# Adjustable Speed Limiter Device (with Optional Intelligent Speed Assistance) Control Function – FNV2

## Functional Description

The Adjustable Speed Limiter Device (with Optional Intelligent Speed Assistance) Control Function consists of a dedicated, fixed RTT with associated text, a chime, and a setup menu (if equipped with Intelligent Speed Assistance). This feature is intended for use in instrument clusters with a 4.2" LCD or similar display with a fixed, dedicated location for the ASLD RTT; it is not intended for use on instrument clusters with a B-display. There are no message center warnings linked to the reconfigurable telltale, however, there is text associated with the RTT.

The purpose of the ASLD fixed, dedicated RTT is to inform the driver if a speed limiter function is available in the vehicle and if the driver has activated the feature or not. Intelligent Speed Assistance (ISA) expands upon this functionality by allowing a driver to automatically limit vehicle speed to the current speed limit, as detected by the Traffic Sign Recognition (TSR) system, plus a driver selectable offset. Only a subset of vehicles equipped with ASLD will also be equipped with the ISA feature.

If ISA is configured on, the ISA setup menu shall provide the driver with the ability choose between “Manual Mode,” which allows basic ASLD functionality to be enabled or disabled via external steering wheel controls, and “Intelligent Mode,” which allows ISA functionality to be enabled or disabled via external steering wheel controls. The driver can also select an offset ranging from 0 kph to 10 kph, or 0 mph to 5 mph depending on the displayed units, via the ISA offset submenu. Note that this range of values is dictated by the Euro New Car Assessment Protocol (NCAP).

The ASLD RTT and associated text correlates the AslChime\_B\_Rq, AslIconDsply\_D\_Rq, and Veh\_V\_DsplyCcSet signals as well as the Operational\_Mode to illuminate or extinguish the ASLD RTT; the AslChime\_B\_Rq signal is used to control the state of the ASLD / ISA chime. On ISA equipped vehicles, the SlMde\_D\_RqDsply signal is also used in the RTT logic. The SlMde\_D\_Stat signal and IsaOffst\_D\_Stat signal are used to populate the corresponding ISA setup menus.

The ASLD RTT shall provide an iconic representation that will illuminate or extinguish to inform the driver that the speed limiter system has been engaged on the vehicle.

Note that ASLD functionality relies on external steering wheel controls [LIM cncl/off, Res +, Set -, (A)CC cncl/off], which are handled by the SCCM and PCM. The only switch inputs for the ASLD (with Optional ISA) Control Function are the SHMI 5-way buttons, which are only required for ISA equipped vehicles.

ASLD, ISA, and TSR are separately configured; however, if ISA\_Cfg = Enabled (0x1), then ASLD\_Cfg = Enabled (0x1) and TSR\_Cfg = Enabled (0x1).

**This STSS is applicable on programs that are equipped with DAT2.0 ADAS domain controller. Programs with CADS3.5 IPMA shall continue to implement the “Adjustable Speed Limit Device (with Optional Intelligent Speed Assistance) – CGEA1.3” STSS.**

**Cluster D&R shall align with ASLD/ISA application feature owner on STSS version.**

## Interfaces

### Interface Context Diagram (I/O Block Diagram)

ASLD (with Optional ISA) Control Function Context Diagram



### Inputs

#### IR-REQ-334841/A-INTERNAL:

* Operational\_Mode
* Display\_Units\_MC, used to determine display units currently set. Refer to Display Unit Selection Control Function STSS.
* ASLD\_Cfg
* ISA\_Cfg
* Settings\_Menu\_Cfg
* M/C\_Display\_Status
* M/C Switch Event

#### MUX signals on the CAN bus:

##### SIG-REQ-334823/A-AslChime\_B\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| AslChime\_B\_Rq | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | No |  |  |  | 0x0 |  |  |
|  |  | Yes |  |  |  | 0x1 |  |  |

##### SIG-REQ-334824/A-AslIconDsply\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| AslIconDsply\_D\_Rq | 2 |  | SED | 1 | 0 |  | 0 (0x0) | 3 (0x3) |
|  |  | Off |  |  |  | 0x0 |  |  |
|  |  | On - Passive |  |  |  | 0x1 |  |  |
|  |  | On - Active |  |  |  | 0x2 |  |  |
|  |  | On - Passive - Overridden |  |  |  | 0x3 |  |  |

##### SIG-REQ-334825/A-SlMde\_D\_RqDsply Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| SlMde\_D\_RqDsply | 2 |  | SED | 1 | 0 |  | 0 (0x0) | 3 (0x3) |
|  |  | No speed limiter symbol |  |  |  | 0x0 |  |  |
|  |  | Auto speed limiter symbol |  |  |  | 0x1 |  |  |
|  |  | Manual speed lim. symbol |  |  |  | 0x2 |  |  |
|  |  | Not Used |  |  |  | 0x3 |  |  |

\* This signal is required for ISA equipped vehicles only.

##### SIG-REQ-334826/A-SlMde\_D\_Stat Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| SlMde\_D\_Stat | 2 |  | SED | 1 | 0 |  | 0 (0x0) | 3 (0x3) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | Auto Mode |  |  |  | 0x1 |  |  |
|  |  | Manual Mode |  |  |  | 0x2 |  |  |
|  |  | ISA not configured |  |  |  | 0x3 |  |  |

\* This signal is required for ISA equipped vehicles only.

