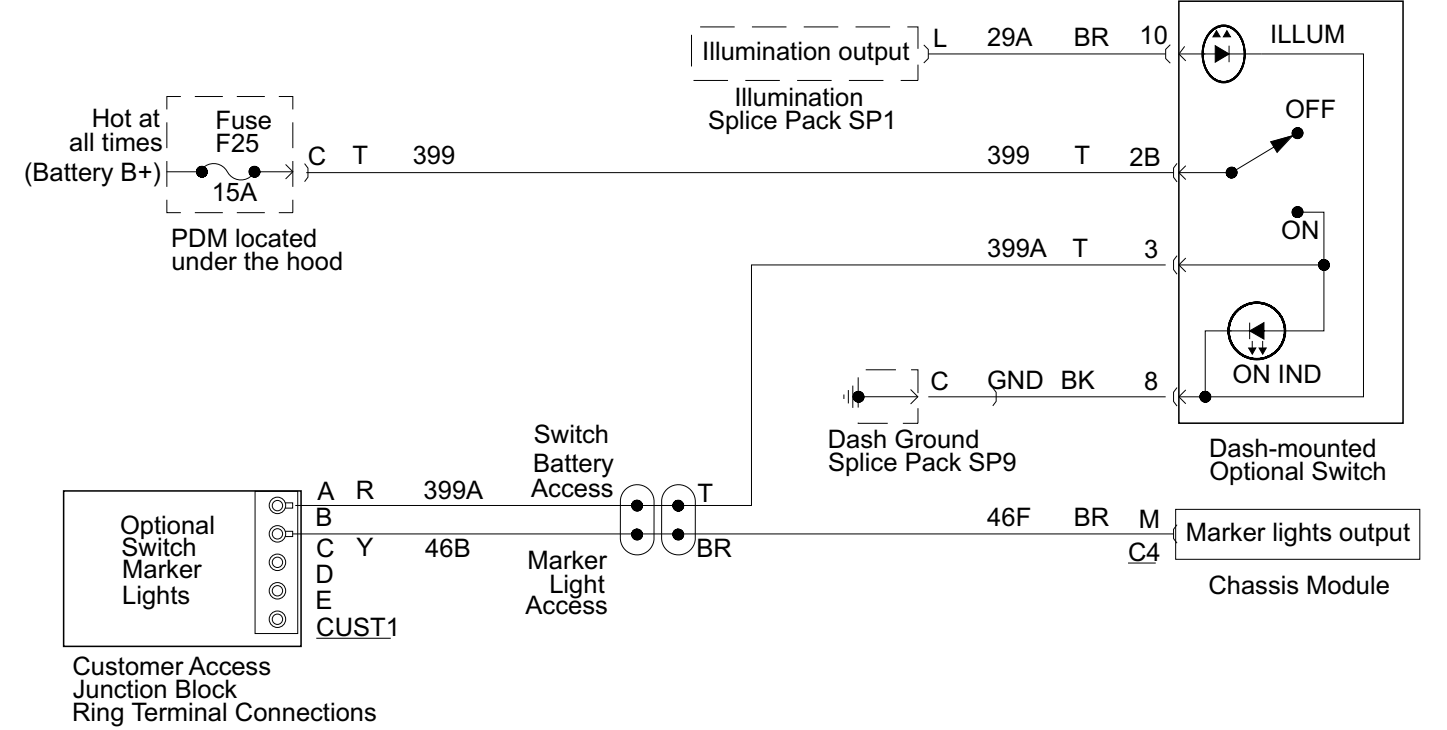
Electrical System Overview

High Current Switch Schematics

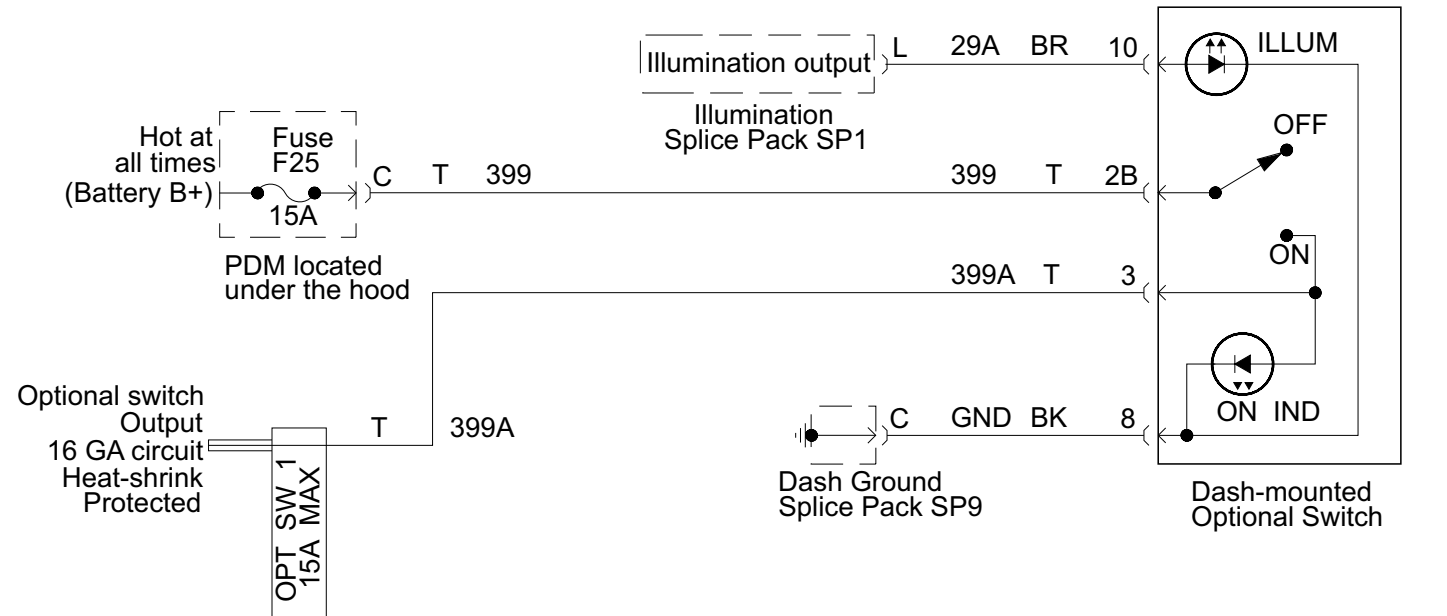
Four-switch Conguration Wiring Diagram



One-switch Conguration Wiring Diagram With Junction Block and market light feed



One-switch Conguration Wiring Diagram Without Junction Block



Tail Lights

Tail Lights and connections

Body builders wishing to supply their own taillights can order the connectors only options shown below.

Many connectors come with mating connectors included and require only the terminals to be supplied by the body builder.

Body builders utilizing factory lights and needing additional lighting interface should use the 353 data codes for body builder interfaces.



