Optimized Idle and Auxiliary Cab Heater Concurrent Operation

83-144

FLA COE
FLB COE
FLD Conventional
Business Class
FLC 112 Conventional

Century Class Conventional
Argosy COE
Cargo
Columbia

Coronado
Business Class M2
> Cascadia
108SD/114SD

Freightliner Service Bulletin

Description of Revisions: *This bulletin replaces the version dated August 2013. The entire content of the bulletin is replaced with updated information.*

General Information

IMPORTANT: The following only applies to Cascadia vehicles equipped with Espar Airtronic or Webasto auxiliary cab heaters.

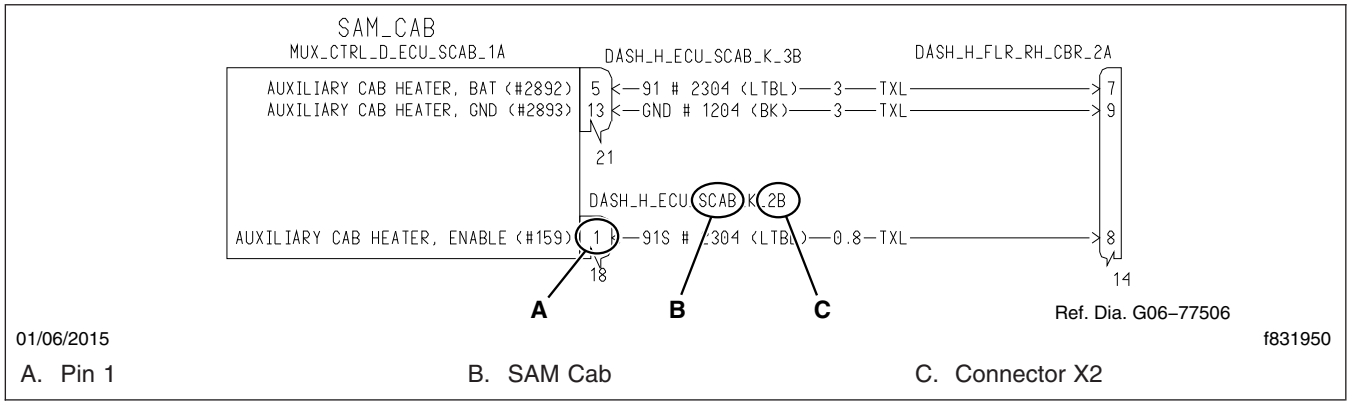
The auxiliary cab heater should only be operated with the truck parked, never while driving, and it should be turned off when not in use.

Cascadia vehicles manufactured after August 2, 2010 and equipped with sleeper cabs, optimized idle (OI), and an auxiliary cab heater were not originally designed to allow OI and the auxiliary cab heater to operate at the same time. The original design required the Ignition key to be in the ON position to enable OI, and ONLY allowed the auxiliary cab heater to work with the ignition key in the OFF or ACC positions. Design intent was for the two systems to be used independently from each other. These vehicles can be reconfigured to allow the OI and the auxiliary cab heater to operate at the same time by relocating the auxiliary cab heater power wire to an alternate SAM Cab pin position. The following information can be used to verify proper operation (power supply) of this circuit or to change the interlocks required to activate output.

Verifying Existing Configuration

NOTE: Both optional pin positions are intended for use in conjunction with OI, which monitors the battery voltage and adds energy as needed to maintain startability by running the engine. Use of the auxiliary cabin heater in either of these options without having OI enabled requires the driver to monitor the battery voltage to help ensure startability because these optional SAM Cab outputs are not PLVD controlled.

To verify the existing SAM Cab connector and pin location of the auxiliary cab heater enable power wire, access the related G06 drawing in the 70C BOM (Wiring - HVAC, AUX). The wire should be in SAM Cab connector X2, X13, or X9 See **Fig. 1**.



A. Pin 1 B. SAM Cab C. Connector X2

Fig. 1, Sample Schematic

Once the existing wire location is identified, you can review the pin options listed below to either confirm the expected behavior of the feature in its current location, or select an alternate pin position (based on the customer desired behavior / interlocks). The primary differences are LVD control, compatibility with OI, valid ignition key positions, dependency on the SAM Cab awake state, and Park Brake state.

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SAM Cab Output Pin Options

IMPORTANT: All pin locations discussed below require the driver to monitor battery voltage to ensure startability, because they are not PLVD controlled. The only exception to that is X2/1, but ONLY with the ignition key in the OFF position.

