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|  | Fog\_Lamps\_FS | | |  |
|  | (F001010) | | |  |
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| Document Approval | | | | |
| Name | Role | | Email Confirmation | Date |
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**Important Note**

You need to use the RE specification macros provided by the “RE\_SpecificationMacroTemplate.dotm” (refer to “Utilities” on [page “Specification Templates” in the RE Wiki](http://wiki.ford.com/display/RequirementsEngineering/Specification+templates)) to allow seamless VSEM import of the specification content. **Use only these RE specification macros to create requirements** in this specification. Refer to “[How to use the Specification Templates](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates?src=contextnavpagetreemode)” on how to enable and use the macros and the requirements templates in this specification.

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# Introduction

## Document Purpose

The Function Specification (FS) specifies an individual function.

To get more information about the concept of feature, function and component level abstraction refer to the [Ford RE Wiki](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Engineering+for+SW+Enabled+Features).

## Document Scope

The following function from the [Global Feature & Function List](https://www.vsemweb.ford.com:443/tc/launchapp?-attach=true&-s=226TCSession&-o=ZmZNi0JHx3NrTDAAAAAAAAAAAAA) is described in this specification:

|  |  |
| --- | --- |
| **Function ID** | **Function Name** |
|  |  |

## Document Audience

The FS is authored by the owners of the individual functions. All Stakeholders, i.e., all people who have a valid interest in the functions and their behavior should read and, if possible, review the FS. It needs to be guaranteed, that all stakeholders have access to the currently valid version of the FS.

**#Hint:** The FS template has the IP Classification “Proprietary” by default. IP Classification “Confidential” might be required in some cases, e.g. by Ford Functional Safety.

**#Macro:** [Add Ins -> Edit Document Properties macro](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates#HowtousetheSpecificationTemplates-EditDocProperties) (select “Proprietary” for “Document Classification”).

### Stakeholder List

For the latest list of the feature stakeholder and their roles & responsibilities refer to [F001010/C VSEM Folder](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=jItFpjdbx3NrTDAAAAAAAAAAAAA&servername=Production_Server).

**#Hint:** Refer to [Ford RE Wiki – Stakeholder List](http://wiki.ford.com/display/RequirementsEngineering/Stakeholder+Analysis) on how to create a stakeholder list. The stakeholder list should be stored in VSEM in the pseudo folder “General Data Artifacts” of the corresponding function.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **CDSID** | **Contact Info** | **Role** | **Stakeholder Group** |
| Eric Aleksander Vieira | EVIEIRA1 | [evieira1@ford.com](mailto:evieira1@ford.com) | Core Feature Owner | Systems Engineering |
| Nicolás Gagliardi | NGAGLIA2 | [ngaglia2@ford.com](mailto:ngaglia2@ford.com) | Model Architect | Model Based System Engineering |
| Lucas Santos | LSANT318 | [lsant318@ford.com](mailto:lsant318@ford.com) | Core Feature Owner | Systems Engineering |
| Jeff Mesko | JMESKO | [jmesko@ford.com](mailto:jmesko@ford.com) | Core Lighting Feature/Function Engineer | Core Lighting |
| Herta Lusho | HLLUSHO | [hllusho@ford.com](mailto:hllusho@ford.com) | Core Lighting | Core Lighting |
| Anthony Strzelczyk | ASTRZELC | [astrzelc@ford.com](mailto:astrzelc@ford.com) | Core Lighting | Core Lighting |

## Document Organization

### Document Context

Refer to the [Specification Structure page](http://wiki.ford.com/display/RequirementsEngineering/Specification+templates) in the [Ford RE Wiki](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Engineering+for+SW+Enabled+Features) to understand how the FS relates to other Ford Requirements Documents and Specifications.

### Document Structure

The structure of this document is explained below:

**Section 1** – Introduction how to use this document including responsibilities and requisite documents. Explains the tterminology. Gives a clarification of the definitions, concepts and abbreviations used in the document.

**Section 2** – Function Specifications: Specifies the logical functions of the function group in detail

**Section 3** – List of Open Concerns

**Section 4** Revision history including a list of new or modified requirements. The requirements in this document are tagged, and this section contains different types of tables listing all, new, or changed requirements by their title and page no.

**Section 5** – Appendix: Presenting additional data mainly in a tabular form, e.g., a data dictionary

**#Hint:** All sections are mandatory, unless explicitly marked by the tag “#Classification” as “optional” or as applicable e.g. to certain domains like “Functional Safety”.

## Document Conventions

### Requirements Templates

Refer to “[How to use the Specification Templates](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates?src=contextnavpagetreemode)” 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"](http://wiki.ford.com/pages/viewpage.action?pageId=104991616&src=contextnavpagetreemode)).

#### 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 a FS 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\_FNC\_LockArbitrator\_00004* This is the fourth requirement on function level for the function Lock Arbitrator.

#### Requirements Attributes

The templates provided by *Specification\_Macros.dotm* define a list of attributes for each requirement. This helps to classify the requirement. The attributes are explained at [RE Wiki - Requirements Attributes](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes?src=contextnavpagetreemode).

## References

### Ford Documents

List here all Ford internal documents, which are directly related to the feature.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Reference** | **Title** | **Doc. ID** | **Revision** | **Document Location** |
|  | Fog Lamps FD | F001010 | B |  |
|  | ELCOMP - RQT-191001-009906:  Low/High Voltage Guaranteed Function/Performance | RQT-191001-009906 |  | <https://www.fede.ford.com/awc/>  FEDE - FORD ENGINEERING DESIGN ENVIRONMENT |
|  | Functional Specification Body Control Module (BCM) | FS-NU5T-14B476-AAB002 | L |  |

Table 1: Ford Documents

|  |  |  |  |
| --- | --- | --- | --- |
| Part ID | **Title** | **Revision** | **Description** |
| 13D061 | Master Lighting Control Switch (MLS)  NOTE: The electrical translation of the physical switch positions are as follows:  **OFF** = all lamps are OFF  **POSITION/PARK** = ONLY Park Lamps are ON  **HEADLAMP** = Parking & Low Beams are ON  **AUTOLAMP** = Automatic control of Parking & Low Beams  If the high beams are on at the time the master headlamp switch turns off, the high beams also turn OFF. |  | This is the multi-position switch on the panel inside the vehicle. Usually located on the left side of the steering column. Typical configuration: Separate push button Fog Switches (Front and/or Rear). Rotary switch positions: OFF, POSITION/ PARKLAMPS, HEADLAMP (LOW BEAM), and AUTOLAMP. Note: POSITION is the same as PARKLAMPS but the term POSITION is used in EU markets. |
| 14B522 | Stalk (Push forward/Pull back) Also contains the turn signal switch and HI/LO headlamp switch. (Part of the SCCM) |  | This is the turn signal stalk which incorporates the Hi/Lo Headlamp switch. Push forward to activate high beams, push again to turn the high beams off. Flash to Pass by pulling the stalk towards you. |
| Typical SCCM | Steering Column Control Module (SCCM) |  |  |

Table 2: HMI Fog and Headlamp Switch and Stalk SW

### External Documents and Publications

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

**#Hint:** You may refer to [IEEE Citation Reference](http://www.ieee.org/documents/ieeecitationref.pdf) on how to format a reference.

| **Reference** | **Document / Publication** |
| --- | --- |
|  |  |
|  |  |

Table 3: External Documents and Publications

## Glossary

**#Hint**: Terms, concepts and abbreviations used in the document shall be defined and illustrated here. Note that changes to terms and/or concepts described in this section tend to cause major updates to this document.

The tables below have feature specific definitions and abbreviations. For additional, non-feature specific terms please refer to the [RE Glossary](http://wiki.ford.com/display/RequirementsEngineering/Glossary?src=contextnavpagetreemode)

### Definitions

**#Hint:** The table below has definitions and abbreviations relevant for the functions in this document. For additional terms please refer to the [RE Glossary](http://wiki.ford.com/display/RequirementsEngineering/Glossary?src=contextnavpagetreemode)

|  |  |
| --- | --- |
| Definition | Description |
| Master Lighting Control Switch **or** Master Headlamp Switch **or** Headlamp Switch | This is the multi-position rotary switch on the panel inside the vehicle. Usually located on the left side of the steering column. |
| Hi/Lo Beam Headlamp Stalk Switch | This is the turn signal stalk which incorporates the Hi/Lo Headlamp switch. Push forward to activate high beams, Pull back to turn the high beams off. Low beam does not have to be active to turn on the high beams. |
| Snowplow electrical attachment | typically, the snowplow or trailer come with their own dedicated ECUs  if not, it has to be configured by the dealership. The BCM has to be configured or a CAN message has to be sent to enable the feature (dealer installation) |
| Trailer electrical attachment | typically, the snowplow or trailer come with their own dedicated ECUs  if not, it has to be configured by the dealership. The BCM has to be configured or a CAN message has to be sent to enable the feature (dealer installation) |
| DRL (Daylight Running Lights) | With headlamp switch in Position/Park, DRL will be active.   1. If the Front Fog turned ON, DRL shall turn OFF and the Park lights stay ON.(U.S. market). 2. If the Front Fog turned ON, DRL shall remain ON (Outside U.S. market). |

Table 4: Definitions relevant for “Logical Function Fog Light”

### Abbreviations

|  |  |  |
| --- | --- | --- |
| Abbr. | Meaning | Description |

|  |  |  |
| --- | --- | --- |
| FFL | Front Fog Light |  |
| RFL | Rear Fog Light |  |
| MLS | Master/Main Light Switch | Head Lamp Switch |
| HMI | Human Machine Interface | The physical interface between human and machine |
| IP or IPC | Instrument Panel or Instrument Cluster | Vehicle operators’ visual feedback of the vehicle’s operation |
| BCM | Body Control Module |  |
| SCCM | Steering Column Control Module |  |
| FSR | Function Safety Requirements | ISO 26262 Related Requirements |
| FD | Feature Document | This document describes the feature basics |
| FS | Functional Specification | The document describing, collecting and developing the requirements of a function or a group of functions. |
| FIS | Feature Implementation Spec | Details how the feature is implemented in software |
| FSM | Functional State Machine | Used to reference a state machine flow chart in the BCM |

Table 5: Abbreviations relevant for Fog Lighting

# Function Specification

## Function Overview

### Function Description

***#Hint:*** *Some descriptive text to explain the purpose and functionality of the function.*

### Function Variants

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** If different variants of the same function are specified in this section, list those variants in the table below.

