# Traffic Sign Recognition Control Function – CGEA1.3

## Functional Description

The Traffic Sign Recognition (TSR) feature is a mechanism for determining the “True” speed limit of the current vehicle path and displaying that information to the user. TSR relies on data transmitted by the Electronic Horizon (EH) feature, as well as data collected by a forward facing camera. The TSR application determines this environmental information and transmits this information to the cluster for display to the user.

There are two variants of the TSR feature

|  |  |  |
| --- | --- | --- |
| Variant Name | Variant Description | Remarks |
| **SLOIF**  **(NCAP Mode)** | **Speed Limit and Overtaking Information Function**  Full TSR functionality including:   * Possibility to de-/activate TSR feature * Displaying up to two speed limit signs incl. detailed supplementary signs and cancelation sign * Displaying up to one no-passing sign incl. detailed supplementary signs and cancelation sign * Optical and acoustical over speed warning   **SLOIF NCAP Mode**  Full TSR functionality with limitations to support EuroNCAP functionalities:   * No possibility to de-/activate TSRfeature * Reduced possibility to adapt over speed warning |  |
| **SLIF** | **Speed Limit Information Function**  Reduced TSR functionality to support EuroNCAP functionalities:   * Displaying up to one speed limit sign incl. generic supplementary sign * Optical over speed warning   (SLIF does not provide:   * Possibility to de-/activate TSR feature * Display no-passing signs * Display detailed supplementary signs * Acoustical over speed warning) | SLIF is sufficient for intelligent speed assist (ISA) and intelligent adaptive cruise control (iACC). |

Using the Message Center Switches and Display, the TSR feature provides:

1. The capability to change the Traffic Sign Recognition feature through the Settings menu
2. The capability to enable/disable the Overspeed warning feature.
3. The capability to customize up to 2 over speed warning thresholds (depending on the TSR variant implemented).
4. The capability to enable/disable a warning chime for overspeed conditions for the SLOIF variant of TSR.

Starting in MY2019 with U625/U611 the Settings are migrating from the cluster to Center stack. This STSS supports displaying settings in the cluster or configuring the cluster settings off if they are displayed in the Center stack. Note that even when the settings for this feature are displayed in the Center Stack, the cluster still provides warnings, chime, detailed, and and generic traffic sign indications for this feature.

Due to the removal of standalone TSR IOD screens,

The TSR (SLOIF and SLIF) RTTs are now defined as generic indications in the STSS (since supplemental information is not detailed).

The TSR (SLOIF) IOD screens are now defined as detailed indications in the STSS (since supplemental information is detailed).

The TSR control function correlates the Personalization signals, several signals from the IPMA module and the Operational\_Mode to determine when to activate the appropriate displays.

## Interfaces

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

**TSR Function Context Diagram** 

### Inputs

#### IR-REQ-312861/B-INTERNAL:

* Operational\_Mode
* M/C Switch Event
* Traffic Sign Recognition – Feature Cfg
* SLIF\_Cfg – Feature Cfg
* TSR\_NCAP\_Adaptations\_Cfg – Feature Cfg
* Settings\_Menu\_Cfg
* M/C\_Display\_Status
* ASLD\_RTT\_MC\_Status\_Flag – Please refer to the “Adjustable Speed Limiter Device (with optional Intelligent Speed Assistance) – CGEA1.3 STSS for more information.
* IACC\_Func\_Disp\_Thin or IACC\_Func\_Disp – Please refer to the CADS spec for more information.
* Speedometer\_Gauge OR Digital\_Speedometer\_MC (depending on how the speedo information is displayed in the cluster)

#### MUX signals on the CAN Bus from IPMA

##### SIG-REQ-312977/A-FeatConfigIpmaActl Signal

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

##### SIG-REQ-312841/A-FeatNoIpma\_No\_Actl Signal

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

##### SIG-REQ-312842/A-PersIndexIpma\_D\_Actl Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| PersIndexIpma\_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 |  |  |  | 0x5 |  |  |
|  |  | Unused |  |  |  | 0x6 |  |  |
|  |  | Unused |  |  |  | 0x7 |  |  |