Combination Stop/Turn/Tail/Backup Lights

294-001 INTEGRAL STOP/TAIL/BACKUP LIGHTS

294-017 INTEGRAL STOP/TAIL/BACKUP LIGHTS WITH 7' ADDITIONAL WIRE AT CHASSIS END OF FRAME



Combination Stop/Turn/Tail, Separate Backup Lights

LED Combination

294-042 FREIGHTLINER LED FLANGE MOUNTED STOP/TAIL/TURN LIGHTS WITH SEPARATE INCANDESCENT BACKUP LIGHTS



Incandescent Combination

294-002 TRUCK-LITE 40 STOP/TAIL WITH SEPARATE BACKUP LIGHTS GROMMET MOUNTED



Wiring Only Options

Combination Stop/Turn/Tail, Separate Backup Light

294-090 OMIT STOP/TAIL/BACKUP LIGHTS AND PROVIDE WIRING FOR COMBINED STOP/TURN LIGHTS TO FOUR FEET BEYOND END OF FRAME



Combination Stop/Tail, Separate Turn Separate Backup Light

294-046 OMIT STOP/TAIL/BACKUP LIGHTS AND PROVIDE WIRING WITH SEPARATE STOP/TURN WIRES TO 4' BEYOND END OF FRAME

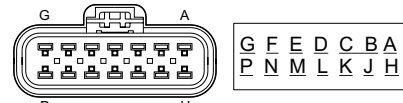
294-094 OMIT STOP/TAIL/BACKUP LIGHTS AND PROVIDE WIRING WITH SEPARATE STOP/TAIL WIRES TO 7' BEYOND END OF FRAME



Combination Stop/Tail, Separate Turn Separate Backup Lights

294-021 TRUCK-LITE 3 CHAMBER MODULES WITH 45 SERIES SEALED BEAM LAMPS

All Plugs viewed from Front

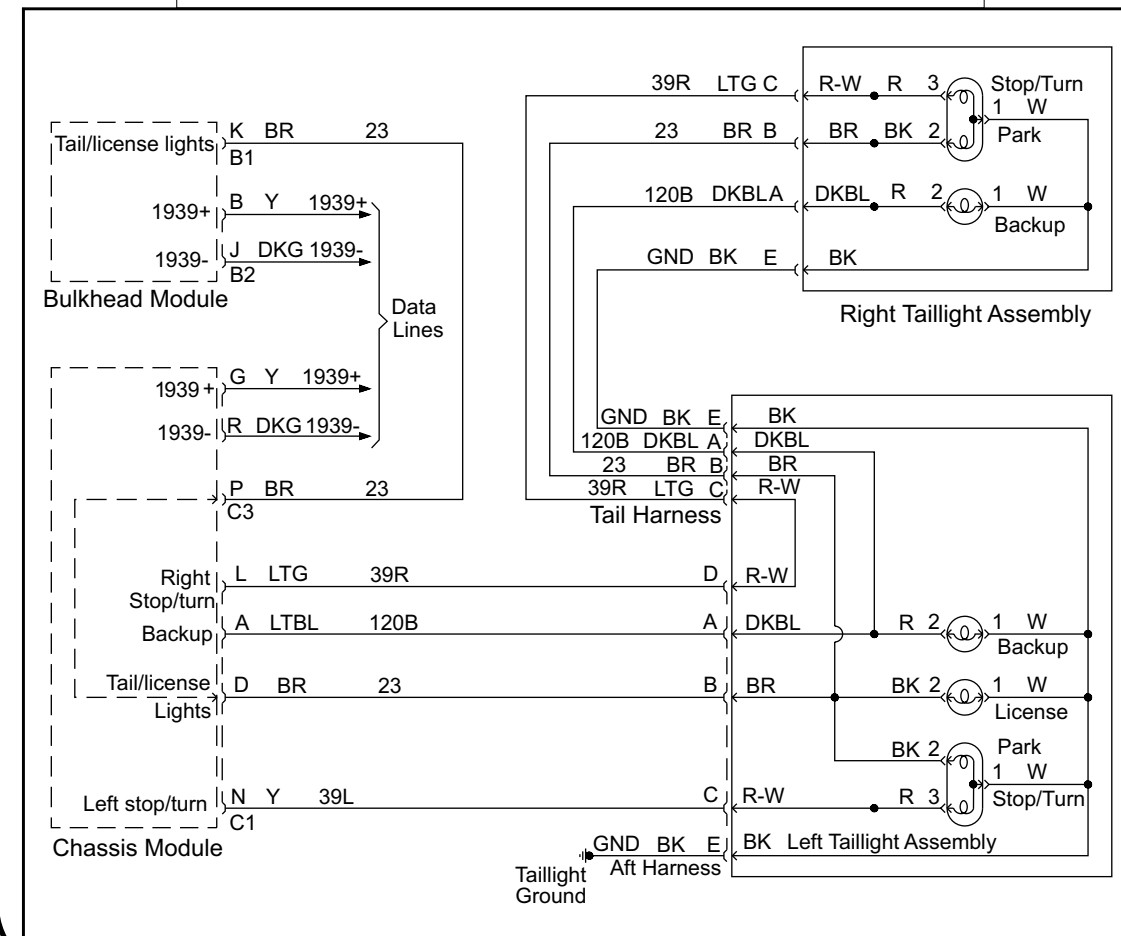


Pinouts at CHM Connector C1

Connector Pin	Signal Name	Signal Type	Circuit Color	Circuit Number	Current Capacity
C1-A	Left Backup Light (combination stop/turn signal)	Digital Output	LTBL	120B	7.45A*
C1-A	Left Backup Light (separate stop/turn signal)	Digital Output	DKBL	120B	7.45A*
C1-B			T	OPTA	
C1-C			T	OPTB	
C1-D	Left Taillight Pass-through	Pass-through	BR	23	1.0A†
C1-E	Right Taillight Pass-through	Pass-through	BR	23A	1.0A†
C1-F	License Plate Light	Digital Output	BR	23C	1.0A†
C1-G	Left Rear Turn Signal Light (separate stop/turn signal)	Digital Output	Y	38L	7.45A‡
C1-H	Backup Alarm	Digital Output	DKBL	120B	7.45A*
C1-J	Right Backup Light	Digital Output	DKBL	120B	7.45A*
C1-K			T	OPTC	
C1-L	Right Stop Light (combination stop/turn signal)	Digital Output	LTG	39R	7.45A
C1-L	Right Stop Light (separate stop/turn signal)	Digital Output	R-W	39R	7.45A
C1-M			T	OPTD	
C1-N	Left Stop/Turn Signal Light (combination stop/turn signal)	Digital Output	Y	39L	7.45A
C1-N	Left Stop Light (separate stop/turn signal)	Digital Output	R-W	39L	7.45A
C1-P	Right Rear Turn Signal Light (separate stop/turn signal)	Digital Output	DKG	38R	7.45A§

* Pins C1-A, C1-H, and C1-J are fed from the same CHM circuit board trace. The max combined current cap for all three pins is 7.45A.
 † Pins C1-D, C1-E, and C1-F are fed from the same CHM circuit board trace. The max combined current cap for all three pins is 1A.
 ‡ Pins C1-G, C2-H, and C3-N are fed by the same CHM circuit board trace. The max combined current cap for all three pins is 7.45A.
 § Pins C1-P, C2-E, and C3-R are fed by the same CHM circuit board trace. The max combined current cap for all three pins is 7.45A.