##### SIG-REQ-334827/A-Veh\_V\_DsplyCcSet Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| Veh\_V\_DsplyCcSet | 8 |  | Unitless | 1 | 0 |  | 0 (0x0) | 253 (0xFD) |
|  |  | Unknown |  |  |  | 0xFE |  |  |
|  |  | Fault |  |  |  | 0xFF |  |  |

##### SIG-REQ-334828/A-LifeCycMde\_D\_Actl Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| LifeCycMde\_D\_Actl | 4 |  | SED | 1 | 0 |  | 0 (0x0) | 15 (0xF) |
|  | Normal |  |  |  | 0x0 |  |  |
|  | Factory |  |  |  | 0x1 |  |  |
|  | NotUsed |  |  |  | 0x2 |  |  |
|  | Transport |  |  |  | 0x3 |  |  |

##### SIG-REQ-334829/A-CtrStkFeatConfigActl Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| CtrStkFeatConfigActl | 16 | - | Undefined | 1 | 0 |  | 0  (0x0) | 65535 (0xFFFF) |

##### SIG-REQ-334830/A-CtrStkFeatNoActl Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| CtrStkFeatNoActl | 16 | - | Undefined | 1 | 0 |  | 0  (0x0) | 65535 (0xFFFF) |

##### SIG-REQ-334831/A-CtrStkPersIndex\_D\_Actl Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| CtrStkPersIndex\_D\_Actl | 3 |  | SED | 1 | 0 |  | 0 (0x0) | 7 (0x7) |
|  |  | PERS\_1 |  |  |  | 0x0 |  |  |
|  |  | PERS\_2 |  |  |  | 0x1 |  |  |
|  |  | PERS\_3 |  |  |  | 0x2 |  |  |
|  |  | PERS\_4 |  |  |  | 0x3 |  |  |
|  |  | Vehicle |  |  |  | 0x4 |  |  |
|  |  | Unused\_1 |  |  |  | 0x5 |  |  |
|  |  | Unused\_2 |  |  |  | 0x6 |  |  |
|  |  | Unused\_3 |  |  |  | 0x7 |  |  |

##### SIG-REQ-334832/A-CtrStkDsplyOp\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| CtrStkDsplyOp\_D\_Rq | 3 |  | SED | 1 | 0 |  | 0 (0x0) | 7 (0x7) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | Query |  |  |  | 0x1 |  |  |
|  |  | Set |  |  |  | 0x2 |  |  |
|  |  | Upload |  |  |  | 0x3 |  |  |
|  |  | Restore |  |  |  | 0x4 |  |  |
|  |  | Copy |  |  |  | 0x5 |  |  |
|  |  | Unused\_1 |  |  |  | 0x6 |  |  |
|  |  | Unused\_2 |  |  |  | 0x7 |  |  |

### Outputs

#### IR-REQ-334842/A-Internal

* ASLD\_Chime\_Status\_Flag, which is used to control the state of the ASLD / ISA chime.
* ASLD\_RTT\_MC\_Status\_Flag, which is used to control the state of the ASLD / ISA reconfigurable telltale.
* ASLD\_SPEED\_SET\_MC, which is used to display associated text related to ASLD / ISA.
* ISA\_SETUP\_MC, which is used to control the settings menu display output for the ISA Setup menu.

#### MUX signals on the CAN bus:

* + DISPLAY\_SPEED\_OFFSET and DISPLAY\_SPEED\_SCALING are referenced here because the PCM uses the same signals in the Adaptive Cruise Control interface to determine the displayed limit speed. These signals are used to adjust the Veh\_V\_DsplyCcSet signal, which is an input to the IPC. Refer to CADS STSS for more details.

##### SIG-REQ-334833/A-DISPLAY\_SPEED\_OFFSET Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| DISPLAY\_SPEED\_OFFSET | 3 |  | KPH | 0.5 | 0 |  | 0 (0x0) | 3.5 (0x7) |

##### SIG-REQ-334834/A-DISPLAY\_SPEED\_SCALING Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| DISPLAY\_SPEED\_SCALING | 4 |  | % | 0.5 | 100 |  | 100 (0x0) | 107.5 (0xF) |

##### SIG-REQ-334835/A-IsaOffst\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| IsaOffst\_D\_Rq | 4 |  | SED | 1 | 0 |  | 0 (0x0) | 15 (0xF) |
|  |  | Zero |  |  |  | 0x0 |  |  |
|  |  | One |  |  |  | 0x1 |  |  |
|  |  | Two |  |  |  | 0x2 |  |  |
|  |  | Three |  |  |  | 0x3 |  |  |
|  |  | Four |  |  |  | 0x4 |  |  |
|  |  | Five |  |  |  | 0x5 |  |  |
|  |  | Six |  |  |  | 0x6 |  |  |
|  |  | Seven |  |  |  | 0x7 |  |  |
|  |  | Eight |  |  |  | 0x8 |  |  |
|  |  | Nine |  |  |  | 0x9 |  |  |
|  |  | Ten |  |  |  | 0xA |  |  |
|  |  | Eleven |  |  |  | 0xB |  |  |
|  |  | Twelve |  |  |  | 0xC |  |  |
|  |  | Thirteen |  |  |  | 0xD |  |  |
|  |  | Null |  |  |  | 0xE |  |  |
|  |  | Faulty |  |  |  | 0xF |  |  |

\* This signal is required for ISA equipped vehicles only.

##### SIG-REQ-334836/A-MetricActv\_B\_Actl Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| MetricActv\_B\_Actl | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Inactive |  |  |  | 0x0 |  |  |
|  |  | Active |  |  |  | 0x1 |  |  |

##### SIG-REQ-334837/A-SlMde\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| SlMde\_D\_Rq | 2 |  | SED | 1 | 0 |  | 0 (0x0) | 3 (0x3) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | Auto Mode |  |  |  | 0x1 |  |  |
|  |  | Manual Mode |  |  |  | 0x2 |  |  |
|  |  | ISA not configured |  |  |  | 0x3 |  |  |

\* This signal is required for ISA equipped vehicles only.