##### SIG-REQ-312843/A-TsrVl1RstrcMsgTxt2\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| TsrVl1RstrcMsgTxt2\_D\_Rq | 3 |  | SED | 1 | 0 |  | 0  (0x0) | 7  (0x7) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | NoSpeedLimitRestriction |  |  |  | 0x1 |  |  |
|  |  | NoRecognizable  Restriction |  |  |  | 0x2 |  |  |
|  |  | RainWet |  |  |  | 0x3 |  |  |
|  |  | Snow |  |  |  | 0x4 |  |  |
|  |  | Trailer |  |  |  | 0x5 |  |  |
|  |  | Time |  |  |  | 0x6 |  |  |
|  |  | NotUsed |  |  |  | 0x7 |  |  |

##### SIG-REQ-312844/A-TsrVl2RstrcMsgTxt2\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| TsrVl2RstrcMsgTxt2\_D\_Rq | 3 |  | SED | 1 | 0 |  | 0  (0x0) | 7  (0x7) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | NoSpeedLimitRestriction |  |  |  | 0x1 |  |  |
|  |  | NoRecognizable  Restriction |  |  |  | 0x2 |  |  |
|  |  | RainWet |  |  |  | 0x3 |  |  |
|  |  | Snow |  |  |  | 0x4 |  |  |
|  |  | Trailer |  |  |  | 0x5 |  |  |
|  |  | Time |  |  |  | 0x6 |  |  |
|  |  | NotUsed |  |  |  | 0x7 |  |  |

##### SIG-REQ-312845/A-TsrVl1StatMsgTxt\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| TsrVl1StatMsgTxt\_D\_Rq | 2 |  | SED | 1 | 0 |  | 0  (0x0) | 3  (0x3) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | LimitChanged |  |  |  | 0x1 |  |  |
|  |  | LimitReliable |  |  |  | 0x2 |  |  |
|  |  | LimitOutdated |  |  |  | 0x3 |  |  |

##### SIG-REQ-312846/A-TsrVl2StatMsgTxt\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| TsrVl2StatMsgTxt\_D\_Rq | 2 |  | SED | 1 | 0 |  | 0  (0x0) | 3  (0x3) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | LimitChanged |  |  |  | 0x1 |  |  |
|  |  | LimitReliable |  |  |  | 0x2 |  |  |
|  |  | LimitOutdated |  |  |  | 0x3 |  |  |

##### SIG-REQ-312847/A-TsrVlUnitMsgTxt\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| TsrVlUnitMsgTxt\_D\_Rq | 2 |  | SED | 1 | 0 |  | 0  (0x0) | 3  (0x3) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | Kph |  |  |  | 0x1 |  |  |
|  |  | Mph |  |  |  | 0x2 |  |  |
|  |  | NoDataExists |  |  |  | 0x3 |  |  |

##### SIG-REQ-312848/A-TsrVl1PrmntMsgTxt\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| TsrVl1PrmntMsgTxt\_D\_Rq | 2 |  | SED | 1 | 0 |  | 0  (0x0) | 3  (0x3) |
|  |  | DoNotShowSignPermanent |  |  |  | 0x0 |  |  |
|  |  | ShowPermanentlyWithoutSupp |  |  |  | 0x1 |  |  |
|  |  | ShowPermanentlyWithSupp |  |  |  | 0x2 |  |  |
|  |  | NotUsed |  |  |  | 0x3 |  |  |

##### SIG-REQ-312849/A-TsrVl2PrmntMsgTxt\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| TsrVl2PrmntMsgTxt\_D\_Rq | 2 |  | SED | 1 | 0 |  | 0  (0x0) | 3  (0x3) |
|  |  | DoNotShowSignPermanent |  |  |  | 0x0 |  |  |
|  |  | ShowPermanentlyWithoutSupp |  |  |  | 0x1 |  |  |
|  |  | ShowPermanentlyWithSupp |  |  |  | 0x2 |  |  |
|  |  | NotUsed |  |  |  | 0x3 |  |  |

