Trailer Light Check

(CORE)
(F002052)

Document Type	**Feature Implementation Specification (FIS)**		
Template Version	**6.1a**		
SysML Report Template Version	**6.1a.11**		
Document ID	**trailer light check_fis v2.0**		
Document Location			
Document Owner	**Eric Vieira (evieira1)**		
Document Revision	**2.0**		
Document Status	**Released**		
Date Issued	**2022/10/24**		
Date Revised	**2022/10/24**		
Model Name and Version	**F002052-Trailer Light Check-gmorei16 - [#227]**		
Document Classification	GIS1 Item Number:	**27.60/35**	
	GIS2 Classification:	**Confidential**	

Document Approval			
Person	Role	Email Confirmation	Date

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1 INTRODUCTION

1.1 Document Purpose

The Feature Implementation Specification (FIS) specifies the deployment of the logical functions of a feature to an electrical architecture. The FIS specifies all interactions between the ECUs of the electrical architecture required for the feature including the technical signals and the interfaces. It also gives interface and integration requirements, which are specific to the feature for the electrical architecture.

To get more information about the concept of feature, function and component level abstraction refer to the Ford RE Wiki.

1.2 Document Scope

This FIS describes the deployment of the feature Trailer Light Check to the following electrical architecture(s):

Trailer Light Check (TLC) feature can be implemented in vehicles with FNV2 and FNV3 architecture (except FNV2.1 which has a low cost BCM Gen II).

1.3 Document Audience

The FIS is authored by **Eric Vieira (evieira1)** . All Stakeholders, i.e., all people who have a valid interest in the feature implementation should read and, if possible, review the FIS. It needs to be guaranteed, that all stakeholders have access to the currently valid version of the FIS.

1.3.1 Stakeholder List

For the latest list of stakeholder of the feature and their influence refer to:
Click here to open the latest Stakeholders List.

1.4 Document Organization

1.4.1 Document Context

Refer to the Specification Structure page in the Ford RE Wiki to understand how the FIS relates to other Ford Requirements Documents and Specifications.

1.4.2 Document Structure

The structure of this document is explained below:

Section 1 – Introduction – Giving an explanation how to use this document including responsibilities and the scope of the document. Additionally, it contains the revision history and a list of unsettled but known issues that have to be consolidated in future versions. It explains the terminology and gives a clarification of the definitions, concepts and abbreviations used in the document.

Section 2 – Feature Implementation Description – Giving an overview of the platform and listing assumptions, constraints or dependencies

Section 3 – Feature Implementation Architecture – Describing 3 Architecture Views:

- Functional Architecture – Showing the logical architecture of functions
- Physical Architecture – Showing the physical architecture (first of all the E/E Architecture), which the Logical Functions get allocated to.

- Software Architecture – Showing the software architecture relevant for the feature (for features with in-house development only)
- Function Deployment – Presenting the allocation of logical functions and signals to the electrical and other components

Section 4 – Deployment Specific Modeling –Modeling techniques providing additional detail on e.g. interface behavior

Section 5 – Deployment Specific Requirements – Deployment specific requirements for ECUs, Network Communication, and Process

Section 6 – List of Open Concerns

Section 7 – Revision History

Section 8 – Appendix - Presenting additional data mainly in a tabular form, e.g., a data dictionary

1.5 Document Conventions

1.5.1 Requirements Templates

Refer to "How to use the Specification Templates" on how to use the specification templates and the VBA macros to create/edit the requirements in the specifications.

The VBA macro enable the import of the specification to VSEM (refer to "How to import specifications into VSEM as separate requirements").

1.5.1.1 Identification of requirements

The unique requirement ID given in the headline of any requirement follows the requirement throughout the development process. The requirement ID format follows a well-defined syntax.

All identifiers in an FIS shall be composed of 4 parts:

- A leading prefix, which indicates the type of requirement (R=Requirement, UC=Use Case, SC=Scenario, …)
- A prefix, which indicates the abstraction level (F=Feature, FNC=Function, CMP = component).
- Followed by a name, indicating the scope, which the requirement belongs to (e.g. feature or function name)
- Ending with the actual requirement number

Example:

R_CMP_LockArbitrator_00004	This is the fourth requirement on component level for the function Lock Arbitrator.

1.5.1.2 Requirements Attributes

Additionally attributes can be added to each requirement. This helps to classify requirements. A list of available attributes is given in the RE Wiki.

1.6 References

1.6.1 Ford Documents

The list of all Ford internal documents, which are directly related.

Reference	Title	Doc. ID	Document Location	Revision
Spec 1	Functional Specification Body Control Module	FS-LU5T-14B476-AAA	VSEM	12.02

Reference	Title	Doc. ID	Document Location	Revision
Spec 2	Functional Specification Body Control Module	FS-MU5T-14B476-ACJ	VSEM	
Spec 3	Functional Specification Body Control Module	FS-NU5T-14B476-AAF	VSEM	
Spec 4	Functional Specification Body Control Module	FS-PU5T-14B476-AGB	VSEM	15.07
Spec 5	AppLink	FDS004146	https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=y1hFbbzox3NrTDAAAAAAAAAAAA&servername=Production_Server	1.31
Spec 6	ECG Infotainment SPSS	VDOC076964-Trailer Light Check ECG SPSS	https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=NmdxdumXx3NrTDAAAAAAAAAAAAA&servername=Production_Server	1.4
Spec 7	APIM Infotainment SPSS	VDOC079457-Trailer Light Check APIM SPSS	https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=mZR17lvhx3NrTDAAAAAAAAAAAA&servername=Production_Server	12.02
Spec 8	Functional Specification TTLM (GEN I)	VDOC012447-FS DG9T-19H517-AB	https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=DiQRAOHfx3NrTDAAAAAAAAAAAA&servername=Production_Server	AB
Spec 9	Functional Specification iTRM (TTLM GEN II)	VDOC088749-FS-NU5T-19H517-AA005	https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=DiQRAOHfx3NrTDAAAAAAAAAAAA&servername=Production_Server	1.4
Spec 10	Functional Specification iTRM	VDOC081877-FS-MU5T-19J294-AC	https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=SRX53Gyfx3NrTDAAAAAAAAAAAA&servername=Production_Server	1.8

Reference	Title	Doc. ID	Document Location	Revision
Spec 11	BCM MY23 GEN III - FS & Model Releases	FDS051699	https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=T8a9IlvXx3NrTDAAAAAAAAAAAA&servername=Production_Server	R04[3]
Spec 12	BCM MY21 GEN I M - FS & Model Releases	FDS031885	https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=CkelYvBXx3NrTDAAAAAAAAAAAA&servername=Production_Server	RC02[3]
Spec 13	BCM MY22 GEN I M - FS & Model Releases	FDS042133	https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=hvcxDa4Qx3NrTDAAAAAAAAAAAA&servername=Production_Server	RC01.2[2]

Table 1-1: Ford internal Documents

1.6.2 External Documents and Publications

The list of external documents could include books, reports and online sources.

Reference	Document / Publication	Document Location
	FMVSS 108 - Lamps, Reflective Devices, And Associated Equipment	
	ECE R/48 Rev.7 - Vehicles with Regard to The Installation of Lighting And Light Signaling Devices	

Table 1-2: External documents and publications

1.7 Glossary

1.7.1 Definitions

Definition	Description
Another Three Letter Acronym	self explanatory
concept	An abstract idea representing fundamental characteristics of its representation. Concepts are perceptions of an object, its characteristics (i.e., structural and behavioral), and its relationship(s) to another object(s).
controlled vocabulary	an organized arrangement of words and phrases used to index content and/or to retrieve content through browsing or searching. It typically includes preferred and variant terms and has a defined scope or describes a specific domain.
controlled vocabulary term	An element of a controlled vocabulary
Parked State	On automatic transmissions, the vehicle PRNDL is in “PARK” and for manual transmissions, the vehicle has the parking brake applied.

Definition	Description
Parking / position lamps	Notionally the parking/position lights. Legal issues prevent us saying parking position lights without saying side lights and license plate lights as FMVSS108 requires all these to be turned on together.
Rear Fog Lamps	Rear Fog lamps when illuminated improve visibility of the vehicle to drivers approaching from the rear and are only to be used in conditions of severely reduced visibility.
Reverse Lamps	The backup/reverse lamps are located at the rear of the vehicle and when illuminated provide an indication that the vehicle is in the reverse gear and may be moving backwards.
Stop Lamps	The stop lamps (also named as brake lamps) are located at the rear of the vehicle and when illuminated indicate the brakes are being applied and provide an indication that the vehicle is reducing speed and shall stop completely.
Turn Indicator Light	The Turn Indicator lamps when illuminated provide the indication that the driver of the vehicle intends to turn or change the lane and can only be illuminated on one side of the vehicle at a time.
Vehicle Stationary	Vehicle is defined as stationary if vehicle speed is less than 4 Kph and vehicle in in the “Parked State”.
vocabulary	A set of terms, each representing a single concept in a Domain of Discourse. A fundamental tool for communication and creating a common understanding of a Domain.
vocabulary Term	An abstraction, in the form of a natural language expression, representing a concept existing in the Ontology of a Domain of Discourse

Table 1-3: Definitions used in this document

1.7.2 Abbreviations

Abbr.	Stands for
ABS	Anti-lock Braking System - Brake ECU
AFS	Aggregated Feature Spec - Type of this document
AOS	Android on Sync - Mobile phone display and synchronization method for Android type mobile devices
APIM	Application Protocol Interface Module - User interface to vehicle and APIM_CDC (Phoenix Domain Controller)
ARL	Documents vehicle-level characteristics, using RQMTs and DVMs
BCM	Body Control Module - Feature arbitrator
BCMc	Body control Module "C" (PDB) - Power Distribution Box
BT	Bluetooth - PIM; AppLink; Bluetooth connection for Ford vehicles
CAN	Controller Area Network - Communications method between modules (bi-directional)
ECG	Enhanced Central Gateway - Module that performs any processing or special functions other than gatewaying CAN signals
EOL	End of Line - Manufacturing location where ECU modules are programmed
EPB	Electric Parking Brake - Electronic Park brake feature
FD1	Flexible Data Rate CAN network 1
FDRS	Ford Diagnostics and Repair Systems - Based on Dealer diagnostic tool usage (Near real time to FDSP SQL Server)
FTCP	Ford Telematics Communication Protocol
GWM	Gateway Module- Module that gateways CAN signals between modules
HARA	Hazard Analysis and Risk Assessment - Risk assessment document
HS1	High Speed CAN network 1
HS3	High Speed CAN network 3
IDS	Integrated Diagnostic System - Diagnostic Service Tool
ITRM	Integrated Trailer Module - Module that delivers power to the trailer battery, turn lights and brake lights

Abbr.	Stands for
LED	Light Emmiting Diode - Diode that emits light when voltage is applied to it
MS1	Medium Speed CAN network 1
PAC	Phoenix Audio Controller - Ford's next generation audio controller post Sync
PCM	Powertrain Control Module - ECU which controls engine and transmission
PDB	Power Distribution box - Box that delivers power to the trailer tail and reverse lights
PDC	Phoenix Domain Controller - Ford's next generation IVI controller for multimedia post Sync
SOC	State of Charge - 12v Battery State of Charge
TCU	Telematics Control Unit - Vehicle modem that communicates with cloud/FordPass/Lincoln Way
TMC	Traffic Management Center
TTLM	Trailer Tow Light Module - Module that delivers power to the trailer battery, turn lights and brake lights
UI	User Interface - HMI interface to user

Table 1-4: Abbreviations used in this document.

2 FEATURE IMPLEMENTATION OVERVIEW

2.1 Description

Trailer Light Check (TLC) feature can be implemented in vehicles with FNV2 architecture and above (except FNV2.1 which has a low cost BCM Gen II) and in vehicles that have a Ford factory/dealer installed trailer wiring and connector. TLC feature will utilize exterior rear lighting connected to BCM and iTRM / BCMc to control vehicle and trailer lights via in-vehicle UI and remote app (FordPass or Lincoln Way).

2.2 Input Requirements/Documents

Reference (Reference as listed in ch. "References")	**Section/Requirement**	**Description**	**Derived Requirement** (optional – reference to requirement in ch. "Feature Implementation Requirements")
Feature/Function Requirements			
Spec 1	Functional Specification Body Control Module	12.02	
Spec 2	Functional Specification Body Control Module		
Spec 3	Functional Specification Body Control Module		
Spec 4	Functional Specification Body Control Module	15.07	
Spec 5	AppLink	1.31	
Spec 6	ECG Infotainment SPSS	1.4	
Spec 7	APIM Infotainment SPSS	12.02	
Spec 8	Functional Specification TTLM (GEN I)	AB	
Spec 9	Functional Specification iTRM (TTLM GEN II)	1.4	
Spec 10	Functional Specification iTRM	1.8	
Spec 11	BCM MY23 GEN III - FS & Model Releases	R04[3]	
Spec 12	BCM MY21 GEN I M - FS & Model Releases	RC02[3]	
Spec 13	BCM MY22 GEN I M - FS & Model Releases	RC01.2[2]	
Ford Engineering Standards			
Legal Regulations			
	Compliance with FMVSS101	The Feature shall comply with FMVSS101.	
	ECE R/48 Rev.7	Lighting and Light-signaling Installation to ECE - United Nations	

	FMVSS-108	Federal Motor Vehicle Safety Standard 108	
Industry Standards			
	ECE R/48 Rev.7	Lighting and Light-signaling Installation to ECE - United Nations	
	Compliance with FMVSS-108	Federal Motor Vehicle Safety Standard 108	
	ISO 26262/2018	Road Vehicles Functional Safety Standards	
Other Sources			
	FAP03-150	Global Engineering Standards	
	Preconditions to activate Trailer Light Check	Trailer Light Check feature shall meet the required preconditions to be activated (ignition in ACC or RUN modes, Trailer electrically connected, All taillights must be Off, Battery SOC >75% when ignition is in ACC mode, Vehicle must be stationary, Other higher priority features that impact vehicle exterior lighting must not be ON)	
	Trailer Light Check HMI Request	Trailer Light Check feature shall be activated / deactivated by user request thru in-vehicle UI HMI or remote app HMI	
	Trailer Light Check Objective	The primary goal of Trailer Light Check feature is to allow the vehicle user to visually check the lights operation of a towed trailer independently.	
	Trailer Light Check Operation	Once activated, Trailer Light Check feature shall start the vehicle and the trailer lights test illumination sequence in the following order: parking or position lights (remain on for the	

		entire test), left turn indicator light, right turn indicator light, brake lights, reverse lights and rear fog lights.	
	User Feedback for Trailer Light Check Operation	Trailer Light Check feature shall provide user feedback via in-vehicle UI or Remote app UI when test is completed or interrupted by any preconditions not met	

Table 2-1: Input Requirements/Documents

2.3 Lessons Learned

1. Global requirements such as rear fog lights should be considered when developing a feature. Must consider all activation paths for trailer lights – specifically that US low spec vehicles without a TRM/ITRM can still operate trailer lights via 4 pin plug where fitted, with circuits routed from the PDB. Full iOS and Android testing are required. (a lot of Android was untested and not implemented) with MY21 P702. Since FNV3 architecture, BCM GEN3 uses CAN signals to communicate with ITRM/TTLM. Then ITRM/TTLM provide hardwired connection to trailer lights but are not end to end protected with current design and are not ASIL complaint. A deviation DVN-7039683 was approved for P708 (FNV3 lead Program) and a Conformance Plan has been established to have modules to be ASIL Complaint on FNV4 architecture.

2.4 Assumptions

Assumption
Assumptions and constraints listed below are representative of current strategies and may be subject to change:

• The trailer light function feature will utilize existing hardware on the vehicle, no new hardware will be required
• Vehicle is at a minimum FNV2 or later architecture
• Vehicle has Ford factory/dealer installed trailer wiring, hitch and TRM/ iTRM/BCMc.
• When any action button command comes from in-vehicle HMI, the request shall be processed instantaneously
• When any action button command comes from remote Applink, the request shall be processed within 5 seconds
• When any action button command comes from remote app cellular connection, the request shall be processed within 25 seconds
• Manual Transmission vehicles shall have electronic parking brake
• BCM Gen I or Gen III are required for feature implementation (Gen II does not support the feature)

3 FEATURE IMPLEMENTATION ARCHITECTURE

3.1 Functional Architecture

3.1.1 Description

Trailer Light Check (TLC) feature can be implemented in vehicles with FNV2 architecture and above (except FNV2.1 which has a low cost BCM Gen II) and in vehicles that have a Ford factory/dealer installed trailer wiring and connector. TLC feature will utilize exterior rear lighting connected to BCM and iTRM / BCMc to control vehicle and trailer lights via in-vehicle UI and remote app (FordPass or Lincoln Way).