Pin locations in connector X9 (X9/4 Body Builder pin, and the Spare Function Pins (SFP) X9/3, X9/5, X9/6 and X9/7) are intended to primarily be used in conjunction with Optimized Idle, which monitors the battery voltage and adds energy as needed to maintain startability (by running the engine). However, they do not prevent using the auxiliary cab heater without OI being enabled. Refer to **Table 2** as a quick reference for pin control and compatibility.

Pin Control and Compatibility Quick Reference							
Connector	**PLVD**	**With OI**	**Ignition ACC**	**Ignition OFF**	**Ignition ON**	**SAM Awake**	**Park Brake**
X2/1	Y, Basic*	N	Y	Y	N	Y	N
X13/1	N	N	Y	Y	N	N	N
X9/4	N	Y	Y	Y	Y	Y	Y
SFP	N	Y	Y	N	Y	Y	Y

* Only applies to ignition OFF key state

Table 1, Pin Control and Compatibility Quick Reference

Option 1: SAM Cab X2/1 Pin Position (PLVD controlled in Ignition OFF)

NOTE: Use of an auxiliary cab heater powered by X2/1 will not work with Optimized Idle (due to incompatible ignition key positions required for operation).

Power supply to X2/1 is a Basic Load, and will not be controlled by PLVD with the ignition key in the ACC position. See the CEESG for more on PLVD and ignition key positions.

X2/1 will be powered when these conditions are met (based on the SAM Cab awake state and ignition key position):

- ignition key in the ACC position (which keeps the SAM Cab awake)
- OR the ignition key in the OFF position AND:
    - Headlights ON
    - Dome lamp(s) ON
    - Door(s) open
    - Or any other conditions that keep the SAM Cab awake

X2/1 will shut off for the following reasons:

- The SAM Cab goes to sleep
- Ignition key is in the OFF position and VDC measured at the SAM drops below the PVLD load shed point for Basic Loads (typically 12.05 VDC). This does not apply to ignition ACC position.

Option 2: SAM Cab X13/1 Pin Position (not PLVD controlled)

NOTE: Use of an auxiliary cab heater powered by X13/1 will not work with Optimized Idle (due to incompatible ignition key positions required for operation).

Power supply to X13/1 does not stop when the SAM Cab goes to sleep (it is not dependent on SAM Cab Awake State).

X13/1 will be powered when:

- The ignition key is in the ACC position
- The ignition key is in the OFF position

X13/1 will not shut off until the SAM Cab no longer has sufficient battery voltage to power itself. However, the auxiliary cab heater may stop running before then, depending on the power requirements of the auxiliary cab heater and its controller (“brown out” conditions).

Option 3: SAM Cab X9/4 Pin Position (not PLVD controlled)

NOTE: Use of an auxiliary cab heater powered by X9/4 will ONLY work with Optimized Idle with the ignition key in the ON position.

X9/4 will be powered when these conditions are met (based on the SAM Cab Awake State and Park Brake interlock):

- Park brake is set
- The ignition key is in the ACC or ON position (which keeps the SAM Cab awake), or
- The ignition key is in the OFF position with
    - Headlights ON
    - Dome lamps ON
    - Door(s) Open
    - Or any other inputs that keep the SAM Cab Awake

X9/4 and OI will function together when these conditions are met:

- Park brake is set
- IGN key in the ON position (which keeps the SAM Cab awake)
- OI is enabled

Option 4: SAM Cab Spare Function Pin (SFP) Position (not PLVD controlled)

This option is not available if all SFPs listed below are already occupied, but could be applied to any one of them to support this feature. Be aware that, even though X9/4 is located near the SFPs, it is a Body Builder pin not a programmable SFP.

- SFP 1 X9/3
- SFP 2 X9/5
- SFP 3 X9/7
- SFP 4 X9/6

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No power is supplied to the SFP when the IGN key is in the OFF position. This was intended to achieve a “key capture” in order to operate the auxiliary cab heater.

SFP will be powered when these conditions are met (based on the SAM Cab awake state and park brake interlock):

- Park brake is set
- IGN key in ACC or ON position

The auxiliary cab heater and OI will function at the same time when these conditions are met:

- Park brake is set
- IGN key in the ON position
- OI is enabled

Instructions for Pin Relocation to either X2/1, X13/1, or X9/4

NOTE: Parameter change is not required.