Variants on Function level could be driven by e.g. technology or feature content. Example: There could be a “Low Content” and a “High Content” variant of some exterior lighting function. The “Low Content” variant is used for Conventional Headlight technology, the “High Content” variant is used for LED and Xenon technology. In this case we call the different technologies the Variant Options, which the Variant depends on. The optional column “Variant condition” allows to express the dependency of a Variant based on Variant Options. Variant Options should be centrally managed in VSEM.

If requirements/signals are not applicable for all variants/variant options, those requirements should state explicitly, which function variant/variant option they apply to.

**#Link:** [RE Wiki – Variant Management](http://wiki.ford.com/display/RequirementsEngineering/Variant+Management).

|  |  |  |
| --- | --- | --- |
| Variant Name | Variant Description | Variant Condition (optional) |
| **Front Fog Light** | Forward facing lamps that illuminate the area close to and in front of the vehicle for better visibility to the driver in adverse weather conditions. |  |
| **Rear Fog Lights** | Rearward facing lamp(s) to improve visibility of the vehicle to other motorists during adverse weather conditions. |  |

Table 6: Function Variants for Fog Lighting

### Input Requirements/Documents

***#Hint:***The table below helps the function owner to collect relevant input *(requirements, documents, mails, models, …)* while writing the spec. When finalizing the spec, the function owner should check, if all inputs have been properly considered by derived/outgoing requirements *in chapter “Function Requirements”.*

*Note: It is not required to list each input requirement individually in this table, referencing the input document is enough (if relevant document section is indicated).*

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference**  (Reference as listed in ch. “**Error! Reference source not found.**) | **Section/Requirement** | **Description** | **Derived Requirement**  (optional – reference to requirement in ch. “**Error! Reference source not found.**”) |
| **Legal Regulations** | | | |
| USA | **FMVSS 101** | CONTROLS AND DISPLAYS |  |
| USA/Canada | **SAE J583** | FRONT FOG LAMP |  |
| USA/Canada | **SAE J578** | CHROMATICITY REQUIREMENTS FOR GROUND VEHICLE LAMPS AND LIGHTING EQUIPMENT |  |
| Canada | **CMVSS 101** | CONTROLS AND DISPLAYS |  |
| ECE | **R19** | POWER-DRIVEN VEHICLE FRONT FOG LAMPS |  |
| ECE | **R37** | UNIFORM PROVISIONS CONCERNING THE APPROVAL OF: FILAMENT LIGHT SOURCES FOR USE IN APPROVED LAMP UNITS OF POWER-DRIVEN VEHICLES AND OF THEIR TRAILERS |  |
| ECE | **R38** | REAR FOG LAMPS FOR POWER-DRIVEN VEHICLES AND THEIR TRAILERS |  |
| ECE | **R48** | VEHICLES WITH REGARD TO THE INSTALLATION OF LIGHTING AND LIGHT-SIGNALLING DEVICES |  |
| ECE | **R112** | MOTOR VEHICLE HEADLAMPS EMITTING AN ASYMMETRICAL PASSING-BEAM OR A DRIVING-BEAM OR BOTH AND EQUIPPED WITH FILAMENT LAMPS AND/OR LIGHT-EMITTING DIODE (LED) MODULES |  |
| ECE | **R121** | VEHICLES WITH REGARD TO THE LOCATION AND IDENTIFICATION OF HAND CONTROLS, TELL-TALES AND INDICATORS |  |
| ECE | **R148** | UNIFORM PROVISIONS CONCERNING THE APPROVAL OF LIGHT-SIGNALLING DEVICES (LAMPS) FOR POWER DRIVEN VEHICLES AND THEIR TRAILERS |  |
| CCC | **GB 11554-2008** | PHOTOMETRIC CHARACTERISTICS OF REAR FOG LAMP FOR POWER-DRIVEN VEHICLES AND THEIR TRAILERS |  |
| CCC | **GB 15766.1-2008** | LAMPS FOR ROAD VEHICLES – DIMENSIONAL, ELECTRICAL AND LUMINOUS REQUIREMENTS |  |
| CCC | **GB 4660-2007** | PHOTOMETRIC CHARACTERISTICS OF POWER-DRIVEN VEHICLE FRONT FOG LAMPS |  |
| CCC | **GB 4785-2007** | PRESCRIPTION FOR INSTALLATION OF THE EXTERNAL LIGHTING AND LIGHT SIGNALLING DEVICES FOR MOTOR VEHICLES AND THEIR TRAILERS |  |
| Brazil | **RESOLUTION NO. 227** | ESTABLISHING THE REQUIREMENTS RELATING TO VEHICLE LIGHTING AND SIGNALLING DEVICES |  |
| Brazil | **CONTRAN RESOLUTION 667** | ESTABLISHING THE CHARACTERISTICS AND TECHNICAL SPECIFICATIONS OF THE SIGNALLING AND LIGHTING SYSTEMS AND THEIR DEVICES APPLICABLE TO CARS, VANS, UTILITY VEHICLES, TRUCKS, LORRIES, TRACTOR UNITS, BUSES, MINIBUSES, TRAILERS AND SEMITRAILERS, NEWLY-MANUFACTURED, NATIONAL OR IMPORTED, AND PROVIDING FOR OTHER MEASURES |  |
| Brazil | **CONTRAN RESOLUTION 758** | ESTABLISHES REQUIREMENTS FOR LOCATIONS AND ILLUMINATION OF CONTROLS, INDICATORS AND TELL-TALES FOR MOTOR AND ELECTRIC VEHICLES. |  |
| Argentina | **DECREE NO.779 ANNEX 1** | LIGHTING AND SIGNALLING SYSTEMS FOR MOTOR VEHICLES |  |
| **Industry Standards** |  |  |  |
| Global | **ISO 26262** | The system should be developed according to Ford's implementation of Functional Safety. |  |
| **Other Sources** |  |  |  |

Table 7: Input Requirements/Documents

### Assumptions

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** A list of known assumptions concerning the effects of the function’s behavior on other functions or elements (i.e., dependencies) as well as assumptions on the behavior expected by the function (e.g. known limitations). During the course of the development most of those assumptions are typically either converted into actual requirements or discarded at some point – such that this chapter remains mostly empty.

## Function Scope



Figure 1: Logic Diagram/Data Flow Diagram of Function Front and Rear Fog Lighting

|  |  |  |
| --- | --- | --- |
| **Transition ID** | **Description** | **Requirements Reference**  (optional) |
| T1 | Initialization at System Start up | [Ignition\_Status](#LSG_D_Ignition_Status_00032)= ON  **Refer to Config parameters in section 2.3.3 for the different configurations and configurations for various markets.** |
| T2 | System Shut Down | [Ignition\_Status](#LSG_D_Ignition_Status_00032) = OFF |
| T3 | User RFL HMI Switch ON | [Rear\_Fog\_Switch\_Status](#LSG_N_Rear_Fog_Switch_Status_00026)= ON |
| T4 | User RFL HMI Switch OFF | [Rear\_Fog\_Switch\_Status](#LSG_N_Rear_Fog_Switch_Status_00026) = OFF |
| T5 | User Front Fog Light HMI ON | [Front\_Fog\_Light\_SW\_Status](#LSG_N_Front_Fog_Light_SW_Status_00029) = ON |
| T6 | User Front Fog Light HMI Switch OFF | [Front\_Fog\_Light\_SW\_Status](#LSG_N_Front_Fog_Light_SW_Status_00029) = OFF |
| T7 | Front Fog Feature Enable Conditions | **Requirement For U.S. Markets:**  [Front Fog Active-US\_00002](#R_ID_FNC_00002_Front_Fog_Lamp_Active_Inp) |
| T8 | Front Fog Feature Disable Conditions | GENERAL REQUIREMENT:  [Front Fog InActive\_00003](#R_ID_FNC_00003_Front_Fog_InActive_Input_)  **Requirement For U.S. Markets**:  [Front Fog Turn OFF-US\_0](#R_ID_FNC_00022_Front_Fog_Turn_OFF_US)  [2](#R_ID_FNC_00022_Front_Fog_Turn_OFF_US) |
| T9 | Rear Fog Feature Enable Conditions | **Requirement For E.U. Markets:**  [Rear Fog Active\_00004](#R_ID_FNC_00004_Rear_Fog_Active_Input_Con) |
| Rear Fog Trailer Enable Conditions | **Requirement For E.U. Markets:**  [Rear Fog Trailer-EU\_00024](#R_ID_FNC_00024_Rear_Fog_Trailer_Light_EU)  [Fog Trailer-ALLOW\_00023](#R_ID_FNC_00023_Rear_Fog_Trailer_Light_US) |
| T10 | Rear Fog Feature Disable Conditions | GENERAL REQUIREMENT:  [Rear Fog InActive\_00005](#R_ID_FNC_00005_Rear_Fog_InActive_Input_C)  **Requirement For E.U. Markets:**  [Rear Fog Disable-EU\_00026](#R_ID_FNC_00026_Rear_Fog_Disable_Conditio) |
| T11 | Front Fog Feature Enable Conditions | **Requirement For E.U. Markets:**  [Front Fog Active-EU\_00020](#R_ID_FNC_00020_Front_Fog_Active_Input_Co) |
| T12 | Front Fog Feature Disable Conditions | **Requirement For E.U. Markets:**  [Front Fog Turn OFF-EU\_00021](#R_ID_FNC_00021_Front_Fog_Turn_OFF_EU) |

Table 8: Logic Diagram Table

## Function Interfaces

**#Hint:**

* First create a Logical Signal in the ”Logical Signals” section of the “Data Dictionary”. Use [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter) (select “Logical Signal” as type).
* Insert just a Word reference to the Signal ID, Name and Description (which are bookmarks in the signal/parameter definition in the section in the Data Dictionary).