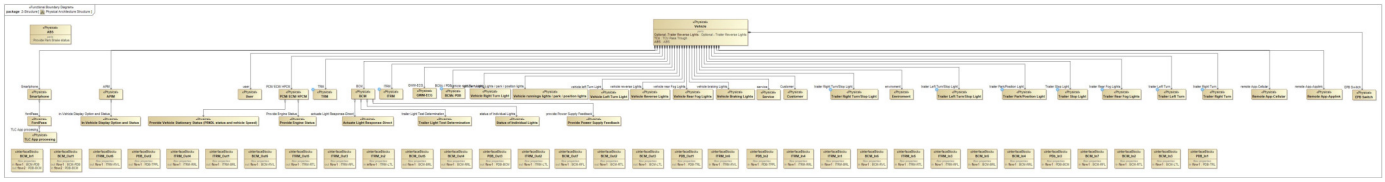


Figure 3-1: Physical Architecture Structure

3.1.2 Function List

The following functions from the Global Feature & Function List are referenced in this Feature Implementation Specification:

Function ID	Function Name	Function Description
	Detect Vehicle Stationary Status	This function will determine the stationary status of the vehicle. The vehicle is determined to be stationary if vehicle speed is < 4kph and either PRNDL is in “Park” (automatic transmission vehicles only) OR electronic parking brake is applied (manual transmission vehicles only).
	Show Publishing Light Status	Displays Light Status on UI while performing Trailer Light Test
	Show Pre-condition Status	This function will display the pre-condition status of the feature on FordPass or in-vehicle HMI. When one or more of the pre-conditions are not met for the feature and user

Function ID	Function Name	Function Description
		requests test to be initiated, the HMI will indicate to the user what must be done to the vehicle for the test to begin. • If vehicle is not stationary, the HMI will tell the user to stop vehicle movement and shift to park (or apply parking brake for manual transmission vehicles) • If Trailer is not connected with vehicle, the HMI will tell the user to ensure the trailer connection is made • If 12v battery SOC < 75% with battery not supported (engine off), the HMI will tell the user to start the engine for test to begin • If the rear fog lights or one of the taillights are illuminated (position / rear fog / reverse / turn indicators / brake / hazards / license plate), the HMI will tell the user to ensure the brake pedal, turn indicator, hazard lights, rear fog lights are not being manually activated • If ignition is not on or in acc., the HMI will tell the user to turn on ignition in order to start test • If another feature that impacts exterior lighting is active (ie. Police Dark Car, Silent Car, RePA, etc.), the HMI will tell the user to turn off interfering external lighting feature Some vehicles on FMVSS markets have a trailer connection without a TRM or ITRM, In these cases the trailer connection precondition cannot be assessed.
	Trailer Light Check User Request	This function allows the user to select to initiate or end Trailer Light Check using in-vehicle HMI or FordPass / Lincoln Way. When the user selects the start or stop buttons this function will send the user input to Conduct Trailer Light Check function. This function also serves to acknowledge receipt of test in progress message.
	Assess Pre-conditions for Trailer Light Test	This function assesses the pre-conditions for enabling the Trailer Light Check to be initiated. The Trailer Light Check feature will not be initiated or the test will exit if already initiated when the following pre-conditions are not met: Ignition Status = RUN, Engine Status = ON OR Engine Status = OFF AND 12v Battery SOC >= 75%, Vehicle Stationary Status = Stationary, Trailer connected, all parking / position lamps are OFF (except parking or position lights) unless demanded by Trailer Light Check, and other features that affect exterior lighting are not active (i.e. Police Dark Car, Silent Car, RePA, etc). This function will also send Pre-condition status message to Conduct Trailer Light Check and Show Pre-Condition Status functions.
	Detect Trailer Connection	Indicates the status of whether the trailer is connected to the vehicle or not.

Function ID	Function Name	Function Description
	Indicate Test Complete	This function will display the test completion status of the feature and potentially troubleshooting information on FordPass / Lincoln Way or in-vehicle HMI. When the Trailer Light Check has completed, the HMI will display a message popup indicating test has been completed with two buttons – Troubleshooting and Exit. At test completion, the user selects the Exit button and will return to the feature main screen. If a problem has been detected, the user selects the Troubleshooting button to see instructions on how to proceed. Troubleshooting text: • Check trailer wiring harness connection at vehicle • Check trailer tow fuses in power distribution box. See owner's manual • Perform an inspection on trailer lamps • Replace faulty bulb or take vehicle/trailer in for service
	Trailer Light Check HMI Display	This function provides an HMI interface to the user on the APIM HMI display and FordPass / Lincoln Way which describes the test and provides the user a method to Start or Stop the test.
	Conduct Trailer Light Check	This function conducts a test of the trailer lights by illuminating each light in conjunction with the vehicle lights.

Function ID	Function Name	Function Description
		Upon initiation of the test, the lights will be illuminated in the sequence below: 1. Parking or position lamps on vehicle and trailer (including front and rear side markers) will turn ON and remain on through test sequences 1-8 1.1 Turn on license plate lights. 2. Wait 2.3* seconds with only parking or position lamps activated on vehicle and trailer (including front and rear side markers) 3. Left turn light on vehicle and trailer will flash on and off 6* times 4. Right turn lights on vehicle and trailer will flash on and off 6* times 5. Brake lights on vehicle and trailer will turn ON for 4.5* seconds 6. Reverse lights on vehicle and trailer will turn ON for 4.5* seconds 7. Rear Fog Lights on trailer will turn ON for 4.5* seconds** 8. Wait 2.3* seconds with only parking or position lamps activated on vehicle and trailer (including front and rear side markers) 9. Turn off all parking / position lamps from vehicle and trailer (including front and rear side markers)*** 9.1 Turn off license plate lights 9.2 Wait 2.3 seconds* 10. Repeat steps 1-8 for 5* times or until user exits out * Duration for each step shall be individually calibrated in addition to number of sequence repetitions. **Step 7 is applicable only to vehicles in ECE homologated markets, in ECE homologated markets, the vehicle rear fog light will not be lit if the trailer is connected. *** If parking or position lamps have been turned on through hard switch in vehicle, parking / position lamps shall remain on during this step. The conduct Trailer Light Check will be initiated only when User_Input = Start_Test and TLC_Precondition_Status = Precondition_Ok

Table 3-1: List of Functions

3.1.3 Signal List

<table>
<tr><th>Signal Name</th><th>Description</th></tr>
<tr><td>Detect_Trailer_Connection</td><td>This logical signal indicates if other features that affect exterior lighting are active or not.
<table>
<tr><th>Data Type</th><th>Init Value</th><th></th></tr>
<tr><td>0x0 – No
0x1 – Yes</td><td>0x0</td><td>0x0</td></tr>
</table></td></tr>
<tr><td>EIPw_D_Stat</td><td>This logical signal indicates the status of whether the 12v battery is supported or not.
<table>
<tr><th>Data Type</th><th>Init Value</th><th></th></tr>
<tr><td>0x0 - Not_Supported
0x1 - Supported
0x2 – Not_Supported_Imminent
0x3 – LV_Event_In_Progress
0x4 – Fault_Limited
0x5 – NotUsed_1
0x6 - NotUsed_2
0x7 - NotUsed_3</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>GearLvrPos_D_Actl</td><td>This logical signal publishes the status of the PRNDL.
<table>
<tr><th>Data Type</th><th>Init Value</th><th></th></tr>
<tr><td>0x0 Park
0x1 Reverse
0x2 Neutral
0x3 Drive
0x4 Sport/Drive Sport
0x5 Low
0x6 1
0x7 2
0x8 3
0x9 4
0xA 5
0xB 6
0xC undefined
0xD undefined
0xE unknown position
0xF fault</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>Ignition_Status</td><td>This logical signal indicates the ignition status of the vehicle.
<table>
<tr><th>Data Type</th><th>Init Value</th><th></th></tr>
<tr><td>0x0 - Unknown
0x1 - Off
0x2 - Accessory
0x4 - Run
0x8 - Start
0xF - Invalid</td><td></td><td></td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Signal Name</th><th>Description</th></tr>
<tr><td>PrkBrkStatus</td><td>This logical signal publishes the status of the EPB state.
<table>
<tr><th>Data Type</th><th>Init Value</th><th></th></tr>
<tr><td>0x0 Not_Supported
0x1 Rear_Caliper_Closed
0x2 Rear_Caliper_Transition
0x3 RWU_by_EPB_Active
0x4 Rear_Caliper_Open
0x5 EPM_Limphome_Active
0x6 ECD_by_Brake_ECU_Active
0x7 GeneralFault_MaintenanceMode</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>Test_Status</td><td>This logical signal indicates when the test is in progress or has completed
<table>
<tr><th>Data Type</th><th>Init Value</th><th></th></tr>
<tr><td>0x0 - Null (Defaulted)
0x1 – Test completed
0x2 – Test ended
0x3 - Test_in_Progress</td><td>0x0 – Null</td><td>0x0 - Nu</td></tr>
</table></td></tr>
<tr><td>TLC_Illum_Light_Status</td><td>This logical signal indicates the light that is illuminated at present instant, when Trailer Light Check
feature is in progress. Note: When publishing light status, lights other than parking lights shall take highest priority for this signal content since parking lights are illuminated throughout test.
<table>
<tr><th>Data Type</th><th>Init Value</th><th></th></tr>
<tr><td>0x0 – Null (defaulted)
0x1 – Park_Light
0x2 – Right_Turn
0x3 – Left_Turn
0x4 – Stop_Light
0x5 – Reverse_Light
0x6 – All_Off
0x7 – Rearfog_Light</td><td>0x0 – Null</td><td>0x0 – Nu</td></tr>
</table></td></tr>
<tr><td>TLC_Precondition_Status</td><td>This logical signal contains information about a particular error or fault states while determining the
preconditions for Trailer Light Check feature.
<table>
<tr><th>Data Type</th><th>Init Value</th><th></th></tr>
<tr><td>0x0 – Null
0x1 – Ignition_Not_On
0x2 – Tailight_Active
0x3 – Start_Engine
0x4 – Precondition_Ok</td><td>0x0 – NULL</td><td>0x0 – NU</td></tr>
</table></td></tr>
</table>

Signal Name	Description
	0x5 – Other_Feature_Interaction 0x6 – Not_Stationary 0x7 – Trailer_Not_Connected
User_Input	When user selects Start Test or Stop Test using in-vehicle or FordPass UI, this logical signal notifies if the user is requesting the test to be initiated or cancelled and sends acknowledgement of receipt of test status. **Data Type**: 0x0 - Null (Defaulted) 0x1 - Stop_Test 0x2 - Start_Test 0x3 - Test_end_ack **Init Value**: 0x0 = Null (Defaulted) 0x0 = Nu
Vehicle_Speed	This logical signal publishes the vehicle speed. **Data Type**: 0 to 655.35 KPH **Init Value**

Table 3-2: List of Logical Signals

3.2 Physical Architecture

3.2.1 E/E Architecture

3.2.1.1 E/E Architecture Variants

E/E Architecture Variant Name	Variant Description	Variant Condition (Optional)
FMVSS-108 Platform Architecture	It is applied to all FMVSS vehicles with iTRM	
FMVSS-108 Platform Architecture – Less ITRM	Relay based PDB solution on low series vehicles without ITRM/TRM	When iTRM is not available, the feature will work but will not support trailer connected as a precondition
ECE R/48 Rev .7 Platform Architecture	It is applied to ECE Homologated markets	

Table 3-3: List of E/E Architecture Variants

3.2.1.1.1 E/E Architecture “Architecture Variant: FMVSS homologated markets without iTRM/ with PDBc driving trailer lamps “

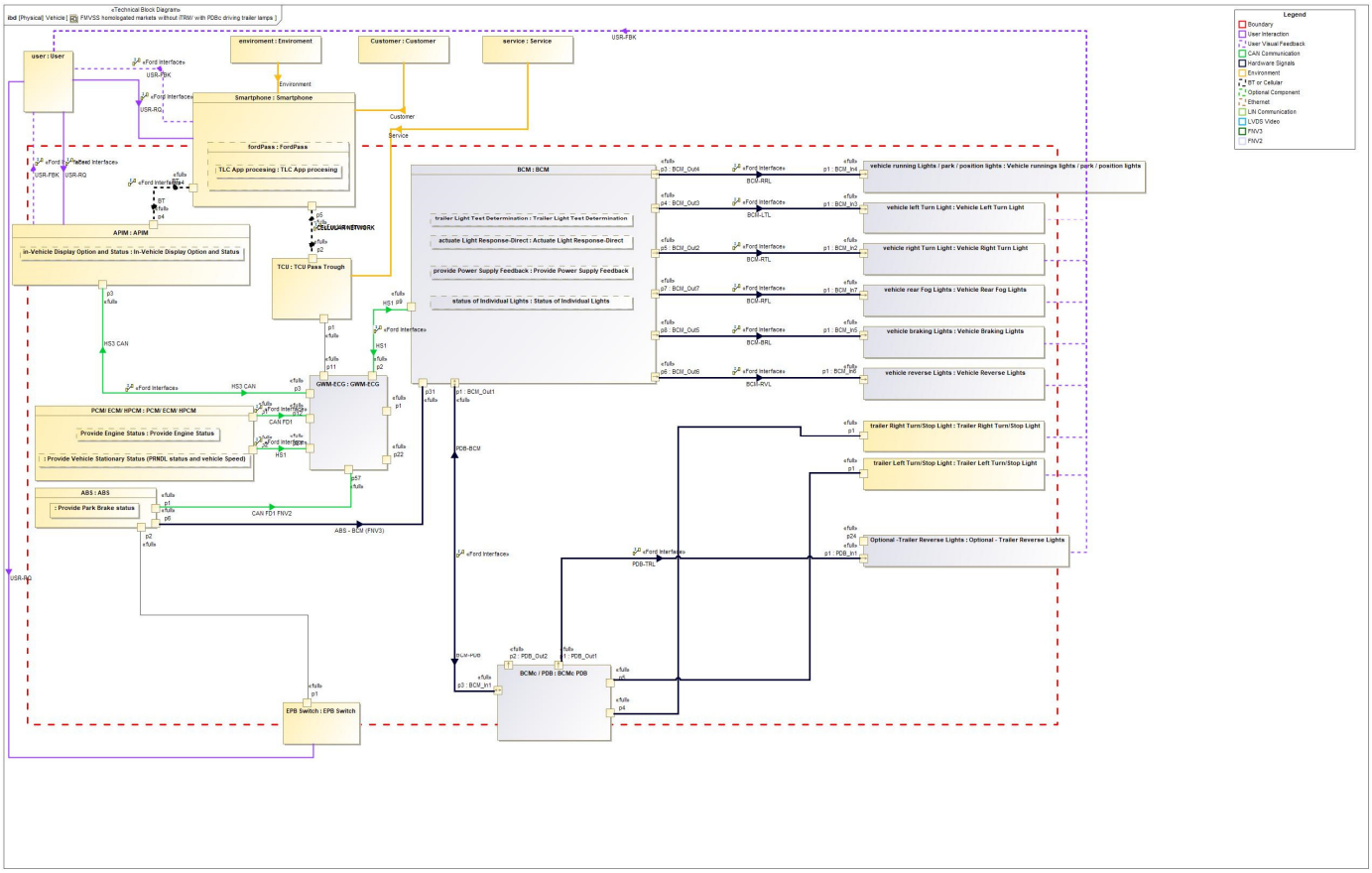


Figure 3-2-1: FMVSS homologated markets without iTRM/ with PDBc driving trailer lamps