##### SIG-REQ-334838/A-FeatConfigIpcActl Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| FeatConfigIpcActl | 16 | - | Undefined | 1 | 0 |  | 0  (0x0) | 65535 (0xFFFF) |

##### SIG-REQ-334839/A-FeatNoIpcActl Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| FeatNoIpcActl | 16 | - | Number | 1 | 0 |  | 0  (0x0) | 65535 (0xFFFF) |

##### SIG-REQ-334840/A-PersIndexIpc\_D\_Actl Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| PersIndexIpc\_D\_Actl | 3 |  | SED | 1 | 0 |  | 0 (0x0) | 7 (0x7) |
|  |  | PERS\_1 |  |  |  | 0x0 |  |  |
|  |  | PERS\_2 |  |  |  | 0x1 |  |  |
|  |  | PERS\_3 |  |  |  | 0x2 |  |  |
|  |  | PERS\_4 |  |  |  | 0x3 |  |  |
|  |  | Vehicle |  |  |  | 0x4 |  |  |
|  |  | Unused\_1 |  |  |  | 0x5 |  |  |
|  |  | Unused\_2 |  |  |  | 0x6 |  |  |
|  |  | Unused\_3 |  |  |  | 0x7 |  |  |

## Function/Performance

### F-REQ-334844/A-Operational Modes

|  |  |
| --- | --- |
| **Mode** | **Differentiating Vehicle Conditions** |
| Sleep Mode | ASLD (with Optional ISA) Control Function OFF |
| Limited Mode | ASLD (with Optional ISA) Control Function OFF |
| Normal Mode | ASLD (with Optional ISA) Control Function ON / OFF |
| Crank Mode | ASLD (with Optional ISA) Control Function ON / OFF |

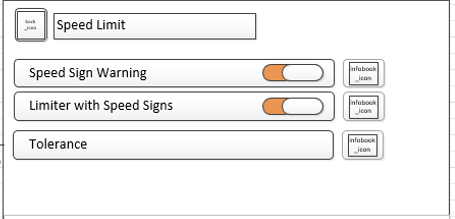
### Voltage Levels

Refer to the Cluster Features table located in the Operational Modes and Voltage Range Strategies Section in this SPSS.

### Human-Machine Interface

#### Visual

Refer to “<*Program*> Cluster Menu Structure.xls”. The images below are for sample purposes only.



The above menu structure only applies when ISA\_Cfg = Enabled (0x1).

Tolerance is common between “Speed Sign Warning” and “Limiter with Speed Signs”

See Section 1.3.5 “Operation: Performance and Functional.”

#### HMI-REQ-334848/A-Indicator Graphics / Display Format

active_rtt standby_rtt 

tbd.41

For actual symbol pixel definition, see program specific HMI requirements: symbol tbd.41.

Note that symbol tbd.41 is used as well in ISA configuration, where a graphical “bracket” to the detected speed sign shall be used to indicate the auto speed limiter mode (see table 1.13).

##### HMI-REQ-334846/A-Indicator Color Coordinates

Green - Reference SDS IL-0017 / IS-0379. (Legacy)

Reference SDS IH-0001 and IH-0006 for updated requirements.

Grey as per HMI styling direction.

##### HMI-REQ-334847/A-Indicator Characteristics

Pixel Display in Message Center Display - ASLD\_RTT\_MC\_Status\_Flag and associated message center message.

#### HMI-REQ-334849/A-Audio

Chime\_30.

Note: this STSS assumes that this DNA chime is defined as: 300ms high, 600ms low.

#### Switch Control Logic

Driver interaction with ISA shall be according to the message center basic functionality display as specified in Message Center X Display\_Y Button Interface Section, where X and Y are appropriate values in this document.

### PFM-REQ-334875/A-System Accuracy

The cluster shall update the display to the proper status within 100ms of receiving a message that results in a change of state as indicated in Section 1.3.5 “Operation: Performance and Functional”.

### Operation: Performance and Functional

#### Subsystem Algorithm Flowchart / State Diagram

##### F-REQ-334850/A-ASLD Diagnostic Configuration Flowchart



##### F-REQ-335354/A-Intelligent Speed Assistance Diagnostic Configuration Flowchart



##### F-REQ-334851/A- ASLD / ISA RTT Control Function Flowchart



##### F-REQ-334852/A-State Matrix for ASLD\_RTT\_MC\_Status\_Flag and ASLD\_SPEED\_SET\_MC (ASLD ONLY)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Operational\_ Mode** | **ASLD\_Cfg** | **AslIconDsply\_D\_Rq** | **AslChime\_B\_Rq** | **Veh\_V\_DsplyCcSet** | **DISPLAY\_ UNITS\_MC** | **ASLD\_RTT\_ MC\_Status\_Flag** | **ASLD\_SPEED\_SET\_MC** *See Notes Below\** |
| Normal or Crank | Enabled (0x1) | Off (0x0) | X | X | X | OFF (0x0) | No graphic shown |
| On-Passive (0x1) | X | 0x0, 0xFE, 0xFF | English (0x0) | ASLD\_Standby (0x1) |  |
| On-Passive (0x1) | X | <>(0x0, 0xFE, 0xFF) | ASLD\_Standby (0x1) |  |
| On-Active (0x2) | No (0x0) | <>(0x0, 0xFE, 0xFF) | ASLD\_Active (0x2) |  |
| On-Active (0x2) | Yes (0x1) | <>(0x0, 0xFE, 0xFF) | ASLD\_Active (0x2) | Flash Veh\_V\_DsplyCcSet  As per note 1 below this table |
| On - Passive - Overridden (0x3) | X | <>(0x0, 0xFE, 0xFF) | ASLD\_Standby\_Override (0x6) | Flash Veh\_V\_DsplyCcSet  As per note 1 below this table |

