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Coding Information

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Title: Fifth Wheel Unlock - Trailer Lamp Detection Calibration

Applies To: LT, RH, Lonestar, MV, HX, HV

CHANGE LOG

Please refer to the change log text box below for recent changes to this article:

06/27/2023 - Modified procedure for new DLB Trailer Cord Calibration tool.
 02/07/2023 - Initial Article Release

DESCRIPTION

This document will guide the user through performing a calibration procedure for the trailer light circuits from the BCM on vehicles equipped with BCM feature 597017. The Body Control Module (BCM) uses the trailer light circuits to detect the presence of trailer or trailer cord still connected to the vehicle to prevent the fifth wheel from unlocking. When updating a vehicle to BCM Software Kernel 735 and Data Version 394 (or newer) this calibration procedure must be completed to maintain the function of the fifth wheel unlock feature. This procedure will need to be performed whether or not the vehicle has trailer lamp detection enabled. Vehicles built with BCM Software Kernel 735 Data Version 394 or newer will have this procedure completed from the factory. This procedure can be performed again later if there are issues where trailers are not detected properly. Vehicles that do not have BCM feature 597017 do not need to perform this procedure.

SYMPTOM(s)

Diagnostic Trouble Code(s) & Dashboard Indicator Light(s):
 No fault codes associated with this procedure.

Customer Observations or Concerns:

- Fifth Wheel unlock switch fast flashes red.
- Driver may hear 3 long beeps from the instrument cluster after the ignition key is turned on.
- Fifth Wheel Unlock feature will not operate.

SPECIAL TOOLS / SOFTWARE

Tool Description	Tool Number	Comments	Instructions
Diamond Logic® Builder		EZ-Tech Software	

SERVICE PARTS INFORMATION

No parts needed for this procedure.

REPAIR STEP(s)

1. Connect to the vehicle using DLB and an applicable data link cable with the ignition key on.

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Get Data Program

Select Advanced Logic Features Faults Connectors Signals Center Panel Cluster Campaign Messages

Features ESC

Create a diagnostics session of the signals associated with the selected features. Make Session

Feature	Description	Inst...
0597011	BCM PROG, FOG LIGHTS, Lighted Control Module (LCM)	<input checked="" type="checkbox"/>
0597012	BCM PROG, ENG COMPRESSION BK, Universal Shifter	<input checked="" type="checkbox"/>
0597013	BCM PROG, ENG COMPRESSION BK, Rocker Switch	<input type="checkbox"/>
0597014	BCM PROG, LOCKING DIFFERENTIAL for Single & Dual & Triple With Single Switch	<input type="checkbox"/>
0597015	BCM PROG, LOCKING DIFFERENTIAL Includes Two Switches, One for each Differential	<input type="checkbox"/>
0597016	BCM PROG, FIFTH WHEEL SLIDE	<input checked="" type="checkbox"/>
0597017	BCM PROG, FIFTH WHL JAW UNLOCK	<input checked="" type="checkbox"/>
0597018	BCM PROG, INTERIOR DOME LIGHTS in Cab, with Switch Control	<input checked="" type="checkbox"/>
0597019	BCM PROG, INTERIOR DOME LIGHTS in Sleeper	<input checked="" type="checkbox"/>
0597020	Engine Exhaust Regeneration Control and Monitoring	<input checked="" type="checkbox"/>

ID	Parameter	Value	Unit	Description
3269	Fifth Wheel Jaw Trailer Check	<input type="checkbox"/>	On/Off	Enables additional in...	0	...
3649	Lft Trn Jaw Unlk Trlr Chk Enbl	<input checked="" type="checkbox"/>	On/Off	Value of 1 enables th...	1	...
3648	Mrkr Jaw Unlk Trlr Lmp Chk Enbl	<input checked="" type="checkbox"/>	On/Off	Value of 1 enables th...	1	...
2413	Request Delay		3 s	This is the PP for th...	300	...
3650	Rgt Trn Jaw Unlk Trlr Lmp Chk Enbl	<input checked="" type="checkbox"/>	On/Off	Value of 1 enables th...	1	...
3645	Tail Jaw Unlk Trlr Lmp Chk Enbl	<input checked="" type="checkbox"/>	On/Off	Value of 1 enables th...	1	...