3.2.1.1.2 E/E Architecture “Architecture Variant: FMVSS homologated markets with iTRM “

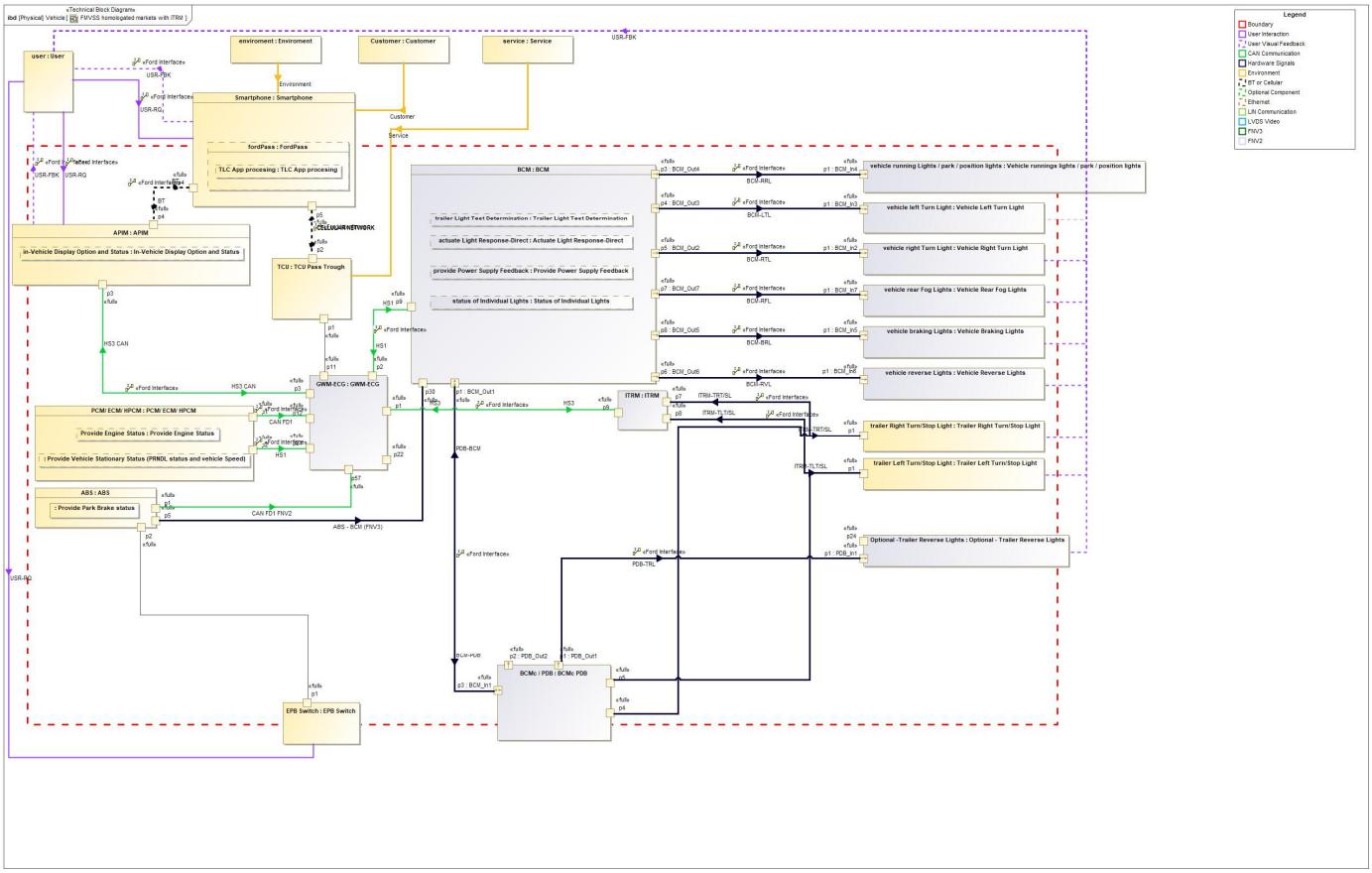


Figure 3-3-2: FMVSS homologated markets with iTRM

3.2.1.1.3 E/E Architecture “Architecture Variant: ECE Homologated markets “

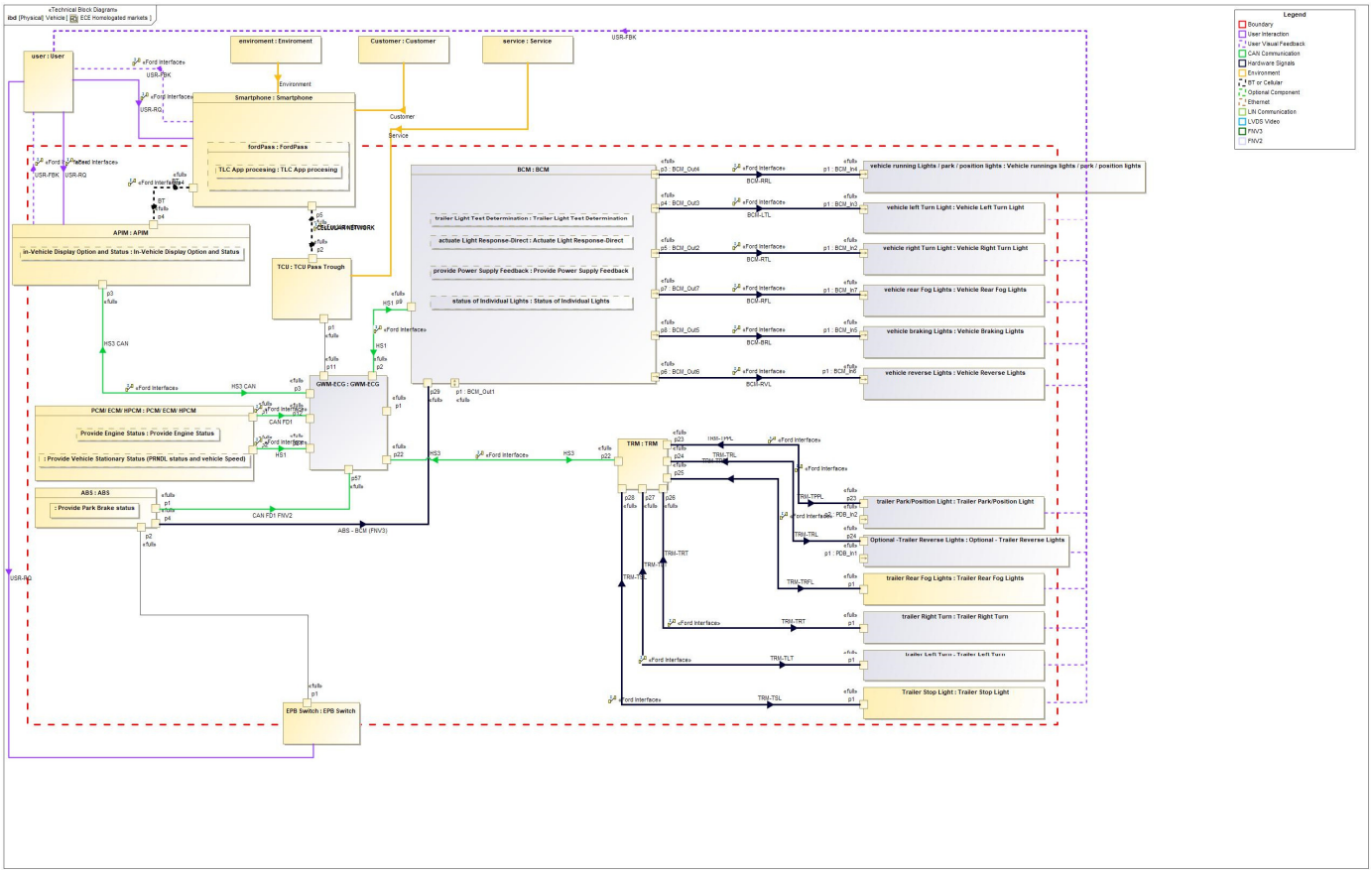


Figure 3-4-3: ECE Homologated markets

3.2.1.1.4 E/E Architecture “Architecture Variant: Network Architecture “

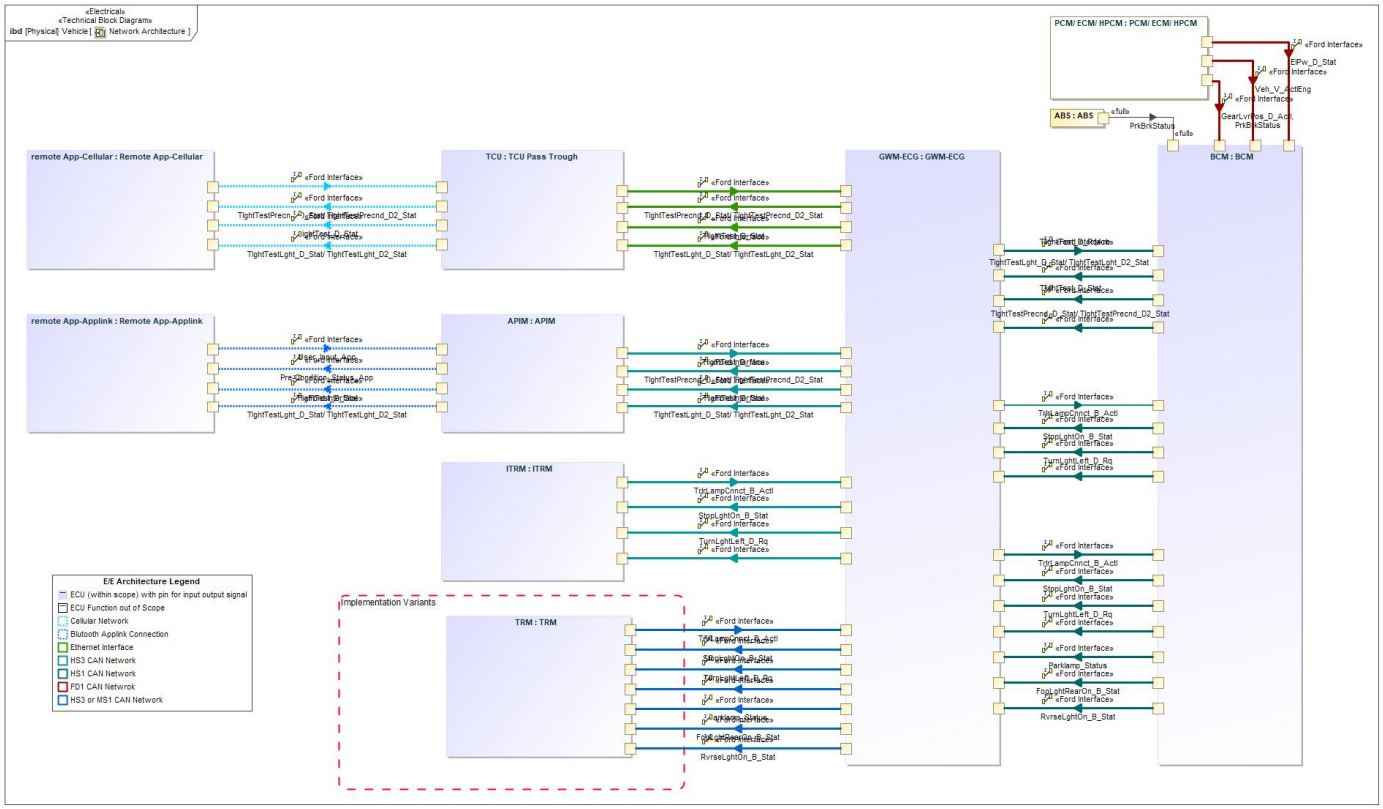


Figure 3-5-4: Network Architecture

3.2.1.2 E/E Components

Component Name	**Description**
ABS	Anti-lock Braking System.
APIM	Application Protocol Interface Module
BCM	Body Computer Module.
GWM-ECG	Gateway Module.
ITRM	Integrated Trailer Module
PCM/ ECM/ HPCM	Power Control Module.
remote App-Applink (Remote App-Applink)	Access from remote app.
remote App-Cellular (Remote App-Cellular)	Access from celular application.
TCU (TCU Pass Trough)	Telematics Control Unit
TRM	Trailer Tow Lighting Module (Trailer Module).

Table 3-4: Electrical Components

3.2.1.3 E/E Connections

Connection Name	**Type**	**Description**	**Connected Nodes**
HS1 CAN	High Speed	High speed 1 CAN network	BCM, GWM_ECG, BCMc / PDBc
HS3 CAN	High Speed	High speed 3 CAN network	APIM, GWM_ECG, TRM_ITRM

FD1 CAN	Flexible Data-rate	CAN – Flexible Data-rate	PCM, ECM, TCM, BCM, GWM_ECG, SOBDMC, ABS, BCMc / PDBc
Ethernet	Ethernet	Ethernet connection	GWM_ECG, TCU

3.2.1.4 Signal List

Signal Name	Description
EIPw_D_Stat	This technical signal indicates the status of whether the 12v battery is supported or not 0x0 - Unknown 0x1- Off 0x2 - Accessory 0x4 - Run 0x8 - Start 0xF - Invalid
FogLghtRearOn_B_Stat	Indicates the status of rear fog lamps. 0x0 - Off 0x1 – On
GearLvrPos_D_Actl	This technical signal publishes the status of the PRNDL. 0x0 Park 0x1 Reverse 0x2 Neutral 0x3 Drive 0x4 Sport/Drive Sport 0x5 Low 0x6 1 0x7 2 0x8 3 0x9 4 0xA 5 0xB 6 0xC undefined 0xD undefined 0xE unknown position 0xF fault
Ignition_Status	This technological signal indicates the ignition status of the vehicle 0x0 - Unknown 0x1- Off 0x2 - Accessory 0x4 - Run 0x8 - Start 0xF - Invalid
Parklamp_Status	
PrkBrkStatus	Indicates the desired status of the park lamps relay prior to consideration of 12v battery voltage and Diagnostics PID control. This is identical to the Parklamps_Command internal dataflow which is the command to control the position / park lamps. 0x0 Not_Supported 0x1 Rear_Caliper_Closed

<table>
<tr><th>Signal Name</th><th>Description</th></tr>
<tr><td></td><td>0x2 Rear_Caliper_Transition
0x3 RWU_by_EPB_Active
0x4 Rear_Caliper_Open
0x5 EPM_Limphome_Active
0x6 ECD_by_Brake_ECU_Active
0x7 GeneralFault_MaintenanceMode</td></tr>
<tr><td>PrkBrkStatus</td><td>This logical signal publishes the status of the EPB state.
<table><tr><th>Data Type</th><th>Init Value</th><th>(</th></tr><tr><td>0x0 Not_Supported
0x1 Rear_Caliper_Closed
0x2 Rear_Caliper_Transition
0x3 RWU_by_EPB_Active
0x4 Rear_Caliper_Open
0x5 EPM_Limphome_Active
0x6 ECD_by_Brake_ECU_Active
0x7 GeneralFault_MaintenanceMode</td><td></td><td></td></tr></table></td></tr>
<tr><td>RvrseLghtOn_B_Stat</td><td>Indicates the status of reverse lights command.

0x0 - Off
0x1 – On</td></tr>
<tr><td>StopLghtOn_B_Stat</td><td>Indicates whether status of Brake Lamp activation for any reason.

0x0 - Off
0x1 – On</td></tr>
<tr><td>StopLghtOn_B_Stat</td><td>Indicates whether status of Brake Lamp activation for any reason.

0x0 - Off
0x1 – On</td></tr>
<tr><td>StopLghtOn_B_Stat</td><td>Indicates whether status of Brake Lamp activation for any reason.

0x0 - Off
0x1 – On</td></tr>
<tr><td>TlghtTest_D_Stat</td><td>FTCP Command</td></tr>
<tr><td>TlghtTestLght_D2_Stat</td><td>FTCP Command</td></tr>
<tr><td>TlghtTestLght_D_Stat/
TlghtTestLght_D2_Stat</td><td>Signal indicates which light is being tested/illuminated.

0x0 – Null (Defaulted)
0x1 – ParkingLightsIlluminated
0x2 – TestingRightTurnSignal
0x3 – TestingLeftTurnSignal
0x4 – TestingBrakeLights
0x5 – TestingReverseLights
0x6 – AllOff
0x7 – TestingRearFogLights</td></tr>
</table>

Signal Name	Description
TlghtTestPrecnd_D2_Stat	FTCP Command
TlghtTestPrecnd_D_Stat/ TlghtTestPrecnd_D2_Stat	0x0 – Null (Defaulted) 0x1 – IgnitionNotOn 0x2 – TailLightsOn 0x3 – BattSocLessThan75Percent 0x4 - PreconditionsPassed 0x5 – InteractionPresent 0x6 – NotStationary 0x7 – TrailerNotConnected
TlightTest_D_RqArb	User input signal containing user request and acknowledgement of receipt of test status. 0x0 - Null (Defaulted) 0x1 - Complete 0x2 - Ended 0x3 - InProgress
TlightTest_D_RqOta	This signal indicates user request and acknowledgement of test complete signal
TlightTest_D_Stat	This technical signal indicates when the test is in progress or has completed 0x0 - Null (Defaulted) 0x1 – Test completed 0x2 – Test ended 0x3 - Test_in_Progress
TrlrLampCnnct_B_Actl	User input signal containing user request and acknowledgement of receipt of test status. 0x0 – No 0x1 – Yes
TrlrLampCnnct_B_Actl	Indicates if a trailer is connected on the trailer lamp circuit. 0x0 – No 0x1 – Yes
TrlrLampCnnct_B_Actl	TrlrLampCnnct_B_Actl 0x0 – No 0x1 – Yes
TurnLghtLeft_D_Rq	Indicates the command for exterior left turn signal / hazard lights. 0x0 Null 0x1 Off 0x2 On 0x3 Seq
TurnLghtLeft_D_Rq	Indicates the command for exterior left turn signal / hazard lights. 0x0 Null 0x1 Off 0x2 On 0x3 Seq

Signal Name	Description
TurnLghtLeft_D_Rq	Indicates the command for exterior left turn signal / hazard lights. 0x0 Null Off On Seq 0x1 0x2 0x3
TurnLghtRight_D_Rq	Indicates the command for exterior right turn signal / hazard lights. 0x0 Null 0x1 Off 0x2 On 0x3 Seq
TurnLghtRight_D_Rq	Indicates the command for exterior right turn signal / hazard lights. 0x0 Null 0x1 Off 0x2 On 0x3 Seq
TurnLghtRight_D_Rq	Indicates the command for exterior right turn signal / hazard lights. 0x0 Null 0x1 Off 0x2 On 0x3 Seq
User_Input_App	User selects Start or Stop buttons using in-vehicle HMI or FordPass / Lincoln Way UI, this logical signal notifies if the user is requesting the test to be initiated or stopped
Veh_V_ActlEng	This technical signal publishes the vehicle speed. - 0 to 655.35 KPH

Table 3-5: List of Technical Signals

3.2.2 Software Component Architecture

No Software Component Architecture Diagrams identified.