##### SIG-REQ-312850/A-TsrOvtkMsgTxt2\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| TsrOvtkMsgTxt2\_D\_Rq | 4 |  | SED | 1 | 0 |  | 0  (0x0) | 15  (0xF) |
|  |  | OvertakingAllowed |  |  |  | 0x0 |  |  |
|  |  | LimAllWithoutRestriction |  |  |  | 0x1 |  |  |
|  |  | LimAllWithoutQlfdRstrc |  |  |  | 0x2 |  |  |
|  |  | LimAllWithRstrcRain |  |  |  | 0x3 |  |  |
|  |  | LimAllWithRstrcSnow |  |  |  | 0x4 |  |  |
|  |  | LimAllWithRstrcTrailer |  |  |  | 0x5 |  |  |
|  |  | LimAllWithRstrcTime |  |  |  | 0x6 |  |  |
|  |  | LimAllCancelled |  |  |  | 0x7 |  |  |
|  |  | LimForTrucksWithoutRstrc |  |  |  | 0x8 |  |  |
|  |  | LimForTrucksWoQlfdRstrc |  |  |  | 0x9 |  |  |
|  |  | LimForTrucksCancelled |  |  |  | 0xA |  |  |
|  |  | NotUsed1 |  |  |  | 0xB |  |  |
|  |  | NotUsed2 |  |  |  | 0xC |  |  |
|  |  | NotUsed3 |  |  |  | 0xD |  |  |
|  |  | NotUsed4 |  |  |  | 0xE |  |  |
|  |  | NotUsed5 |  |  |  | 0xF |  |  |

##### SIG-REQ-312851/A-TsrOvtkMsgTxt\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| TsrOvtkMsgTxt\_D\_Rq | 3 |  | SED | 1 | 0 |  | 0  (0x0) | 7  (0x7) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | OvertakingAllowed |  |  |  | 0x1 |  |  |
|  |  | LimAllWithoutRestriction |  |  |  | 0x2 |  |  |
|  |  | LimAllWithoutQlfdRstrc |  |  |  | 0x3 |  |  |
|  |  | LimAllCancelled |  |  |  | 0x4 |  |  |
|  |  | LimForTrucksWithoutRstrc |  |  |  | 0x5 |  |  |
|  |  | LimForTrucksWoQlfdRstrc |  |  |  | 0x6 |  |  |
|  |  | LimForTrucksCancelled |  |  |  | 0x7 |  |  |

##### SIG-REQ-312852/A-TsrOvtkStatMsgTxt\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| TsrOvtkStatMsgTxt\_D\_Rq | 2 |  | SED | 1 | 0 |  | 0  (0x0) | 3  (0x3) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | LimitChanged |  |  |  | 0x1 |  |  |
|  |  | LimitReliable |  |  |  | 0x2 |  |  |
|  |  | LimitOutdated |  |  |  | 0x3 |  |  |

##### SIG-REQ-312853/A-TsrMsgTxt\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| TsrMsgTxt\_D\_Rq | 4 |  | SED | 1 | 0 |  | 0  (0x0) | 15  (0xF) |
|  |  | Null |  |  |  | 0 (0x0) |  |  |
|  |  | NoInformationAllOK |  |  |  | 1 (0x1) |  |  |
|  |  | NoNavAvailableSwitchedOff |  |  |  | 2 (0x2) |  |  |
|  |  | NoNavDataAvailable |  |  |  | 3 (0x3) |  |  |
|  |  | WrngNavDatIncomp  DatCarrier |  |  |  | 4 (0x4) |  |  |
|  |  | CountryNotSupported |  |  |  | 5(0x5) |  |  |
|  |  | RegionNotSupported |  |  |  | 6 (0x6) |  |  |
|  |  | OffRoad |  |  |  | 7 (0x7) |  |  |
|  |  | LimitedSystemPerformance |  |  |  | 8 (0x8) |  |  |
|  |  | RecgnzdSignNotUsbl  ForDsply |  |  |  | 9 (0x9) |  |  |
|  |  | NotUsed |  |  |  | 10-15 (0xA – 0xF) |  |  |