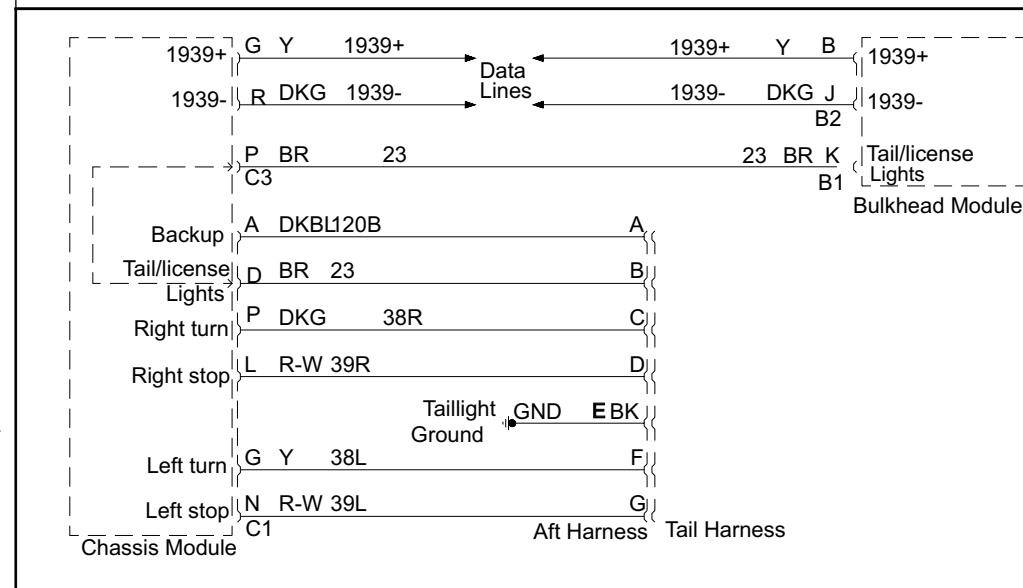
Lighting Outputs For Integrated Rear Lights (Combination stop/turn signal)



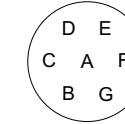
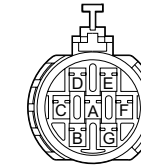
EPA 2007 Models

Tail Lights Detail

Rear Lighting Connection (separate stop/turn signal)

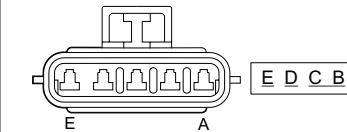


Rear Light Connector (separate stop/turn signal)



Mating connector supplied with Chassis
 Packard Connector PAC 12110751
 Terminal supplied by Body Builder
 Packard Terminal PAC 15304719
 Freightliner Seal Part# 23-12497-282

Connector Pin	Signal Name	Signal Type	Circuit Color	Circuit Number
A	Backup Light	Output	DKBL	120B
B	Taillights and License Light	Output	BR	23
C	Right Turn Signal Light	Output	DKG	38R
D	Right Stop Light	Output	R-W	39R
E	Ground	Ground	BK	GND
F	Left Turn Signal Light	Output	Y	38L
G	Left Stop Light	Output	R-W	39L

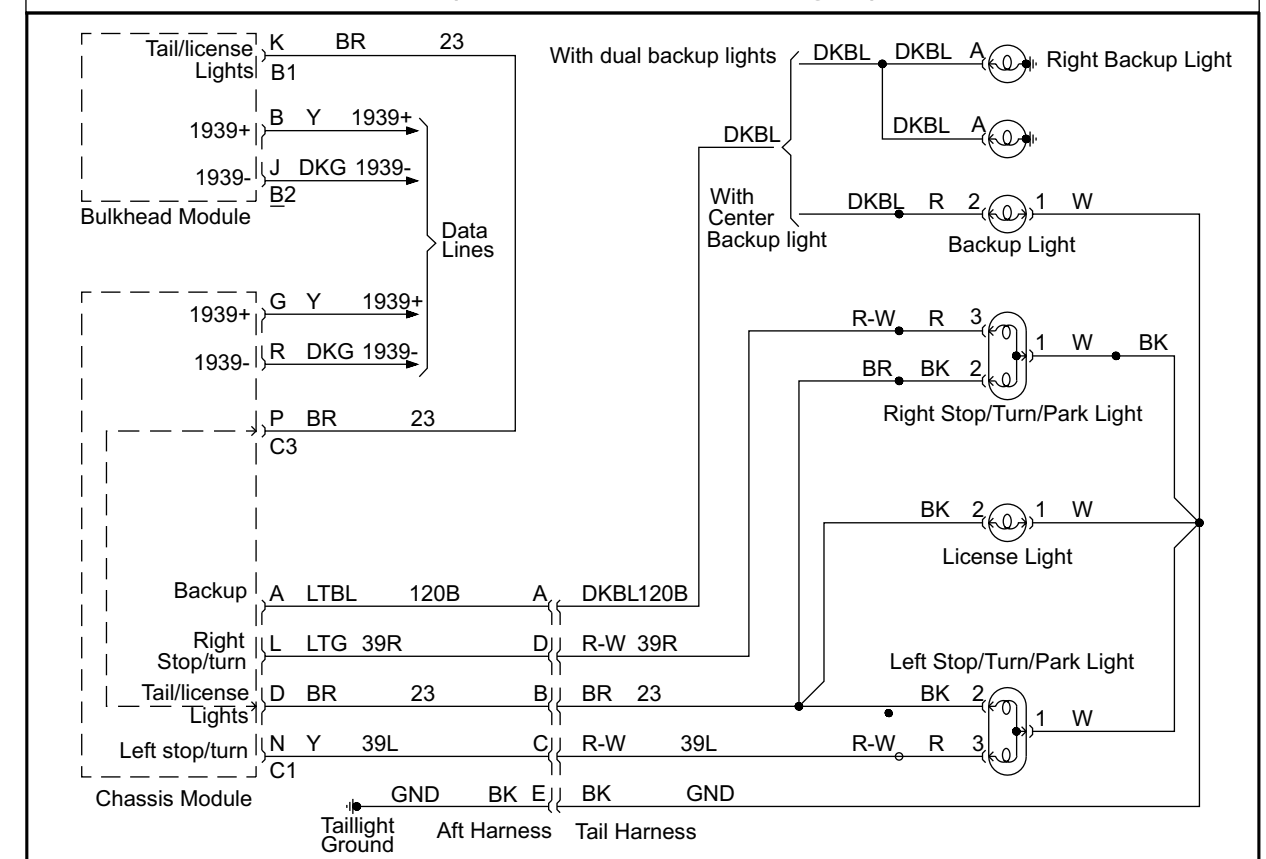


Mating connector supplied by Body Builder
 Packard Connector 12186400
 Terminal supplied by Body Builder
 Packard Terminal 12129497
 Freightliner Part# 23-13213-131

Rear Light Connector (combination stop/turn signal)

Connector Pin	Signal Name	Signal Type	Circuit Color	Circuit Number
A	Backup Light	Output	LTBL	120B
B	Taillights and License Light	Output	BR	23
C	Left Stop/Turn Signal Light	Output	Y	39L
D	Right Stop/Turn Signal Light	Output	LTG	39R
E	Ground	Ground	BK	GND

Lighting Outputs For Individual Rear Lights (Combination stop/turn signal)





EPA 2007 Models

Engine & Transmission Interface

Engine Interface:

Freightliner provides an engine interface harness when an rpm control system is ordered for optional body builder features and PTO (power takeoff) applications.