Figure 1: Check for Fifth Wheel Unlock Feature 597017

Note: If you do not see feature 597017 in the feature list it is not installed on the vehicle you are working on and this procedure and iKnow does not apply.

Item 1: Check mark under installed column indicating feature is present on this vehicle.

2. Verify the vehicle is equipped with feature 597017 under the features tab. There should be a check mark next to the feature description (Figure 1, Item 1). If you do not see feature 597017 listed in the features tab the vehicle is not equipped with the fifth wheel unlock feature. If the vehicle is not equipped with feature 597017 this iKnow and procedure does not apply.

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Get Data Program Program Test Bench

Select Advanced Update International software on selected vehicles. For the ESC this is automatic when making other changes.

VIN/Name	Tem...	Conf...	Status	Description
3HAESTZT0KL756993		206	Modified	
3HAESTZT2ML148427		1	Pending Confirmation	
3HAESTZT7PL516184		2	Pending Confirmation	
3HAETUAN8KL098248		7		
3HAWKSUN1FL659587		105	Modified	
3HCEUTAN8PL324500		3		
3HSDZAPR5JN693505		4		
3HSDZTR1LN864780		56	Unsaved Changes	
3HTPCTZT6NN484682		3	Pending Confirmation	
4DRBUC8N4PB111949		3		
4DRBUC8N5PB005865		1	Pending Confirmation	
4DRBUC8N5PB111944		4		
4DRBUC8N8PB108441		2	Pending Confirmation	
4DRBUC8N8PB490910		13		
4DRBUC8N9PB117388		4		
4DRBUC8NXPB111941		5		
Alt IST AT 1	✓	1		
Fan Control 1	✓	3		

Selected Vehicle: 3HSDZTR1LN864780



Module	Address	Data Link	Kernel	Description	Selected Module	Detected
Stalk Shifter			✓ 56	Serial	ESC	
Switch Pack 2			✓ 25	Serial	902010	
Switch Pack 1			✓ 25	Hardware	504	
Lighting Control Module			✓ 18	Configuration	56	
Instrument Cluster			✓ 40449	Kernel	735	1
Passenger Door Pod			✓ 202	Data Version	394	2
Front HVAC Control Module			✓ 1945001			
ESC	33Drivetrain J1939		✓ 735			

State

You are now working online.

Figure 2: Check Current BCM/ESC Software Level

- Item 1: Kernel Version
- Item 2: Data Version
- Item 3: Update All Button
- Item 4: Program Button

3. Return to the select tab in DLB and verify the BCM (labelled as ESC in DLB) has at least Kernel 735 (Figure 2, Item 1) and Data Version 394 (Figure 2, Item 2). If not, use the update all button (Figure 2, Item 3) to load the latest software for the modules on the vehicle. Then use the program button (Figure 2, Item 4) to flash the updates to the vehicle.