**#Link:** [RE Wiki – Adding a Logical Signal or Parameter](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter)

### Logical Inputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| [Ignition\_Status](#LSG_D_Ignition_Status_00032) | The processed value for current Ignition state.  Ignition status (OFF, ACC, RUN), primary HMI input to Front and Rear fog lamp logic control block. |
| [Front\_Fog\_Light\_SW\_Status](#LSG_N_Front_Fog_Light_SW_Status_00029) | Indicates a driver request for front fog lights. |
| [Rear\_Fog\_Switch\_Status](#LSG_N_Rear_Fog_Switch_Status_00026) | Indicates a driver request for rear fog lights. |
| [Headlight\_Status](#LSG_N_Headlight_Status_00031) | Indicates the status of Headlamp switch after debouncing and filtering. Headlamp switch (Off, Position, Low Beam, Auto Light). |
| [SnowPlowMode\_Status](#LSG_D_SnowPlowMode_Status_00030) | Determines that the request for the Snow Plow Mode is present/not present. Typically a CAN or LIN message from an external Snow Plow ECU. Typically installed by Dealer. |
| [ExtLightIgnition\_Status](#LPR_D_ExtLightIgnition_Status_00057) | This signal is used for exterior lights which have dependency on Ignition Status. When Ignition\_Status is ACC or OFF, ExtLightIgnition\_Status is DISABLE |
| [High\_Beam\_Indicator\_Rqst](#LSG_D_High_Beam_Indicator_Rqst_00035) | Signal used to request high beams ON or OFF. Hi/Lo\_Beam\_Stalk\_SW Part of the SCCM Stalk Headlamp push/pull switch on steering column |
| High\_Beam\_Cmd | Command to turn on/turn off the high beams. |
| [FTP\_Status](#LSG_N_FTP_Status_00036) | Indicates a driver request for flash-to-pass. FTP\_High\_Beam\_Switch\_Type\_Cfg  FTPHighBeamInputType\_Cfg |
| [HeadLamp\_HMI\_SW\_LowBeam](#LPR_D_LowBeam_00002) | Low beam is ON. Head Lamp HMI state input to Front and Rear fog logic control block |
| [HeadLamp\_HMI\_SW\_PositionLight](#LPR_D_PositionLight_00004) | Position/Park Light is ON. Head Lamp HMI state input to Front and Rear fog logic control block. |

Table 9: Logic Inputs for Fog Lighting

### Logical Outputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| [Exterior\_LF\_Front\_Fog\_Lamp](#LSG_D_Exterior_LF_Front_Fog_Lamp_00038) | Left Front Fog lamps turned on or off (output). |
| [Exterior\_RF\_Front\_Fog\_Lamp](#LSG_D_Exterior_RF_Front_Fog_Lamp_00039) | Right Front Fog lamps turned on or off (output). |
| [Exterior\_LF\_Rear\_Fog\_Lamp](#LSG_D_Exterior_LF_Front_Fog_Lamp_00038) | Left Rear Fog lamps turned on or off (output). |
| [Exterior\_RF\_Rear\_Fog\_Lamp](#LSG_D_Exterior_RF_Front_Fog_Lamp_00039) | Right Rear Fog lamps turned on or off (output). |
| [Front\_Telltale\_Lamp](#LSG_D_Front_Telltale_Lamp_00043) | Front Fog Telltale turned on or off .  Driver Front Fog visual feedback inside vehicle on dashboard |
| [Rear\_Telltale Lamp](#LSG_D_Rear_Telltale_Lamp_00044) | Rear Fog Telltale turned on or off.  Driver Rear Fog visual feedback inside vehicle on dashboard |
| [Rear\_Fog\_Trailer\_Output](#LSG_D_Rear_Trailer_Fog_Output_00023) | Rear Fog lamps and/or Trailer Fog Lamps turned on or off (output). |
| [LowBeamsOnly\_Rqst](#LSG_D_LowBeamsOnly_Rqst_00045) | Control low beam headlamps activation for dual and quad headlamps, both HID and non-HID for headlamps used as low beams only. This covers both situations of manual low beam on the MLS (HEADLAMP) and Autolamps that detect nighttime conditions, when LowBeamsOnly\_Rqs = ON |
| [LowBeams\_WithDRL\_Rqst](#LSG_D_LowBeams_WithDRL_Rqst_00046) | Control low beam headlamps activation for dual and quad headlamps, both HID and non-HID for headlamps used as low beams or configured as DRL. This covers both situations of manual low beam position of MLS (HEADLAMP) and Autolamps that detect nighttime conditions and DRL (night), when **LowBeams\_WithDRL\_Rqst** = ON |

Table 10: Logic Outputs for Fog Lighting

### Logical Parameters

**#Hint**: Put requirements for parameters here, which are implemented as configuration parameters using Method 2 or 3 or as parameters for calibration.

|  |  |
| --- | --- |
| **Parameter Name** | **Description** |
| [RearFogWithTrailer\_Cfg](#LPR_D_RearFogWithTrailer_Cfg_00058) | Determines if vehicle Rear Fog Lamps are allowed to operate when a trailer is connected. |
| [FrontFog\_Enable\_Cfg](#LPR_D_FrontFog_Enable_Cfg_00029) | This parameter enables/disables the Front Fog Lighting feature. |
| [RearFog\_Config](#LPR_D_RearFog_Config_00005) | Rear Fog lamp(s) configured on vehicle per international standards. |
| [FrontFog\_AutoCancel\_Cfg](#LPR_N_FrontFog_AutoCancel_Cfg_00017) | **FrontFog\_AutoCancel\_Cfg** shall be set to NO\_CANCEL for North America (U.S. and Canada)  **FrontFog\_AutoCancel\_Cfg** shall be set to CANCEL for EU and all other NON-north American countries. |
| [FrontFog\_WithHighBeams\_Cfg](#LPR_D_FrontFog_WithHighBeams_Cfg_00012) | **FrontFog\_WithHighBeams\_Cfg** shall be set to ALLOW for EU.  **FrontFog\_WithHighBeams\_Cfg** shall be set to INHIBIT for US |
| [FogLamp\_Start\_Delay\_Cfg](#LPR_N_FogLamp_Start_Delay_Cfg_00060) | (EU) Provides a delay, following the return of ignition to RUN, to allow  Parklamps\_Command to return to ON, before the usual front fog cancellation conditions are evaluated. |
| [FogLampOffDelayFast\_Cfg](#LPR_N_FogLampOffDelayFast_Cfg_00025) | When FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams on with fast ramp-up (Ramping\_Speed =  FAST), FogLampOffDelayFast\_Cfg is the delay from the beginning of High Beam ramp-up until Front Fog turn-off. |
| [RearFogLamp\_Start\_Delay\_Cfg](#LPR_D_RearFogLamp_Start_Delay_Cfg_00061) | provides a delay, following the return of ignition to RUN, to allow updated status of Front\_Fog\_Light\_Rqst and Headlamps\_Command to be available to the Rear fog feature, before the usual Rear fog cancellation conditions are evaluated. |
| [FogLampOffDelayMid\_Cfg](#LPR_D_FogLampOffDelayMid_Cfg_00024) | When FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams on with medium ramp-up (Ramping\_Speed = MEDIUM), FogLampOffDelayMid\_Cfg is the delay from the beginning of High Beam ramp-up until Front Fog turn-off. |
| [FogLampOffDelaySlow\_Cfg](#LPR_N_FogLampOffDelaySlow_Cfg_00023) | When FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams on with slow ramp-up (Ramping\_Speed =  SLOW), FogLampOffDelaySlow\_Cfg is the delay from the beginning of High Beam ramp-up until Front Fog turn-off. |
| [FogLampOnDelayFast\_Cfg](#LPR_D_FogLampOnDelayFast_Cfg_00022) | When FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams off with fast ramp-down (Ramping\_Speed = FAST), FogLampOnDelayFast\_Cfg is the delay from the beginning of High Beam ramp-down until Front Fog turn-on. |
| [FogLampOnDelayMid\_Cfg](#LPR_D_FogLampOnDelayMid_Cfg_00021) | When FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams off with medium ramp-down  (Ramping\_Speed = MEDIUM), FogLampOnDelayMid\_Cfg is the delay from the beginning of High Beam ramp-down until Front Fog turn-on. |
| [FogLampOnDelaySlow\_Cfg](#LPR_D_FogLampOnDelaySlow_Cfg_00020) | When FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams off with slow ramp-down (Ramping\_Speed = SLOW), FogLampOnDelaySlow\_Cfg is the delay from the beginning of High Beam ramp-down until Front Fog turn-on. |
| [Numeric\_Zero](#LPR_D_Numeric_Zero_00062) | A signal which will be used by different interior lighting features to check or to assign the numerical value of 0 |
| [Front\_Fog\_Lamp\_DbncV](#LPR_D_Front_Fog_Lamp_DbncV_00051) | Debounced and Voltage Range Monitor modified version of customer request to activate Front Fog Lamps. |

Table 11: Logic Parameters for Fog Lighting

## Function Modeling

**#Classification:** Mandatory

**#Hint:** Typical modeling artifacts in this section are State Machines, Activity Diagrams / Flow Charts, Decision Tables, and possibly Sequence Diagrams, which can all be used as techniques to analyze the function requirements.

It is highly recommended to use at least one of the following modeling techniques for modeling and analyzing the Function behavior and derived requirements (refer to sample diagrams below): State Machines, Activity Diagrams / Flow Charts, or Decision Tables

**#Links:** Analyze / Model Requirements: [RE Wiki – Analyze / Model Requirements](http://wiki.ford.com/pages/viewpage.action?pageId=110594919&src=contextnavpagetreemode)

### Use Cases

**#Classification:** Infotainment Only (remove section, if not used)

**#Hint:** Some Domains (e.g. Infotainment) use not only Customer Use Cases (in the Feature Doc), but refine Use Case descriptions down to function level. In general, the RE approach encourages the use of Use Cases on Feature Level but not on Function Level. Activity Diagrams are a more suitable way to express the same on Function Level.

