

Adjusting Automatic Temperature Control Range with Optimized Idle

54-322

FLA COE
FLB COE
FLD Conventional
Business Class
FLC 112 Conventional

Century Class Conventional
Argosy
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122SD and Coronado

Business Class M2
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108SD/114SD
> New Cascadia

**Freightliner
Service Bulletin**

Description of Revisions: *This bulletin replaces the version dated 12/06/2019. Tables 3 and 4 have been updated. Steps to change and match HVAC desired settings have been updated.*

General Information

Under normal driving conditions, front and rear HVAC systems operate as independent constant outlet temperature control (COTC) systems when Optimized Idle™ (OI) is not armed. The desired outlet temperature is selected directly with the temperature selection knobs. When OI is armed, HVAC systems change to an automatic temperature control (ATC) system, and operate as follows:

- When the engine OFF, blowers are disabled;
- when the engine is ON for Battery Mode or OI oil temperature, cabin temperature is maintained at the selected set-point;
- minimum blower speed (engine on) is elevated to speed 4;
- desired cabin temperature and blower speed is selected from the sleeper controls;
- front controls are disabled prior to 18.44.01 SW;
- with 18.44.01 SW and later, front blower speed and temperature setting are by default controlled to the settings on the rear controller. However, if front blower speed and temperature settings are subsequently adjusted after arming OI, front HVAC control will temporarily switch back to normal COTC mode, and be controlled to the front HVAC settings, for a duration of 10 minutes.;
- temperature range is re-mapped to a smaller range for automatic temperature control; and
- recirculation mode defaults to outside air.

Refer to [Table 1](#) and [Table 2](#) to understand the change from COTC to ATC in OI Comfort Mode.

NOTE: When the low temperature parameter is changed (step 19) the value for detent 1 changes from 60 to the selected value. Temperatures for all detents in between detent 1 and 21 will then be mapped linearly.

Blower Detent	
Blower Detent	Blower Detent Mapping
0	0
1	4
2	4
3	4
4	4
5	5
6	6
7	7
8	8
9	9
10	10

Table 1, Blower Detent

Temperature Detent		
Temperature Detent	Temperature Scaling (°F)	Temperature Scaling (°C)
1	60	15.6
2	61	16.1
3	62	16.7
4	63	17.2
5	64	17.8
6	65	18.3
7	66	18.9
8	67	19.4
9	68	20.0
10	69	20.6
11	70	21.1
12	71	21.7
13	72	22.2
14	73	22.8
15	74	23.3
16	75	23.9
17	76	24.4
18	77	25.0
19	78	25.6
20	79	26.1
21	80	26.7

Table 2, Temperature Detent

Optimized Idle Comfort Mode

Optimized Idle in comfort mode operates under the following conditions:

- If "Comfort Mode YES" is selected when OI is armed, the Rear HVAC controller is enabled to request the CPC to start engine, to support cabin comfort.
- If the interior temperature exceeds Cooling Upper Hysteresis, the engine is requested ON for Cooling; HVAC is set to Full Cold until Cooling Lower Hysteresis is reached.
- If the interior temperature falls below Heating Lower Hysteresis, the engine is requested ON for heating; HVAC is set to Full Hot until Heating Upper Hysteresis is reached.

The HVAC automatically switches between heating and cooling modes, and maintains cabin temperature within heating or cooling hysteresis bands. The default width is 9.9°F.

OI hysteresis band width is defined by the Par_HVAC_Controller_Hysteresis on the rear HVAC along with the Par_HVAC_Controller_Hysteresis on the front HVAC controllers. Both units must be paired correctly for OI comfort mode to work properly. See [Table 3](#) and [Table 4](#).

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**Freightliner
Service Bulletin**

Controller Hysteresis Prior to Software Version 18.44.01							
Hex	Heating		Cooling		Range	HVAC_R Parameter	HVAC_F Parameter
	Upper	Lower	Upper	Lower			
0x14	+3.6°F	-6.3°F	+6.3°F	-3.6°F	-9.9°F	A 018 447 20 28	A 017 447 90 28