3.3 Function Deployment

3.3.1 Deployment Variants

3.3.1.1 Deployment Vehicle System Behavior

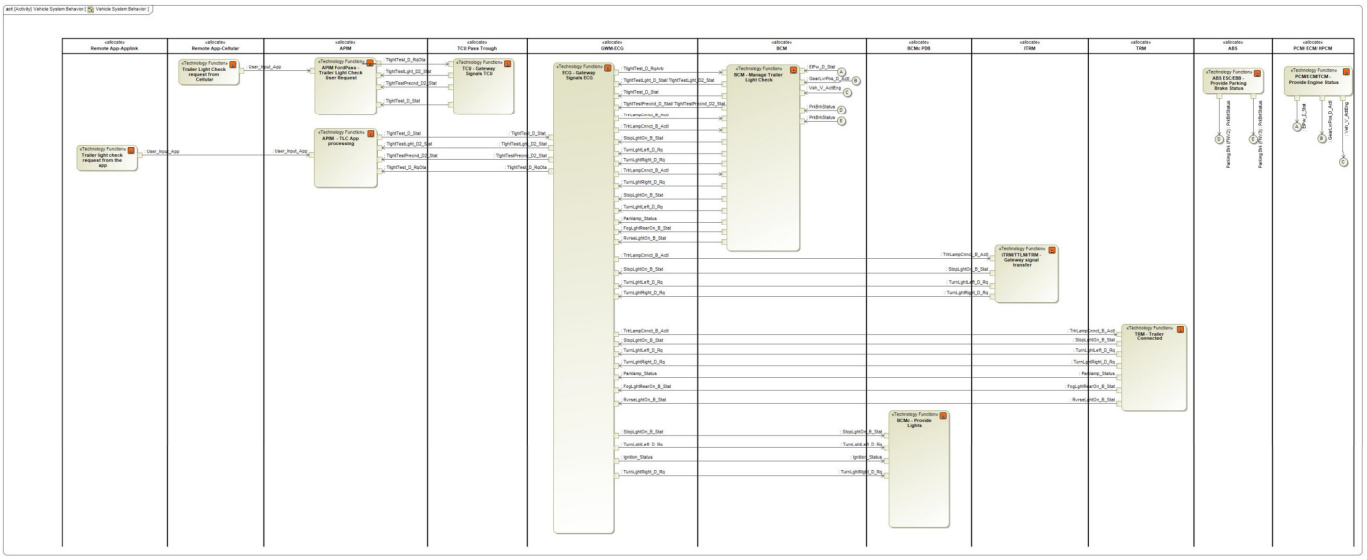


Figure 3-6: Vehicle System Behavior

3.3.2 Function Allocation

Component	Technology Function Name	Logical Function Name
ABS	ABS ESC/EBB - Provide Parking Brake Status	*No logical function Realized by this Technology function.*
APIM	APIM FordPass - Indicate Test Complete	*No logical function Realized by this Technology function.*
	APIM - TLC App processing	Show Pre-condition Status Trailer Light Check HMI Display Trailer Light Check User Request Show Publishing Light Status Indicate Test Complete
	APIM FordPass - Trailer Light Check HMI Display	*No logical function Realized by this Technology function.*
	APIM FordPass - Show Pre-Condition Status	*No logical function Realized by this Technology function.*
	APIM FordPass - Trailer Light Check User Request	Trailer Light Check HMI Display Trailer Light Check User Request Show Pre-condition Status Show Publishing Light Status Indicate Test Complete
BCM	BCM - Conduct Trailer Light Check	*No logical function Realized by this Technology function.*

	BCM - M2 Config	*No logical function Realized by this Technology function.*
	BCM - Manage Trailer Light Check	Assess Pre-conditions for Trailer Light Test Conduct Trailer Light Check
BCMc PDB	BCMc - Provide Lights	*No logical function Realized by this Technology function.*
GWM-ECG	ECG - Gateway Signals ECG	*No logical function Realized by this Technology function.*
	ECG - GWM M2_config	*No logical function Realized by this Technology function.*
ITRM	iTRM/TTLM/TRM - Gateway signal transfer	*No logical function Realized by this Technology function.*
	iTRM/TTLM/TRM - Trailer Connect	*No logical function Realized by this Technology function.*
PCM/ ECM/ HPCM	PCM/ECM/TCM - Provide Engine Status	Detect Vehicle Stationary Status
Remote App-Applink	Trailer light check request from the app	*No logical function Realized by this Technology function.*

Remote App-Cellular	Trailer Light Check request from Cellular	*No logical function Realized by this Technology function.*
TCU Pass Trough	TCU - Gateway Signals TCU	*No logical function Realized by this Technology function.*
TRM	TRM - Trailer Connected	Detect Trailer Connection

Table 3-6: Function Allocation Table (Basic)

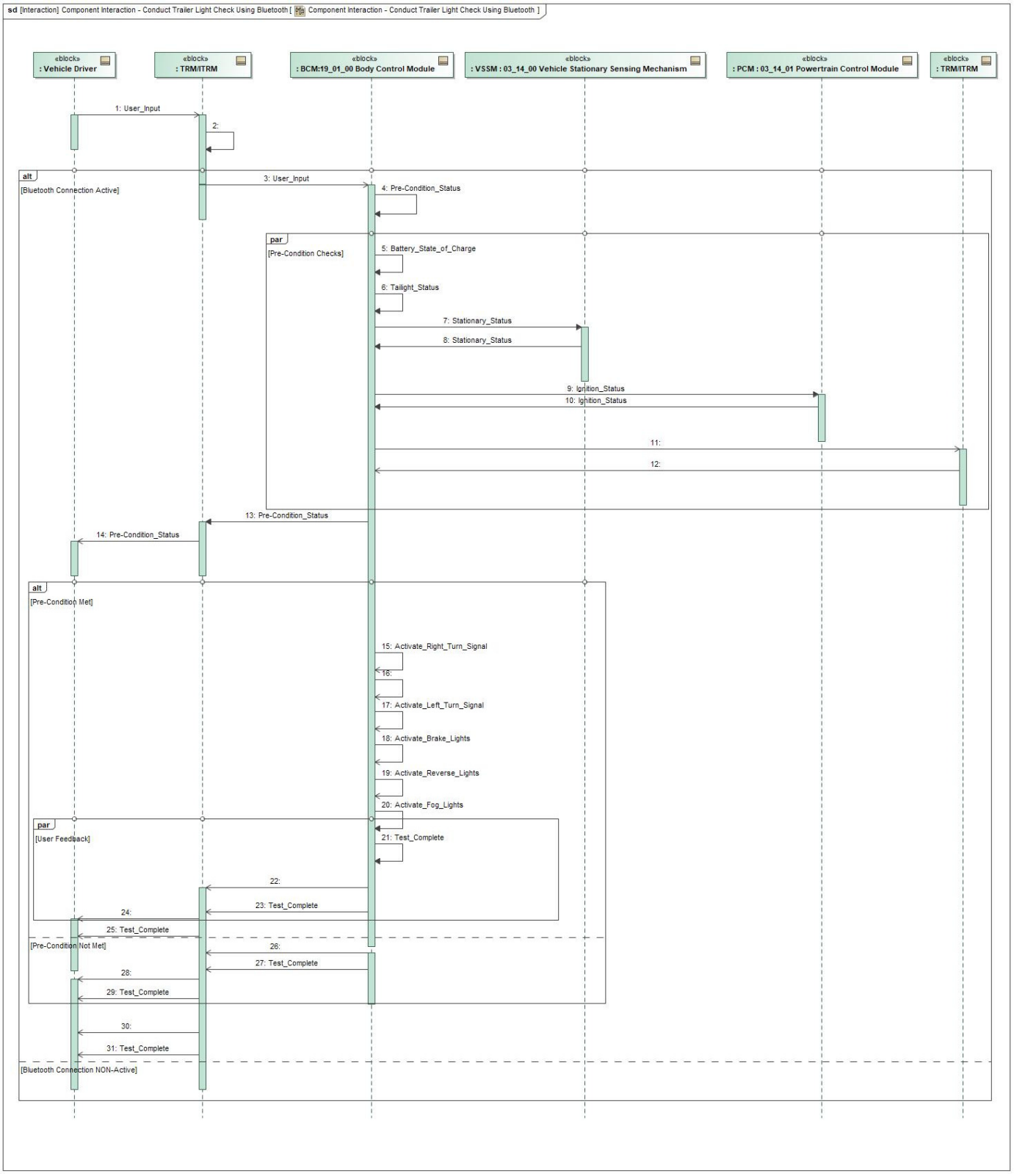
Component		Technology Function Name	TSR	
Name	**ASIL**		**ID**	**ASIL**

Table 3-7: Function Allocation Table (Functional Safety Extension)

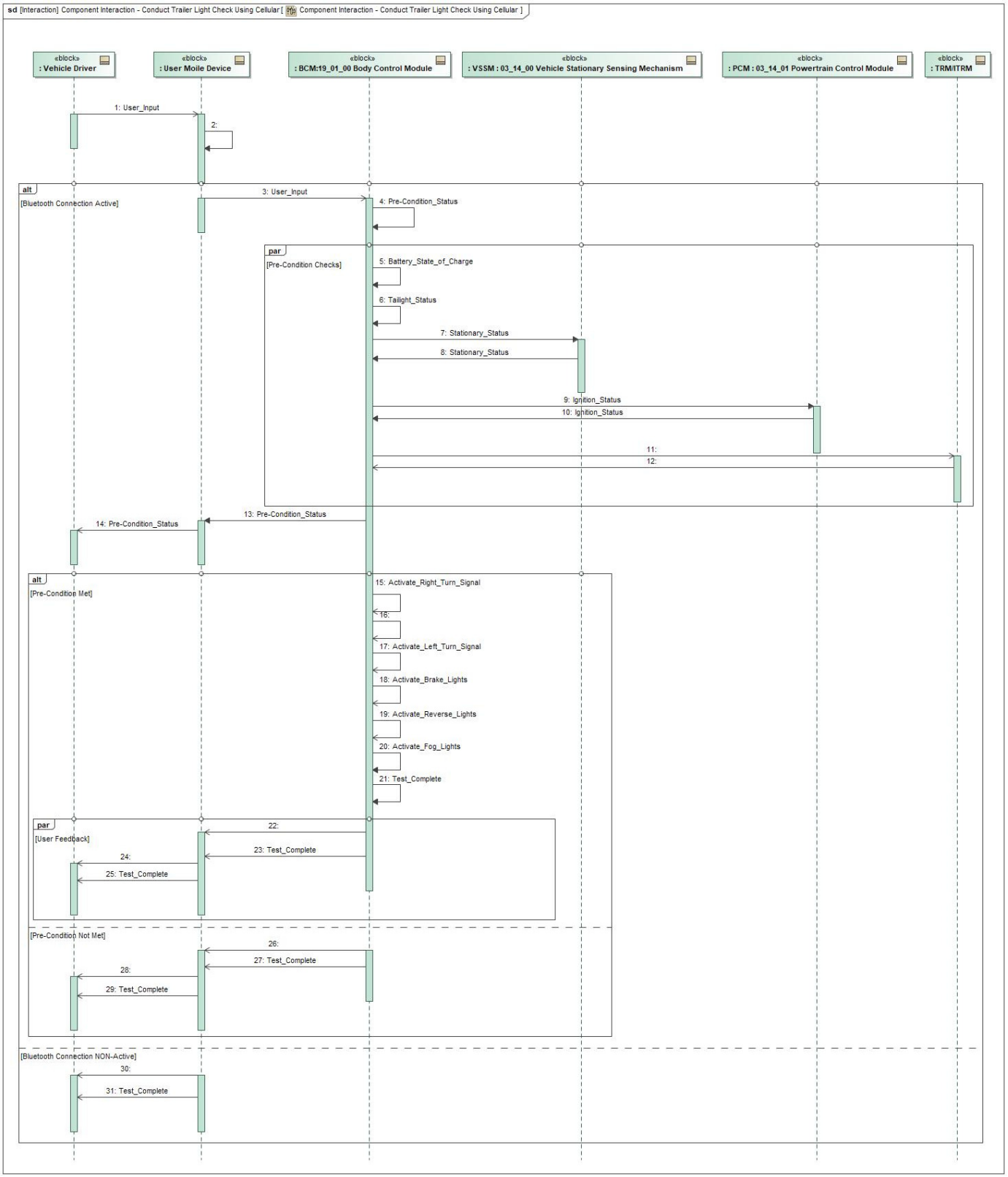
4 FEATURE IMPLEMENTATION MODELING

4.1 Component Interaction Diagrams

4.1.1 Scenario: Component Interaction - Conduct Trailer Light Check Using Bluetooth



4.1.2 Scenario: Component Interaction - Conduct Trailer Light Check Using Cellular



4.2 Component Interface Behavior Diagrams

No Component Interface Diagrams identified.

See Appendix Section 8.1.9 for Technology State Machines

5 FEATURE IMPLEMENTATION REQUIREMENTS

5.1 Functional Safety

5.1.1 ASIL Decomposition of Technical Safety Requirements

ASIL Decompositions not specified.

5.2 Requirements on Components

5.2.1 ABS

ABS

5.2.1.1 Technology Function ABS ESC/EBB - Provide Parking Brake Status

Provide Parking Brake Status.

5.2.1.1.1 Function Interfaces

5.2.1.1.1.1 Inputs

(No inputs have been defined)

5.2.1.1.1.2 Outputs

Output Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Publisher Interface	Connection (*Optional*)
Parking Brk (FNV2)	PrkBrkStatus	PrkBrkStatus	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
Parking Brk (FNV3)	PrkBrkStatus	PrkBrkStatus	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-1: Output Signal mappings of Function

5.2.1.1.1.3 Parameters

(No parameters have been defined)

5.2.1.1.1.4 Interface Requirements

No Interface Requirements identified for Function ABS ESC/EBB - Provide Parking Brake Status

5.2.1.1.2 Function Requirements

5.2.1.1.2.1 Component Specific Requirements

###R_CMP_Trailer Light Check_00005### - Park brake status unavailable for less than 5 seconds (manual transmission ONLY)

When PrkBrkStatus is not available for less than 5 seconds, BCM shall hold onto previous value of PrkBrkStatus for determining vehicle stationary status of Trailer Light Check feature

Satisfied by:

- ABS ESC/EBB - Provide Parking Brake Status
- BCM - Manage Trailer Light Check

###R_CMP_Trailer Light Check_00006### - Park brake status unavailable for more than 5 seconds (manual transmission ONLY)

When PrkBrkStatus is not available for 5 or more seconds, BCM shall set vehicle stationary status to 0x0 (Not stationary)

Satisfied by:

- ABS ESC/EBB - Provide Parking Brake Status
- BCM - Manage Trailer Light Check

5.2.2 APIM

APIM

5.2.2.1 Technology Function APIM FordPass - Indicate Test Complete

Indicate Test Complete

5.2.2.1.1 Function Interfaces

5.2.2.1.1.1 Inputs

(No inputs have been defined)

5.2.2.1.1.2 Outputs

(No outputs have been defined)

5.2.2.1.1.3 Parameters

(No parameters have been defined)

5.2.2.1.1.4 Interface Requirements

No Interface Requirements identified for Function APIM FordPass - Indicate Test Complete

5.2.2.1.2 Function Requirements

5.2.2.1.2.1 Component Specific Requirements

No “Approved” or “Ready for Review” requirements identified for this function.