**#Links:** Infotainment – “Harmony Systems Engineering” Approach

### State Charts

**#Classification:** Optional (remove section, if not used)

**#Hint:** State Charts are widely used to describe reactive, event-driven behavior.

**#Links:** State Charts [RE Wiki – State Charts](http://wiki.ford.com/display/RequirementsEngineering/State+Charts?src=contextnavpagetreemode)

**

Figure 2: State Machine of Function Front and Rear Fog Lighting

### Activity Diagrams

**#Classification:** Optional (remove section, if not used)

**#Hint:** Activity diagrams are well suited to describe a flow of actions (e.g. to refine the an use case).

**#Links:** Activity Diagrams: [RE Wiki – Activity Diagram](http://wiki.ford.com/display/RequirementsEngineering/Activity+Diagram?src=contextnavpagetreemode), [SysML User Group – Activity Diagram Basics](https://pd3.spt.ford.com/sites/SystemsEngineering/SEC/sysml-teamsite/SysML%20Wiki/Activity%20Diagram%20Basics.aspx)



Figure 3: Activity Diagram/Data Flow Diagram for Front and Rear Fog Lighting

### Sequence Diagrams

**#Classification:** Optional (remove section, if not used)

**#Hint:** Sequence diagrams may help to analyze the interaction between Functions in specific scenarios.

**#Links:** Sequence Diagrams: [RE Wiki – Sequence Chart](http://wiki.ford.com/display/RequirementsEngineering/Sequence+Chart?src=contextnavpagetreemode), [SysML User Group – Sequence Diagram Basics](https://pd3.spt.ford.com/sites/SystemsEngineering/SEC/sysml-teamsite/SysML%20Wiki/Sequence%20Diagram%20Basics.aspx)



Figure 4: Sequence Diagram of Function Fog Lighting

### Decision Tables

**#Classification:** Optional (remove section, if not used)

**#Hint:** Decision Tables are well suited to describe combinatorial logic

## Function Requirements

#Macro: [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates#AddNewRequirement) (select “FNC” as ID Prefix, the function name as ID Infix (Short Name) and “Requirement” as type)

#Link: [*RE Wiki – How to write good requirements*](http://wiki.ford.com/display/RequirementsEngineering/How+to+write+better+requirements?src=contextnavpagetreemode)

### Functional Requirements

***#Hint:*** *Please also consider specific situations like Initialization (Startup) and Deinitialization (Shutdown) apart from Normal Operation and Error Handling. E.g. a* state chart or activity diagram in section “*Function Modeling*” might help for better understanding.

#### **Normal Operation**

Note: (Any CAN and LIN communications will be covered in the Implementation Spec)

The following requirements apply to Fog\_Lamp\_Usage\_Cfg = FOG\_ONLY .

For U.S. markets, DRL and Fog cannot be on at the same time.

###R\_FNC\_Front Fog Active-US\_00002### Front Fog Lamp Active Input Conditions

Front Fog Light Feature shall be enabled when [Headlight\_Status](#LSG_N_Headlight_Status_00031) = (!OFF OR AUTO (Night Light)

&& [FrontFog\_Enable\_Cfg](#LPR_D_FrontFog_Enable_Cfg_00029) = ENABLE && [FrontFog\_WithHighBeams\_Cfg](#LPR_D_FrontFog_WithHighBeams_Cfg_00012) = INHIBIT && FTP\_Status= NULL && [Front\_Fog\_Light\_SW\_Status](#LSG_N_Front_Fog_Light_SW_Status_00029)= ON && [SnowPlowMode\_Status](#LSG_D_SnowPlowMode_Status_00030)= DISABLED && [Ignition\_Status](#LSG_N_Ignition_00001) = RUN && [High\_Beam\_Indicator\_Rqst](#LSG_D_High_Beam_Indicator_Rqst_00035)= OFF && [LowBeamsOnly\_Rqst](#LSG_D_LowBeamsOnly_Rqst_00045) = ON OR [LowBeams\_WithDRL\_Rqst](#LSG_D_LowBeams_WithDRL_Rqst_00046) = ON (headlamps are in low beam state).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [FrontFog\_Enable\_Cfg](#LPR_D_FrontFog_Enable_Cfg_00029) | [Front\_Fog\_Light\_SW\_Status](#LSG_N_Front_Fog_Light_SW_Status_00029) | [FrontFog\_WithHighBeams\_Cfg](#LPR_D_FrontFog_WithHighBeams_Cfg_00012) | LowBeamsOnly\_Rqst OR LowBeams\_WithDRL\_Rqst | [Ignition\_Status](#LSG_N_Ignition_00001) | [Snow\_Plow\_Status](#LSG_N_Snow_Plow_Status_00011) | [High\_Beam\_Indicator\_Rqst](#LSG_D_High_Beam_Indicator_Rqst_00035) | FTP\_Status | [Headlight\_Status](#LSG_N_Headlight_Status_00031) |
| ENABLE | ON | INHIBIT | ON | RUN | DISABLED | OFF (headlamps are in low beam state) | NULL | POSITION/PARK, Low Beam, or Auto (night light) |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_Front Fog Active\_00002### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** | Not to include battery criteria as this is assumed to be taken care of by other modules or functions outside fog. Debounce of inputs to be moved to implementation spec. | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_Front Fog Active-EU\_00020### Front Fog Active Input Conditions

Front Fog Lamps shall turn on when [Headlight\_Status](#LSG_N_Headlight_Status_00031) = (!OFF OR AUTO (Night Light) && [FrontFog\_Enable\_Cfg](#LPR_D_FrontFog_Enable_Cfg_00029) = ENABLE && [FrontFog\_WithHighBeams\_Cfg](#LPR_D_FrontFog_WithHighBeams_Cfg_00012) = ALLOW && [Front\_Fog\_Status](#LSG_N_Front_Fog_HMI_Status_00008) = ON && [Snow\_Plow\_Status](#LSG_N_Snow_Plow_Status_00011) = DISABLED && [FrontFog\_AutoCancel\_Cfg](#LPR_N_FrontFog_AutoCancel_Cfg_00017) = CANCEL && [Ignition\_Status](#LSG_N_Ignition_00001) = RUN. (NOTE: High Beam allows Front Fog Lamps to be on for EU.)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| [FrontFog\_Enable\_Cfg](#LPR_D_FrontFog_Enable_Cfg_00029) | [Front\_Fog\_Light\_SW\_Status](#LSG_N_Front_Fog_Light_SW_Status_00029) | [FrontFog\_AutoCancel\_Cfg](#LPR_N_FrontFog_AutoCancel_Cfg_00017) | [FrontFog\_WithHighBeams\_Cfg](#LPR_D_FrontFog_WithHighBeams_Cfg_00012) | [Ignition\_Status](#LSG_N_Ignition_00001) | [Snow\_Plow\_Status](#LSG_N_Snow_Plow_Status_00011) | [Headlight\_Status](#LSG_N_Headlight_Status_00031) |
| ENABLE | ON | CANCEL | INHIBIT | RUN | DISABLED | POSITION/PARK, Low Beam, or Auto (night light) |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_Front Fog Active-EU\_00020### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** | Not to include battery criteria as this is assumed to be taken care of by other modules or functions outside fog. Debounce of inputs to be moved to implementation spec. | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_Front Fog InActive\_00003### Front Fog InActive Input Conditions

Front Fog Lamps shall not turn on when [Snow\_Plow\_Status](#LSG_N_Snow_Plow_Status_00011) = ENABLED || [FrontFog\_Enable\_Cfg](#LPR_D_FrontFog_Enable_Cfg_00029) = DISABLED

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_Front Fog InActive\_00003### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_Front Fog Turn OFF-EU\_00021### Front Fog Turn OFF-EU

Front Fog Lamps shall turn off when [Headlight\_Status](#LSG_N_Headlight_Status_00031) = (OFF or DRL turns ON, or Auto detect daylight) || [Front\_Fog\_Status](#LSG_N_Front_Fog_HMI_Status_00008) = OFF || [Ignition\_Status](#LSG_N_Ignition_00001) != RUN.

|  |  |  |
| --- | --- | --- |
| [Front\_Fog\_Status](#LSG_N_Front_Fog_HMI_Status_00008) | [Ignition\_Status](#LSG_N_Ignition_00001) | [Headlight\_Status](#LSG_N_Headlight_Status_00031) |
| OFF | != RUN | OFF or DRL turns ON |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_Front Fog Turn OFF-EU\_00021### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_Front Fog Turn OFF-US\_00022### Front Fog Turn OFF-US

Front Fog Lamps shall turn off when [Headlight\_Status](#LSG_N_Headlight_Status_00031) = (OFF OR AUTO (Day Light) OR DRL turns ON) || [High\_Beam\_Indicator\_Rqst](#LSG_D_High_Beam_Indicator_Rqst_00035)= ON && [Ignition\_Status](#LSG_N_Ignition_00001) != RUN || [Front\_Fog\_Status](#LSG_N_Front_Fog_HMI_Status_00008) = OFF

|  |  |  |  |
| --- | --- | --- | --- |
| [High\_Beam\_Indicator\_Rqst](#LSG_D_High_Beam_Indicator_Rqst_00035) | [Front\_Fog\_Status](#LSG_N_Front_Fog_HMI_Status_00008) | [Ignition\_Status](#LSG_N_Ignition_00001) | [Headlight\_Status](#LSG_N_Headlight_Status_00031) |
| ON | OFF | != RUN | OFF OR AUTO (Day Light) OR DRL turns ON |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_Front Fog Turn OFF-US\_00022### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_Rear Fog Active\_00004### Rear Fog Active Input Conditions