Table 3, Controller Hysteresis Prior to Software Version 18.44.01

New Controller Hysteresis, Compatible with Software Version 18.44.01							
Hex	Heating		Cooling		Range	Parameters	
	Upper	Lower	Upper	Lower		HVAC_R Parameter	HVAC_F Parameter
0x0A	+4°F	-6°F	+6°F	-4°F	10°F	A 018 447 27 28	A 017 447 97 28
0x14	+3.6°F	-6.3°F	+6.3°F	-3.6°F	9.9°F	A 018 447 20 28	A 017 447 90 28
0X1E	+3°F	-5°F	+5°F	-3°F	8°F	A 018 447 28 28	A 018 447 96 28
0x28	+2.5°F	-4.5°F	+4.5°F	-2.5°F	7°F	A 017 447 51 28	A 017 447 95 28
0x32	+1.5°F	-3.5°F	+3.5°F	-1.5F	5°F	A 017 447 52 28	A 017 447 93 28
0x3C	+1°F	-3°F	+3°F	-1°F	4°F	A 017 447 53 28	A 017 447 92 28

Table 4, New Controller Hysteresis, Compatible with Software Version 18.44.01

Use the instructions in this bulletin to reduce the hysteresis and improve driver comfort in ATC mode.

Setup Instructions

1. Park the vehicle, apply the parking brakes, and shut down the engine. Chock the tires.
2. Connect the vehicle to DiagnosticLink. Make sure that DiagnosticLink is updated to the latest version, 8.10, or newer. To update DiagnosticLink, select "Update" from the dropdown menu under "Tools." See [Fig. 1](#).

It is recommended when flashing to configure DiagnosticLink to connect only to "Default" modules, and stay in this configuration unless it is specifically needed to manually connect to the Common Telematics Platform (cTP) ECU. Default modules allow DiagnosticLink to connect only to the modules that need flashing, and ignores things like the cTP or the steering angle sensor.

To make this change in DiagnosticLink:

- From the top click "Tools", and select "Options" form the drop down menu.
- Find and select the "Connection" tab.
- Click the "Select Defaults" box on the right side of the tab, and select "Apply."

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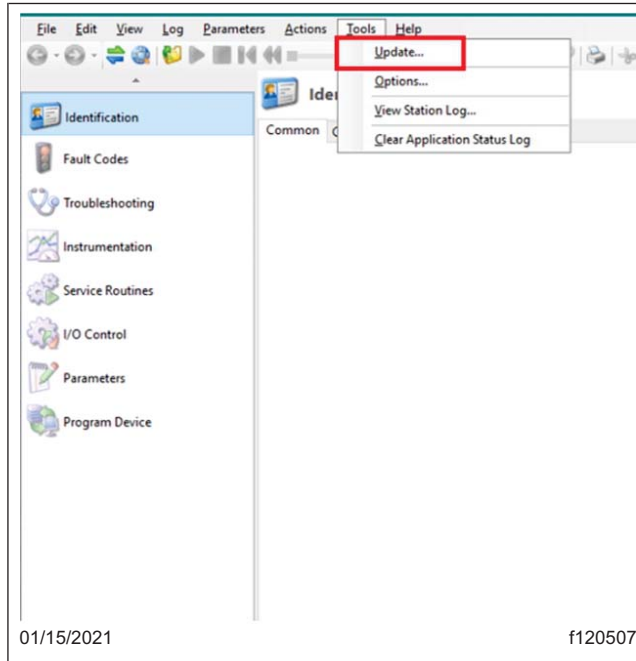


Fig. 1, Updating DiagnosticLink to the Latest Version

IMPORTANT: Before performing this procedure, make sure to address any pre-existing conditions or fault codes first.

3. Select "Program Device." See [Fig. 2](#). If there are any items in the section "Request Pending" downloads, they should be removed. To remove them, select the "Request Pending" list item, then press the "Remove All" button. See [Fig. 3](#).

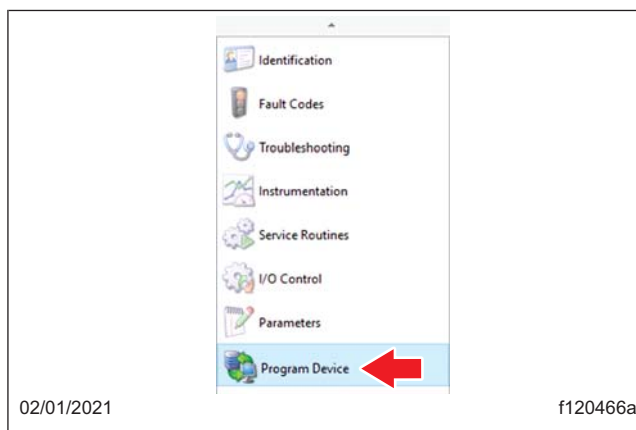


Fig. 2, Program Device Screen

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Freightliner
Service Bulletin