5.2.2.2 Technology Function APIM - TLC App processing

TLC App processing

5.2.2.2.1 Function Interfaces

5.2.2.2.1.1 Inputs

Input Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Subscriber Interface	Connection *(Optional)*
input	User_Input_App	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input1	TlghtTestLght_D2_Stat	TLC_Illum_Light_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input2	TlghtTestPrecnd_D2_Stat	TLC_Precondition_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input3	TlightTest_D_RqOta	User_Input	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-2: Input Signal mappings of Function

5.2.2.2.1.2 Outputs

Output Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Publisher Interface	Connection *(Optional)*
output	TlghtTest_D_Stat	Test_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-3: Output Signal mappings of Function

5.2.2.2.1.3 Parameters

(No parameters have been defined)

5.2.2.2.1.4 Interface Requirements

No Interface Requirements identified for Function APIM - TLC App processing

5.2.2.2.2 Function Requirements

5.2.2.2.2.1 Component Specific Requirements

###R_CMP_Trailer Light Check_00010### - APIM signal timing for Trailer Light Check

The signals mentioned in this document shall be published within the timing of 1000 milliseconds.
TLC_Precondition_Status (TlghtTestPrecnd_D_Stat/TlghtTestPrecnd_D2_Stat); Test_Status (TlghtTest_D_Stat); TLC_Illum_Light_Status (TlghtTestLght_D_Stat/TlghtTestLght_D2_Stat), User_Input (TlightTest_D_Mnu)

Satisfied by:

- APIM - TLC App processing
- APIM FordPass - Trailer Light Check User Request

###R_CMP_Trailer Light Check_00011### - APIM signal latency for Trailer Light Check

The signals mentioned in this document shall be published with a signal latency of 40 milliseconds.
TLC_Precondition_Status (TlghtTestPrecnd_D_Stat/TlghtTestPrecnd_D2_Stat); Test_Status (TlghtTest_D_Stat); TLC_Illum_Light_Status (TlghtTestLght_D_Stat/TlghtTestLght_D2_Stat), User_Input (TlightTest_D_Mnu)

Satisfied by:

- APIM - TLC App processing
- APIM FordPass - Trailer Light Check User Request

5.2.2.3 Technology Function APIM FordPass - Trailer Light Check HMI Display

Trailer Light Check HMI Display

5.2.2.3.1 Function Interfaces

5.2.2.3.1.1 Inputs

(No inputs have been defined)

5.2.2.3.1.2 Outputs

(No outputs have been defined)

5.2.2.3.1.3 Parameters

(No parameters have been defined)

5.2.2.3.1.4 Interface Requirements

No Interface Requirements identified for Function APIM FordPass - Trailer Light Check HMI Display

5.2.2.3.2 Function Requirements

5.2.2.3.2.1 Component Specific Requirements

No “Approved” or “Ready for Review” requirements identified for this function.

5.2.2.4 Technology Function APIM FordPass - Show Pre-Condition Status

Show Pre-Condition Status

5.2.2.4.1 Function Interfaces

5.2.2.4.1.1 Inputs

(No inputs have been defined)

5.2.2.4.1.2 Outputs

(No outputs have been defined)

5.2.2.4.1.3 Parameters

(No parameters have been defined)

5.2.2.4.1.4 Interface Requirements

No Interface Requirements identified for Function APIM FordPass - Show Pre-Condition Status

5.2.2.4.2 Function Requirements

5.2.2.4.2.1 Component Specific Requirements

No “Approved” or “Ready for Review” requirements identified for this function.

5.2.2.5 Technology Function APIM FordPass - Trailer Light Check User Request

Trailer Light Check User Request

5.2.2.5.1 Function Interfaces

5.2.2.5.1.1 Inputs

Input Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Subscriber Interface	Connection *(Optional)*
input1	TlghtTestLght_D2_Stat	TLC_Illum_Light_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input2	TlghtTestPrecnd_D2_Stat	TLC_Precondition_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input3	TlghtTest_D_Stat	Test_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input	User_Input_App	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-4: Input Signal mappings of Function

5.2.2.5.1.2 Outputs

Output Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Publisher Interface	Connection *(Optional)*
output	TlightTest_D_RqOta	User_Input	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-5: Output Signal mappings of Function

5.2.2.5.1.3 Parameters

(No parameters have been defined)

5.2.2.5.1.4 Interface Requirements

No Interface Requirements identified for Function APIM FordPass - Trailer Light Check User Request

5.2.2.5.2 Function Requirements

5.2.2.5.2.1 Component Specific Requirements

###R_CMP_Trailer Light Check_00010### - APIM signal timing for Trailer Light Check

The signals mentioned in this document shall be published within the timing of 1000 milliseconds.
TLC_Precondition_Status (TlghtTestPrecnd_D_Stat/TlghtTestPrecnd_D2_Stat); Test_Status (TlghtTest_D_Stat); TLC_Illum_Light_Status (TlghtTestLght_D_Stat/TlghtTestLght_D2_Stat), User_Input (TlightTest_D_Mnu)

Satisfied by:

- APIM - TLC App processing
- APIM FordPass - Trailer Light Check User Request

###R_CMP_Trailer Light Check_00011### - APIM signal latency for Trailer Light Check

The signals mentioned in this document shall be published with a signal latency of 40 milliseconds.
TLC_Precondition_Status (TlghtTestPrecnd_D_Stat/TlghtTestPrecnd_D2_Stat); Test_Status (TlghtTest_D_Stat); TLC_Illum_Light_Status (TlghtTestLght_D_Stat/TlghtTestLght_D2_Stat), User_Input (TlightTest_D_Mnu)

Satisfied by:

- APIM - TLC App processing
- APIM FordPass - Trailer Light Check User Request

5.2.3 BCM

BCM

5.2.3.1 Technology Function BCM - Conduct Trailer Light Check

Conduct Trailer Light Check

5.2.3.1.1 Function Interfaces

5.2.3.1.1.1 Inputs

(No inputs have been defined)

5.2.3.1.1.2 Outputs

(No outputs have been defined)

5.2.3.1.1.3 Parameters

(No parameters have been defined)

5.2.3.1.1.4 Interface Requirements

No Interface Requirements identified for Function BCM - Conduct Trailer Light Check

5.2.3.1.2 Function Requirements

5.2.3.1.2.1 Component Specific Requirements

###R_CMP_Trailer Light Check_00001### - BCM signal timing for Trailer Light Check

The signals mentioned in this document shall be published within the timing of 1000 milliseconds.
TLC_Precondition_Status (TlghtTestPrecnd_D_Stat/TlghtTestPrecnd_D2_Stat); Test_Status (TlghtTest_D_Stat); TLC_Illum_Light_Status (TlghtTestLght_D_Stat/TlghtTestLght_D2_Stat); Parking lights (Parklamp_Status), Reverse lights (RvrseLghtOn_B_Stat), Stop lights (StopLghtOn_B_Stat), Left indicator telltale (TurnLghtLeftOn_B_Stat), Left

turn activation (TurnLghtLeft_D_Rq), Right indicator telltale (TurnLghtRightOn_B_Stat), Right turn activation (TurnLghtRight_D_Rq), Rear fog lights (FogLghtRearOn_B_Stat).

Satisfied by:

- BCM - Conduct Trailer Light Check
- BCM - M2 Config
- BCM - Manage Trailer Light Check
- BCMc - Provide Lights

###R_CMP_Trailer Light Check_00002### - BCM signal latency for Trailer Light Check

The signals mentioned in this document shall be published with a signal latency of 40 milliseconds. TLC_Precondition_Status (TlghtTestPrecnd_D_Stat/TlghtTestPrecnd_D2_Stat); Test_Status (TlghtTest_D_Stat); TLC_Illum_Light_Status (TlghtTestLght_D_Stat/TlghtTestLght_D2_Stat); Parking lights (Parklamp_Status), Reverse lights (RvrseLghtOn_B_Stat), Stop lights (StopLghtOn_B_Stat), Left indicator telltale (TurnLghtLeftOn_B_Stat), Left turn activation (TurnLghtLeft_D_Rq), Right indicator telltale (TurnLghtRightOn_B_Stat), Right turn activation (TurnLghtRight_D_Rq), Rear fog lights (FogLghtRearOn_B_Stat).

Satisfied by:

- BCM - Conduct Trailer Light Check
- BCM - M2 Config
- BCM - Manage Trailer Light Check
- BCMc - Provide Lights

###R_CMP_Trailer Light Check_00012### - TlghtTest_D_RqArb signal behavior

TlghtTest_D_RqArb signal shall publish values based on the logic mentioned in Table 18 below:

Requirement#	TlightTest_D_RqOta	TlightTest_D_Mnua	TlghtTest_D_Stat	TlghtTest_D_RqArb
R_CMP_Trailer ~~L~~Light Check_00083.1	0x2 (Start test)	Not [0x1]	Not [0x3]	0x2 (Start test)
R_CMP_Trailer Light Check_00083.2	Not [0x1]	0x2 (Start test)	Not [0x3]	0x2 (Start test)
R_CMP_Trailer Light Check_00083.3	0x1 (Stop test)	Don't care	Don't care	0x1 (Stop test)
R_CMP_Trailer Light Check_00083.4	Don't care	0x1 (Stop test)	Don't care	0x1 (Stop test)
R_CMP_Trailer Light Check_00083.5	Not [0x1]	Not [0x1]	0x3 (Test in progress)	0x0 (Null)

R_CMP_Trailer Light Check_00083.6	Don't care	Don't care	0x1 (Test completed) or 0x2 (Test ended)	0x3 (Test end ack)
R_CMP_Trailer Light Check_00083.7	Not [0x1 or 0x2]	Not [0x1 or 0x2]	0x0 (Null)	0x0 (Null)

Satisfied by:

- BCM - Conduct Trailer Light Check

5.2.3.2 Technology Function BCM - M2 Config

BCM_M2_Config

5.2.3.2.1 Function Interfaces

5.2.3.2.1.1 Inputs

(No inputs have been defined)

5.2.3.2.1.2 Outputs

(No outputs have been defined)

5.2.3.2.1.3 Parameters

(No parameters have been defined)

5.2.3.2.1.4 Interface Requirements

No Interface Requirements identified for Function BCM - M2 Config

5.2.3.2.2 Function Requirements

5.2.3.2.2.1 Component Specific Requirements

###R_CMP_Trailer Light Check_00001### - BCM signal timing for Trailer Light Check

The signals mentioned in this document shall be published within the timing of 1000 milliseconds. TLC_Precondition_Status (TlghtTestPrecnd_D_Stat/TlghtTestPrecnd_D2_Stat); Test_Status (TlghtTest_D_Stat); TLC_Illum_Light_Status (TlghtTestLght_D_Stat/TlghtTestLght_D2_Stat); Parking lights (Parklamp_Status), Reverse lights (RvrseLghtOn_B_Stat), Stop lights (StopLghtOn_B_Stat), Left indicator telltale (TurnLghtLeftOn_B_Stat), Left turn activation (TurnLghtLeft_D_Rq), Right indicator telltale (TurnLghtRightOn_B_Stat), Right turn activation (TurnLghtRight_D_Rq), Rear fog lights (FogLghtRearOn_B_Stat).

Satisfied by:

- BCM - Conduct Trailer Light Check
- BCM - M2 Config
- BCM - Manage Trailer Light Check
- BCMc - Provide Lights

###R_CMP_Trailer Light Check_00002### - BCM signal latency for Trailer Light Check

The signals mentioned in this document shall be published with a signal latency of 40 milliseconds. TLC_Precondition_Status (TlghtTestPrecnd_D_Stat/TlghtTestPrecnd_D2_Stat); Test_Status (TlghtTest_D_Stat); TLC_Illum_Light_Status (TlghtTestLght_D_Stat/TlghtTestLght_D2_Stat); Parking lights (Parklamp_Status), Reverse lights (RvrseLghtOn_B_Stat), Stop lights (StopLghtOn_B_Stat), Left indicator telltale (TurnLghtLeftOn_B_Stat), Left turn activation (TurnLghtLeft_D_Rq), Right indicator telltale (TurnLghtRightOn_B_Stat), Right turn activation (TurnLghtRight_D_Rq), Rear fog lights (FogLghtRearOn_B_Stat).

Satisfied by:

- BCM - Conduct Trailer Light Check
- BCM - M2 Config
- BCM - Manage Trailer Light Check
- BCMc - Provide Lights

5.2.3.3 Technology Function BCM - Manage Trailer Light Check

Manages the trailer light check feature.

5.2.3.3.1 Function Interfaces

5.2.3.3.1.1 Inputs

Input Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Subscriber Interface	Connection *(Optional)*
input	ElPw_D_Stat	ElPw_D_Stat	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input1	Veh_V_ActlEng	Vehicle_Speed	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input2	GearLvrPos_D_Actl	GearLvrPos_D_Actl	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input3	PrkBrkStatus	PrkBrkStatus	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input4	PrkBrkStatus	PrkBrkStatus	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input6	TrlrLampCnnct_B_Actl	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input7	TrlrLampCnnct_B_Actl	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input5	TlightTest_D_RqArb	User_Input	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

input8	TrlrLampCnnct_B_Actl	Detect_Trailer_Connection	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-6: Input Signal mappings of Function

5.2.3.3.1.2 Outputs

Output Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Publisher Interface	Connection *(Optional)*
output	TlghtTestLght_D_Stat/ TlghtTestLght_D2_Stat	TLC_Illum_Light_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output1	TlightTest_D_Stat	Test_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output2	TlghtTestPrecnd_D_Stat/ TlghtTestPrecnd_D2_Stat	TLC_Precondition_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output6	StopLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output7	TurnLghtLeft_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output8	TurnLghtRight_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output3	TurnLghtRight_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output4	StopLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output5	TurnLghtLeft_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output9	Parklamp_Status	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output10	FogLghtRearOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output11	RvrseLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-7: Output Signal mappings of Function

5.2.3.3.1.3 Parameters

(No parameters have been defined)

5.2.3.3.1.4 Interface Requirements

No Interface Requirements identified for Function BCM - Manage Trailer Light Check

5.2.3.3.2 Function Requirements

5.2.3.3.2.1 Component Specific Requirements

###R_CMP_Trailer Light Check_00001### - BCM signal timing for Trailer Light Check

The signals mentioned in this document shall be published within the timing of 1000 milliseconds. TLC_Precondition_Status (TlghtTestPrecnd_D_Stat/TlghtTestPrecnd_D2_Stat); Test_Status (TlghtTest_D_Stat); TLC_Illum_Light_Status (TlghtTestLght_D_Stat/TlghtTestLght_D2_Stat); Parking lights (Parklamp_Status), Reverse lights (RvrseLghtOn_B_Stat), Stop lights (StopLghtOn_B_Stat), Left indicator telltale (TurnLghtLeftOn_B_Stat), Left turn activation (TurnLghtLeft_D_Rq), Right indicator telltale (TurnLghtRightOn_B_Stat), Right turn activation (TurnLghtRight_D_Rq), Rear fog lights (FogLghtRearOn_B_Stat).

Satisfied by:

- BCM - Conduct Trailer Light Check
- BCM - M2 Config
- BCM - Manage Trailer Light Check
- BCMc - Provide Lights

###R_CMP_Trailer Light Check_00002### - BCM signal latency for Trailer Light Check

The signals mentioned in this document shall be published with a signal latency of 40 milliseconds. TLC_Precondition_Status (TlghtTestPrecnd_D_Stat/TlghtTestPrecnd_D2_Stat); Test_Status (TlghtTest_D_Stat); TLC_Illum_Light_Status (TlghtTestLght_D_Stat/TlghtTestLght_D2_Stat); Parking lights (Parklamp_Status), Reverse lights (RvrseLghtOn_B_Stat), Stop lights (StopLghtOn_B_Stat), Left indicator telltale (TurnLghtLeftOn_B_Stat), Left turn activation (TurnLghtLeft_D_Rq), Right indicator telltale (TurnLghtRightOn_B_Stat), Right turn activation (TurnLghtRight_D_Rq), Rear fog lights (FogLghtRearOn_B_Stat).

Satisfied by:

- BCM - Conduct Trailer Light Check
- BCM - M2 Config
- BCM - Manage Trailer Light Check
- BCMc - Provide Lights

###R_CMP_Trailer Light Check_00005### - Park brake status unavailable for less than 5 seconds (manual transmission ONLY)

When PrkBrkStatus is not available for less than 5 seconds, BCM shall hold onto previous value of PrkBrkStatus for determining vehicle stationary status of Trailer Light Check feature

Satisfied by:

- ABS ESC/EBB - Provide Parking Brake Status
- BCM - Manage Trailer Light Check

###R_CMP_Trailer Light Check_00006### - Park brake status unavailable for more than 5 seconds (manual transmission ONLY)

When PrkBrkStatus is not available for 5 or more seconds, BCM shall set vehicle stationary status to 0x0 (Not stationary)

Satisfied by:

- ABS ESC/EBB - Provide Parking Brake Status
- BCM - Manage Trailer Light Check

###R_CMP_Trailer Light Check_00009### - TlghtTest_D_RqArb is unavailable/missing during test

When Trailer Light Check is in progress and TlghtTest_D_RqArb is unavailable/missing, BCM shall continue with test until end.