Rear Fog Lamps shall turn on when [RearFog\_Config](#LPR_D_RearFog_Config_00005) = ENABLE && [Rear\_Fog\_Switch\_Status](#LSG_N_Rear_Fog_Switch_Status_00026) = ON && [Ignition\_Status](#LSG_N_Ignition_00001) = RUN && [Front\_Fog\_Status](#LSG_N_Front_Fog_HMI_Status_00008) = ON OR ([LowBeamsOnly\_Rqst](#LSG_D_LowBeamsOnly_Rqst_00045) = ON || [LowBeams\_WithDRL\_Rqst](#LSG_D_LowBeams_WithDRL_Rqst_00046) = ON) (when low beams are ON, high beams can also be ON. If front fogs are no installed, then Low beams ON can qualify)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [RearFog\_Config](#LPR_D_RearFog_Config_00005) | [Front\_Fog\_Status](#LSG_N_Front_Fog_HMI_Status_00008) | [LowBeamsOnly\_Rqst](#LSG_D_LowBeamsOnly_Rqst_00045) **OR** [LowBeams\_WithDRL\_Rqst](#LSG_D_LowBeams_WithDRL_Rqst_00046) | [Rear\_Fog\_Switch\_Status](#LSG_N_Rear_Fog_Switch_Status_00026) | [Ignition\_Status](#LSG_N_Ignition_00001) |
| ENABLE | ON | ON | ON | RUN |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_Rear Fog Active\_00004### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_Rear Fog Trailer-ALLOW\_00023### Rear Fog Trailer Light-ALLOW

Rear Fog and Trailer Lamps shall turn on when [RearFog\_Config](file:///C:/Users/ASTRZELC/Desktop/FORD/Assigned%20Work%20Task/FOG%20LAMPS/Funtion%20Spec%20Docs/EQUATIONS.docx#LPR_D_RearFog_Config_00005) = ENABLE && [Rear\_Fog\_Switch\_Status](#LSG_N_Rear_Fog_Switch_Status_00026) = ON && [Ignition\_Status](#LSG_N_Ignition_00001) = RUN && [RearFogWithTrailer\_Cfg](#LSG_D_RearFogWithTrailer_Cfg_00022) = ALLOW && ([Front\_Fog\_Status](#LSG_N_Front_Fog_HMI_Status_00008) = ON || ([LowBeamsOnly\_Rqst](#LSG_D_LowBeamsOnly_Rqst_00045) = OFF || [LowBeams\_WithDRL\_Rqst](#LSG_D_LowBeams_WithDRL_Rqst_00046) = OFF)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [RearFog\_Config](#LPR_D_RearFog_Config_00005) | [Front\_Fog\_Status](#LSG_N_Front_Fog_HMI_Status_00008) | [Rear\_Fog\_Switch\_Status](#LSG_N_Rear_Fog_Switch_Status_00026) | LowBeamsOnly\_Rqst OR LowBeams\_WithDRL\_Rqst | [RearFogWithTrailer\_Cfg](#LSG_D_RearFogWithTrailer_Cfg_00022) | [Ignition\_Status](#LSG_N_Ignition_00001) |
| ENABLE | ON | ON | OFF | ALLOW | RUN |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_Rear Fog Trailer-US\_00023### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_Rear Fog Trailer-INHIBIT\_00024### Rear Fog Trailer Light-INHIBIT

Only Rear Fog Trailer Lamps shall turn on when [Rear\_Fog\_Switch\_Status](#LSG_N_Rear_Fog_Switch_Status_00026) = ON && [Ignition\_Status](#LSG_N_Ignition_00001) = RUN && [RearFogWithTrailer\_Cfg](#LSG_D_RearFogWithTrailer_Cfg_00022) = INHIBIT && [Front\_Fog\_Status](#LSG_N_Front_Fog_HMI_Status_00008) = ON || ([LowBeamsOnly\_Rqst](#LSG_D_LowBeamsOnly_Rqst_00045) = ON || [LowBeams\_WithDRL\_Rqst](#LSG_D_LowBeams_WithDRL_Rqst_00046) = ON)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| [RearFog\_Config](#LPR_D_RearFog_Config_00005) | [Front\_Fog\_Status](#LSG_N_Front_Fog_HMI_Status_00008) | [[Rear\_Fog\_Switch\_Status](#LSG_N_Rear_Fog_Switch_Status_00026)](#LSG_N_Rear_Fog_HMI_Status_00009) | [LowBeamsOnly\_Rqst](#LSG_D_LowBeamsOnly_Rqst_00045) | [High\_Beam\_Indicator\_Rqst](#LSG_D_High_Beam_Indicator_Rqst_00035) | LowBeamsOnly\_Rqst OR LowBeams\_WithDRL\_Rqst | [RearFogWithTrailer\_Cfg](#LSG_D_RearFogWithTrailer_Cfg_00022) | [Ignition\_Status](#LSG_N_Ignition_00001) |
| ENABLE | ON | ON | ON | OFF | ON | INHIBIT | RUN |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_Rear Fog Trailer-US\_00024### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_Rear Fog Disable-EU\_00026### Rear Fog Disable Conditions-EU

Rear Fog and Trailer Fog Lamps shall turn off when [Rear\_Fog\_Switch\_Status](#LSG_N_Rear_Fog_Switch_Status_00026)= OFF || [Ignition\_Status](#LSG_N_Ignition_00001) = (ACC || OFF) || Front\_Fog\_Status = OFF || [Headlight\_Status](#LSG_N_Headlight_Status_00031) = AUTO (light status = BRIGHT) || [Headlight\_Status](#LSG_N_Headlight_Status_00031) = OFF || ([LowBeamsOnly\_Rqst](#LSG_D_LowBeamsOnly_Rqst_00045) = OFF || [LowBeams\_WithDRL\_Rqst](#LSG_D_LowBeams_WithDRL_Rqst_00046) = OFF)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [Headlight\_Status](#LSG_N_Headlight_Status_00031) | [Headlight\_Status](#LSG_N_Headlight_Status_00031) | [Front\_Fog\_Status](#LSG_N_Front_Fog_HMI_Status_00008) | LowBeamsOnly\_Rqst OR LowBeams\_WithDRL\_Rqst | [Rear\_Fog\_Switch\_Status](#LSG_N_Rear_Fog_Switch_Status_00026) | [Ignition\_Status](#LSG_N_Ignition_00001) |
| OFF | AUTO (light status = BRIGHT) | OFF | OFF | OFF | OFF |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_Rear Fog Disable-EU\_00026### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_Rear Trailer Mode\_00007### Rear Trailer Configuration

Rear Fog Light shall be configurable, if in case a Trailer is attached to the vehicle, both RFL's (Trailer and Vehicle) are activated when [RearFogWithTrailer\_Cfg](#LSG_D_RearFogWithTrailer_Cfg_00022) = ALLOW or only the Trailers RFL is activated when [RearFogWithTrailer\_Cfg](#LSG_D_RearFogWithTrailer_Cfg_00022) = INHIBIT. (CAN message)

The Rear Fog Light on the trailer shall behave in the same way as on the vehicle such as all rear fog lamps on the trailer must remain illuminated as long as Rear Fog Light is selected.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_Rear Trailer Mode\_00007### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_Ext Lighting Ign Status\_00012### Ext Lighting Ign Status

When Ignition\_Status is ACC or OFF, ExtLightIgnition\_Status shall be DISABLE.

This signal is used for exterior lights which have dependency on Ignition Status.

ExtLightIgnition\_Status remains DISABLE when Ignition\_Status changes OFF/ACC to RUN before starting

the engine for duration of 3 seconds (HeadlampsOffDelayTime\_Cfg) to avoid light flicker on lamps.

ExtLightIgnition\_Status has NO\_EFFECT when Ignition\_Status is in RUN after delay of 3 seconds HeadlampsOffDelayTime\_Cfg) or ExtLightMode\_Cfg = IGN\_INDEPENDENT

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_Ext Lighting Ign Status\_00012### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_Head Beam Ramp Speed\_00008### Head Beam Ramp Speed

Head Beam Ramp Speed shall be used to control fog lamp intensity. This option is available for EU markets.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_Head Beam Ramp Speed\_00008### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_Operational Voltage Range for Fog\_00034### Voltage effect on Fog

Conform to ELCOMP - RQT-191001-009906. The operational voltage ranges shall be controlled by other functions and do not need to be considered by the fog lamp feature. Therefore, will not to be considered be effected by the fog lamp function.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_Operational Voltage Range for Fog\_00034### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_DTC\_Diagnostics\_00039### DTC\_Requirements

The Fog Feature shall incorporate DTC’s to identify faults throughout the feature control network.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_DTC\_Diagnostics\_00039### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Maintainability | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_DID\_Parameters\_00040### DID\_Requirements

The Fog Feature shall incorporate DID’s to identify status and states of controls throughout the feature control network.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_DID\_Parameters\_00040### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Maintainability | | | **Priority** | High (Mandatory) | **Status** | Draft | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

#### Error Handling

***#Hint:*** *FMEA counter measures could be considered as requirements in this chapter*

*WHEN switch failed? Lamp failure? Etc. diagnostic spec for the BCM.*

### Non-Functional Requirements

***#Hint:*** *Non-functional requirements specify some performance criteria in addition to the functional behavior given defined by the functional requirements. Timing (if not already included in the functional requirements), security details (e.g. how secure does an algorithm have to be) or reliability (e.g. mean time between failure) could be specified in this section.*

### Functional Safety Requirements

**#Classification**: Functional Safety only – If not used, remove content and state “Not Applicable”

***#Hint:*** *The Functional Safety process does currently not allow to refine FSRs inside the Function Specification. Therefore, the Function Specification just lists the FSRs “inherited” from the features which contribute to this Logical Function. The “inherited” FSRs get cascaded 1:1 as input to the Implemented Functions.*

**#Link:**[RE Wiki – RE Alignment with Functional Safety (ISO26262)](http://wiki.ford.com/pages/viewpage.action?pageId=176397025)

[RE Wiki - Requirements Attributes](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes)

[Functional Safety Sharepoint](https://pd3.spt.ford.com/sites/GlobalFunctionalSafety/Pages/default.aspx) – Functional Safety Concept

*ASIL rated QM – No FSR’s*

|  |  |
| --- | --- |
| **FSR ID**  (from Feature Doc) | **Requirement Title** |
|  |  |
|  |  |
| … |  |

Table 12: Inherited FSRs for Fog Lighting

### Other Requirements

#### Design Requirements

***#Hint:*** *Requirements of a Logical Function should be typically agnostic of their SW/HW implementation*. If for specific reasons the function owner needs to define explicitly design constraints, it can be done in this chapter.