F-REQ-334852 continued on next page…

**(F-REQ-334852** **continued)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Operational\_ Mode** | **ASLD\_Cfg** | **AslIconDsply\_D\_Rq** | **AslChime\_B\_Rq** | **Veh\_V\_DsplyCcSet** | **DISPLAY\_ UNITS\_MC** | **ASLD\_RTT\_ MC\_Status\_Flag** | **ASLD\_SPEED\_SET\_MC** *See Notes Below\** |
| Normal or Crank | Enabled (0x1) | On-Passive (0x1) | X | 0x0, 0xFE, 0xFF | Metric (0x1) | ASLD\_Standby (0x1) | standby-set_kmh_stss |
| On-Passive (0x1) | X | <>(0x0, 0xFE, 0xFF) | ASLD\_Standby (0x1) | standby_kmh_stss |
| On-Active (0x2) | No (0x0) | <>(0x0, 0xFE, 0xFF) | ASLD\_Active (0x2) | active_kmh_stss |
| On-Active (0x2) | Yes (0x1) | <>(0x0, 0xFE, 0xFF) | ASLD\_Active (0x2) | active_kmh_stss  standby_override_kmh_stss  active_kmh_stss  Flash Veh\_V\_DsplyCcSet  As per note 1 below this table |
| On - Passive - Overridden (0x3) | X | <>(0x0, 0xFE, 0xFF) | ASLD\_Standby\_Override (0x6) | active_kmh_stss  standby_override_kmh_stss  active_kmh_stss  Flash Veh\_V\_DsplyCcSet  As per note 1 below this table |
| All Other Cases | | | | | | OFF (0x0) | No graphics shown |

\*Notes: Veh\_V\_DsplyCcSet = 120 (0x78) in example graphics shown above when “120” is displayed. Veh\_V\_DsplyCcSet from the PCM should contain any sort of compensation factors (including the offset) in its signal value. The displayed limit speed should correspond to the value of Veh\_V\_DsplyCcSet.

The ASLD RTT sample graphic is shown for reference only; ASLD\_SPEED\_SET\_MC refers to the text to the right of the ASLD RTT graphic.

Graphics shown above are for example purposes only. Please refer to the program specific graphic library for accurate graphics.

##### F-REQ-334853/A-State Matrix for ASLD\_RTT\_MC\_Status\_Flag and ASLD\_SPEED\_SET\_MC (ASLD with ISA)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Operational\_**  **Mode** | **ISA\_Cfg** | **SlMde\_D\_RqDsply** | **AslIconDsply\_D\_Rq** | **AslChime\_B\_Rq** | **Veh\_V\_DsplyCcSet** | **DISPLAY\_ UNITS\_**  **MC** | **ASLD\_RTT\_ MC\_Status\_Flag** | **ASLD\_SPEED\_SET\_MC** *See Notes Below\** |
| Normal or  Crank | Enabled (0x1) | No speed limiter symbol (0x0) | X | X | X | X | OFF (0x0) | No graphic shown |
| X | Off (0x0) | X | X | X | OFF (0x0) | No graphic shown |
| Manual speed lim. Symbol (0x2) | On-Passive (0x1) | X | 0x0, 0xFE, 0xFF | English (0x0) | ASLD\_Standby (0x1) |  |
| Manual speed lim. Symbol (0x2) | On-Passive (0x1) | X | <>(0x0, 0xFE, 0xFF) | ASLD\_Standby (0x1) |  |
| Manual speed lim. Symbol (0x2) | On-Active (0x2) | No (0x0) | <>(0x0, 0xFE, 0xFF) | ASLD\_Active (0x2) |  |
| Manual speed lim. Symbol (0x2) | On-Active (0x2) | Yes (0x1) | <>(0x0, 0xFE, 0xFF) | ASLD\_Active (0x2) | Flash Veh\_V\_DsplyCcSet  As per note 1 below this table |
| Manual speed lim. Symbol (0x2) | On - Passive - Overridden (0x3) | X | <>(0x0, 0xFE, 0xFF) | ASLD\_Standby\_Override (0x6) | Flash Veh\_V\_DsplyCcSet  As per note 1 below this table |

F-REQ-334853 continued on next page…

**(F-REQ-334853**  **continued)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Operational\_ Mode** | **ISA\_Cfg** | **SlMde\_D\_RqDsply** | **AslIconDsply\_D\_Rq** | **AslChime\_B\_Rq** | **Veh\_V\_DsplyCcSet** | **DISPLAY\_ UNITS\_**  **MC** | **ASLD\_RTT\_ MC\_Status\_Flag** | **ASLD\_SPEED\_SET\_MC** *See Notes Below\** |
| Normal or Crank | Enabled (0x1) | Manual speed lim. Symbol (0x2) | On-Passive (0x1) | X | 0x0, 0xFE, 0xFF | Metric (0x1) | ASLD\_Standby (0x1) | standby-set_kmh_stss |
| Manual speed lim. Symbol (0x2) | On-Passive (0x1) | X | <>(0x0, 0xFE, 0xFF) | ASLD\_Standby (0x1) | standby_kmh_stss |
| Manual speed lim. Symbol (0x2) | On-Active (0x2) | No (0x0) | <>(0x0, 0xFE, 0xFF) | ASLD\_Active (0x2) | active_kmh_stss |
| Manual speed lim. Symbol (0x2) | On-Active (0x2) | Yes (0x1) | <>(0x0, 0xFE, 0xFF) | ASLD\_Active (0x2) | active_kmh_stss  standby_override_kmh_stss  active_kmh_stss  Flash Veh\_V\_DsplyCcSet  As per note 1 below this table |
| Manual speed lim. Symbol (0x2) | On - Passive - Overridden (0x3) | X | <>(0x0, 0xFE, 0xFF) | ASLD\_Standby\_Override (0x6) | active_kmh_stss  standby_override_kmh_stss  active_kmh_stss  Flash Veh\_V\_DsplyCcSet  As per note 1 below this table |