4. Once updating is complete turn the ignition key off.

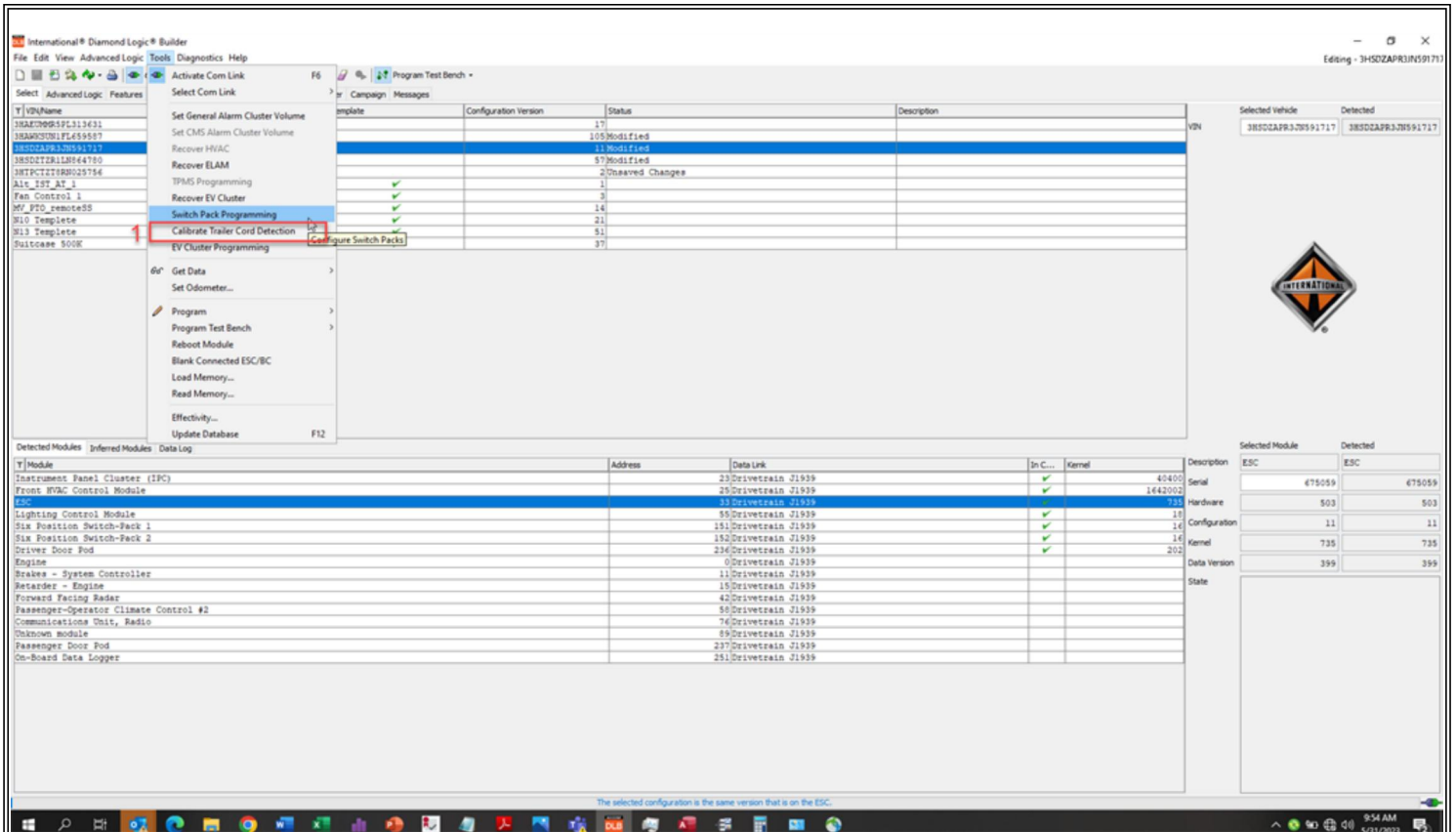


Figure 3: Select Calibrate Trailer Cord Detection In Tools Menu

Note: If Calibrate Trailer Cord Detection is not shown or grayed out in the tools menu then feature 597017 is not installed on the vehicle you are working on and this procedure and iKnow does not apply.

Item 1: Calibrate Trailer Cord Detection tool.

5. Select Calibrate Trailer Cord Detection in the tools menu (Figure 3, Item 1). If Calibrate Trailer Cord Detection is not shown or grayed out in the tools menu then feature 597017 is not installed on the vehicle you are working on and this procedure and iKnow does not apply.

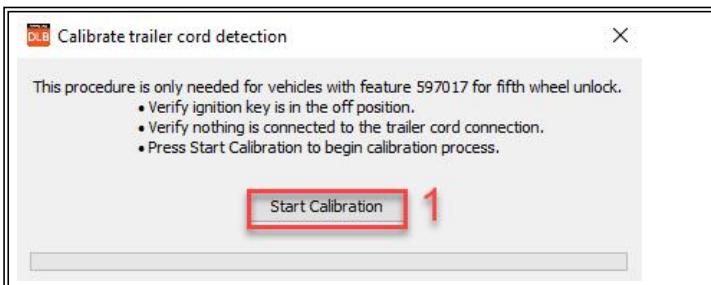


Figure 4: Calibration Tool

Item 1: Start Calibration Button

6. Follow the on screen instructions. It is recommended that all external lights be turned off for this procedure. Verify the igniton key is in the off position and that nothing is connected to the trailer cord connection then press the Start Calibration Button (Figure 4, Item 1).