# Open Concerns

**#Hint:** The following list presents open concerns, which have to be discussed or clarified over the course of the on-going requirements engineering.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ID | Concern Description | e-Tracker / Reference | Responsible | Status | Solution |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |
| 5 |  |  |  |  |  |
| 6 |  |  |  |  |  |
| 7 |  |  |  |  |  |
| 8 |  |  |  |  |  |
| 9 |  |  |  |  |  |

Table 13: Open Concerns

# Revision History

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Revision | Date | Description | Approved by | Responsible |
| A |  | Initial version |  |  |
|  |  |  |  |  |

## Template Revisions

*#Important: Do not change this section*

# Appendix

## Data Dictionary

### [Logical Signals](#_Logical_Inputs) (LSG)

**#Macro:** [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter) (select “Logical Signal” as type)

###LSG\_VBattState\_00028### LSG\_VBattState

Array indicating Current State of a specific Voltage Range.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
|  | HI\_V | Temporary High voltage |
| LO\_V | Temporary Low voltage |
| NORM\_V | Normal voltage |
| OVER\_V | Too high too long, Over Voltage |
| UNDER\_V | Too low too long, Under Voltage |

###LSG\_Ignition\_Status\_00032### LSG\_Ignition\_Status

The processed value for current Ignition state.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | ACC | ignition is in the ACC position |
| OFF | ignition is in the OFF position |
| RUN | ignition is in the RUN position |
| START | ignition is in the START position |
|  |  |

###LSG\_Front\_Fog\_Light\_SW\_Status\_00029### LSG\_Front\_Fog\_Light\_SW\_Status

Indicates a driver request for front fog lights.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | OFF | request to turn the front fog lights off |
| ON | request to turn the front fog lights on |

###LSG\_Rear\_Fog\_Switch\_Status\_00026### LSG\_Rear\_Fog\_Switch\_Status

Indicates a driver request for rear fog lights.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | OFF | request to turn the rear fog lights off |
| ON | request to turn the rear fog lights on |

###LSG\_SnowPlowMode\_Status\_00030### LSG\_SnowPlowMode\_Status

Determines that the request for the Snow Plow Mode is present/not present

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | DISABLED | Snow Plow Mode request is not present. |
| ENABLED | Snow Plow Mode request is present |

###LSG\_Headlight\_Status\_00031### LSG\_Headlight\_Status

Indicates the status of Headlamp switch after debouncing and filtering.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | AUTOLAMPS | the headlamp switch is in the autolamps position |
| HEADLAMPS | the headlamp switch is in the headlamps position |
| OFF | the headlamp switch is in the off position |
| POSITION | the headlamp switch is in the position lights position |

###LSG\_Headlamp\_HMI\_SW\_00002### LSG\_Headlamp\_Switch

Headlamp switch (Off, Position, Low Beam, Auto Light), secondary HMI input to Front and Rear fog lamp logic control block.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | OFF | Headlamp Switch is in the OFF position |
| POSITION | Headlamp Switch is in POSITION |
| LOWBEAM | Headlamp Switch is in the LOW\_BEAM position |
| AUTOLIGHT | Headlamp Switch is in the AUTO\_LIGHT position |

###LSG\_LowBeamsOnly\_Rqst\_00045### LSG\_LowBeamsOnly\_Rqst

This message controls low beam headlamps activation. It covers both situations of manual low beam ON the MLS Headlamp and Autolamps that detect nighttime conditions

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | ON | LOWBEAM is ON, not HIGHBEAM |
| OFF | LOWBEAM is OFF |

###LSG\_LowBeams\_WithDRL\_Rqst\_00046### LSG\_LowBeams\_WithDRL\_Rqst

Control low beam headlamps activation for dual and quad headlamps, both HID and non-HID for headlamps used as low beams or configured as DRL. This covers both situations of manual low beam position of MLS (HEADLAMP) and Autolamps that detect nighttime conditions and DRL (night), when **LowBeams\_WithDRL\_Rqst** = ON

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | ON | LOWBEAM is ON |
| OFF | LOWBEAM is OFF |
| ON\_DRL | Turn low beam headlamps on when configured as daytime running |

###LSG\_Front\_Fog\_HMI\_Status\_00008### LSG\_Front\_Fog\_HMI\_Status

Front Fog switch, HMI input to Front fog lamp logic control block.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | ON | Front Fog Switch is active |
| OFF | Front Fog Switch is not active |

###LSG\_Rear\_Fog\_HMI\_Status\_00009### LSG\_Rear\_Fog\_HMI\_Status

Rear Fog switch, HMI input to Rear fog lamp logic control block.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **ONEncoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | ON | Rear Fog Switch is active |
| OFF | Rear Fog Switch is not active |

###LSG\_RearFogWithTrailer\_Cfg\_00022### LSG\_RearFogWithTrailer\_Cfg

The Rear Fog Light on the trailer shall behave in the same way as on the vehicle such as all rear fog lamps on the trailer must remain illuminated as long as Rear Fog Light is selected.

In the case a trailer is connected to the vehicle, when [RearFogWithTrailer\_Cfg](#LSG_D_RearFogWithTrailer_Cfg_00022) = INHIBIT, the rear fog lamp on the trailer is illuminated, but the rear fog lamp on the vehicle is deactivated when Rear Fog Light is selected. This is required for **European** applications and allowed by ECE regulations. However, when [RearFogWithTrailer\_Cfg](#LSG_D_RearFogWithTrailer_Cfg_00022) = ALLOW, both vehicle and trailer rear fog lamps will be illuminated. This is required for **Brazilian** applications.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | ALLOW | Vehicle Rear Fog Lamps are allowed to operate when the trailer module reports that a trailer is connected. |
| INHIBIT | Vehicle Rear Fog Lamps are not allowed to operate when the trailer module reports that a trailer is connected. |

###LSG\_Trailer\_Tow\_Present\_Status\_00037### LSG\_Trailer\_Tow\_Present\_Status

This CAN signal indicates the status of trailer tow connected or not connected.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | NOT\_PRESENT | Trailer tow not connected |
| PRESENT | Trailer tow connected |

###LSG\_Snow\_Plow\_Status\_00011### LSG\_Snow\_Plow\_Status

Snow Plow Status (could be either CAN message or hardwired) input to Front fog lamp logic control block. (Configured by the dealership)

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | NOT\_PRESENT | Trailer tow not connected |
| PRESENT | Trailer tow connected |

###LSG\_Exterior\_LF\_Front\_Fog\_Lamp\_00038### LSG\_Exterior\_LF\_Front\_Fog\_Lamp

Left Front Fog lamp turns on or off (Logical Outputs)

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | ON | Exterior Left Front Fog Lamp ON |
| OFF | Exterior Left Front Fog Lamp OFF |
|  |  |

###LSG\_Exterior\_RF\_Front\_Fog\_Lamp\_00039### LSG\_Exterior\_RF\_Front\_Fog\_Lamp

Right Front Fog lamp turns on or off (Logical Outputs)

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | ON | Exterior Right Front Fog Lamp ON |
| OFF | Exterior Right Front Fog Lamp OFF |

###LSG\_Front\_Telltale\_Lamp\_00043### LSG\_Front\_Telltale\_Lamp

Front Fog Telltale turns on or off synchronist to the front fog lamps turn on and off.

Front\_Fog\_Light\_Rqst is mapped to a CAN signal to drive a telltale on the instrument cluster. The telltale indicates a customer

request, not if the circuit is operating properly. The telltale is a visual indicator that the front fog lamps have been switched on

(closed circuit telltale), but not one that monitors if is operating correctly or not (operational telltale). Specifically, the front fog lamp telltale is on only when the request for the Front Fog Lamp feature is active. The telltale remains off when front fog lamps are used for other features such as Daytime Running Lights or Cornering Lights.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **ONEncoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | ON | Front Fog Telltale is ON |
| OFF | Front Fog Telltale is OFF |

###LSG\_Rear\_Telltale\_Lamp\_00044### LSG\_Rear\_Telltale\_Lamp

Rear Fog Telltale turns on or off at the same time the Rear Lamps turn on and off.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **ONEncoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | ON | Rear Fog Telltale is ON |
| OFF | Rear Fog Telltale is OFF |

###LSG\_Rear \_Fog\_ Trailer \_Output\_00023### LSG\_Rear\_ Fog\_ Trailer\_Output

Logic status output of the Rear Trailer Fog Lamp circuit.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **ONEncoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | ON | Trailer Lamp is ON |
| OFF | Trailer Lamp is OFF |

###LSG\_Exterior\_LF\_Rear\_Fog\_Lamp\_00041### LSG\_Exterior\_LF\_Rear\_Fog\_Lamp

Left Rear Fog Lamp turned on or off (Logical Outputs)

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | ON | Exterior Left Rear Front Fog Lamp ON |
| OFF | Exterior Left Rear Front Fog Lamp OFF |

###LSG\_Exterior\_RF\_Rear\_Fog\_Lamp\_00042### LSG\_Exterior\_RF\_Rear\_Fog\_Lamp

Right Rear Fog Lamp turned on or off (Logical Outputs)

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | ON | Exterior Right Rear Front Fog Lamp ON |
| OFF | Exterior Right Rear Front Fog Lamp OFF |

### Logical Parameters

**#Macro:** [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter) (select “Logical Parameter” as type)

#### **Logical Parameters (LPR)**

###LPR\_Fog\_Lamp\_Usage\_Cfg\_00064### LPR\_Fog\_Lamp\_Usage\_Cfg

This Parameter determines the usage of foglamps.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | Fog Only | fog lamps used as fog lamp only ( Used as standard default value.) |
| Fog and DRL | fog lamps used as fog and DRL light |
| Fog and Cornering | fog lamps used as fog and cornering light |
| Fog and DRL and Cornering | fog lamps used as fog ,DRL and cornering light |
|  |  |

###LPR\_RearFogWithTrailer\_Cfg\_00058### LPR\_RearFogWithTrailer\_Cfg

The Rear Fog Light on the trailer shall behave in the same way as on the vehicle such as all rear fog lamps on the trailer must remain illuminated as long as Rear Fog Light is selected.