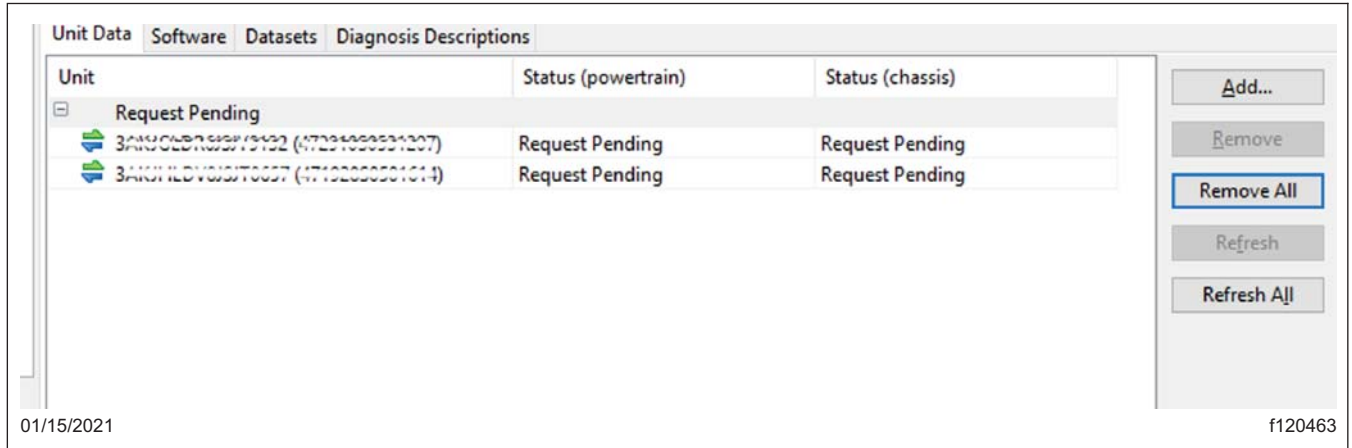


Fig. 3, Removing Pending Requests

- Once all controllers are connected, read the vehicle parameters. See Fig. 4.

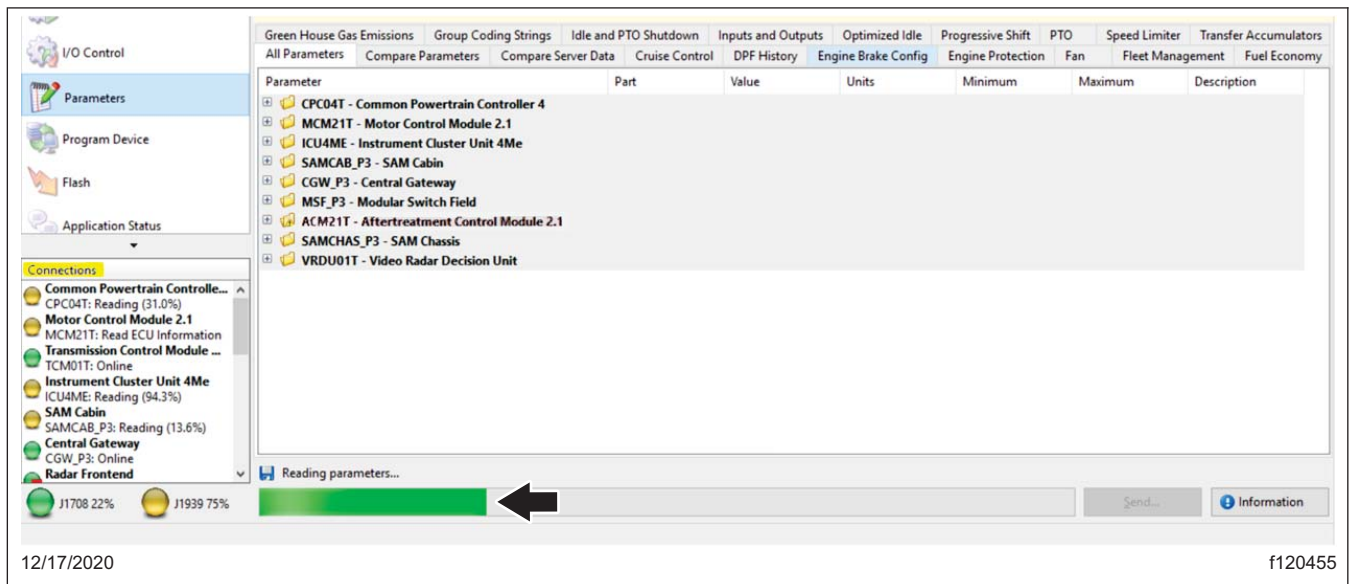


Fig. 4, Reading Vehicle Parameters on DiagnosticLink

- Select "Program Device." There should be data to upload. Click "Connect to Server" to upload vehicle parameters to the server. See Fig. 5.