Satisfied by:

- BCM - Manage Trailer Light Check

5.2.4 BCMc PDB

BCMc PDB

5.2.4.1 Technology Function BCMc - Provide Lights

Manages the trailer lights when BCMc (Power Distribution Box) is available.

5.2.4.1.1 Function Interfaces

5.2.4.1.1.1 Inputs

Input Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Subscriber Interface	Connection *(Optional)*
input	StopLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input1	TurnLghtLeft_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input2	Ignition_Status	Ignition_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input3	TurnLghtRight_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-8: Input Signal mappings of Function

5.2.4.1.1.2 Outputs

(No outputs have been defined)

5.2.4.1.1.3 Parameters

(No parameters have been defined)

5.2.4.1.1.4 Interface Requirements

No Interface Requirements identified for Function BCMc - Provide Lights

5.2.4.1.2 Function Requirements

5.2.4.1.2.1 Component Specific Requirements

No “Approved” or “Ready for Review” requirements identified for this function.

5.2.5 EPB Switch

EPB Switch
No functions allocated to this component.

5.2.6 GWM-ECG

GWM-ECG

5.2.6.1 Technology Function ECG - Gateway Signals ECG

Manages the Gateway signals through ECG.

5.2.6.1.1 Function Interfaces

5.2.6.1.1.1 Inputs

Input Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Subscriber Interface	Connection *(Optional)*
input	TlghtTest_D_Stat	Test_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input1	TurnLghtRight_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input2	TurnLghtLeft_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input3	StopLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input4	RvrseLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input5	FogLghtRearOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input6	Parklamp_Status	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input7	TurnLghtRight_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input8	TurnLghtLeft_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input9	StopLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input10	TlghtTestLght_D_Stat/ TlghtTestLght_D2_Stat	TLC_Illum_Light_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input11	TlightTest_D_Stat	Test_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

input12	TlghtTestPrecnd_D_Stat/ TlghtTestPrecnd_D2_Stat	TLC_Precondition_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input16	StopLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input17	TurnLghtLeft_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input18	TurnLghtRight_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input13	TurnLghtRight_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input14	StopLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input15	TurnLghtLeft_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input19	Parklamp_Status	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input20	FogLghtRearOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
input21	RvrseLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-9: Input Signal mappings of Function

5.2.6.1.1.2 Outputs

Output Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Publisher Interface	Connection (*Optional*)
output	TlghtTestLght_D2_Stat	TLC_Illum_Light_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output1	TlghtTestPrecnd_D2_Stat	TLC_Precondition_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output2	TlightTest_D_RqOta	User_Input	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output3	TrlrLampCnnct_B_Actl	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output4	TrlrLampCnnct_B_Actl	Detect_Trailer_Connection	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output6	TrlrLampCnnct_B_Actl	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output7	TrlrLampCnnct_B_Actl	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output5	TlightTest_D_RqArb	User_Input	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output8	TrlrLampCnnct_B_Actl	Detect_Trailer_Connection	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

output9	StopLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output10	TurnLghtLeft_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output11	Ignition_Status	Ignition_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output12	TurnLghtRight_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-10: Output Signal mappings of Function

5.2.6.1.1.3 Parameters

(No parameters have been defined)

5.2.6.1.1.4 Interface Requirements

No Interface Requirements identified for Function ECG - Gateway Signals ECG

5.2.6.1.2 Function Requirements

5.2.6.1.2.1 Component Specific Requirements

###R_CMP_Trailer Light Check_00012### TlghtTest_D_RqArb signal behavior

TlghtTest_D_RqArb signal shall publish values based on the logic mentioned in Table 18 below:

Requirement#	TlightTest_D_RqOta	TlightTest_D_Mnu	TlghtTest_D_Stat	TlghtTest_D_RqArb
R_CMP_Trailer Light Check_00083.1	0x2 (Start test)	Not [0x1]	Not [0x3]	0x2 (Start test)
R_CMP_Trailer Light Check_00083.2	Not [0x1]	0x2 (Start test)	Not [0x3]	0x2 (Start test)
R_CMP_Trailer Light Check_00083.3	0x1 (Stop test)	Don't care	Don't care	0x1 (Stop test)
R_CMP_Trailer Light Check_00083.4	Don't care	0x1 (Stop test)	Don't care	0x1 (Stop test)
R_CMP_Trailer Light Check_00083.5	Not [0x1]	Not [0x1]	0x3 (Test in progress)	0x0 (Null)
R_CMP_Trailer Light Check_00083.6	Don't care	Don't care	0x1 (Test completed) or 0x2 (Test ended)	0x3 (Test end ack)
R_CMP_Trailer Light Check_00083.7	Not [0x1 or 0x2]	Not [0x1 or 0x2]	0x0 (Null)	0x0 (Null)

Table 11: TlghtTest_D_RqArb signal behavior

5.2.6.2 Technology Function ECG - GWM M2_config

GWM M2_config

5.2.6.2.1 Function Interfaces

5.2.6.2.1.1 Inputs

(No inputs have been defined)

5.2.6.2.1.2 Outputs

(No outputs have been defined)

5.2.6.2.1.3 Parameters

(No parameters have been defined)

5.2.6.2.1.4 Interface Requirements

No Interface Requirements identified for Function ECG - GWM M2_config

5.2.6.2.2 Function Requirements

5.2.6.2.2.1 Component Specific Requirements

No “Approved” or “Ready for Review” requirements identified for this function.

5.2.7 ITRM

ITRM

5.2.7.1 Technology Function iTRM/TTLM/TRM - Gateway signal transfer

Gateway signal transfer

5.2.7.1.1 Function Interfaces

5.2.7.1.1.1 Inputs

Input Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Subscriber Interface	Connection (*Optional*)
input	TrlrLampCnnct_B_Actl	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-12: Input Signal mappings of Function

5.2.7.1.1.2 Outputs

Output Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Publisher Interface	Connection (*Optional*)
output	TurnLghtRight_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output1	TurnLghtLeft_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output2	StopLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-13: Output Signal mappings of Function

5.2.7.1.1.3 Parameters

(No parameters have been defined)

5.2.7.1.1.4 Interface Requirements

No Interface Requirements identified for Function iTRM/TTLM/TRM - Gateway signal transfer

5.2.7.1.2 Function Requirements

5.2.7.1.2.1 Component Specific Requirements

###R_CMP_Trailer Light Check_00014### - BCM signal on FMVSS vehicles without ITRM/TRM modules for Trailer Light Check

On FMVSS vehicles without ITRM/TRM modules, the BCM shall internally control the TT Park Relay (FET) to activate or deactivate the trailer parking lights accordingly during the Trailer Light Check sequence.

Satisfied by:

- iTRM/TTLM/TRM - Gateway signal transfer
- iTRM/TTLM/TRM - Trailer Connect

5.2.7.2 Technology Function iTRM/TTLM/TRM - Trailer Connect

Informs the Trailer is Connected.

5.2.7.2.1 Function Interfaces

5.2.7.2.1.1 Inputs

(No inputs have been defined)

5.2.7.2.1.2 Outputs

(No outputs have been defined)

5.2.7.2.1.3 Parameters

(No parameters have been defined)

5.2.7.2.1.4 Interface Requirements

No Interface Requirements identified for Function iTRM/TTLM/TRM - Trailer Connect

5.2.7.2.2 Function Requirements

5.2.7.2.2.1 Component Specific Requirements

###R_CMP_Trailer Light Check_00014### - BCM signal on FMVSS vehicles without ITRM/TRM modules for Trailer Light Check

On FMVSS vehicles without ITRM/TRM modules, the BCM shall internally control the TT Park Relay (FET) to activate or deactivate the trailer parking lights accordingly during the Trailer Light Check sequence.

Satisfied by:

- iTRM/TTLM/TRM - Gateway signal transfer
- iTRM/TTLM/TRM - Trailer Connect

5.2.8 PCM/ ECM/ HPCM

PCM/ ECM/ HPCM

5.2.8.1 Technology Function PCM/ECM/TCM - Provide Engine Status

Provide Engine Status and vehicle stationary.

5.2.8.1.1 Function Interfaces

5.2.8.1.1.1 Inputs

(No inputs have been defined)

5.2.8.1.1.2 Outputs

Output Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Publisher Interface	Connection (*Optional*)
output	ElPw_D_Stat	ElPw_D_Stat	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output1	Veh_V_ActlEng	Vehicle_Speed	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output2	GearLvrPos_D_Actl	GearLvrPos_D_Actl	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-14: Output Signal mappings of Function

5.2.8.1.1.3 Parameters

(No parameters have been defined)

5.2.8.1.1.4 Interface Requirements

No Interface Requirements identified for Function PCM/ECM/TCM - Provide Engine Status

5.2.8.1.2 Function Requirements

5.2.8.1.2.1 Component Specific Requirements

###R_CMP_Trailer Light Check_00007### - Vehicle Speed unavailable for less than 5 seconds

When Veh_V_ActlEng signal is not available for less than 5 seconds, BCM shall hold onto the previous value of Veh_V_ActlEng for determining vehicle stationary status of Trailer Light Check feature

Satisfied by:

- PCM/ECM/TCM - Provide Engine Status

###R_CMP_Trailer Light Check_00008### - Vehicle Speed unavailable for more than 5 seconds

When Veh_V_ActlEng signal is not available for 5 or more seconds, BCM shall set vehicle stationary status to 0x0 (Not stationary)

Satisfied by:

- PCM/ECM/TCM - Provide Engine Status

5.2.9 Remote App-Applink

Remote App-Applink

5.2.9.1 Technology Function Trailer light check request from the app

5.2.9.1.1 Function Interfaces

5.2.9.1.1.1 Inputs

(No inputs have been defined)

5.2.9.1.1.2 Outputs

Output Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Publisher Interface	Connection (*Optional*)
output	User_Input_App	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-15: Output Signal mappings of Function

5.2.9.1.1.3 Parameters

(No parameters have been defined)

5.2.9.1.1.4 Interface Requirements

No Interface Requirements identified for Function Trailer light check request from the app

5.2.9.1.2 Function Requirements

5.2.9.1.2.1 Component Specific Requirements

No “Approved” or “Ready for Review” requirements identified for this function.

5.2.10 Remote App-Cellular

Remote App-Cellular

5.2.10.1 Technology Function Trailer Light Check request from Cellular

5.2.10.1.1 Function Interfaces

5.2.10.1.1.1 Inputs

(No inputs have been defined)

5.2.10.1.1.2 Outputs

Output Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Publisher Interface	Connection *(Optional)*
output	User_Input_App	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-16: Output Signal mappings of Function

5.2.10.1.1.3 Parameters

(No parameters have been defined)

5.2.10.1.1.4 Interface Requirements

No Interface Requirements identified for Function Trailer Light Check request from Cellular

5.2.10.1.2 Function Requirements

5.2.10.1.2.1 Component Specific Requirements

No “Approved” or “Ready for Review” requirements identified for this function.

5.2.11 Smartphone

Smartphone
No functions allocated to this component.

5.2.12 TCU Pass Trough

TCU Pass Trough

5.2.12.1 Technology Function TCU - Gateway Signals TCU

Provides the Gateway signals that flows between TCU and BCM.

5.2.12.1.1 Function Interfaces

5.2.12.1.1.1 Inputs

Input Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Subscriber Interface	Connection *(Optional)*
input	TlightTest_D_RqOta	User_Input	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-17: Input Signal mappings of Function

5.2.12.1.1.2 Outputs

Output Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Publisher Interface	Connection *(Optional)*

output	TlghtTestLght_D2_Stat	TLC_Illum_Light_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output1	TlghtTestPrecnd_D2_Stat	TLC_Precondition_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output2	TlghtTest_D_Stat	Test_Status	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-18: Output Signal mappings of Function

5.2.12.1.1.3 Parameters

(No parameters have been defined)

5.2.12.1.1.4 Interface Requirements

No Interface Requirements identified for Function TCU - Gateway Signals TCU

5.2.12.1.2 Function Requirements

5.2.12.1.2.1 Component Specific Requirements

###R_CMP_Trailer Light Check_00013### - TCU Pass-Through signals

TCU shall act as a pass-through for the signals indicated in Table 20

Technical Signal Name	From	To
TlghtTest_D_RqOta	Remote App (Cellular)	GWM/ECG
TlghtTestPrecnd_D2_Stat	GWM/ECG	Remote App (Cellular)
TlghtTest_D_Stat	GWM/ECG	Remote App (Cellular)
TlghtTestLght_D2_Stat	GWM/ECG	Remote App (Cellular)

Satisfied by:

- TCU - Gateway Signals TCU

5.2.13 TRM

TRM

5.2.13.1 Technology Function TRM - Trailer Connected

Manages the trailer connection and its lights.

5.2.13.1.1 Function Interfaces

5.2.13.1.1.1 Inputs

Input Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Subscriber Interface	Connection (*Optional*)

input	TrlrLampCnnct_B_Actl	Detect_Trailer_Connection	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-19: Input Signal mappings of Function

5.2.13.1.1.2 Outputs

Output Name	Technical Signal Name	Logical Signal Name	Mapping Details *(Conditional)*	Publisher Interface	Connection (*Optional*)
output1	FogLghtRearOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output2	Parklamp_Status	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output3	TurnLghtRight_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output4	TurnLghtLeft_D_Rq	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output5	StopLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.
output	RvrseLghtOn_B_Stat	No logical signals Realized by this Technology signal.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.	Not supported by Magicdraw generation.

Table 5-20: Output Signal mappings of Function

5.2.13.1.1.3 Parameters

(No parameters have been defined)

5.2.13.1.1.4 Interface Requirements

No Interface Requirements identified for Function TRM - Trailer Connected

5.2.13.1.2 Function Requirements

5.2.13.1.2.1 Component Specific Requirements

No “Approved” or “Ready for Review” requirements identified for this function.

5.3 Requirements on Connections

5.3.1 Networks

5.3.2 HW I/Os

5.4 Requirements on Development Process

No Requirements with “In-Progress” Status identified.

6 OPEN CONCERNS

ID	Concern Description	e-Tracker Reference	Status	Solution
	Modeling Action Item Example		Not Started	

Table 6-1: Open Concerns

7 REVISION HISTORY

No Revision History found.

Revision	Date	Description	Approved by	Responsible
A		Initial version		

8 APPENDIX

8.1 Data Dictionary

8.1.1 Logical Signals

Detect_Trailer_Connection

This logical signal indicates if other features that affect exterior lighting are active or not.

Data Type	Init Value	Default Value (missing signal)
0x0 – No 0x1 – Yes	0x0	0x0

ASIL		A
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of Detect_Trailer_Connection

ElPw_D_Stat

This logical signal indicates the status of whether the 12v battery is supported or not.

Data Type	Init Value	Default Value (missing signal)
0x0 - Not_Supported 0x1 - Supported 0x2 – Not_Supported_Imminent 0x3 – LV_Event_In_Progress 0x4 – Fault_Limited 0x5 – NotUsed_1 0x6 - NotUsed_2 0x7 - NotUsed_3		

ASIL		A
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of ElPw_D_Stat

GearLvrPos_D_Actl

This logical signal publishes the status of the PRNDL.

Data Type	Init Value	Default Value (missing signal)
0x0 Park 0x1 Reverse 0x2 Neutral 0x3 Drive 0x4 Sport/Drive Sport 0x5 Low 0x6 1 0x7 2 0x8 3 0x9 4 0xA 5 0xB 6 0xC undefined 0xD undefined 0xE unknown position 0xF fault		

ASIL		A
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of GearLvrPos_D_Actl

Ignition_Status

This logical signal indicates the ignition status of the vehicle.

Data Type	Init Value	Default Value (missing signal)
0x0 - Unknown 0x1 - Off 0x2 - Accessory 0x4 - Run 0x8 - Start 0xF - Invalid		

ASIL		A
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of Ignition_Status

PrkBrkStatus

This logical signal publishes the status of the EPB state.

Data Type	Init Value	Default Value (missing signal)
0x0 Not_Supported 0x1 Rear_Caliper_Closed 0x2 Rear_Caliper_Transition 0x3 RWU_by_EPB_Active 0x4 Rear_Caliper_Open 0x5 EPM_Limphome_Active 0x6 ECD_by_Brake_ECU_Active 0x7 GeneralFault_MaintenanceMode		

ASIL		A
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of PrkBrkStatus

Test_Status

This logical signal indicates when the test is in progress or has completed

Data Type	Init Value	Default Value (missing signal)
0x0 - Null (Defaulted) 0x1 – Test completed 0x2 – Test ended 0x3 - Test_in_Progress	0x0 – Null	0x0 - Null

ASIL		A
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of Test_Status

TLC_Illum_Light_Status

This logical signal indicates the light that is illuminated at present instant, when Trailer Light Check feature is in progress. Note: When publishing light status, lights other than parking lights shall take highest priority for this signal content since parking lights are illuminated throughout test.