In the case a trailer is connected to the vehicle, when [RearFogWithTrailer\_Cfg](#LSG_D_RearFogWithTrailer_Cfg_00022) = INHIBIT, the rear fog lamp on the trailer is illuminated, but the rear fog lamp on the vehicle is deactivated when Rear Fog Light is selected. This is required for **European** applications and allowed by ECE regulations. However, when [RearFogWithTrailer\_Cfg](#LSG_D_RearFogWithTrailer_Cfg_00022) = ALLOW, both vehicle and trailer rear fog lamps will be illuminated. This is required for **Brazilian** applications.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | ALLOW | Vehicle Rear Fog Lamps are allowed to operate when the trailer module reports that a trailer is connected. |
| INHIBIT | Vehicle Rear Fog Lamps are not allowed to operate when the trailer module reports that a trailer is connected. |

###LPR\_FR\_Fog\_Input\_Ckt\_00018### LPR\_FR\_Fog\_Input\_Ckt

Determines if a Front Fog Lamp is shut off while an adjacent turn signal is flashing. It does not matter which feature is trying to activate the Front Fog Lamps.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | Value 1 | Interpretation of value 1 |
| Value 2 | … |
| … | … |
|  |  |
|  |  |

###LPR\_ HeadLamp\_HMI\_SW\_LowBeam\_00002### LPR\_LowBeam

Low beam is ON. Head Lamp HMI state input to Front and Rear fog logic control block.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | ON | Low Beam enabled |

###LPR\_ HeadLamp\_HMI\_SW\_PositionLight\_00004### LPR\_PositionLight

Position/Park Light is ON. Head Lamp HMI state input to Front and Rear fog logic control block. ("Position" would turn on license plate lamps, tail lamps, side marker lamps, and the front amber or white marker lamps. but not the actual headlamps.)

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) ( | Min Value | 3.5 |
| Max Value | 5.5 |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 | Binary Logic one (Interpretation of value 1) |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | | Volts – Digital Input |

###LPR\_RearFog\_Config\_00005### LPR\_RearFog\_Config

Rear Fog lamp(s) configured on vehicle per international standards.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | PRESENT | Rear Fog lamps are presently installed on vehicle |
| NOT\_PRESENT | Rear Fog lamps are not available on vehicle |

###LPR\_FrontFog\_AutoCancel\_Cfg\_00017### LPR\_FrontFog\_AutoCancel\_Cfg

**FrontFog\_AutoCancel\_Cfg** shall be set to CANCEL for EU. When the ignition switch changes to OFF or ACC, or the position/parklamps turn off, or Snow Plow Mode is enabled, the user request for foglamps (**Front\_Fog\_Light\_SW\_Status**) shall be cancelled and the front fog lamps shall turn off

**FrontFog\_AutoCancel\_Cfg** shall be set to NO\_CANCEL for North America. When the ignition switch changes to OFF or ACC, or the position/parklamps turn off, or Snow Plow Mode is enabled, the user request for fog lamps (**Front\_Fog\_Light\_SW\_Status**) shall not change, but the front fog lamps shall turn off.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | CANCEL | For EU markets |
| NO\_CANCEL | for North America markets |

###LPR\_FrontFog\_WithHighBeams\_Cfg\_00012### LPR\_FrontFog\_WithHighBeams\_Cfg

**FrontFog\_WithHighBeams\_Cfg** shall be set to ALLOW for EU. Fog lamps and high beam headlamps be allowed to be on simultaneously

**FrontFog\_WithHighBeams\_Cfg** shall be set to INHIBIT for US. Regulations require that the front fog lamps be extinguished when high beam headlamps are on.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | ALLOW | for EU markets |
| INHIBIT | for US markets |

###LPR\_FogLamp\_Start\_Delay\_Cfg\_00060### LPR\_FogLamp\_Start\_Delay\_Cfg

**FogLamp\_Start\_Delay\_Cfg (EU)** provides a delay, following the return of ignition to RUN, to allow Parklamps\_Command to return to ON, before the usual front fog cancellation conditions are evaluated.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 200 |
| Resolution | 1 |
| Offset |  |
|  |  |
| **Unit** | | Milliseconds |

###LPR\_RearFogLamp\_Start\_Delay\_Cfg\_00061### LPR\_RearFogLamp\_Start\_Delay\_Cfg

**RearFogLamp\_Start\_Delay\_Cfg (EU)** provides a delay, following the return of ignition to RUN, to allow updated status of Front\_Fog\_Light\_Rqst and Headlamps\_Command to be available to the Rear fog feature, before the usual Rear fog cancellation conditions are evaluated.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 200 |
| Resolution | 1 |
| Offset |  |
| **Unit** | | Milliseconds |  |

###LPR\_FogLampOnDelaySlow\_Cfg\_00020### LPR\_FogLampOnDelaySlow\_Cfg

When FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams off with slow ramp-down (Ramping\_Speed = SLOW), FogLampOnDelaySlow\_Cfg is the delay from the beginning of High Beam ramp-down until Front Fog turns-on.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 2000 |
| Resolution | 20 |
| Offset |  |
| **Unit** | | Milliseconds |

###LPR\_FogLampOnDelayMid\_Cfg\_00021### LPR\_FogLampOnDelayMid\_Cfg

hen FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams off with medium ramp-down (Ramping\_Speed = MEDIUM), FogLampOnDelayMid\_Cfg is the delay from the beginning of High Beam ramp-down until Front Fog turns-on.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 2000 |
| Resolution | 20 |
| Offset |  |
| **Unit** | | Milliseconds |

###LPR\_FogLampOnDelayFast\_Cfg\_00022### LPR\_FogLampOnDelayFast\_Cfg

When FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams off with fast ramp-down (Ramping\_Speed = FAST), FogLampOnDelayFast\_Cfg is the delay from the beginning of High Beam ramp-down until Front Fog turns-on.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 2000 |
| Resolution | 20 |
| Offset |  |
| **Unit** | | Milliseconds |

###LPR\_FogLampOffDelaySlow\_Cfg\_00023### LPR\_FogLampOffDelaySlow\_Cfg

When FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams on with slow ramp-up (Ramping\_Speed = SLOW), FogLampOffDelaySlow\_Cfg is the delay from the beginning of High Beam ramp-up until Front Fog turns-off.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 2000 |
| Resolution | 20 |
| Offset |  |
| **Unit** | | Milliseconds |

###LPR\_FogLampOffDelayMid\_Cfg\_00024### LPR\_FogLampOffDelayMid\_Cfg

When FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams on with medium ramp-up (Ramping\_Speed = MEDIUM), FogLampOffDelayMid\_Cfg is the delay from the beginning of High Beam ramp-up until Front Fog turns-off.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 2000 |
| Resolution | 20 |
| Offset |  |
| **Unit** | | Milliseconds |

###LPR\_FogLampOffDelayFast\_Cfg\_00025### LPR\_FogLampOffDelayFast\_Cfg

When FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams on with fast ramp-up (Ramping\_Speed = FAST), FogLampOffDelayFast\_Cfg is the delay from the beginning of High Beam ramp-up until Front Fog turns-off.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 2000 |
| Resolution | 20 |
| Offset |  |
| **Unit** | | Milliseconds |

###LPR\_FogLampSwitchType\_Cfg\_00026### LPR\_FogLampSwitchType\_Cfg

FogLampSwitchType\_Cfg is a method 2 configuration parameter which decides the front/rear fog lighting switch input types which can be either HARDWIRED, LIN or CAN.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | HARDWIRED | Hardwired front/rear fog switch type |
| LIN | front/rear fog switch type |
| CAN | Front/rear fog soft button |

###LPR\_FogLampCkt\_Switch\_Cfg\_00027### LPR\_FogLampCkt\_Switch\_Cfg

Indicates if Input Switch for Front Fog Lamp are used or not.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | NOT\_USED | Module configured to not use the Left/Right Front Fog Lamp Output circuits, indicates to not to log DTC |
| USED | UModule configured to use the Left/Right Front Fog lamp Output circuits, indicates to log DTC |

###LPR\_FrontFog\_Enable\_Cfg\_00029### LPR\_FrontFog\_Enable\_Cfg

This parameter enables/disables the Front Fog Lighting feature. It may be set to ENABLED, even if the

vehicle is not fitted with a Front Fog Lighting Switch and Front Fog Lamps.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | DISABLED | the Front Fog Lighting feature is disabled. |
| ENABLED | the Front Fog Lighting feature is enabled. |

###LPR\_FrontFog\_WithHighBeams\_Cfg\_00030### LPR\_FrontFog\_WithHighBeams\_Cfg

This configuration parameter indicates whether the front fog lamps are allowed/inhibited to be on when high beams or flash-to-pass are on.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | ALLOW | Front fog lamps are allowed to be on when high beams or flash-to-pass are on |
| NHIBIT | Front fog lamps are inhibited when high beams or flash-to-pass are on |

###LPR\_FrontFogCkt\_WithTurn\_Cfg\_00031### LPR\_FrontFogCkt\_WithTurn\_Cfg

Determines if a Front Fog Lamp is shut off while an adjacent turn signal is flashing. It does not matter which feature is trying to activate the Front Fog Lamps.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | ALLOW | The Front Fog Lamp is allowed to illuminate while an adjacent turn signal is flashing |
| INHIBIT | INHIBIT The Front Fog Lamp is shut off while an adjacent turn signal isflashing. This configuration should be used only when required to meet regulations. Consult with the Body Exterior Lighting group. |

###LPR\_Fog\_Lamp\_Ckt\_Usage\_DutyCycleRamp\_Cfg\_00032### LPR\_Fog\_Lamp\_Ckt\_Usage\_DutyCycleRamp\_Cfg

Determines if LF/RF\_Fog\_Lamp\_Ckt ramping, as a Cornering Light, is optimized for halogen bulbs, or for LEDs to appear linear without jitter.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | LINEAR | when LF/RF\_Fog\_Lamp\_Ckt intensity is ramped as a Cornering Light, the intensity percentage is used directly as the duty cycle. This gives a linear duty cycle ramp. |
| VRMS | when LF/RF\_Fog\_Lamp\_Ckt intensity is ramped as a Cornering Light, the intensity is a percentage of VrmsTarget\_Cfg. This gives a nonlinear duty cycle ramp. |

###LPR\_Fog\_InRushTimeDelay\_Cfg\_00033### LPR\_Fog\_InRushTimeDelay\_Cfg

Time delay between activation of the left side and activation of the right side Front Fog Lamps. This delay minimizes electrical load due to in-rush current.