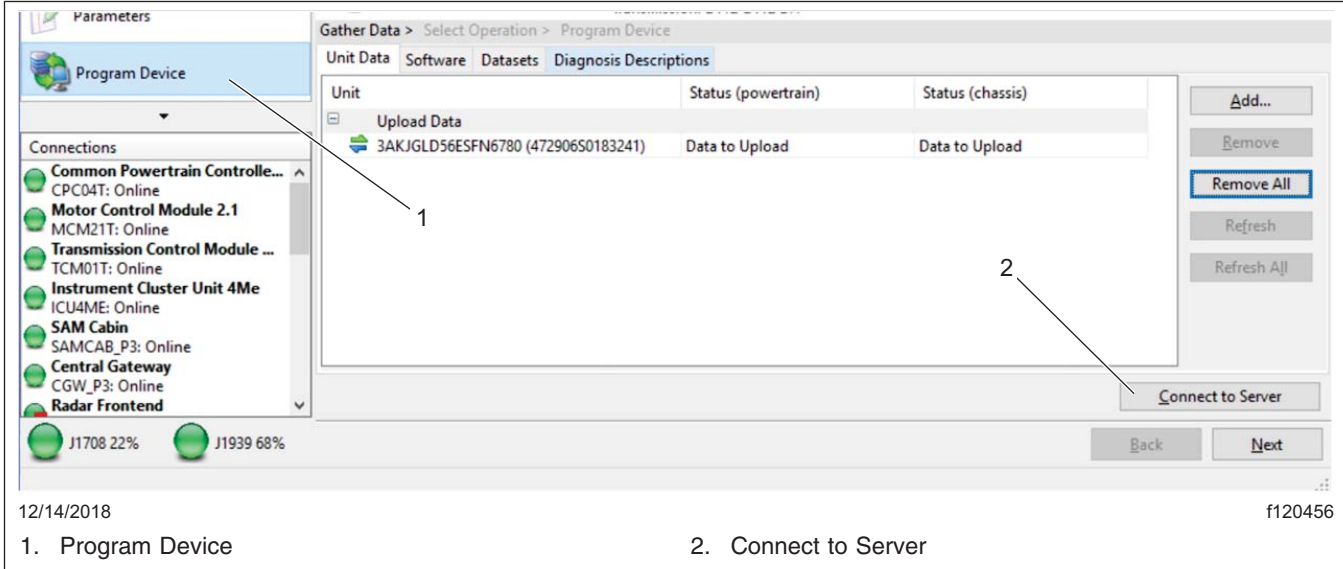


Fig. 5, Uploading Vehicle Parameters

6. Click "Add" to add a download request for the vehicle. See [Fig. 6](#).

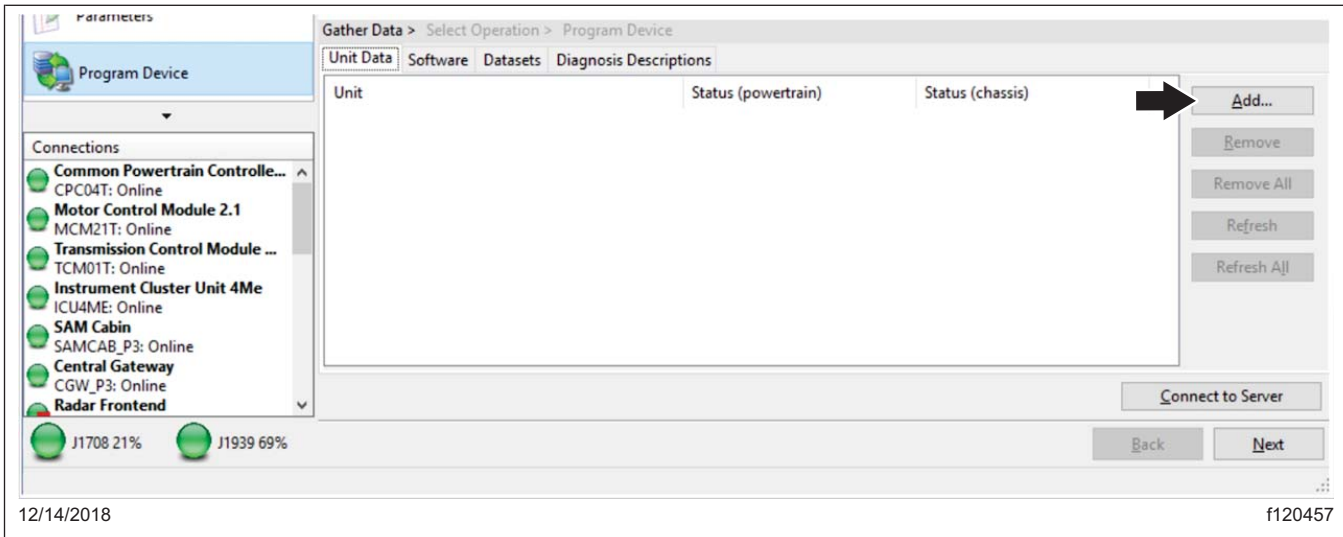


Fig. 6, Adding the VIN to Download Updated Server Data

7. Make sure the correct VIN and hardware is populated, then click OK. See [Fig. 7](#).

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Freightliner Service Bulletin

Request Equipment Data Download

Enter the identity of the equipment you wish to program.

Vehicle Identification VIN PIN

3AKJGLD56ESFN6780

Engine Serial Number (Unit Number)

472906S0183241

Device controllers for this equipment

+ Add - Remove

Device	Hardware Part Number
CPC04T	A0034461002-001
MCM21T	A0004469135-001
TCM01T	A0504460109-001
ICU4ME	06-84378-000
SAMCAB_P3	06-74862-000
CGW_P3	06-73829-003
MSF_P3	06-66446-002
ACM21T	A0004463754-003
SAMCHAS_P3	06-74863-000

Clear All OK Cancel

12/11/2018 f120458

Fig. 7, Verifying Correct VIN Hardware

- There should be a request pending status for the VIN. Click "connect to server" to download the updated unit data. See [Fig. 8](#). The server will provide any new software available on the server as well as updated parameter sets for the new software, adjusted for the parameter set that was just uploaded from the vehicle.