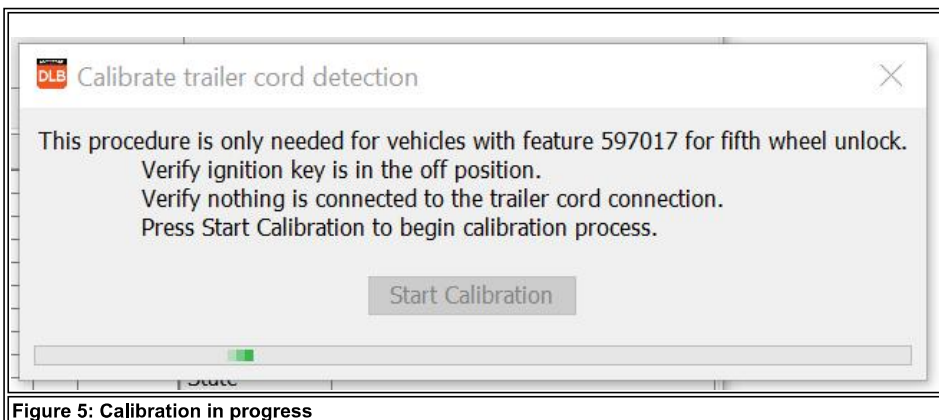


Figure 5: Calibration in progress

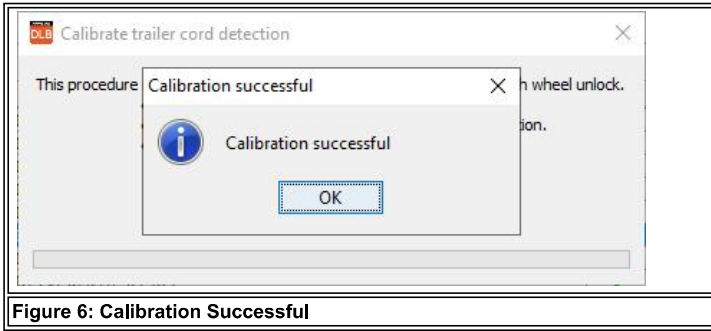


Figure 6: Calibration Successful

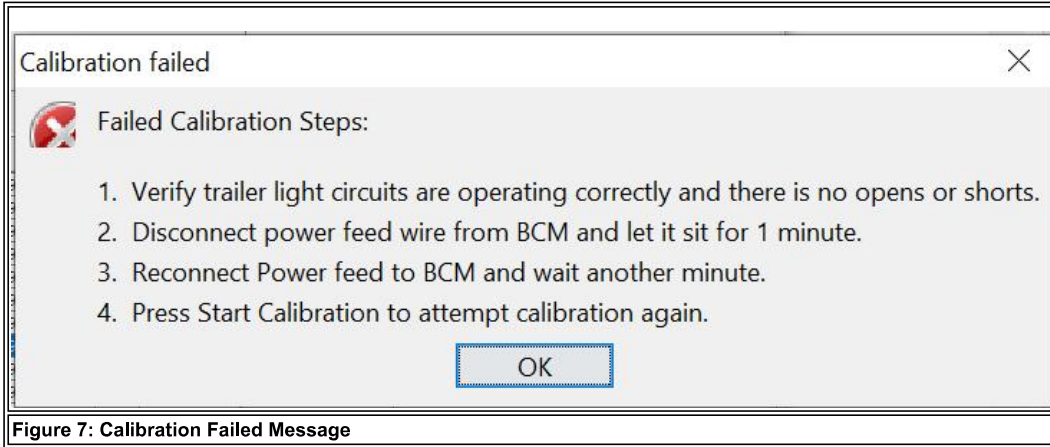


Figure 7: Calibration Failed Message

7. During Calibration the tool window will look like Figure 5 with a green indicator bar scrolling across the screen. Calibration should take less than 2 minutes and if successful the tool will display Calibration Successful message (Figure 6) and the instrument cluster will beep. Disconnect the service tool and verify correct function of the fifth wheel unlock feature. If the failed calibration message pops up (Figure 7) follow the on screen steps to resolve the issue and attempt to calibrate again. If it fails again try the manual calibration procedure below.

Manual Calibration Procedure

Note: this procedure should only be used if the calibration tool fails more than 2 times.