F-REQ-334853 continued on next page…

**(F-REQ-334853** **continued)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Operational\_ Mode** | **ISA\_Cfg** | **SlMde\_D\_RqDsply** | **AslIconDsply\_D\_Rq** | **AslChime\_B\_Rq** | **Veh\_V\_DsplyCcSet** | **DISPLAY\_ UNITS\_**  **MC** | **ASLD\_RTT\_ MC\_Status\_Flag** | **ASLD\_SPEED\_SET\_MC** *See Notes Below\** | |
| Normal or Crank | Enabled (0x1) | Auto speed limiter symbol (0x1) | On-Passive (0x1) | X | 0x0, 0xFE, 0xFF | English (0x0) | ISA\_Standby (0x3) | |  |
| Auto speed limiter symbol (0x1) | On-Passive (0x1) | X | <>(0x0, 0xFE, 0xFF) | ISA\_Standby (0x3) | |  |
| Auto speed limiter symbol (0x1) | On-Active (0x2) | X | <>(0x0, 0xFE, 0xFF) | ISA\_Active (0x4) | |  |
| Auto speed limiter symbol (0x1) | On - Passive - Overridden (0x3) | X | <>(0x0, 0xFE, 0xFF) | ISA\_Standby\_Override (0x5) | | Flash Veh\_V\_DsplyCcSet  As per note 1 below this table |

F-REQ-334853 continued on next page…

**(F-REQ-334853** **continued)**

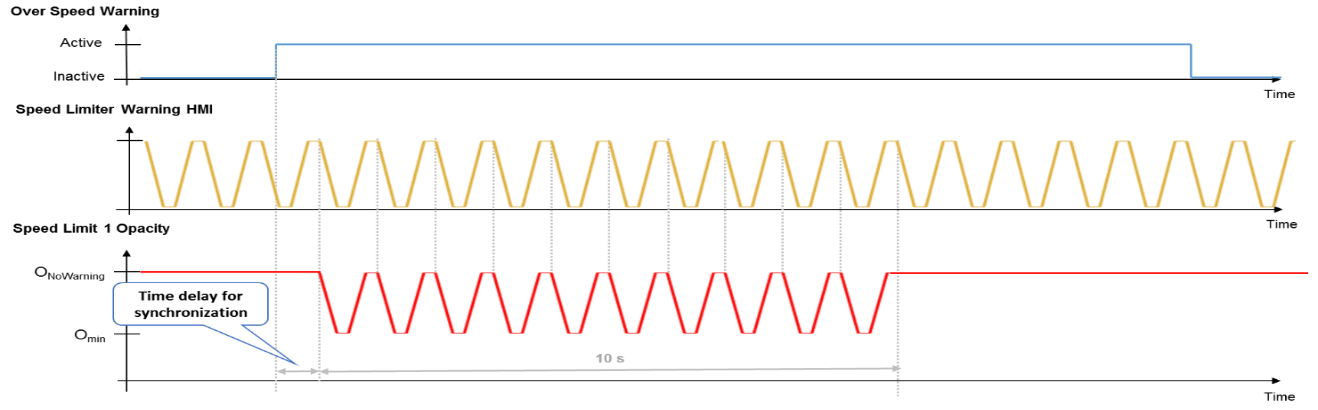
|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Operational\_ Mode** | **ISA\_Cfg** | **SlMde\_D\_RqDsply** | **AslIconDsply\_D\_Rq** | **AslChime\_B\_Rq** | **Veh\_V\_DsplyCcSet** | **DISPLAY\_ UNITS\_**  **MC** | **ASLD\_RTT\_ MC\_Status\_Flag** | **ASLD\_SPEED\_SET\_MC** *See Notes Below\** |
| Normal or Crank | Enabled (0x1) | Auto speed limiter symbol (0x1) | On-Passive (0x1) | X | 0x0, 0xFE, 0xFF | Metric (0x1) | ISA\_Standby (0x3) | isa_standby-set_kmh_stss |
| Auto speed limiter symbol (0x1) | On-Passive (0x1) | X | <>(0x0, 0xFE, 0xFF) | ISA\_Standby (0x3) | isa_standby_kmh_stss |
| Auto speed limiter symbol (0x1) | On-Active (0x2) | X | <>(0x0, 0xFE, 0xFF) | ISA\_Active (0x4) | isa_active_kmh_stss |
| Auto speed limiter symbol (0x1) | On - Passive - Overridden (0x3) | X | <>(0x0, 0xFE, 0xFF) | ISA\_Standby\_Override (0x5) | isa_active_kmh_stss  isa_active-override_kmh_stss  isa_active_kmh_stss  Flash Veh\_V\_DsplyCcSet  As per note 1 below this table |
| All Other Cases | | | | | | | OFF (0x0) | No graphics shown |

\*Notes: Veh\_V\_DsplyCcSet = 120 (0x78) in example graphics shown above when “120” is displayed. Veh\_V\_DsplyCcSet from the PCM should contain any sort of compensation factors (including the offset) in its signal value. The displayed limit speed should correspond to the value of Veh\_V\_DsplyCcSet.

The ASLD RTT sample graphic is shown for reference only; ASLD\_SPEED\_SET\_MC refers to the text to the right of the ASLD RTT graphic.

Graphics shown above are for example purposes only. Please refer to the program specific graphic library for accurate graphics.

Note 1: The flashing/ramping of the ASLD indication shall be synchronized with the TSR over speed indication as follows:



If the above defined pulsation is not feasible due to component hardware limitations, the pulsation shall be replaced by a flashing between two opacities.