The optional features provided by this harness include:

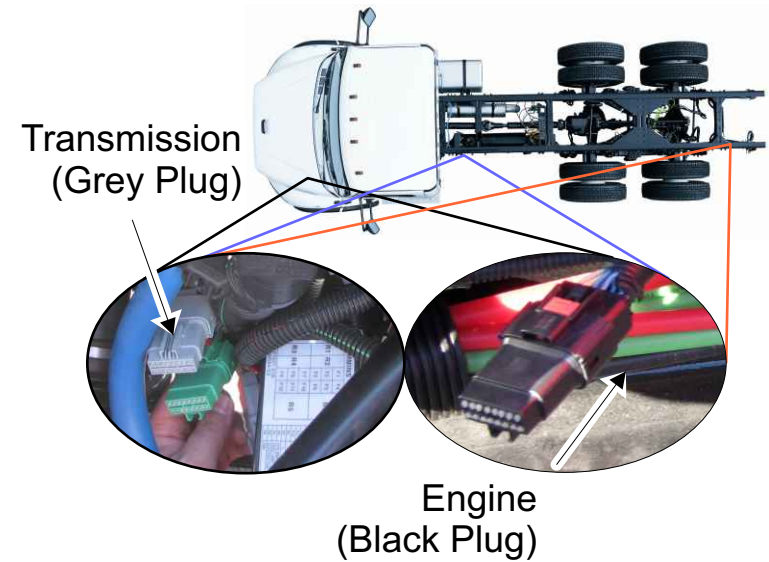
- Fast idle
- Increment/decrement
- Multiple fixed speeds
- Variable RPM title

Mod 148 determines the **type of remote engine throttle**

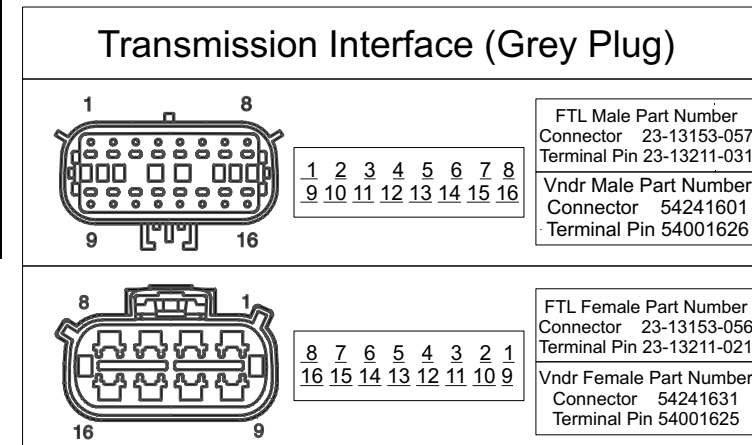
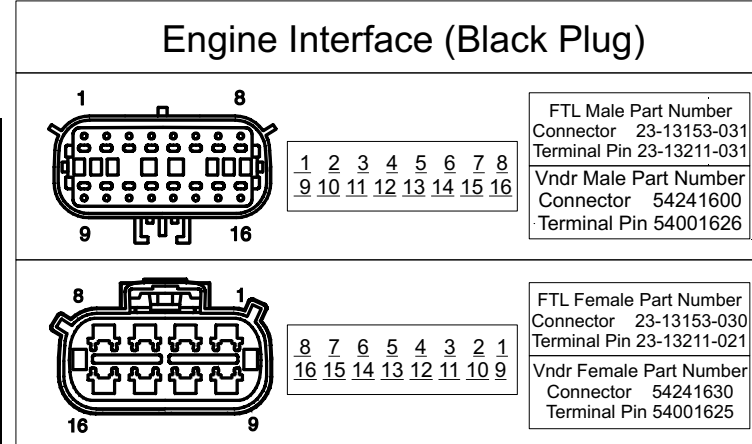
Mod 163 determines the **location of the interface connector**

Mod 87L determines the **interlock requirements**

Data Book Codes for Engine Remote Interface Harnesses (ERIH)	
Data Book Code	Description
148-070	ERIH With Fixed Single Speed
148-071	ERIH With Increment/Decrement
148-072	ERIH With Multiple Set Speeds
148-073	ERIH for Remote Throttle
163-001	ERIH at Back of Cab
163-002	ERIH at End of Frame
163-003	ERIH at End of Frame w/6-ft Harness
163-004	ERIHs in Engine Compartment
163-005	ERIH Behind Front Bumper
163-006	ERIH Inside the Cab Under the Dash
87L-001	ERIH With Park Brake Interlock
87L-003	ERIH With Park Brake and Neutral Interlocks
87L-005	ERIH Without Interlocks



Engine Remote Interface Connector Pinout Assignments			
Cavity	Circuit	Circuit Description	Engine
1	483Z	Sensor Common Ground With Interlock	All engines
2	439U	Remote PTO	All engines
3	492U	Cruise Control PTO Remote On/Off	All engines except CAT
4	483A	PTO Set	All engines
5	483B	PTO Resume	All engines
6	439V1	PTO Set Speed A Signal	Detroit Diesel, Mercedes, CAT (M2 only)
	483R	Maximum Operating Speed/Governor	Cummins only
7	439V2	PTO Set Speed B Signal	Detroit Diesel, Mercedes, CAT (M2 only)
8	483E	Tachometer + Signal, Engine rpm	All engines
9	483F	Tachometer - Signal, Engine rpm	Caterpillar only
	492Z	Throttle Inhibit	Detroit Diesel and Mercedes-Benz only
10	483N	Remote Throttle On/Off	All engines except CAT
11	483C	Remote Throttle Signal	All engines
12	483D	Remote Throttle Power	All engines
13	492Y	Remote Signal Ground	All engines
14	492W	PTO Active	Caterpillar only
15	Optional	Optional Circuit	All engines
16	Optional	Optional Circuit	All engines



Transmission interface:

- The transmission interface harness provides the VIW connection for the current generation of 1000/2000 Series or 3000/4000 Series electronic controls, depending on the transmission that is installed in the vehicle.
- The transmission interface harness provides most of the optional I/O circuits, in addition to the speedometer signal, in a front wall connector that can be used by the body builder.