Typically use 0 ms if the ckt is used as power supply ckt for EEL modules.

Typically use 20 ms if Front Fog Lamps are fitted with low current devices (LED). Reason is to minimize the visible offset.

Typically use 50 ms if Front Fog Lamps are fitted with high current devices (bulbs). Reason is to stagger the large inrush current.

Engineer setting this parameter should consult the Design Transmittal for the in-rush duration of each vehicle load. Consult the Body Module Technical Specialist if the Design Transmittal states a value greater than 50ms.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 500 |
| Resolution | 1 |
| Offset |  |
| **Unit** | | ms |

###LPR\_FrontTurn\_Position\_Lamps\_Cfg\_00034### LPR\_FrontTurn\_Position\_Lamps\_Cfg

FrontTurn\_Position\_Lamps\_Cfg determines if LF\_Turn\_Lamp\_Ckt and RF\_Turn\_Lamp\_Ckt are configured

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | TURN\_ONLY | determines if LF\_Turn\_Lamp\_Ckt and RF\_Turn\_Lamp\_Ckt are configured as turn only |
| TURN\_POSITION | determines if LF\_Turn\_Lamp\_Ckt and RF\_Turn\_Lamp\_Ckt are configured as Combined position/turn (dual intensity with flash) |

###LPR\_FrontFogLightMaxIntensity\_Cfg\_00035### LPR\_FrontFogLightMaxIntensity\_Cfg

Maximum intensity value for Front Fog Lamps Output

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 1 |
| Max Value | 100 |
| Resolution | 1 |
| Offset |  |
|  |  |
| **Unit** | | Scalar |

###LPR\_FrontFogLightMinIntensity\_Cfg\_00036### LPR\_FrontFogLightMinIntensity\_Cfg

Minimum intensity value for Front Fog Lamps Output

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 1 |
| Max Value | 100 |
| Resolution | 1 |
| Offset |  |
| **Unit** | | Scalar |

###LPR\_FrontFogCkt\_WithTurn\_Cfg\_00037### LPR\_FrontFogCkt\_WithTurn\_Cfg

Determines if a Front Fog Lamp is shut off while an adjacent turn signal is flashing. It does not matter which feature is trying to activate the Front Fog Lamps.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | ALLOW | The Front Fog Lamp is allowed to illuminate while an adjacent turn signal is flashing. |
| INHIBIT | The Front Fog Lamp is shut off while an adjacent turn signal is flashing. |

###LPR\_FrontFog\_WithHighBeams\_Cfg\_00038### LPR\_FrontFog\_WithHighBeams\_Cfg

This configuration parameter indicates whether the front fog lamps are allowed/inhibited to be on when high beams or flash-to-pass are on.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | ALLOW | Front fog lamps are allowed to be on when high beams or flash-to-pass are on |
| INHIBIT | Front fog lamps are inhibited when high beams or flash-to-pass are on |

#### **Command Parameters**

###LPR\_Front\_Fog\_Light\_Left\_Cmd\_00052### LPR\_Front\_Fog\_Light\_Left\_Cmd

Command to control the left front fog lamps.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 1 |
| Max Value | 100 |
| Resolution | 1 |
| Offset |  |
| **Unit** | | Scalar - Percent |

###LPR\_Front\_Fog\_Light\_Right\_Cmd\_00054### LPR\_Front\_Fog\_Light\_Right\_Cmd

Command to control right front fog lamp.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 1 |
| Max Value | 100 |
| Resolution | 1 |
| Offset |  |
| **Unit** | | Scalar - Percent |

#### **Special Logical Parameters**

###LSG\_High\_Beam\_Indicator\_Rqst\_00035### LSG\_High\_Beam\_Indicator\_Rqst

Signal used to request high beams ON or OFF.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | OFF | High beams are off |
| ON | High beams are on |

###LSG\_FTP\_Status\_00036### LSG\_FTP\_Status

Indicates a driver request for flash-to-pass.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Discrete  Encoding) | FTP | request to turn the flash-to-pass on |
| NULL | request to turn the flash-to-pass off |

###LPR\_ExtLightIgnition\_Status\_00057### LPR\_ExtLightIgnition\_Status

This signal is used for exterior lights which have dependency on Ignition Status. When Ignition\_Status is

ACC or OFF, ExtLightIgnition\_Status is DISABLE.

ExtLightIgnition\_Status remains DISABLE when Ignition\_Status changes OFF/ACC to RUN before starting

the engine for duration of 3 seconds (HeadlampsOffDelayTime\_Cfg) to avoid light flicker on lamps.

ExtLightIgnition\_Status has NO\_EFFECT when Ignition\_Status is in RUN after delay of 3 seconds

(HeadlampsOffDelayTime\_Cfg) or ExtLightMode\_Cfg = IGN\_INDEPENDENT

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | DISABLE | Ignition\_Status is OFF, ACC or START to hold exterior lights off for 3 seconds |
| NO\_EFFECT | Ignition\_Status does not affect Exterior Lights |

###LPR\_LF\_Fog\_DRL\_Cornering\_Mrg\_00039### LPR\_LF\_Fog\_DRL\_Cornering\_Mrg

Temperory variable to store the status of left front fog lamp ouput circuit when used as fog,DRL and

cornering.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 100 |
| Resolution | 1 |
| Offset |  |
| **Unit** | | Percentage |

###LPR\_DRL\_WithFog\_Cfg\_00040### LPR\_DRL\_WithFog\_Cfg

Determines if Daytime Running Lights on a vehicle are to be deactivated when the Front Fog Lamps are

activated by the driver.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | ALLOW | The Daytime Running Lamps are allowed to illuminate while Front Fog Lamps are activated by the driver. |
| INHIBIT | The Daytime Running Lamps are shut off while Front Fog Lamps are activated by the driver. This configuration should be used only when required to meet regulations. Consult with the Body Exterior Lighting group. |

###LPR\_LF\_Fog\_Lamp\_Ckt\_Usage\_Cfg\_00041### LPR\_LF\_Fog\_Lamp\_Ckt\_Usage\_Cfg

Output circuit to control the left front fog lamp.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 100 |
| Resolution | 1 |
| Offset |  |
| **Unit** | |  |

###LPR\_ExtLightDebounceDelay\_Extended\_Cfg\_00043### LPR\_ExtLightDebounceDelay\_Extended\_Cfg

An extended time interval that is allowed for inputs to be determined, following reset, before features executed. We want ExtLightDebounceDelay\_Extended\_Cfg > ExtLightDebounceDelay\_Cfg. We want Front Fog Lighting to execute before Rear Fog Lighting so fronts have time to recover first, else might cancel rears.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 4000 |
| Resolution | 1 |
| Offset |  |
| **Unit** | | Milliseconds |

###LPR\_RF\_Fog\_Lamp\_Ckt\_Usage\_Cfg\_00046### LPR\_RF\_Fog\_Lamp\_Ckt\_Usage\_Cfg

Determines RF\_Fog\_Lamp\_Ckt are used asfog lamp only or repurposed as power supply or as fog with DRL

or fog with cornering or fog DRL with cornering or as turn lamps. Note: Repurposed features are not part of our process and will be addressed in other documents.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | FOG\_CORNERING | RF\_Fog\_Lamp\_Ckt used as fog lamp with cornerning |
| FOG\_DRL | RF\_Fog\_Lamp\_Ckt used as fog lamp with DRL |
| FOG\_DRL\_CORNERING | RF\_Fog\_Lamp\_Ckt used as fog lapm with DRL and cornerning |
| FOG\_ONLY | RF\_Fog\_Lamp\_Ckt used as fog lamp |
| NOT\_USED | RF\_Fog\_Lamp\_Ckt used is not used |
| POWER\_SUPPLY | RF\_Fog\_Lamp\_Ckt used as power supply |

###LPR\_FogLampOffDelay\_Duration\_00049### LPR\_FogLampOffDelay\_Duration

When FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams

on with a Ramping\_Speed =( FAST/SLOW/MEDIUM/ IMMEDIATELY), FogLampOffDelay\_Duration is

the delay from the beginning of High Beam ramp-up until Front Fog turn-off.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 2000 |
| Resolution | 20 |
| Offset |  |
| **Unit** | | Milliseconds |

###LPR\_FogLampOnDelay\_Duration\_00050### LPR\_FogLampOnDelay\_Duration

When FrontFog\_WithHighBeams\_Cfg = INHIBIT, and Auto High Beam Control feature turns High Beams

off with a Ramping\_Speed =( FAST/SLOW/MEDIUM/ IMMEDIATELY), FogLampOnDelay\_Duration is

the delay from the beginning of High Beam ramp-down until Front Fog turn-on.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Continuous |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 2000 |
| Resolution | 20 |
| Offset |  |
| **Unit** | | Milliseconds |

###LPR\_Front\_Fog\_Lamp\_DbncV\_00051### LPR\_Front\_Fog\_Lamp\_DbncV

Debounced and Voltage Range Monitor modified version of customer request to activate Front Fog Lamps.

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Discrete |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Discrete  Encoding) | Active | as defined in module hardware specification |
| Value Inactive | as defined in module hardware specification |

###LPR\_Numeric\_Zero\_00062### LPR\_Numeric\_Zero

A signal which will be used by different interior lighting features to check or to assign the numerical value of 0

|  |  |  |
| --- | --- | --- |
| **Encoding Type Name** | | Constant |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value | 0 |
| Max Value | 1 |
| Resolution | 1 |
| Offset |  |

### Encoding Types

**#Macro:** [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/Adding+an+Encoding+Type) (select “Encoding Type” as type)

Document ends here.