**This exception shall be approved by the IPC D&R and ASLD feature application team.**

##### F-REQ-334854/A-ISA Setup RX CAN Routine Flowchart



##### F-REQ-334855/A-ISA\_SETUP\_MC based on SlMde\_D\_Stat

|  |  |  |
| --- | --- | --- |
| **ISA\_Cfg** | **SlMde\_D\_Stat** | **ISA\_SETUP\_MC** |
| Enabled | Null (0x0) | 0x2 (Manual Mode) |
| Enabled | Auto Mode (0x1) | 0x1 (Auto Mode) |
| Enabled | Manual Mode (0x2) | 0x2 (Manual Mode) |
| Enabled | ISA Not Configured (0x3) | 0x2 (Manual Mode) |
| Enabled | Missing per section 1.4.1 | 0x0 (Null) |
| Disabled | X | Not Present  (Defaults to 0x0) |

##### F-REQ-334856/A-ISA\_SETUP\_MC Sample Graphics

|  |  |
| --- | --- |
| **ISA\_SETUP\_MC** | **Sample Graphics** |
| Auto Mode (0x1)  (Speed limiter with speed signs Turned On) |  |
| Manual Mode (0x2)  (speed limiter with speed signs Turned Off) |  |
| All other cases |  |

In the menu structure, the “Intelligent Limit Offset” may be called “Tolerance”.

##### F-REQ-334857/A- ISA Setup Centerstack Signal Gateway Routine Flowchart



##### F-REQ-334858/A-SlMde\_D\_Rq State based upon CtrStkFeatConfigActl

| **CtrStkFeatConfigActl**  **Signal** | **Display Menu**  **In Center Stack (For reference)** | **SlMde\_D\_Rq**  **Signal** |
| --- | --- | --- |
| (0x0) Manual Mode  (Intelligent Offset OFF) | **🗹** Manual  🞎Intelligent | Manual Mode (0x2) |
| (0x1) Intelligent Mode  (Intelligent Offset ON) | 🞎Manual  **🗹** Intelligent | Auto Mode (0x1) |
| Unused (0x2-0xFF) | 🞎Manual  🞎Intelligent | No change |

##### F-REQ-334859/A-FeatConfigIpcActl State based upon ISA\_SETUP\_MC

| **ISA\_SETUP\_MC** | **Display Menu**  **In Center Stack (For reference)** | **FeatConfigIpcActl**  **Signal** |
| --- | --- | --- |
| 0x2 (Manual Mode) | **🗹** Manual  🞎Intelligent | (0x0) Manual |
| 0x1 (Auto Mode) | 🞎Manual  **🗹** Intelligent | (0x1) Intelligent |
| Null (0x0) | 🞎Manual  🞎Intelligent | (0x0) Manual |

In the tables above,

Manual = Speed Limiter with Speed Signs turned Off

Intelligent = Speed Limiter with Speed Signs turned On

##### F-REQ-334860/A-Intelligent Speed Assistance (ISA) Tolerance

With the DAT2.0 architecture, ISA does not use the PCM based speed offset for this feature anymore. However, since IPC transmits the IsaOffst\_D\_Rq signal, it is permanently set to 0xE (Null). IsaOffst\_D\_Rq = 0xE (Null)

ISA utilizes the same speed tolerance as the SLIF/SLOIF (Traffic Sign Recognition) tolerance Personalization feature ID 0x080E. Please refer to the requirements to set up TSR\_OSW\_THRESHOLD\_MC in the “Traffic Sign Recognition Function – FNV2” STSS to implement this tolerance.

##### F-REQ-334861/A-ISA\_SETUP\_MC Display and SlMde\_D\_Rq Control Subroutine Flowchart



##### F-REQ-334862/A-ASLD\_Chime\_Status\_Flag Control Subroutine Flowchart



#### Operation Description (supports algorithm flowchart /state diagram)

##### F-REQ-334863/A-Feature Configuration

* ASLD, ISA, and TSR are separately configured; however, if ISA\_Cfg = Enabled (0x1), then ASLD\_Cfg = Enabled (0x1) and TSR\_Cfg = Enabled (0x1).

##### F-REQ-334864/A-Chime Control

* “ASLD\_Chime\_Status\_Flag Control Subroutine” shall be implemented for both ASLD and ASLD with ISA equipped vehicles.

##### F-REQ-334865/A-Chime Behavior

* The PCM may use the AslChime\_B\_Rq signal to request a single chime in certain circumstances, which does not require any additional logic. However, this strategy assumes that the definition of Chime\_30 remains the same. The PCM will pulse the AslChime\_B\_Rq signal in such a way that only one “plink” of Chime\_30 is played according to the Chime Arbitrator. In other words, AslChime\_B\_Rq will have a value of Yes (0x1) for less than ASLDChime\_Hi + ASLDChime\_Lo milliseconds as per Section 1.3.5.4.

##### F-REQ-334866/A-Speed Offset

* The Veh\_V\_DsplyCcSet signal sent on the CAN network is the limit speed for the display. It has already been adjusted to match speedometer bias using DISPLAY\_SPEED\_OFFSET and DISPLAY\_SPEED\_SCALING as defined in the CADS STSS. This signal has also been adjusted according to the ISA offset value, if applicable.