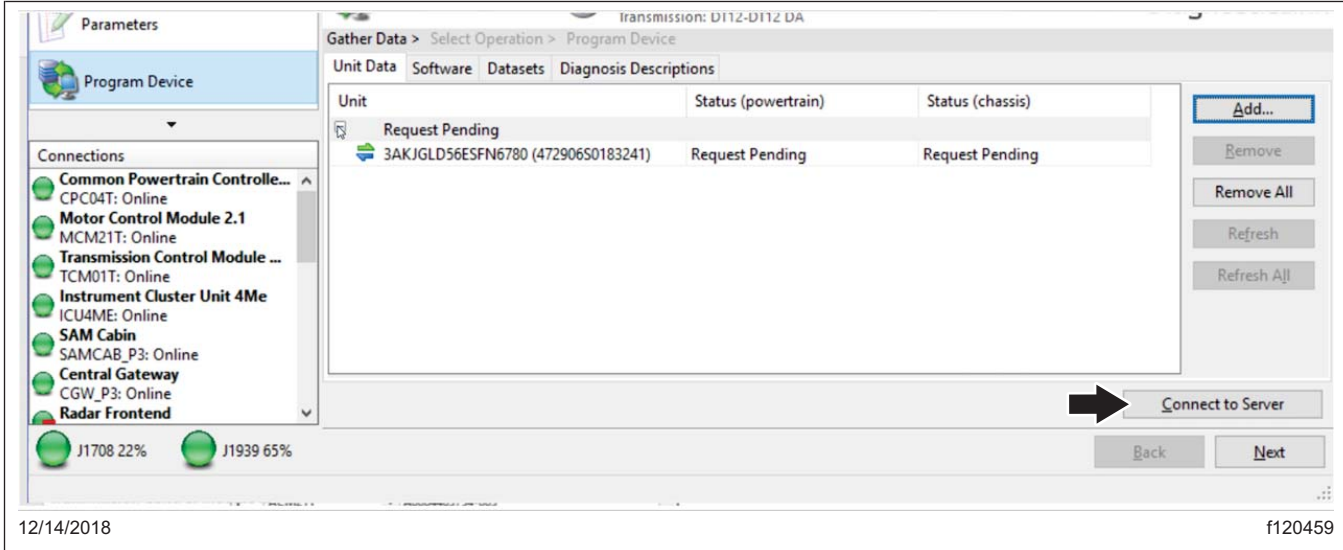


Fig. 8, Downloading Updated Unit Data

9. Once the data has been downloaded, click "Next". See [Fig. 9](#).

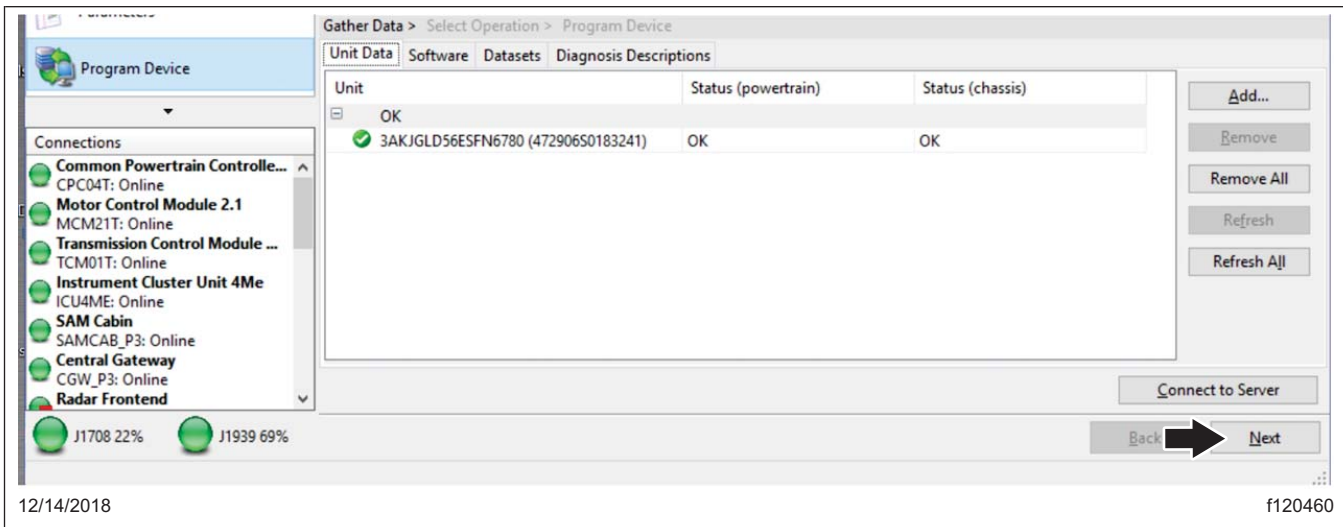


Fig. 9, Clicking Next

NOTE: This new logic prevents nuisance engine starts, giving the operator more control.

10. Update HVAC_R01T and HVAC_F01T to the "Newest" software level, 18.44.1. If "Newest" is not available, the ECU may already have the correct software. Verify that the software version is 18.44.1, or higher, in DiagnosticLink Identification. See [Fig. 10](#).

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Freightliner
Service Bulletin

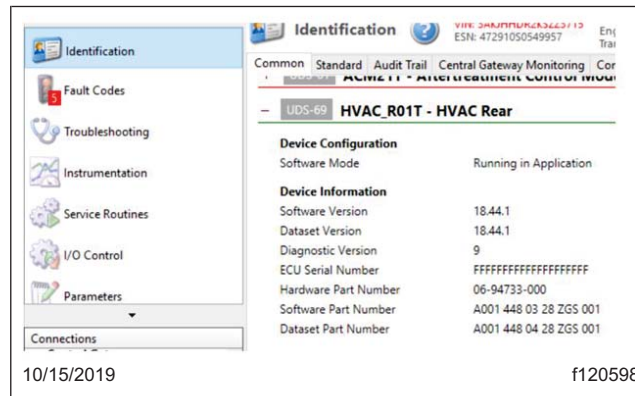


Fig. 10, Verifying the Software Level

IMPORTANT: After a programming, some fault codes may become active and some ECUs may not auto connect. Cycling the ignition may clear the faults and connect the ECUs.

11. Turn the ignition to the OFF position, unplug and restart DiagnosticLink, and wait one minute.
12. Cycle the ignition 3 times, waiting 30 seconds between key off and key on.
13. Turn the key to the ON position and connect the vehicle to DiagnosticLink.
14. Go to "Actions" and select "ICUC Automatic Configuration." Click "Start."
15. Turn the ignition to the OFF position, unplug from the diagnostic port, and start DiagnosticLink. Wait one minute.
16. Connect DiagnosticLink, turn the key to the ON position. Clear inactive faults, and troubleshoot any active faults.
17. To maintain pairing of the rear and front HVAC controllers, both the front and rear parameters Par_HVAC_Controller_Hysteresis need to be set the same. Select the desired temperature range for the rear HVAC as shown in [Fig. 11](#). After making the change, set the same temperature range for the Front HVAC as shown in [Fig. 12](#). See [Table 4](#) for pairing values.