Data Book Codes for the EPA 2007 Transmission Interface Harnesses	
Data Book Code	Description
34C-001	Transmission Interface Harness at the Frontwall
34C-002	Transmission Interface Harness at Back of Cab
34C-003	Transmission Interface at End of Frame

Transmission Interface Connector Pinout Assignments on M2 Vehicles				
Pin No.	Freightliner Circuit No.	Allison Transmission® Circuit No.	Allison Transmission Function†	
			1000/2000 Series	3000/4000 Series
1	232E	163	Ignition Signal	Ignition Signal
2	497C7 (O‡)	150	PTO Enable	—
3	497C8 (O)	113	—	Secondary Mode Indicator Range Indicator Engine Overspeed Indicator
4	497Y	103	Digital Ground	Digital Ground
5	497K (O)	125	Vehicle Speed Sensor	Vehicle Speed Sensor
6	497C4 (O)	105	Output Speed Indicator A	Output Speed Indicator A
7	497C3 (O)	145	Neutral Indicator for PTO Two-Speed Axle Enable	Neutral Indicator for PTO Two-Speed Axle Enable
8	497D3 (I§)	143	PTO Enable	Direction Change Enable PTO Enable Reverse Enable
9	497C1 (O)	130	—	Engine Overspeed Indicator PTO Enable Secondary Mode Indicator
10	497D5 (I)	142	Secondary Mode Input	Auxiliary Hold Secondary Mode Input Two-Speed Axle Enable Automatic Neutral-Dual Input With Park Brake Auto Neutral-Dual Input With Service Brake Status Auxiliary Function Range Inhibit (special) Auto Neutral-Dual Input With Service Brake Status
11	497D6 (I)	101	Auxiliary Function Range Inhibit (standard)	Auxiliary Function Range Inhibit (standard) Automatic Neutral-Dual Input With Park Brake Shift Selector Transition Two-Speed Axle Enable Shift Selector Transition/Secondary Shift Schedule Auxiliary Function Range Inhibit (special)
12	497D10 (I)	117	—	Automatic Neutral-Single Input Direction Change Enable Reverse Enable Automatic Neutral-Dual Input With Park Brake Auto Neutral-Dual Input With Service Brake Status
13	497C6 (O)	164	Sump Retarder Temperature Indicator	Sump Retarder Temperature Indicator
14	497D1 (I)	123	3rd Lockup Pump Mode	4th Lockup Pump Mode Kickdown Direction Change Enable
15	497D4 (I)	122	3rd Lockup Pump Mode Transfer Case Low	4th Lockup Pump Mode Refuse Packer Step Switch Reduced Engine Load at Stop
16	497C3 (O)	145	Neutral Indicator for PTO Two-Speed Axle Enable	Neutral Indicator for PTO Two-Speed Axle Enable

† When more than one function is listed, see the Allison Transmission Vocational Model Guide for the applicable function.
§ Output



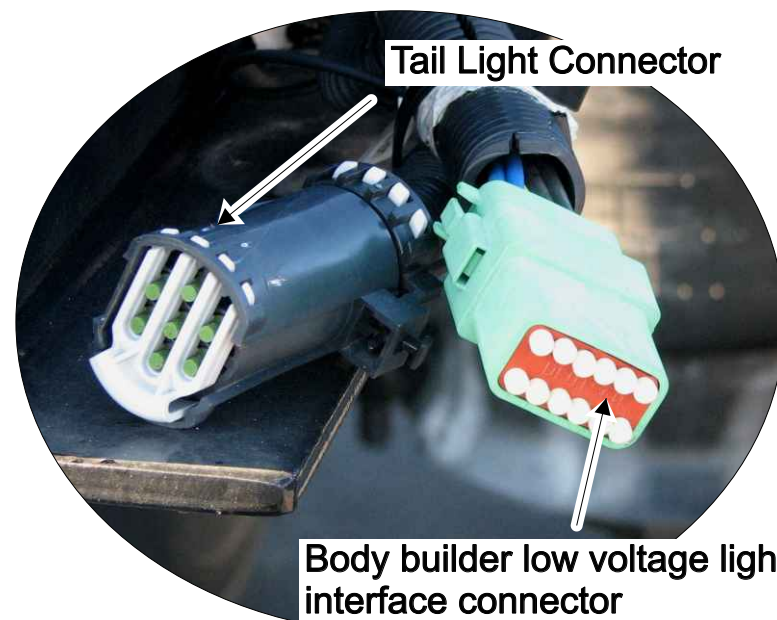
EPA 2007 Models

Body Builder Lighting Interfaces

Vehicle Interface Lighting

- 353-022 VEHICLE INTERFACE WIRING WITH BODY BUILDER CONNECTOR MOUNTED BACK OF CAB
- 353-023 VEHICLE INTERFACE WIRING WITH BODY BUILDER CONNECTOR MOUNTED END OF FRAME
- 353-026 VEHICLE INTERFACE WIRING AND PDM WITH BODY BUILDER CONNECTOR, BACK OF CAB
- 353-027 VEHICLE INTERFACE WIRING AND PDM WITH BODY BUILDER CONNECTOR AT END OF FRAME
- 353-038 MARKER LAMP CONNECTION FOR BODY BUILDERS

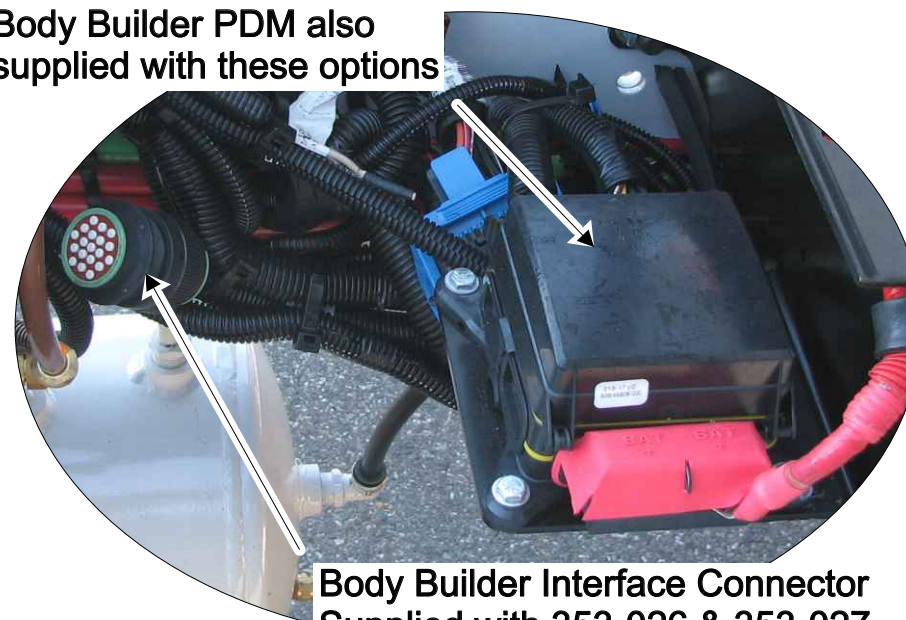
		Stop Lamps	Turn Lamps	Backup Lamps	Marker Lamps	Connection Point
Low Current Options	353 - 022	2.1 A per side	4.0 amps*	6.0 amps	6.0 amps	BOC, Marker Lamps to C4 -M
	353 - 023	2.1 A per side	4.0 amps*	6.0 amps	6.0 amps	EOF, Marker Lamps to C4 -M
High Current Options	353 - 026	20 A per side	20 amps*	6.0 amps	combine with tail	Back of Cab, PDM
	353 - 027	20 A per side	20 amps*	6.0 amps	combine with tail	End of Frame, PDM
	353 - 038	MARKER LAMP CONNECTION FOR BODY BUILDERS				