##### F-REQ-334867/A-Personalization Feature Number Definition:

|  |  |  |  |
| --- | --- | --- | --- |
| **Feature Name** | **Feature Num** | **Cfg Num** | **Cfg Value** |
| Speed Limiter | 0x0D00 | 0x00 | Manual Mode  (Tolerance OFF) |
| 0x01 | Intelligent Mode  (Tolerance ON) |
| Tolerance | 0x080E | 0x0 – 0x4 | Number |

#### FS-REQ-334876/A;1-Function Safety Classification (EMC)

Class B

#### Memory Storage

##### NVM-REQ-334868/A-Memory Parameters Table

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter Name** | **Description** | **Value at**  **Battery Connect** | **Value at**  **Module Wake-up** |
| ASLD\_Chime\_Status\_Flag | Used to control the ASLD / ISA chime output, which is passed to the chime arbitrator. | Inactive | Inactive |
| ASLD\_RTT\_MC\_Status\_Flag | Used to control the state of the ASLD / ISA RTT. Encoded as: OFF (0x0), ASLD\_Standby (0x1), ASLD\_Active (0x2), ISA\_Standby (0x3), ISA\_Active (0x4) | OFF (0x0) | OFF (0x0) |
| ASLD\_SPEED\_SET\_MC | Output text associated with ASLD / ISA. | Inactive | Inactive |
| ISA\_SETUP\_MC | ISA Setup submenu status. | Inactive | Inactive |
| ASLD\_Chime\_Duration | Duration of a series of ASLD / ISA chimes.  Given that Chime\_30 is high for 300 ms and low for 600 ms, this is equal to:  ASLDChime\_Hi \* 4 + ASLDChime\_Lo \* 3  = 3000 ms | 3000ms | 3000ms |
| ASLD\_Chime\_Delay | Desired time delay after a series of ASLD chimes. | 10000ms | 10000ms |
| AslChime\_B\_Rq (CAN) | Input CAN signal used as an input to ASLD\_Chime\_Status\_Flag and to determine if the display should be flashing ( in ASLD Only or ISA “Manual” mode) | No (0x0) | No (0x0) |
| AslIconDsply\_D\_Rq (CAN) | Input CAN signal used as an input to the ASLD\_SPEED\_SET\_MC text. | OFF (0x0) | OFF (0x0) |
| SlMde\_D\_RqDsply (CAN) | Input CAN signal used as an input to the ASLD RTT when ISA is configured on. | Null (0x0) | Null (0x0) |
| SlMde\_D\_Stat (CAN) | Input CAN signal used to drive the ISA\_SETUP\_MC displayed speed limiter mode selection. | Null (0x0) | Null (0x0) |
| Veh\_V\_DsplyCcSet (CAN) | Input CAN signal used as the input to ASLD\_SPEED\_SET\_MC text. | 0 (0x0) | 0 (0x0) |
| DISPLAY\_SPEED\_OFFSET (CAN) | Output CAN signal transmitted by the cluster used by the Adaptive Cruise Control interface to determine the displayed speed limit. | Refer to  CADS Cluster Interface spec | Refer to  CADS Cluster Interface spec |
| DISPLAY\_SPEED\_SCALING (CAN) | Output CAN signal transmitted by the cluster used by the Adaptive Cruise Control interface to determine the displayed speed limit. | Refer to  CADS Cluster Interface spec | Refer to  CADS Cluster Interface spec |
| LifeCycMde\_D\_Actl (CAN) Signal | CAN input signal used to provide information about which Carmode the vehicle is in i.e. Normal, factory etc. | 0x0 | 0x0 |
| HMI\_DELAY | Desired time delay to prevent flicker of strikethrough text. | 100ms | 100ms |
| IsaOffst\_D\_Rq (CAN) | Output CAN signal used to request a new ISA offset value. | Null (0xE) | Null (0xE) |
| MetricActv\_B\_Actl (CAN) | Output CAN signal transmitted by the cluster that describes which units are being used in the display. | Refer to  Display Unit Selection Control Function STSS | Refer to  Display Unit Selection Control Function STSS |
| SlMde\_D\_Rq (CAN) | Output CAN signal used to request the speed limiter mode (either manual or intelligent modes), or indicate that ISA is configured off. | Null (0x0) | Null (0x0) |
| DISPLAY\_UNITS\_MC | Input that controls the indicated units in the display. | Refer to  Display Unit Selection Control Function STSS | Refer to  Display Unit Selection Control Function STSS |
| Operational\_Mode | 4 state indicator for cluster operational mode | Limited | Limited, Normal or Crank |

\* Refer to Message Center X Display\_Y Button Interface Section, where X and Y are appropriate values in this document.

##### NVM-REQ-334869/A-Timers Table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Timer Name** | **Duration** | **Description** | **Min** | **Max** | **Resolution** |
| ASLD\_Chime\_Timer | See Description | Duration of this timer shall be equal to ASLD\_Chime\_Duration + ASLD\_Chime\_Delay  as defined in the Memory Storage table. | 0ms | 45000ms | 100ms |
| HMI\_Delay\_Timer | See Description | Delay is needed to prevent a flickering of the strikethrough font when speed is set. | 0ms | 200ms | 50ms |

Note: Timers shall be programmable within the shown range, to at least the max value listed. Higher max values and finer resolutions are acceptable.

#### Reconfigurable Telltale

Yes – Refer to Section 1.3.3.2 for required RTTs.

#### Prove Out

Not applicable.

#### Message Center Message

Not applicable.

## Error Handling

### Missing Message Strategy

The signals will be declared missing as per the Diagnostics section of this STSS.

DTCs states and history will be determined as per the Diagnostics section of this STSS.

#### SR-REQ-334870/A-Configuration Dependency

If ASLD\_Cfg = Disabled (0x0), the cluster shall never log a missing message DTC for this feature.

If a signal is declared as missing, the display shall be done as “All other cases” in the tables. The last status shall not be kept.