1. Park the vehicle on a level surface, shut down the engine, and apply the parking brakes. Chock the tires.
2. Research the current enable pin location (using the G06 in the 70C BOM).
3. Remove the pin from the existing location and relocate it to the desired output. See **Fig. 2** for SAM Cab pin X2/1 and X9/4 connector locations, and **Fig. 3** for SAM Cab X13/1 connector location.

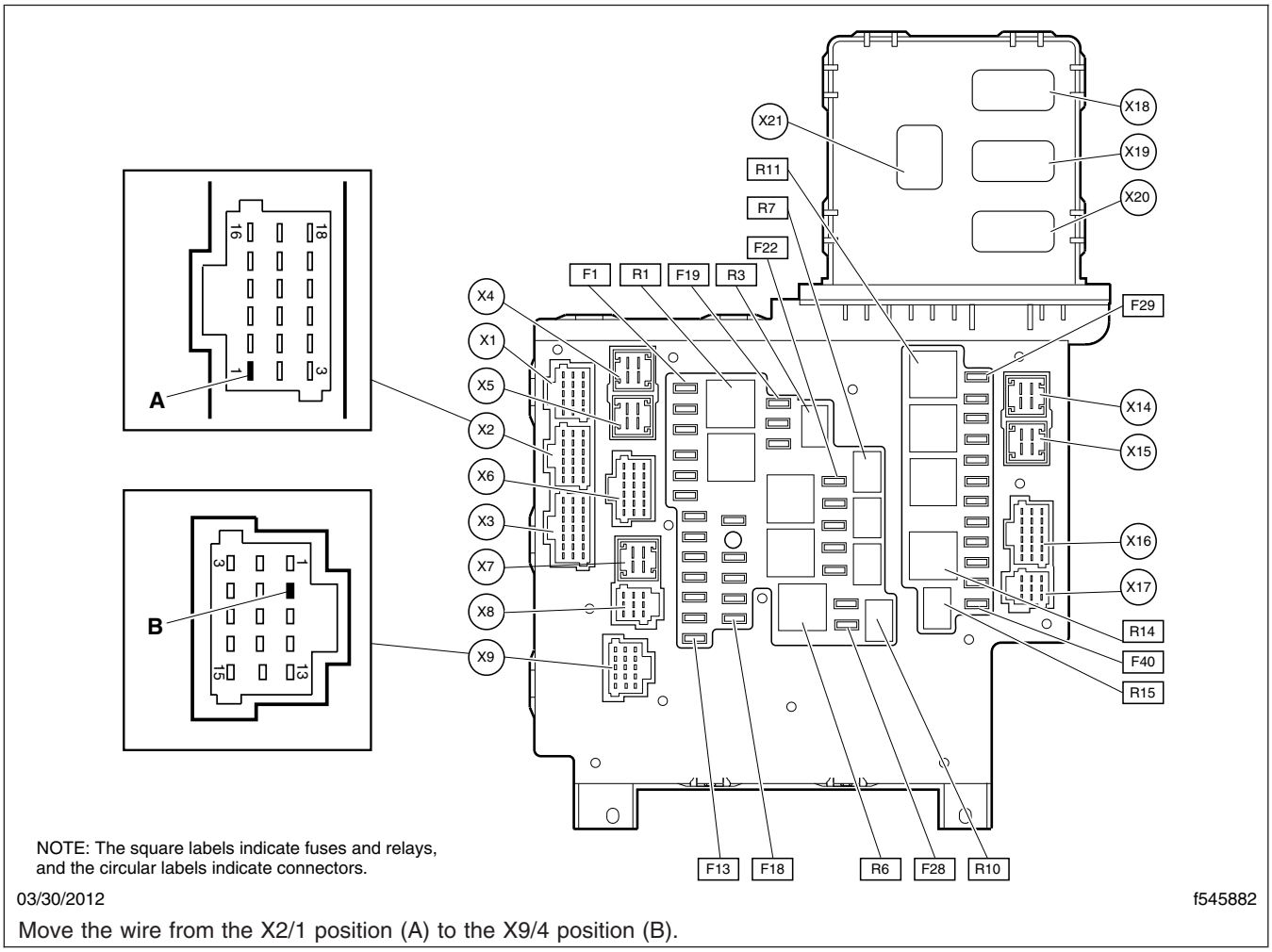
Instructions for Pin Relocation to a Spare Function Pin

NOTE: The SAM Cab parameters needing changes are determined by the destination spare function pin (SFP) chosen for pin relocation. All four parameters (service parameter set) need to be changed to the correct values for the associated SFP to activate properly.