##### SIG-REQ-312854/A-TsrVLim1MsgTxt\_D\_Rq Signal

| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TsrVLim1MsgTxt\_D\_Rq | 8 |  | SED | 1 | 0 |  | 0  (0x0) | 255  (0xFF) |
|  |  | Null |  |  |  | 0 (0x0) |  |  |
|  |  | Message1 |  |  |  | 1 (0x1) |  |  |
|  |  | Message2 |  |  |  | 2 (0x2) |  |  |
|  |  | Message3 |  |  |  | 3 (0x3) |  |  |
|  |  | Message4 |  |  |  | 4 (0x4) |  |  |
|  |  | Message5 |  |  |  | 5 (0x5) |  |  |
|  |  | Message6 |  |  |  | 6 (0x6) |  |  |
|  |  | Message7 |  |  |  | 7 (0x7) |  |  |
|  |  | Message8 |  |  |  | 8 (0x8) |  |  |
|  |  | Message9 |  |  |  | 9 (0x9) |  |  |
|  |  | Message0 |  |  |  | 10 (0xA) |  |  |
|  |  | Message11 |  |  |  | 11 (0xB) |  |  |
|  |  | Message12 |  |  |  | 12 (0xC) |  |  |
|  |  | Message13 |  |  |  | 13 (0xD) |  |  |
|  |  | Message14 |  |  |  | 14 (0xE) |  |  |
|  |  | Message15 |  |  |  | 15 (0xF) |  |  |
|  |  | Message16 |  |  |  | 16 (0x10) |  |  |
|  |  | Message17 |  |  |  | 17 (0x11) |  |  |
|  |  | Message18 |  |  |  | 18 (0x12) |  |  |
|  |  | Message19 |  |  |  | 19 (0x13) |  |  |
|  |  | Message20 |  |  |  | 20 (0x14) |  |  |
|  |  | Message21 |  |  |  | 21 (0x15) |  |  |
|  |  | Message22 |  |  |  | 22 (0x16) |  |  |
|  |  | Message23 |  |  |  | 23 (0x17) |  |  |
|  |  | Message24 |  |  |  | 24 (0x18) |  |  |
|  |  | Message25 |  |  |  | 25 (0x19) |  |  |
|  |  | Message26 |  |  |  | 26 (0x1A) |  |  |
|  |  | Message27 |  |  |  | 27 (0x1B) |  |  |
|  |  | Message28 |  |  |  | 28 (0x1C) |  |  |
|  |  | Message29 |  |  |  | 29 (0x1D) |  |  |
|  |  | Message30 |  |  |  | 30 (0x1E) |  |  |
|  |  | … |  |  |  | … |  |  |
|  |  | Message250 |  |  |  | 250 (0xFA) |  |  |
|  |  | LimitCancelled |  |  |  | 251 (0xFB) |  |  |
|  |  | NotToBeDisplayed |  |  |  | 252 (0xFC) |  |  |
|  |  | NotUsed |  |  |  | 253, 254 (0xFD, 0xFE) |  |  |
|  |  | NoLimit |  |  |  | 255 (0xFF) |  |  |