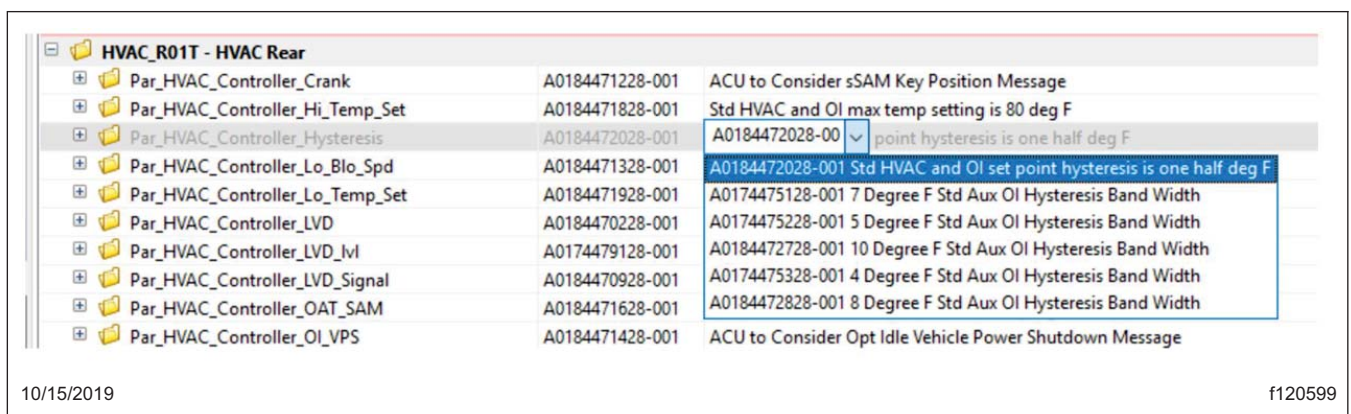


Fig. 11, Changing the Rear HVAC Hysteresis to the Desired Setting

Freightliner Service Bulletin

FLA COE
FLB COE
FLD Conventional
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FLC 112 Conventional

Century Class Conventional
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Columbia
122SD and Coronado

Business Class M2
Cascadia
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HVAC_F01T - HVAC Front			
Par_HVAC_Controller_CoolPmp_Type	A0174478128-001	Single Speed Coolant Pump	
Par_HVAC_Controller_Crank	A0174478228-001	FCU to consider sSAM key pos message	
Par_HVAC_Controller_Fan_Type	A0174477428-001	Single Speed Engine Fan	
Par_HVAC_Controller_Hi_Temp_Set	A0174478828-001	Std HVAC and OI max temp setting is 80 deg F	
Par_HVAC_Controller_Hysteresis	A0174479028-001	A0174479028-001 Std HVAC and OI hysteresis is one half deg F	
Par_HVAC_Controller_Lo_Blo_Spd	A0174478328-001	A0174479628-001 8 Degree F Std Aux OI Hysteresis Band Width	
Par_HVAC_Controller_Lo_Temp_Set	A0174478928-001	A0174479728-001 10 Degree F Std Aux OI Hysteresis Band Width	
Par_HVAC_Controller_LVD	A0174476428-001	A0174479328-001 5 Degree F Std Aux OI Hysteresis Band Width	
Par_HVAC_Controller_LVD_lvl	A0174475428-001	A0174479528-001 7 Degree F Std Aux OI Hysteresis Band Width	
Par_HVAC_Controller_LVD_Signal	A0174477828-001	A0174479228-001 4 Degree F Std Aux OI Hysteresis Band Width	
Par_HVAC_Controller_OAT_SAM	A0174478628-001	A0174479028-001 Std HVAC and OI set point hysteresis is one half deg F	

03/10/2021 f120599a

Fig. 12, Changing the Front Hysteresis to Match the Rear Hysteresis Setting to Maintain Pairing

18. Change parameter Par_HVAC_Controller_Lo_Temp_set_R01T to the desired setting as shown in [Table 2](#). See [Fig. 13](#).