Tail Light Connector

Body builder low voltage lighting interface connector supplied with 353-022 & 353-023 (See next page for schematics)

Body Builder PDM also supplied with these options



Body Builder Interface Connector Supplied with 353-026 & 353-027 (See next page for schematics)

High-current Lighting Interface Harness A06-48218					
Connector Pin	Signal Name	Signal Type	Circuit Color	Circuit Number	Current Capacity
		TERM-MALE 12/14 AWG DUF 046020412141 TERM-MALE 16/18 AWG DUF 046020216141			
1-5					
6	Ground	Ground	BK	GND 2	
7					
8*	Backup Light	+12V via PDM Fuse 2 (20A) With relay 1 (backup light) active.	DKBL	120B	20A
9					
10	Right Stop Light	+12V via PDM Fuse 4 (20A) With relay 2 (right stop light) Active.	R-W	36	20A
11	Ground	Ground	BK	GND 1	
12	Right Stop Light or Right Stop/Turn Light	+12V via PDM Fuse 6 (20A) With relay 3 (right turn light) Active.	DKG	38R	20A
13					
14	Left Taillight	+12V via PDM Fuse 1 (20A) With relay 4 (left taillight) active.	BR	23A	20A
15	Ground	Ground	BK	GND 2	
16	Left Stop Light or Left Stop/Turn Light	+12V via PDM Fuse 5 (20A) with relay 6 (left turn light) active.	Y	38L	20A
17					
18	Left Stop Light	+12V via PDM Fuse 3 (20A) With relay 5 (left stop light) active.	R-W	36	20A
19	Ground	Ground	BK	GND 1	

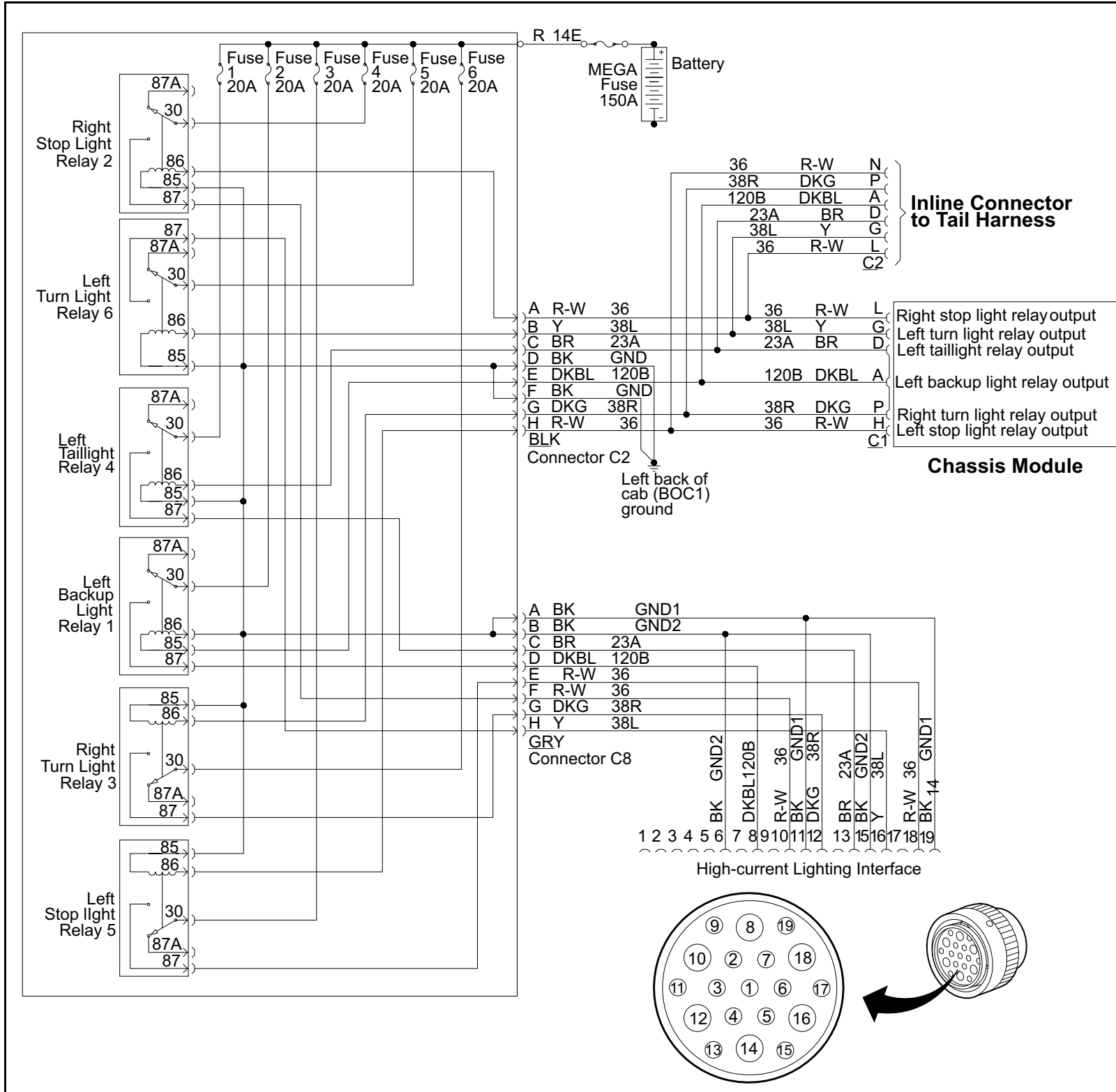
* Some early harnesses have pin 8 located in pin 17.

Low-current Lighting Interface Harness A06-44388					
Connector Pin	Signal Name	Signal Type	Circuit Color	Circuit Number	Current Capacity
		TERM-MALE ,S16,SOL,16-18AWG (Solid)DUF 046020216141 TERM-MALE ,S16,SOL,14-16AWG (Solid)DUF 046021516141 TERM-MALE ,S16,,16-18AWG (stamped) DUF 1060 16 0122 PS TERM-MALE ,S16,,14-16AWG (stamped) DUF 1060 14 0122 PS			
1	Left Backup Light	Digital Output	DKBL	120B	7.45A*
2	Left Taillight	Digital Output	BR	23A	1.0A
3	Right Taillight	Digital Output	BR	23A	1.0A
4	Left Turn Light	Digital Output	Y	38L	7.45A
5	Backup Alarm	Digital Output	DKBL	120B	7.45A*
6	Right Backup Light	Digital Output	DKBL	120B	7.45A*
7	Right Stop Light or Right Stop/Turn Light	Digital Output	R-W	36	6.7A
8	Left Stop Light or Left Stop/Turn Light	Digital Output	R-W	36	6.7A
9	Right Turn Light	Digital Output	DKG	38R	7.45A
10 - 12					