Data Type	Init Value	Default Value (missing signal)
0x0 – Null (defaulted) 0x1 – Park_Light 0x2 – Right_Turn	0x0 – Null	0x0 – Null

0x3 – Left_Turn 0x4 – Stop_Light 0x5 – Reverse_Light 0x6 – All_Off 0x7 – Rearfog_Light		

ASIL		A
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of TLC_Illum_Light_Status

TLC_Precondition_Status

This logical signal contains information about a particular error or fault states while determining the preconditions for Trailer Light Check feature.

Data Type	Init Value	Default Value (missing signal)
0x0 – Null 0x1 – Ignition_Not_On 0x2 – Tailight_Active 0x3 – Start_Engine 0x4 – Precondition_Ok 0x5 – Other_Feature_Interaction 0x6 – Not_Stationary 0x7 – Trailer_Not_Connected	0x0 – NULL	0x0 – NULL

ASIL		A
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of TLC_Precondition_Status

User_Input

When user selects Start Test or Stop Test using in-vehicle or FordPass UI, this logical signal notifies if the user is requesting the test to be initiated or cancelled and sends acknowledgement of receipt of test status.

Data Type	Init Value	Default Value (missing signal)
0x0 - Null (Defaulted) 0x1 - Stop_Test 0x2 - Start_Test 0x3 - Test_end_ack	0x0 = Null (Defaulted)	0x0 = Null (Defaulted)

ASIL		A
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of User_Input

Vehicle_Speed

This logical signal publishes the vehicle speed.

Data Type	Init Value	Default Value (missing signal)
0 to 655.35 KPH		

ASIL		A
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of Vehicle_Speed

8.1.2 Logical Parameters

8.1.3 Technical Signals

ElPw_D_Stat

This technical signal indicates the status of whether the 12v battery is supported or not

0x0 - Unknown
0x1- Off
0x2 - Accessory
0x4 - Run
0x8 - Start
0xF - Invalid

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of ElPw_D_Stat

FogLghtRearOn_B_Stat

Indicates the status of rear fog lamps.

0x0 - Off
0x1 – On

ASIL	

Value	Encoding Name	CAN

Table: Signal Details of FogLghtRearOn_B_Stat

GearLvrPos_D_Actl

This technical signal publishes the status of the PRNDL.

0x0 Park
0x1 Reverse
0x2 Neutral
0x3 Drive
0x4 Sport/Drive Sport
0x5 Low
0x6 1
0x7 2
0x8 3
0x9 4
0xA 5
0xB 6
0xC undefined
0xD undefined
0xE unknown position
0xF fault

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of GearLvrPos_D_Actl

Ignition_Status

This technological signal indicates the ignition status of the vehicle

0x0 - Unknown
0x1- Off
0x2 - Accessory
0x4 - Run
0x8 - Start
0xF - Invalid

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of Ignition_Status

Parklamp_Status

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of Parklamp_Status

PrkBrkStatus

Indicates the desired status of the park lamps relay prior to consideration of 12v battery voltage and Diagnostics PID control. This is identical to the Parklamps_Command internal dataflow which is the command to control the position / park lamps.

0x0 Not_Supported
0x1 Rear_Caliper_Closed
0x2 Rear_Caliper_Transition
0x3 RWU_by_EPB_Active
0x4 Rear_Caliper_Open
0x5 EPM_Limphome_Active
0x6 ECD_by_Brake_ECU_Active
0x7 GeneralFault_MaintenanceMode

ASIL		
Value	Encoding Name	

Table: Signal Details of PrkBrkStatus

PrkBrkStatus

This logical signal publishes the status of the EPB state.

Data Type	Init Value	Default Value (missing signal)
0x0 Not_Supported 0x1 Rear_Caliper_Closed 0x2 Rear_Caliper_Transition 0x3 RWU_by_EPB_Active 0x4 Rear_Caliper_Open 0x5 EPM_Limphome_Active 0x6 ECD_by_Brake_ECU_Active 0x7 GeneralFault_MaintenanceMode		

ASIL		
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of PrkBrkStatus

RvrseLghtOn_B_Stat

Indicates the status of reverse lights command.

0x0 - Off
0x1 – On

ASIL	

Value	Encoding Name	

Table: Signal Details of RvrseLghtOn_B_Stat

StopLghtOn_B_Stat

Indicates whether status of Brake Lamp activation for any reason.

0x0 - Off
0x1 – On

ASIL		
Value	Encoding Name	

Table: Signal Details of StopLghtOn_B_Stat

StopLghtOn_B_Stat

Indicates whether status of Brake Lamp activation for any reason.

0x0 - Off
0x1 – On

ASIL		
Value	Encoding Name	

Table: Signal Details of StopLghtOn_B_Stat

StopLghtOn_B_Stat

Indicates whether status of Brake Lamp activation for any reason.

0x0 - Off
0x1 – On

ASIL		
Value	Encoding Name	

Table: Signal Details of StopLghtOn_B_Stat

TlghtTest_D_Stat

FTCP Command

ASIL		
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of TlghtTest_D_Stat

TlghtTestLght_D2_Stat

FTCP Command

ASIL		
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of TlghtTestLght_D2_Stat

TlghtTestLght_D_Stat/ TlghtTestLght_D2_Stat

Signal indicates which light is being tested/illuminated.

0x0 – Null (Defaulted)
0x1 – ParkingLightsIlluminated
0x2 – TestingRightTurnSignal
0x3 – TestingLeftTurnSignal
0x4 – TestingBrakeLights
0x5 – TestingReverseLights
0x6 – AllOff
0x7 – TestingRearFogLights

ASIL		
Value	Encoding Name	

Table: Signal Details of TlghtTestLght_D_Stat/ TlghtTestLght_D2_Stat

TlghtTestPrecnd_D2_Stat

FTCP Command

ASIL		
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of TlghtTestPrecnd_D2_Stat

TlghtTestPrecnd_D_Stat/ TlghtTestPrecnd_D2_Stat

0x0 – Null (Defaulted)
0x1 – IgnitionNotOn
0x2 – TailLightsOn
0x3 – BattSocLessThan75Percent
0x4 - PreconditionsPassed 0x5 – InteractionPresent
0x6 – NotStationary
0x7 – TrailerNotConnected

ASIL	

Value	Encoding Name	CAN

Table: Signal Details of TlghtTestPrecnd_D_Stat/ TlghtTestPrecnd_D2_Stat

TlightTest_D_RqArb

User input signal containing user request and acknowledgement of receipt of test status.

0x0 - Null (Defaulted)
0x1 - Complete
0x2 - Ended
0x3 - InProgress

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of TlightTest_D_RqArb

TlightTest_D_RqOta

This signal indicates user request and acknowledgement of test complete signal

ASIL		
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of TlightTest_D_RqOta

TlightTest_D_Stat

This technical signal indicates when the test is in progress or has completed

0x0 - Null (Defaulted)
0x1 – Test completed
0x2 – Test ended
0x3 - Test_in_Progress

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of TlightTest_D_Stat

TrlrLampCnnct_B_Actl

User input signal containing user request and acknowledgement of receipt of test status.

0x0 – No
0x1 – Yes

ASIL	

Value	Encoding Name	CAN

Table: Signal Details of TrlrLampCnnct_B_Actl

CAN TrlrLampCnnct_B_Actl

Indicates if a trailer is connected on the trailer lamp circuit.

0x0 – No
0x1 – Yes

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of TrlrLampCnnct_B_Actl

CAN TrlrLampCnnct_B_Actl

TrlrLampCnnct_B_Actl

0x0 – No
0x1 – Yes

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of TrlrLampCnnct_B_Actl

CAN TurnLghtLeft_D_Rq

Indicates the command for exterior left turn signal / hazard lights.

0x0 Null
0x1 Off
0x2 On
0x3 Seq

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of TurnLghtLeft_D_Rq

CAN TurnLghtLeft_D_Rq

Indicates the command for exterior left turn signal / hazard lights.

0x0 Null
0x1 Off
0x2 On
0x3 Seq

ASIL	

Value	Encoding Name	CAN

Table: Signal Details of TurnLghtLeft_D_Rq

CAN TurnLghtLeft_D_Rq

Indicates the command for exterior left turn signal / hazard lights.

0x0 Null
Off
On
Seq

0x1
0x2
0x3

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of TurnLghtLeft_D_Rq

CAN TurnLghtRight_D_Rq

Indicates the command for exterior right turn signal / hazard lights.

0x0 Null
0x1 Off
0x2 On
0x3 Seq

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of TurnLghtRight_D_Rq

CAN TurnLghtRight_D_Rq

Indicates the command for exterior right turn signal / hazard lights.

0x0 Null
0x1 Off
0x2 On
0x3 Seq

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of TurnLghtRight_D_Rq

CAN TurnLghtRight_D_Rq

Indicates the command for exterior right turn signal / hazard lights.

0x0 Null
0x1 Off
0x2 On
0x3 Seq

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of TurnLghtRight_D_Rq

User_Input_App

User selects Start or Stop buttons using in-vehicle HMI or FordPass / Lincoln Way UI, this logical signal notifies if the user is requesting the test to be initiated or stopped

ASIL		
Value	Encoding Name	--
	Value Range	[-]
	Resolution	
	Unit	

Table: Signal Details of User_Input_App

Veh_V_ActlEng

This technical signal publishes the vehicle speed.

- 0 to 655.35 KPH

ASIL		
Value	Encoding Name	CAN

Table: Signal Details of Veh_V_ActlEng

8.1.3.1 GSDB Signals

Not supported by MagicDraw report generation.

8.1.3.2 HW I/Os

Not supported by MagicDraw report generation.

8.1.3.3 Diagnostic Interfaces

8.1.3.3.1 DTCs

<Some Description of the DTC.
Refer to VSEM document "Diagnostic Fault Coverage and DTC Numbers Design Consideration", what to fill into the attributes below>

Test Period Time	
Test Run Criteria,	

Enable Criteria (EC)	
Applicable	
FailureTypeBytes	
Test Period Time	
Test Run Criteria,	

8.1.3.3.2 DIDs

Not supported by MagicDraw report generation.

8.1.4 Technical Parameters

8.1.4.1 Method 2

###TPR_Trailer Light Check_00001### BCM - RearFog_Enable_Cfg

This configuration parameter indicates whether the rear fog lights are enabled or disabled. For Ford Europe set this configuration parameter to ENABLED and for Ford North America set this configuration parameter to DISABLED.

Encoding Type Name		RearFog_Enable_Cfg	
Encoding Type Description		NA	
Encoding Type		Numeric	
Value	**Min Value**	NA	
	Max Value	NA	
	Resolution	NA	
	Offset	NA	
	Unit	NA	
Encoding Type		SED	
Value		0x00	Disabled
		0x01	Enabled
Init Default Value		0x01-Enabled	

###TPR_Trailer Light Check_00002### TRM_Available_Cfg

Configuration parameter to represent Trailer Tow Module (TRM) Module is Present or Absent.

Encoding Type Name		TRM_Available_Cfg
Encoding Type Description		NA
Encoding Type		Discrete
Value	**Min Value**	NA
	Max Value	NA
	Resolution	NA
	Offset	NA
	Unit	NA
Encoding Type		

Value	0x00	Abscent
	0x01	Present
Init Default Value	0x01 Present	

###TPR_Trailer Light Check_00003### BCM - TLC_ChkTrailerConnected_Cfg

This configuration parameter determines if Trailer Light Check feature is allowed to operate only when a trailer is connected.
Disable - Trailer Light Check feature is allowed to operate irrespective of trailer connection status and TRM module availability. i.e. Trailer Light Check feature is allowed to operate on vehicle and on trailer irrespective of connection.
Enable - Trailer Light Check feature is allowed to operate only when a trailer is connected i.e. Trailer Light Check feature is allowed to operate only on trailer if it is connected and not allowed to operate on vehicle if trailer is not connected.

Encoding Type Name		TLC_ChkTrailerConnected_Cfg	
Encoding Type Description		NA	
Encoding Type		Discrete	
Value	**Min Value**	NA	
	Max Value	NA	
	Resolution	NA	
	Offset	NA	
	Unit	NA	
Encoding Type			
Value		0x00	Disable
		0x01	Enable
Init Default Value		0x00 Disable	

###TPR_Trailer Light Check_00004### BCM - TLC_Feature_Enable_Cfg

This configuration parameter indicates if the Trailer Light Check feature is present in a vehicle or not.
Disable - Trailer Light Check feature is not present in vehicle.
Enable - Trailer Light Check feature is present in vehicle.

Encoding Type Name		TLC_Feature_Enable_Cfg
Encoding Type Description		NA
Encoding Type		Discrete
Value	**Min Value**	NA
	Max Value	NA
	Resolution	NA
	Offset	NA
	Unit	NA

Encoding Type		
Value	0x00	Disable
	0x01	Enable
Init Default Value	0x00 Disable	

###TPR_Trailer Light Check_00005### BCM - RearFogWithTrailer_Cfg

Determines if vehicle Rear Fog Lamps are allowed to operate when a trailer is connected.
ALLOW - Vehicle Rear Fog Lamps are allowed to operate when the trailer module reports that a trailer is connected. This is required for Brazilian applications. The ECE regulation sentence allowing the Vehicle Rear Fog Lamps to turn off is missing from the Brazilian regulations.
INHIBIT - Vehicle Rear Fog Lamps are not allowed to operate when the trailer module reports that a trailer is connected. This is required for European applications and allowed by ECE regulations.

Encoding Type Name		RearFogWithTrailer_Cfg	
Encoding Type Description		NA	
Encoding Type		Discrete	
Value	**Min Value**	NA	
	Max Value	NA	
	Resolution	NA	
	Offset	NA	
	Unit	NA	
Encoding Type			
Value		0x00	Allow
		0x01	Inhibit
Init Default Value		0x01 Inhibit	

###TPR_Trailer Light Check_00006### APIM - Trailer Light Check

The Trailer Light Check Interface Client shall have a configurable parameter to determine whether the Trailer Light Check feature is to be supported.

DataIdentifier Value	0xDE00	
DataIdentifier Name	Config Block DE00	
Parameter Info	Trailer Light Check	
Value	0x00	Disabled
	0x01	Enabled

###TPR_Trailer Light Check_00007### APIM - Trailer Light Variant

The Trailer Light Check Interface Client shall have a configurable parameter to determine which variant of the Light Test Preconditions status signal to use.
Variant 1 shall indicate for the client to use the existing LightTestPreconditions_St signal, while Variant 2 shall indicate for the client to use the new LightTestPreconditions2_St signal.

DataIdentifier Value	0xDE01	
DataIdentifier Name	Config Block DE01	
Parameter Info	Trailer Light Variant	
Value	0x00	Variant 1
	0x01	Variant 2

###TPR_Trailer Light Check_00008### APIM - Trailer Check for Fog Lamps

DataIdentifier Value	0xDE01	
DataIdentifier Name	Config Block DE01	
Parameter Info	Trailer Check for Fog Lamps	
Value	0x00	Disabled
	0x01	Enabled

###TPR_Trailer Light Check_00009### GWM - Trailer Light Check Pre-Condition Signal

The Trailer Light Check OnBoard Client shall have a configurable parameter to determine which variant of the Light Test Preconditions status signal to use.
Variant 1 shall indicate for the client to use the existing LightTestPreconditions_St signal, while Variant 2 shall indicate for the client to use the new LightTestPreconditions2_St signal.