1. Shut down the engine, apply the parking brakes, and chock the tires.
2. Research the current enable pin location (using the G06 in the 70C BOM).
3. Move to any available X9 connector spare function pin cavity:
   - SFP 1 X9/3
   - SFP 2 X9/5
   - SFP 3 X9/7
   - SFP 4 X9/6
4. In DiagnosticLink, set the parameters for the new configuration.
   - 4.1 Connect DiagnosticLink to the vehicle.
   - 4.2 Click on SAM Cab.
   - 4.3 Click on Parameters.

     The Features drop down list can be used to quickly navigate to each of the four parameters (two will be located in one section, and the other two "Cont." will be located in another section)

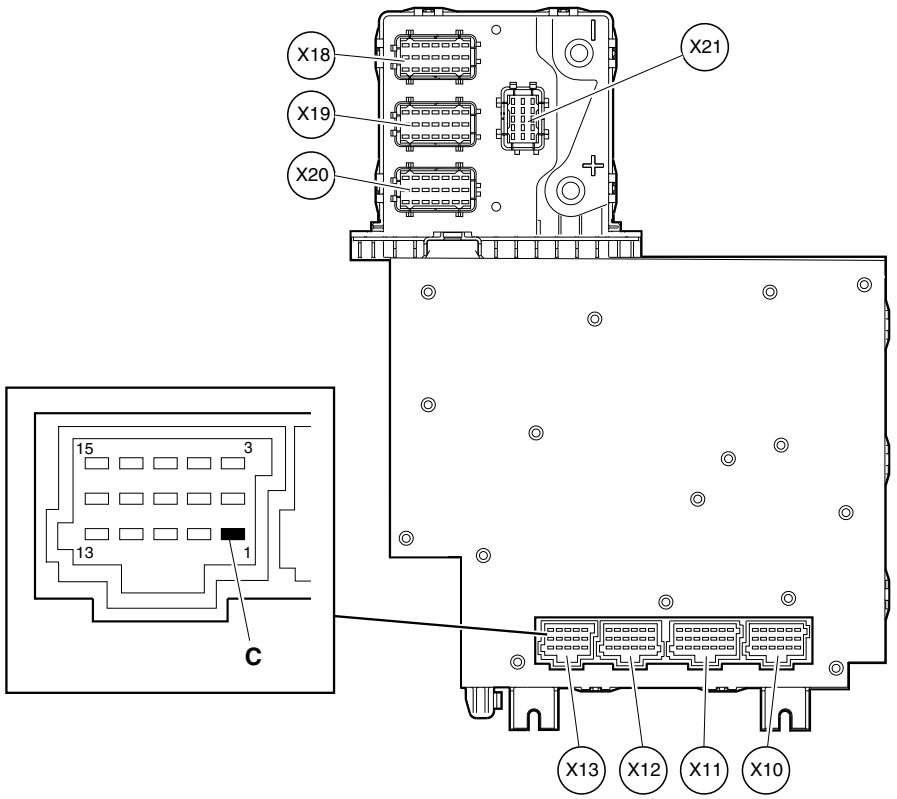
   IMPORTANT: All four parameters in the set must be changed for the appropriate SFP being reworked.



Move the wire from the X2/1 position (A) to the X9/4 position (B).

Fig. 2, SAM Cab (bottom view)

4.4 Update the parameter values for the destination SFP chosen in Step 3. **Table 2** Lists the SFPs along with the corresponding service parameter sets. **Figure 4** shows an example parameter set changed using DiagnosticLink.



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Move the wire from the X13/1 position (C) to the X9/4 position (B) in **Fig. 1**.

Fig. 3, SAM Cab (top view)