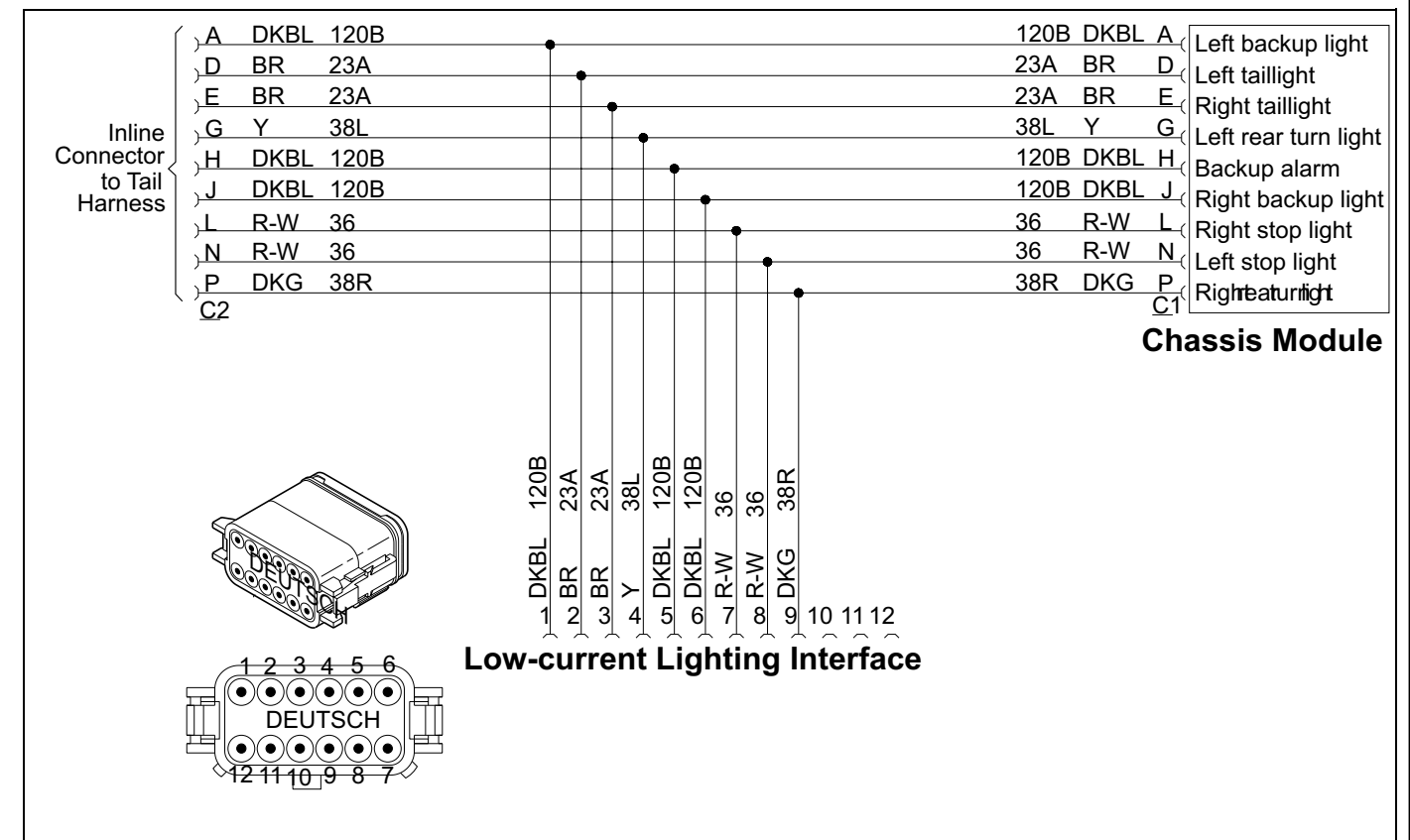
* This pin is fed by CHM pins 1, 5, and 6. The maximum combined current capacity for all three pins is 7.45A.

Body Lighting Interface Schematics

High Current Interface Ref Harness A06-48218



Low Current Interface Ref Harness A06-44388





EPA 2007 Models

Trailer Electrical System

- 296-010 PRIMARY CONNECTOR/RECEPTACLE CENTER PIN POWERED THROUGH IGNITION
- 296-025 PRIMARY CONNECTOR/RECEPTACLE WIRED FOR COMBINATION STOP/TURN, CENTER PIN POWERED THROUGH IGNITION
- 297-001 SAE J560 7-WAY PRIMARY TRAILER CABLE RECEPTACLE MOUNTED END OF FRAME
- 297-005 SAE J560 7-WAY PRIMARY TRAILER CABLE RECEPTACLE MOUNTED ON CHASSIS BACK OF CAB/SLEEPER
- 297-008 SAE J560 7-WAY PRIMARY TRAILER CABLE RECEPTACLE BRACKET MOUNTED LH DECK BACK OF CAB