## Diagnostics

### Self-Test

None

### Engineering Test Mode

Reference section “Dealer / Engineering Test Mode (ETM)”

### Part II Performance

#### DCR-REQ-334871/A-DID DE00:

| **Block**  **Num** | **Block Description** | **Size (bits)** | **Byte(s)** | **Bits** | **State: Description** | **"0"** | **"1"** | **Default** | **Comments/**  **Information** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PACKETED BLOCKS | |  |  |  |  |  |  |  |  |
| $00 | Option Content (B&A) | 1 | \* | \* | ASLD | Disabled | Enabled | Disabled | Disabled means feature is not present in the vehicle. This feature is only enabled on European vehicles. |
| \*Byte and bit location to be identified in Part II Specification for this cluster | | | | | | | | | |

#### DCR-REQ-334872/A-DID DE02:

| **Block**  **Num** | **Block Description** | **Size (bits)** | **Byte(s)** | **Bits** | **State: Description** | **"0"** | **"1"** | **Default** | **Comments/**  **Information** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PACKETED BLOCKS | |  |  |  |  |  |  |  |  |
| $02 | Option Content (B&A) | 1 | \* | \* | Intelligent Speed Assistance | Disabled | Enabled | Disabled | This parameter allows the “Speed Limiter -> Manual Mode/Intelligent Mode/Intelligent Tolerance” settings menu to be displayed in the cluster or Center Stack (since cluster is signal gateway for this feature). Menu display is determined by Settings Menu config.  Disabled means both message center and Center Stack setup feature is not present in the vehicle. |
| \*Byte and bit location to be identified in Part II Specification for this cluster | | | | | | | | | |

#### DCR-REQ-334873/A-DID DE09:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Block**  **Num** | **Block Description** | **Size (bits)** | **Byte(s)** | **Bits** | **State: Description** | **"0"** | **"1"** | **Default** | **Comments/Information** |
| PACKETED BLOCKS | |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| $09 | Option Content (B&A) | 1 | \* | \* | Settings Menu | Cluster | Center Stack | Cluster | This parameter allows the Settings menu to be displayed in the cluster when 0x0. When 0x1, the expectation is that settings are displayed in the Centerstack. For this feature (when 0x1), the cluster will remove almost all items from settings menu. (Cluster display choices remain). Note this is a global config, each feature still has its own config for presence on vehicle. |
|  | \*Byte and bit location to be identified in Part II Specification for this cluster | | | | | |  |  |  |

#### DTC-REQ-334874/A-Supported Diagnostic Trouble Codes (DTCs)

DTCs shall be logged as per the diagnostics section of this SPSS.\*

|  |  |
| --- | --- |
| **DTC** | **Description** |
| C10000 | Lost Communication with ECM/PCM |
| C40100 | Invalid Data Received from ECM/PCM |

\* If the missing signal has a related update bit, \_UB, signal, then the “Invalid Data” DTC is to be logged. Otherwise, the “Lost Communication” DTC is logged.

## Reference Specifications

IS-0001 WARNINGS/INDICATORS/DISPLAYS PROVEOUT

IS-0052 OPERATING VOLTAGES - FUNCTIONAL/PERFORMANCE

IS-0069 FUNCTIONAL IMPORTANCE CLASS

IS-0324 WINDSHIELD & OTHER REFLECTIONS

IS-0327 WARNING INDICATOR EVALUATION

IS-0379 NORTH AMERICAN WARNINGS AND INDICATORS STRATEGY

IL-0017 TELLTALE AND INTERIOR ILLUMINATION COLOR

IL-0019 GENERAL ILLUMINATION DIMMING

IL-0021 CRAFTSMANSHIP - DISPLAYS

IL-0022 GENERAL ILLUMINTATION COLOR

IL-0023 CLARITY/LEGIBILITY/READABILITY

IL-0025 INTERIOR ILLUMINATION INTENSITY

IL-0027 VISUAL CONTRAST

IL-0043 OPERATIONAL ENVIRONMENT FUNCTIONALITY

IL-0045 COLOR

IL-0048 ILLUMINATION ACCEPTABILITY

03-0661 PLACEMENT: CONTROL AND DISPLAY LOCATIONS

03-0662 PLACEMENT: LOGICAL GROUPING FUNCTION AND USAGE

03-0664 PLACEMENT: DOWN VISION TO COMPONENTS WITH HIGH VISUAL DEMAND

03-0665 PLACEMENT: EXPECTED LOCATIONS OF CONTROLS AND DISPLAYS VDS

03-0670 INTERIOR VISIBILITY

03-0671 INTERIOR VISIBILITY: REFLECTIONS FROM COMPONENTS & SURFACES

03-0672 INTERIOR VISIBILITY: REFLECTIONS IN DISPLAYS

03-0673 INTERIOR VISIBILITY: VISUAL OBSCURATIONS

03-0674 INTERIOR VISIBILITY: ILLUMINATION CONTROLS / DISPLAYS

03-0675 INTERIOR VISIBILITY: VEILING GLARE

03-0677 INTERIOR VISIBILITY: SUNLIGHT WASHOUT

03-0681 IDENTIFICATION: CHARACTER AND SYMBOL SIZE

03-0682 IDENTIFICATION: LEGIBILITY

03-0685 IDENTIFICATION: SYMBOLS, ABBREV FOR CONTROL

03-0721 LOGIC OF OPERATION: OPERATIONAL STEREOTYPES

03-0722 LOGIC OF OPERATION: INTERPRETATION

03-0723 LOGIC OF OPERATION: USE OF SYSTEMS WITH VISUAL DISPLAY

## Revision History

## STSS Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Revision Level** | **Name** | **Change Description** | **Date** |
| 1.0 | V. Patel | Initial release for FNV2 architecture. Leveraged from “Adjustable Speed Limiter Device (with Optional Intelligent Speed Assistance) – CGEA1.3\_5.2” STSS  DI CC approval: 10/8/2018  Feature owner: Sepcke, Felix; Ediger, Andreas | 12/06/2018 |
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