1. Turn the ignition key off. Verify there is nothing connected to the trailer cord.

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Get Data Program Program Test Bench

Select Advanced Logic Features Faults Connectors Signals Center Panel Cluster Campaign Messages

Features ESC

Create a diagnostics session of the signals associated with the selected features. **Make Session** 2

Feature	Description	Inst...
0597010	BCM PROG, AIR SUSPENSION DUMP	<input checked="" type="checkbox"/>
0597011	BCM PROG, FOG LIGHTS, Lighted Control Module (LCM)	<input checked="" type="checkbox"/>
0597012	BCM PROG, ENG COMPRESSION BK, Universal Shifter	<input checked="" type="checkbox"/>
0597013	BCM PROG, ENG COMPRESSION BK, Rocker Switch	<input type="checkbox"/>
0597014	BCM PROG, LOCKING DIFFERENTIAL for Single & Dual & Triple With Single Switch	<input type="checkbox"/>
0597015	BCM PROG, LOCKING DIFFERENTIAL Includes Two Switches, One for each Differential	<input type="checkbox"/>
0597016	BCM PROG, FIFTH WHEEL SLIDE	<input checked="" type="checkbox"/>
0597017	BCM PROG, FIFTH WHL JAW UNLOCK	<input checked="" type="checkbox"/>
0597018	BCM PROG, INTERIOR DOME LIGHTS in Cab, with Switch Control	<input checked="" type="checkbox"/>
0597019	BCM PROG, INTERIOR DOME LIGHTS in Sleeper	<input checked="" type="checkbox"/>

ID	Parameter	Value	Unit	Description
3269	Fifth Wheel Jaw Trailer Check	<input type="checkbox"/>	On/Off		0	...
3780	Jaw Unlk Trlr Left Lmp Chk Raw Curr Thrshld	0.043988	V	Trailer Left Turn Lam...	9	...
3778	Jaw Unlk Trlr Mrkr Lmp Chk Raw Curr Thrshld	0.043988	V	Trailer Marker Lamp R...	9	...
3781	Jaw Unlk Trlr Right Lmp Chk Raw Curr Thrshld	0.043988	V	Trailer Right Turn La...	9	...
3779	Jaw Unlk Trlr Tail Lmp Chk Raw Curr Thrshld	0.043988	V	Trailer Tail Lamp Raw...	9	...
3649	Lft Trn Jaw Unlk Trlr Chk Enbl	<input checked="" type="checkbox"/>	On/Off	Value of 1 enables th...	1	...
3648	Mrkr Jaw Unlk Trlr Lmp Chk Enbl	<input checked="" type="checkbox"/>	On/Off	Value of 1 enables th...	1	...
2413	Request Delay		3 s		300	...
3650	Rgt Trn Jaw Unlk Trlr Lmp Chk Enbl	<input checked="" type="checkbox"/>	On/Off	Value of 1 enables th...	1	...
3645	Tail Jaw Unlk Trlr Lmp Chk Enbl	<input checked="" type="checkbox"/>	On/Off	Value of 1 enables th...	1	...
3787	Trailer Lamp Calibration Low Range Max Param	2.4976	V	Trailer Lamp Test Cal...	511	...
3690	Trailer Lamp Detection Delay	100	ms	Amount of time to del...	10	...
3786	Trailer Lamp Detection High Current Param	1	A	Trailer Lamp Detectio...	...	mA
3678	Trailer Lamp Detection Time	1000	ms	Time for the Jaw Unlo...	100	...

Waiting for connection...

Figure 8: Create Session with Feature 597017

- Item 1: Feature 597017
- Item 2: Make Session Button

2. With ignition key still off go to the features tab and find feature 597017 in the list (Figure 8, Item 1). Create a diagnostics session with the feature by clicking the Make Session button (Figure 8, Item 2).