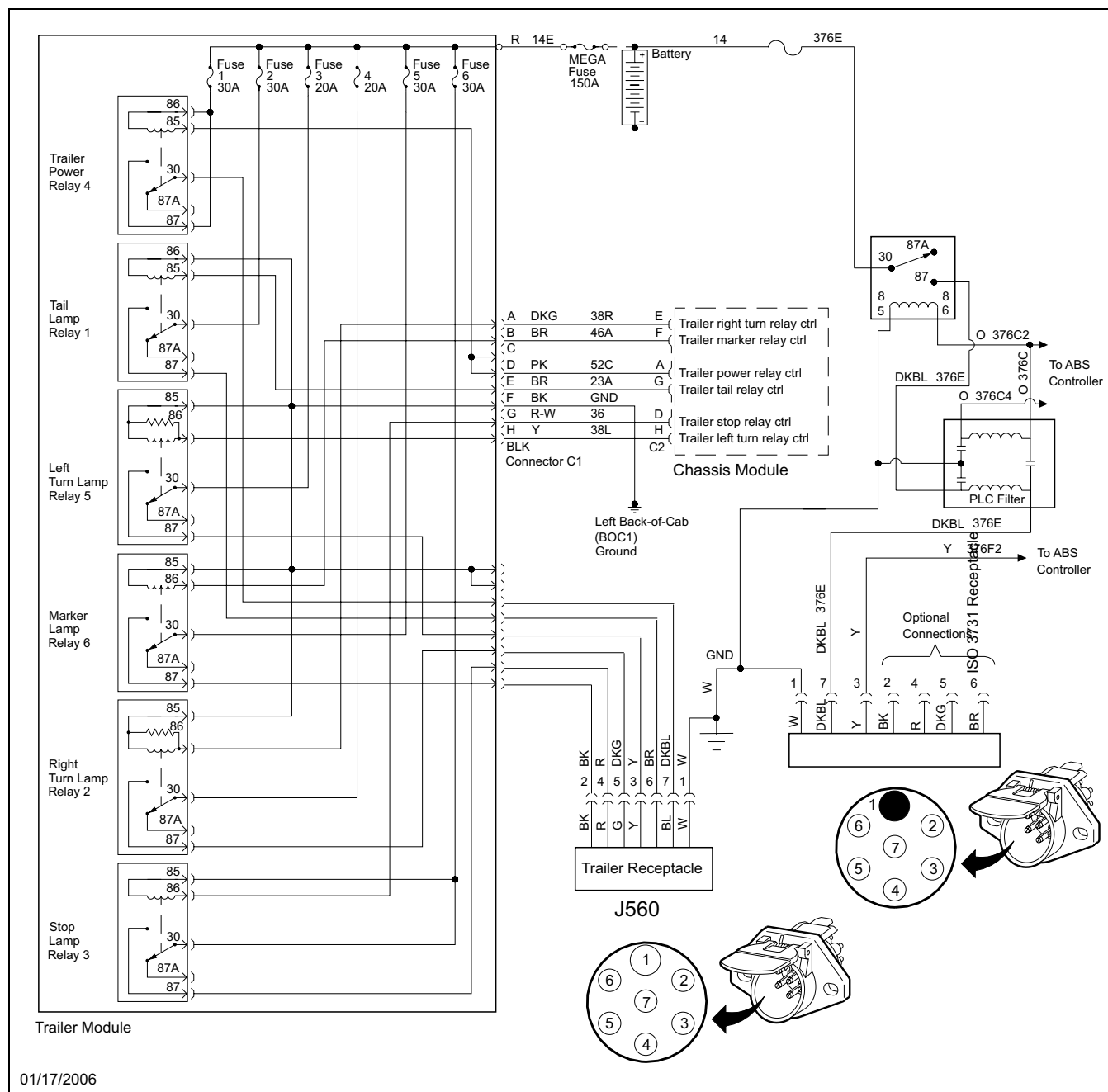
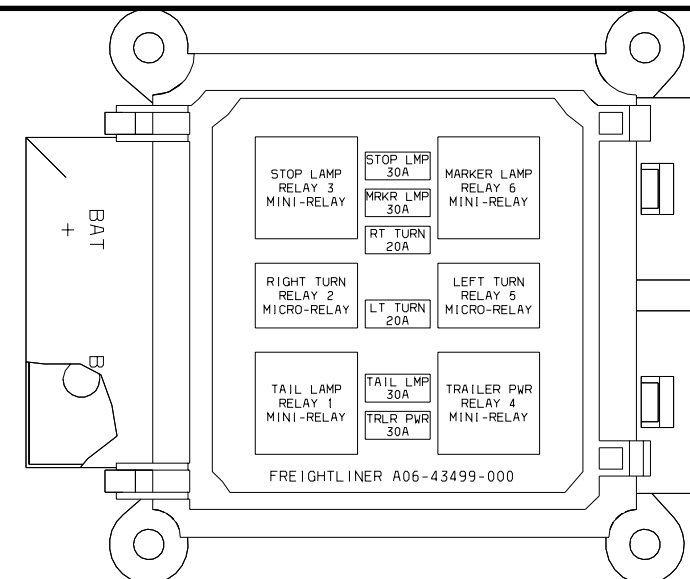
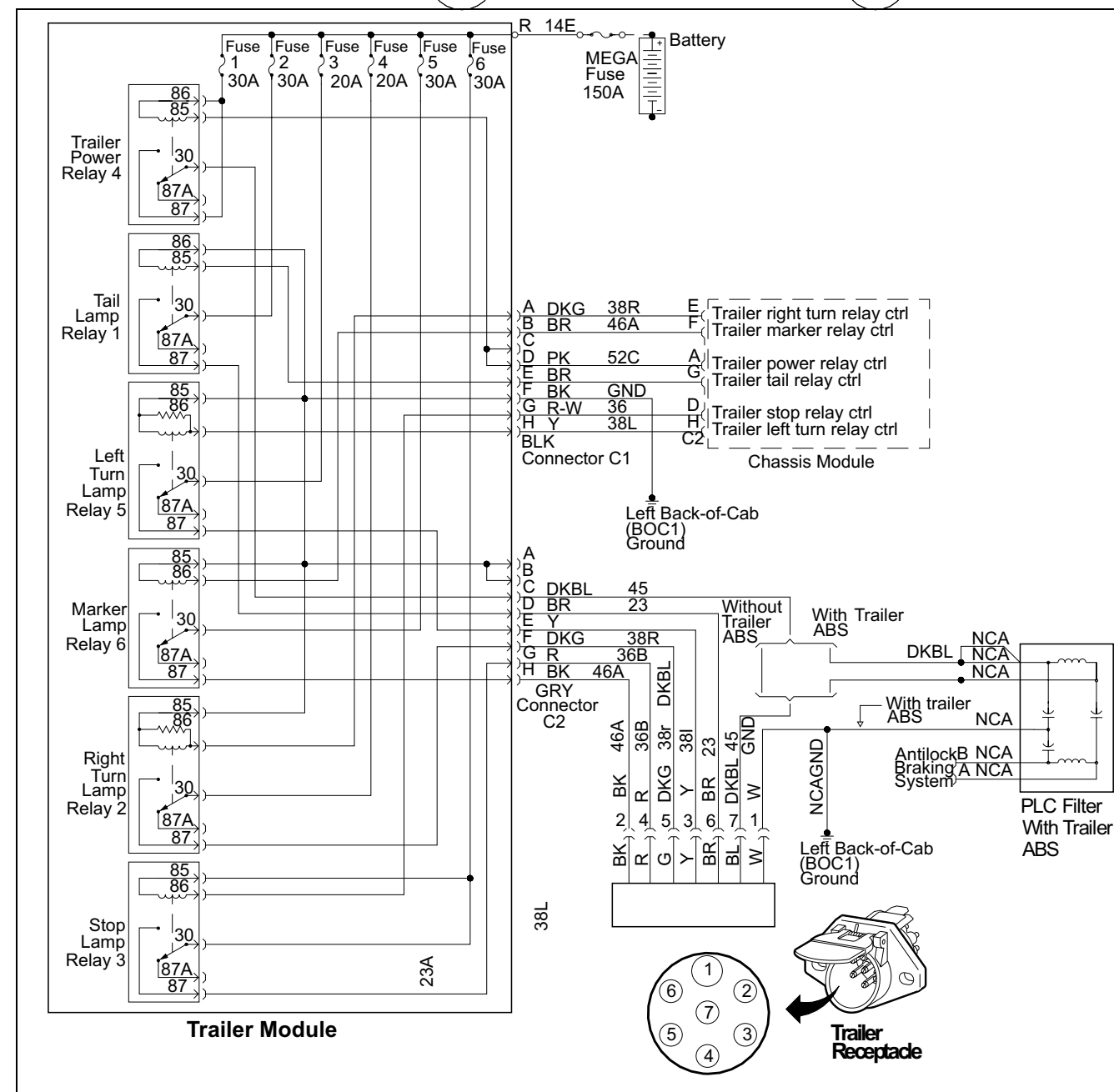


Fig. 2, Wiring Diagram of the Trailer Electrical System With Both J560 and ISO 3731 Connectors (primary and secondary receptacles)



Wiring Diagram of the Trailer Electrical System With Only a J560 Connector (primary receptacle)