HVAC_R01T - HVAC Rear			
Par_HVAC_Controller_Crank	A0184471228-001	ACU to Consider sSAM Key Position Message	
Par_HVAC_Controller_Hi_Temp_Set	A0184471828-001	Std HVAC and OI max temp setting is 80 deg F	
Par_HVAC_Controller_Hysteresis	A0184472028-001	Std HVAC and OI set point hysteresis is one half deg F	
Par_HVAC_Controller_Lo_Blo_Spd	A0184471328-001	Std HVAC and OI min blower speed is 4	
Par_HVAC_Controller_Lo_Temp_Set	A0184471928-001	A0184471928-001 Std HVAC and OI min temp is 60 deg F	
Par_HVAC_Controller_LVD	A0184470228-001	A0184471928-001 Std HVAC and OI min temp is 60 deg F	
Par_HVAC_Controller_LVD_lvl	A0174479128-001	A0174477528-001 Std HVAC and OI min temp is 70 deg F	
Par_HVAC_Controller_LVD_Signal	A0184470928-001	A0174475528-001 Std HVAC and OI min temp is 68 deg F	
Par_HVAC_Controller_OAT_SAM	A0184471628-001	A0174475628-001 Std HVAC and OI min temp is 62 deg F	
Par_HVAC_Controller_OI_VPS	A0184471428-001	A0174477728-001 Std HVAC and OI min temp is 66 deg F	
Par_HVAC_Controller_temp_offset	A0184471528-001	A0174477628-001 Std HVAC and OI min temp is 64 deg F	
Par_HVAC_Controller_truck_config	A0184470828-001	4 Truck Config is Parksmart with OI	

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Fig. 13, Changing the Rear Temperature Setting to the Desired Setting

19. Change parameter Par_HVAC_Controller_Lo_Temp_Set on HVAC_F01T to desired settings to match HVAC_R01T setting. See [Fig. 14](#).

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Cargo
Columbia
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Business Class M2
Cascadia
108SD/114SD
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**Freightliner
Service Bulletin**

Parameter Name	ID	Description
HVAC_F01T - HVAC Front		
Par_HVAC_Controller_CoolPmp_Type	A0174478128-001	Single Speed Coolant Pump
Par_HVAC_Controller_Crank	A0174478228-001	FCU to consider sSAM key pos message
Par_HVAC_Controller_Fan_Type	A0174477428-001	Single Speed Engine Fan
Par_HVAC_Controller_Hi_Temp_Set	A0174478828-001	Std HVAC and OI max temp setting is 80 deg F
Par_HVAC_Controller_Hysteresis	A0174479028-001	Std HVAC and OI set point hysteresis is one half deg F
Par_HVAC_Controller_Lo_Blo_Spd	A0174478328-001	Std HVAC and OI min blower speed is 4
Par_HVAC_Controller_Lo_Temp_Set	A0174478928-001	A0174478928-001 Std HVAC and OI min temp is 60 deg F
Par_HVAC_Controller_Lo_Temp_Set	(from parent)	A0174477028-001 Std HVAC and OI min temp is 68 deg F
Par_HVAC_Controller_LVD	A0174476428-001	A0174477928-001 Std HVAC and OI min temp is 70 deg F
Par_HVAC_Controller_LVD_Ivl	A0174475428-001	A0174477228-001 Std HVAC and OI min temp is 66 deg F
Par_HVAC_Controller_LVD_Signal	A0174477828-001	A0174475728-001 Std HVAC and OI min temp is 62 deg F
Par_HVAC_Controller_OAT_SAM	A0174478628-001	A0174477128-001 Std HVAC and OI min temp is 64 deg F
Par_HVAC_Controller_OI_VPS	A0174478428-001	A0174478928-001 Std HVAC and OI min temp is 60 deg F

03/10/2021 f120601

Fig. 14, Changing the Front Temperature Setting to Match the Rear Desired Setting

20. After arming Optimized Idle, a 3 minute delay is imposed before the HVAC system will implement comfort criteria.
21. If the outside temp is relatively hot (10°F above the set-point), conditions for OI heat start request must be present for 20 minutes before engine start is made.
22. If outside temperature is relatively cold (10°F below the set-point), conditions for OI Cool Start request must be present for 20 minutes before engine start request is made. Adjusting front HVAC controls in OI mode will revert front HVAC to COTC Mode for 10 minutes.

NOTE: An extremely large temperature offset of 15°F above or below the set point will bypass the 20-minute delay indicated in steps 21 and 22, but not the 3-minute delay noted in step 20.

Warranty

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