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Simulating - 3HSDZTR1LN864780

Get Data Program Program Test Bench

Select Advanced Logic Features Faults Connectors Signals Center Panel Cluster Campaign Messages

ESC Signals Custom Master List J1939 Detected J1939 Watched Graph

Session: 0597017

Signal	Signal Type	Unit	Pins	Watch	Lock	Name	Physical ...	Index	Value
Trailer Tail Lamp Low Range Raw Current		V		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Traile...		765	0
Lft Trn Jaw Unlk Trlr Chk Offset		V		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Lft Tr...		468	0
Switch Timer		s		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Switch...		1862	4.92
Tail Jaw Unlk Trlr Chk Offset		V		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Tail J...		728	0
Trailer Right Turn Lamp Low Range Raw Cu...		V		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Traile...		759	0
Trailer NVM FEI Cal Timer		s		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Traile...		1857	14.98
Trailer Lamp Test NVM Verify Flag		On/Off		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Traile...		744	<input type="checkbox"/>
Fifth Wheel Jaw Unlock Switch	J1939 Input	On/Off		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fifth ... P_J193...		272	<input type="checkbox"/>
Mrkr Jaw Unlk Trlr Chk Offset		V		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Mrkr J...		501	0
Fifth Wheel Control State Prev		No Units		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fifth ...		265	7
Trailer Lamp Test NVM Access		No Units		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Traile...		741	Inactive
Trailer Lamp Calibration Timer		ms		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Traile...		1860	0
Alarm(Cluster) lLongBeep		On/Off		<input type="checkbox"/>	<input checked="" type="checkbox"/>	EGC Al...		173	<input type="checkbox"/>
Trailer Connected		On/Off		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Traile...		738	<input type="checkbox"/>
Trailer ABS Warning Lamp	J1939 Input	No Units		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Traile... P_J193...		737	0
Jaw Unlock Trailer Lamps Steady ON		No Units		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Jaw Un...		406	0: Ina...
Fifth Wheel Alarm State		No Units		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fifth ...		263	0
Park Brake		On/Off		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Park B...		550	<input type="checkbox"/>
Fifth Wheel Jaw Unlock Switch Ind Cmd	J1939 Output	No Units		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fifth ... P_J193...		273	Switch...
Trailer Marker Lamp Raw Signal	Analog Input	V		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Traile... P_AIN...		755	0
Trailer Lamp Calibration Verify Timer		ms		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Traile...		1859	0
Trailer Lamp Test NVM Verify Result		No Units		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Traile...		745	15
Key State	J1939 Output	No Units		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Key State P_J193...		407	0
Trailer Marker Lamp Low Range Raw Current		V		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Traile...		754	0
Fifth Wheel Indicator State		No Units		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fifth ...		266	0
Trailer Lamp Test Calibration Result		No Units		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Traile...		740	4080
DiagFilt_FifthWheelJawUnlockSol2Cmd_4079		ms		<input type="checkbox"/>	<input checked="" type="checkbox"/>	DiagFi...		1998	0
Fifth Wheel Control State		No Units		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fifth ...		264	7
Vehicle Speed		mph		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Wheel ...		793	0
Request Delay Timer		s		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Reques...		1870	0

Bit 3 (Circuit 3) Left Turn verified.
Bit 4 (Circuit 4) Right Turn verified.

Simulator running at roughly 73.13% of real time 3233.12 estimated seconds elapsed

Figure 10: Result Verification

Item 1: Trailer_Lamp_Test_NVM_Verify_Result Signal
Item 2: Signal Value

- Find signal Trailer_Lamp_Test_NVM_Verify_Result (Figure 10, Item 1). When the calibration procedure is complete and successful the value of this signal will show as 15 (Figure 10, Item 2). It should only take 15-20 seconds after Trailer_Lamp_Test_Calibration_Request was forced to enable in step 3.
- If Trailer_Lamp_Test_NVM_Verify_Result does not change to 15 after 1 minute go to the Failed Calibration Steps below. If it changes to 15 proceed to step 6.
- Uncheck the value box for signal Trailer_Lamp_Test_Calibration_Request (Figure 9, Item 3) and unlock the signal with the lock button (Figure 9, Item 2)
- Disconnect the service tool and verify correct function of the fifth wheel unlock feature.

Failed Calibration Steps:

- Verify trailer light circuits are operating correctly and there is no opens or shorts.
- Disconnect power feed wire from BCM and let it sit for 1 minute.
- Reconnect power feed to BCM and wait another minute.
- Follow calibration procedure above to attempt calibration again.

WARRANTY INFORMATION

Warranty Claim Coding:

Refer to the [Warranty Coding Manual](#) for Group and Noun Codes.

Standard Repair Time(s):

Refer to the [SRT Manual](#) for Repair Times

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