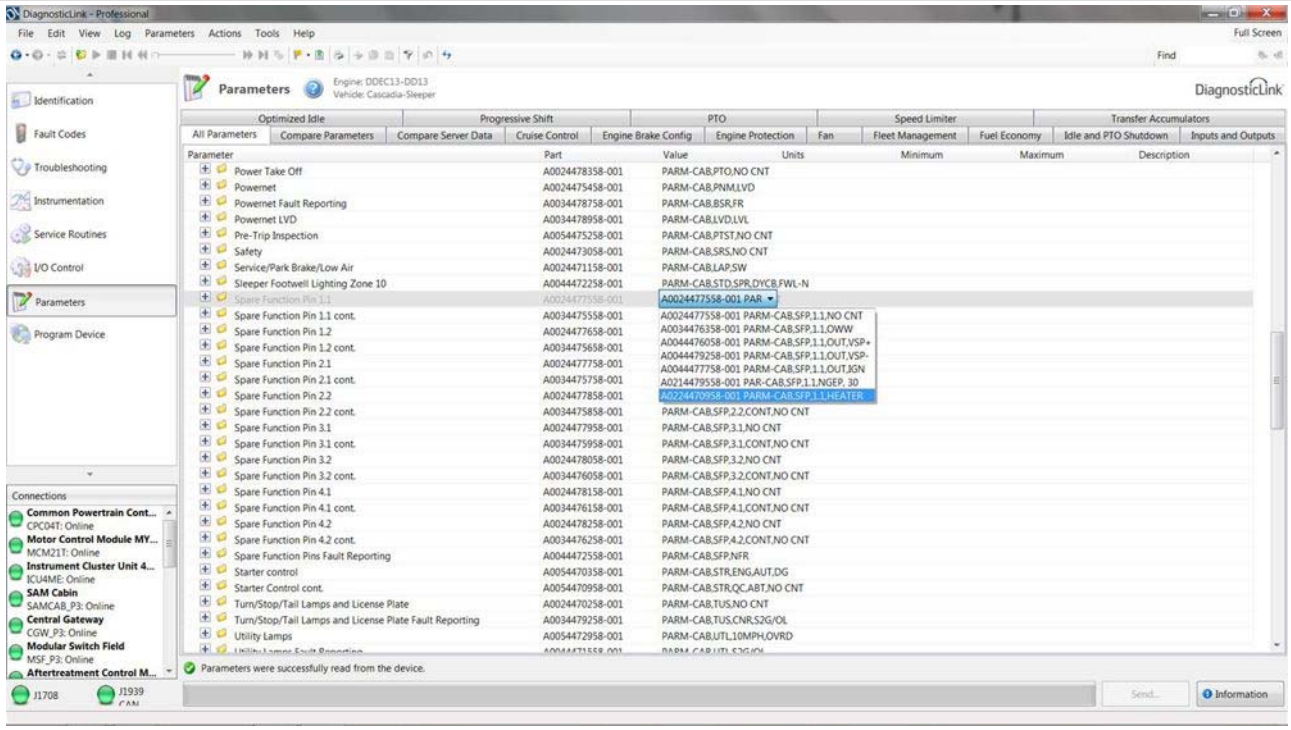

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Fig. 4, DiagnosticLink Parameter Screen

Parameter Settings		
Spare Function Pin 1: SFP 1 X9/3		
Setting	**Part Number**	**Version**
PARM-CAB,SFP,1.1,HEATER	A0224470958	001
PARM-CAB,SFP,1.1,CONT,NO CNT	A0034475558	001
PARM-CAB,SFP,1.2,HEATER	A0224471158	001
PARM-CAB,SFP,1.2,CONT,HEATER	A0224471258	001
Spare Function Pin 2: SFP 2 X9/5		
Setting	**Part**	**Version**
PARM-CAB,SFP,2.1,HEATER	A0224471358	001
PARM-CAB,SFP,2.1,CONT,NO CNT	A0034475758	001
PARM-CAB,SFP,2.2,HEATER	A0224471558	001
PARM-CAB,SFP,2.2,CONT,HEATER	A0224471658	001
Spare Function Pin 3: SFP 3 X9/7		
Setting	**Part**	**Version**
PARM-CAB,SFP,3.1,HEATER	A0224471758	001
PARM-CAB,SFP,3.1,CONT,NO CNT	A0034475958	001
PARM-CAB,SFP,3.2,HEATER	A0224471958	001

Parameter Settings		
Spare Function Pin 1: SFP 1 X9/3		
Setting	**Part Number**	**Version**
PARM-CAB,SFP,3.2,CONT,HEATER	A0224472058	001
Spare Function Pin 4: SFP 4 X9/6		
Setting	**Part**	**Version**
PARM-CAB,SFP,4.1,HEATER	A0224472158	001
PARM-CAB,SFP,4.1,CONT,NO CNT	A0034476158	001
PARM-CAB,SFP,4.2,HEATER	A0224472358	001
PARM-CAB,SFP,4.2,CONT,HEATER	A0224472458	001

Table 2, Parameter Settings

Warranty

This is an informational bulletin only. Warranty does not apply.