DataIdentifier Value	0xDE00	
DataIdentifier Name	ECG Optional Configuration	
Parameter Info	Trailer Light Check Pre-Condition Signal	
Value	0x00	TlghtTestPrecnd_D_Stat
	0x01	TlghtTestPrecnd_D2_Stat
Init Default Value	0x00 - TlghtTestPrecnd_D_Stat	

###TPR_Trailer Light Check_00010### GWM - SyncTrailerLightCheckStatusAlert_qosLevel

DataIdentifier Value	0xDE05	
DataIdentifier Name	Additional Alert Configuration Byte	
Parameter Info	SyncTrailerLightCheckStatusAlert_qosLevel	
Value	0x00	N/A
	0x01	QOS level:1
	0x02	QOS level:2
	0x03	N/A
Init Default Value	0x1	QOS level:1

###TPR_Trailer Light Check_00011### GWM - SyncTrailerLightCheckStatusAlert_inDRXStatus

DataIdentifier Value	0xDE05	
DataIdentifier Name	Additional Alert Configuration Byte	
Parameter Info	SyncTrailerLightCheckStatusAlert_inDRXStatus	
Value	0x00	Alert is never sent in DRX
	0x01	Alert is held, send is delayed until next DRX Wakeup, IGN ON, or other alarm
	0x02	Alert sent immediately; DRX reset
	0x03	Alert sent immediately; DRX reset only if VBATT is not low, otherwise connection time extended
	0x04	Alert sent immediately; DRX reset only if VBATT is not low; Conenction time not extended
	0x05	Alert sent immediately; DRX continues; Connection time extended
	0x06	Alert sent immediately; DRX continues; Connection time extended only if VBATT is not low
	0x07	Alert sent immediately; DRX continues; Connection time not extended
Init Default Value	0x07	Alert sent immediately; DRX continues; Connection time not extended

###TPR_Trailer Light Check_00012### GWM - SyncTrailerLightCheckStatusAlert_inRoamingStatus

DataIdentifier Value	0xDE05	
DataIdentifier Name	Additional Alert Configuration Byte	
Parameter Info	SyncTrailerLightCheckStatusAlert_inRoamingStatus	
Value	0x00	Disable
	0x01	Enable

Init Default Value	0x01	Enable

###TPR_Trailer Light Check_00013### GWM - SyncTrailerLightCheckStatusAlert_PriorityID

DataIdentifier Value	0xDE05	
DataIdentifier Name	Additional Alert Configuration Byte	
Parameter Info	SyncTrailerLightCheckStatusAlert_PriorityID	
Value	0x00	Disable
	0x01	Enable
Init Default Value	0x00	Disable

###TPR_Trailer Light Check_00014### GWM - SyncTrailerLightCheckStatusAlert_status

DataIdentifier Value	0xDE05	
DataIdentifier Name	Additional Alert Configuration Byte	
Parameter Info	SyncTrailerLightCheckStatusAlert_status	
Value	0x00	Disable
	0x01	Enable
Init Default Value	0x01	Enable

###TPR_Trailer Light Check_00015### GWM - bSAllow_FEATURE68_TrailerTest

This configuration parameter indicates the valid subscription for Trailer Light Test.

DataIdentifier Value	0xDE17	
DataIdentifier Name	bSAllow_FEATURE68_TrailerTest	
Value	0x00	Off
	0x01	On
Init Default Value	0x00 Off	

###TPR_Trailer Light Check_00016### GWM - bPAllow_FEATURE68_TrailerTest

This configuration parameter indicates the capability for Trailer Light Test.

DataIdentifier Value	0xDE1A

DataIdentifier Name	bPAllow_FEATURE68_TrailerTest	
Value	0x00	Off
	0x01	On
Init Default Value	0x00 Off	

8.1.4.2 Mtehod 3

###TPR_Trailer Light Check_00017### BCM - TLC_AllLamps_OffTime_Cfg

This configuration parameter which indicates the time duration for which position/parking lights, turn lamps, stop/brake lamps and reverse lamps are turned OFF while Trailer Light Check feature is in progress.
Note: If parking lights have been turned on through hard switch in vehicle, parking lights shall remain on.

Encoding Type Name		TLC_AllLamps_OffTime_Cfg
Encoding Type Description		NA
Encoding Type		Numeric
Value	Min Value	0
	Max Value	10000
	Resolution	1
	Offset	NA
	Unit	Milliseconds
Init Default Value		2300

###TPR_Trailer Light Check_00018### BCM - TLC_ParkingLight_OnTime_Cfg

This configuration parameter indicates the time duration for which only Position/Parking Lights are illuminated because of Trailer Light Check feature.

Encoding Type Name		TLC_ParkingLight_OnTime_Cfg
Encoding Type Description		NA
Encoding Type		Numeric
Value	Min Value	0
	Max Value	10000
	Resolution	1
	Offset	NA
	Unit	Milliseconds
Init Default Value		2300

###TPR_Trailer Light Check_00019### BCM - TLC_RearFogLamp_OnTime_Cfg

This configuration parameter indicates the time duration for which the Rear fog lamps are illuminated because of Trailer Light Check feature.

Encoding Type Name		TLC_RearFogLamp_OnTime_Cfg
Encoding Type Description		NA
Encoding Type		Numeric
Value	**Min Value**	0
	Max Value	10000
	Resolution	1
	Offset	NA
	Unit	Milliseconds
Init Default Value		4500

###TPR_Trailer Light Check_00020### BCM - TLC_ReverseLamp_OnTime_Cfg

This configuration parameter indicates the time duration for which Reverse lamps are illuminated because of Trailer Light Check feature.

Encoding Type Name		TLC_ReverseLamp_OnTime_Cfg
Encoding Type Description		NA
Encoding Type		Numeric
Value	**Min Value**	0
	Max Value	10000
	Resolution	1
	Offset	NA
	Unit	Milliseconds
Init Default Value		4500

###TPR_Trailer Light Check_00021### BCM - TLC_Seq_Cnt_Cfg

This configuration parameter indicates the number of times the Trailer Light Check feature is to be repeated, in order to accomplish the testing of the feature.

Encoding Type Name		TLC_Seq_Cnt_Cfg
Encoding Type Description		NA
Encoding Type		Numeric
Value	**Min Value**	0
	Max Value	10
	Resolution	1
	Offset	NA
	Unit	Counts
Init Default Value		5

###TPR_Trailer Light Check_00022### BCM - TLC_Stationary_VehSpeed_Cfg

This configuration parameter indicates the maximum speed for which the Trailer Light feature functionality is allowed. If Vehicle Speed is greater than this configuration parameter, Trailer Light feature is inhibited.

Encoding Type Name		TLC_Stationary_VehSpeed_Cfg
Encoding Type Description		NA
Encoding Type		Numeric
Value	**Min Value**	0
	Max Value	10
	Resolution	1
	Offset	NA
	Unit	kph
Init Default Value		4

###TPR_Trailer Light Check_00023### BCM - TLC_StopLamp_OnTime_Cfg

This configuration parameter indicates the time duration for which Stop/Brake lamps are illuminated because of Trailer Light Check feature.

Encoding Type Name		TLC_StopLamp_OnTime_Cfg
Encoding Type Description		NA
Encoding Type		Numeric
Value	**Min Value**	0
	Max Value	10000
	Resolution	1
	Offset	NA
	Unit	Milliseconds
Init Default Value		4500

###TPR_Trailer Light Check_00024### BCM - TLC_TurnLamps_NoOfFlash_Cfg

Maximum number of flashes allowed when Trailer Light Check feature requests the Turn lamps to be flashed.

Encoding Type Name		TLC_TurnLamps_NoOfFlash_Cfg
Encoding Type Description		NA
Encoding Type		Numeric
Value	**Min Value**	0
	Max Value	10
	Resolution	1
	Offset	NA
	Unit	Counts
Init Default Value		6

###TPR_Trailer Light Check_00025### BMS - TLC_LghtngCtrlSOCLevel_Cfg

This configuration parameter indicates the Battery SOC threshold to enable Trailer Light Check feature.

Encoding Type Name	TLC_LghtngCtrlSOCLevel_Cfg
Encoding Type Description	NA
Encoding Type	Numeric

Value	**Min Value**	0
	Max Value	255
	Resolution	1
	Offset	NA
	Unit	Percent
Init Default Value		75

###TPR_Trailer Light Check_00026### BMS - SOCQFCheckEnable_TLCLghtng_Cfg

New BMS-Battery M3 used to enable/disable usage of BattULoState_D_Qlty (Quality Factor of Battery State-of-Charge) for calculation of TLC_LightingControlLevel_Rq.

Encoding Type Name		SOCQFCheckEnable_TLCLghtng_Cfg
Encoding Type Description		NA
Encoding Type		Numeric
Value	**Min Value**	
	Max Value	
	Resolution	1
	Offset	NA
	Unit	
Init Default Value		FALSE

8.1.5 Mappings

User_Input - TlightTest_D_RqArb

User_Input - TlightTest_D_RqOta

Vehicle_Speed - Veh_V_ActlEng

PrkBrkStatus - PrkBrkStatus

PrkBrkStatus - PrkBrkStatus

TLC_Precondition_Status - TlghtTestPrecnd_D_Stat/ TlghtTestPrecnd_D2_Stat

TLC_Precondition_Status - TlghtTestPrecnd_D2_Stat

Detect_Trailer_Connection - TrlrLampCnnct_B_Actl

Ignition_Status - Ignition_Status

ElPw_D_Stat - ElPw_D_Stat

TLC_Illum_Light_Status - TlghtTestLght_D2_Stat

TLC_Illum_Light_Status - TlghtTestLght_D_Stat/ TlghtTestLght_D2_Stat

Test_Status - TlightTest_D_Stat

Test_Status - TlghtTest_D_Stat

GearLvrPos_D_Actl - GearLvrPos_D_Actl

8.1.6 Technical Interfaces

Not supported by MagicDraw report generation.

8.1.6.1 AIS Interfaces

8.1.6.1.1 Publisher Interfaces

8.1.6.1.2 Subscriber Interfaces

8.1.6.2 AUTOSAR Ports

Not supported by MagicDraw report generation.

8.1.7 Messages/APIs

8.1.7.1 CAN Bus FD1 Message List

CAN ID	Message Name	Transmission Mode	Period	Technical Signal Names	Transmitter(s)	Receiver(s)

0x32A	ECG_Data_FD1	Event Periodic	1000	TlghtTest_D_RqArb	GWM	BCM
0x3C3	BCM_Lamp_Stat	Event Periodic	1000	StopLghtOn_B_Stat	BCM	GWM_ECG BCMC_CPDB
0x3C3	BCM_Lamp_Stat	Event Periodic	1000	RvrseLghtOn_B_Stat	BCM	GWM
0x3BA	Body_Info_10	Event Periodic	1000	TlghtTestPrecnd_D_Stat	BCM	GWM
0x3BA	Body_Info_10	Event Periodic	1000	TlghtTest_D_Stat	BCM	GWM
0x3BA	Body_Info_10	Event Periodic	1000	TlghtTestLght_D_Stat	BCM	GWM
0x3B3	BodyInfo_3	Event Periodic	1000	TurnLghtLeft_D_Rq	BCM	GWM_ECG BCMC_CPDB
0x3B3	BodyInfo_3	Event Periodic	1000	TurnLghtRight_D_Rq	BCM	GWM_ECG BCMC_CPDB
0x3B3	BodyInfo_3	Event Periodic	1000	Parklamp_Status	BCM	GWM_ECG
0x3B3	BodyInfo_3	Event Periodic	1000	FogLghtRearOn_B_Stat	BCM	GWM
0x213	DesiredTorqBrk	Fixed Periodic	20	PrkBrkStatus	ABS	BCM GWM_ECG
0x202	EngVehicleSpThrottle2	Fixed Periodic	20	Veh_V_ActlEng	PCM	BCM GWM_ECG
0x3B4	Tire_Pressure_Stat	Event Periodic	1000	TlghtTestPrecnd_D2_Stat	BCM	GWM
0x3B4	Tire_Pressure_Stat	Event Periodic	1000	TlghtTestLght_D2_Stat	BCM	GWM
0x230	TransGearData	Fixed Periodic	20	GearLvrPos_D_Actl	PCM	BCM GWM_ECG
0x167	VehicleOperatingModes	Fixed Periodic	10	ElPw_D_Stat	PCM	BCM GWM_ECG
0x43C	Battery_Mgmt_3_FD1	NoMsgSend Type	1000	BSBattSOC	GWM	ECM_DIESEL PCM PCM_HEV
0x3B3	BodyInfo_3	NoMsgSend Type	500	Ignition_Status	GWM	ABS_ESC CMR_DSMC ECM_DIESEL IPMA_ADAS PCM PCM_HEV PSCM SOBDMC_HPCM _FD1 TCCM TCM_DSL VDM

8.1.7.2 CAN Bus HS1 Message List

CAN ID	Message Name	Transmission Mode	Period	Technical Signal Names	Transmitter(s)	Receiver(s)

0x32A	ECG_Data_HS1	Event Periodic	1000	TlghtTest_D_RqArb	GWM	BCM
0x3C3	BCM_Lamp_Stat	Event Periodic	1000	StopLghtOn_B_Stat	BCM	GWM
0x3C3	BCM_Lamp_Stat	Event Periodic	1000	RvrseLghtOn_B_Stat	BCM	GWM
0x3BA	Body_Info_10	Event Periodic	1000	TlghtTestPrecnd_D_Stat	BCM	GWM
0x3BA	Body_Info_10	Event Periodic	1000	TlghtTest_D_Stat	BCM	GWM
0x3BA	Body_Info_10	Event Periodic	1000	TlghtTestLght_D_Stat	BCM	GWM
0x3B3	BodyInfo_3	Event Periodic	1000	TurnLghtLeft_D_Rq	BCM	GWM
0x3B3	BodyInfo_3	Event Periodic	1000	TurnLghtRight_D_Rq	BCM	GWM
0x3B3	BodyInfo_3	Event Periodic	1000	Parklamp_Status	BCM	GWM
0x3B3	BodyInfo_3	Event Periodic	1000	FogLghtRearOn_B_Stat	BCM	GWM
0x430	Cluster_Info1_HS1	Event Periodic	100	TrlrLampCnnct_B_Actl	GWM	BCM
0x3B3	BodyInfo_3	Event Periodic	500	Ignition_Status	BCM	ACCM BCMC_CPDB BECM DCACA_GAS DCACA_HEV DCDC_HEV DCDC_LISB GWM PACM

8.1.7.3 CAN Bus HS3 Message List

CAN ID	Message Name	Transmission Mode	Period [ms]	Technical Signal Names	Transmitter(s)	Receiver(s)
0x45C	TrailerAid_Data3	Event Periodic	1000	TrlrLampCnnct_B_Actl	APIM APIM_CISM	GWM
0x45C	TrailerAid_Data3	Event Periodic	1000	TlightTest_D_Mnu	APIM APIM_CISM	GWM
0x3BA	Body_Info_10_HS3	NoMsgSend Type	1000	TlghtTestPrecnd_D_Stat	GWM	APIM
0x3B4	Tire_Pressure_Status_HS3	NoMsgSend Type	1000	TlghtTestPrecnd_D2_Stat	GWM	APIM
0x3BA	Body_Info_10_HS3	NoMsgSend Type	1000	TlghtTest_D_Stat	GWM	APIM
0x3BA	Body_Info_10_HS3	NoMsgSend Type	1000	TlghtTestLght_D_Stat	GWM	APIM
0x3B4	Tire_Pressure_Status_HS3	NoMsgSend Type	1000	TlghtTestLght_D2_Stat	GWM	APIM

8.1.7.4 CAN Bus MS1 Message List

CAN ID	Message Name	Transmission Mode	Period [ms]	Technical Signal Names	Transmitter(s)	Receiver(s)
0x443	TrailerInfo	Event Periodic	1000	TrlrLampCnnct_B_Actl	TRM	GWM

8.1.7.5 LIN Bus "<Bus Name>"

Not supported by MagicDraw report generation.

8.1.7.6 AUTOSAR Interfaces

Not supported by MagicDraw report generation.

8.1.7.7 SOA Service Contracts

Not supported by MagicDraw report generation.

8.1.8 Encoding Types

8.1.8.1 Logical Encoding Types

8.1.8.2 Technology Encoding Types

Parklamp_Status missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

StopLghtOn_B_Stat missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

TurnLghtLeft_D_Rq missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

Veh_V_ActlEng missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

StopLghtOn_B_Stat missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

TurnLghtLeft_D_Rq missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

RvrseLghtOn_B_Stat missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

TurnLghtRight_D_Rq missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

TlightTest_D_RqArb missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

TurnLghtLeft_D_Rq missing Network Coding Type Name

Value Range	[-]
Resolution	

Interpretation	
Units	

TlghtTestLght_D_Stat/ TlghtTestLght_D2_Stat missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

ElPw_D_Stat missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

TrlrLampCnnct_B_Actl missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

PrkBrkStatus missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

TlightTest_D_Stat missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

FogLghtRearOn_B_Stat missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

GearLvrPos_D_Actl missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

TlghtTestPrecnd_D_Stat/ TlghtTestPrecnd_D2_Stat missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

TrlrLampCnnct_B_Actl missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

StopLghtOn_B_Stat missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

TrlrLampCnnct_B_Actl missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

TurnLghtRight_D_Rq missing Network Coding Type Name

Value Range	[-]	
Resolution		
Interpretation		
	Not supported	0x0
Units		

Ignition_Status missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

TurnLghtRight_D_Rq missing Network Coding Type Name

Value Range	[-]
Resolution	
Interpretation	
Units	

8.1.9 Technology State Machines

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