##### SIG-REQ-312855/A-TsrVLim2MsgTxt\_D\_Rq Signal

| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TsrVLim2MsgTxt\_D\_Rq | 8 |  | SED | 1 | 0 |  | 0  (0x0) | 255  (0xFF) |
|  |  | Null |  |  |  | 0 (0x0) |  |  |
|  |  | Message1 |  |  |  | 1 (0x1) |  |  |
|  |  | Message2 |  |  |  | 2 (0x2) |  |  |
|  |  | Message3 |  |  |  | 3 (0x3) |  |  |
|  |  | Message4 |  |  |  | 4 (0x4) |  |  |
|  |  | Message5 |  |  |  | 5 (0x5) |  |  |
|  |  | Message6 |  |  |  | 6 (0x6) |  |  |
|  |  | Message7 |  |  |  | 7 (0x7) |  |  |
|  |  | Message8 |  |  |  | 8 (0x8) |  |  |
|  |  | Message9 |  |  |  | 9 (0x9) |  |  |
|  |  | Message10 |  |  |  | 10 (0xA) |  |  |
|  |  | Message11 |  |  |  | 11 (0xB) |  |  |
|  |  | Message12 |  |  |  | 12 (0xC) |  |  |
|  |  | Message13 |  |  |  | 13 (0xD) |  |  |
|  |  | Message14 |  |  |  | 14 (0xE) |  |  |
|  |  | Message15 |  |  |  | 15 (0xF) |  |  |
|  |  | Message16 |  |  |  | 16 (0x10) |  |  |
|  |  | Message17 |  |  |  | 17 (0x11) |  |  |
|  |  | Message18 |  |  |  | 18 (0x12) |  |  |
|  |  | Message19 |  |  |  | 19 (0x13) |  |  |
|  |  | Message20 |  |  |  | 20 (0x14) |  |  |
|  |  | Message21 |  |  |  | 21 (0x15) |  |  |
|  |  | Message22 |  |  |  | 22 (0x16) |  |  |
|  |  | Message23 |  |  |  | 23 (0x17) |  |  |
|  |  | Message24 |  |  |  | 24 (0x18) |  |  |
|  |  | Message25 |  |  |  | 25 (0x19) |  |  |
|  |  | Message26 |  |  |  | 26 (0x1A) |  |  |
|  |  | Message27 |  |  |  | 27 (0x1B) |  |  |
|  |  | Message28 |  |  |  | 28 (0x1C) |  |  |
|  |  | Message29 |  |  |  | 29 (0x1D) |  |  |
|  |  | Message30 |  |  |  | 30 (0x1E) |  |  |
|  |  | … |  |  |  | … |  |  |
|  |  | Message250 |  |  |  | 250 (0xFA) |  |  |
|  |  | LimitCancelled |  |  |  | 251 (0xFB) |  |  |
|  |  | NotToBeDisplayed |  |  |  | 252 (0xFC) |  |  |
|  |  | NotUsed |  |  |  | 253, 254 (0xFD, 0xFE) |  |  |
|  |  | NoLimit |  |  |  | 255 (0xFF) |  |  |

##### SIG-REQ-312856/A-TsrOswWarnMsgTxt\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| TsrOswWarnMsgTxt\_D\_Rq | 2 |  | SED | 1 | 0 |  | 0  (0x0) | 3  (0x3) |
|  |  | Null |  |  |  | 0 (0x0) |  |  |
|  |  | False |  |  |  | 1 (0x1) |  |  |
|  |  | True |  |  |  | 2 (0x2) |  |  |
|  |  | NotUsed |  |  |  | 3 (0x3) |  |  |

### Outputs

#### IR-REQ-312862/A-INTERNAL

* TSR\_INFO\_SETUP\_MC, controls setting menu display output for TSR indications (generic or detailed – corresponds to the “Always Shown” or “Activate TSR” menu items).
* TSR\_OSW\_SETUP\_MC, controls setting menu display output for TSR Overspeed Warning Setup.
* TSR\_OSW\_THRESHOLD\_1\_MC, controls setting menu display output for TSR Overspeed Offset 1.
* TSR\_OSW\_THRESHOLD\_2\_MC, controls setting menu display output for TSR Overspeed Offset 2.
* TSR\_No\_Passing\_Detail\_Ind\_MC, displays different graphics pertaining to detailed TSR No Passing information.
* TSR\_No\_Passing\_Generic\_Ind\_MC, displays status of generic TSR No Passing Information.
* TSR\_Speed\_Limit\_1\_Detail\_MC, displays detailed graphics pertaining to TSR Speed Limit 1.
* TSR\_Speed\_Limit\_1\_Generic\_MC, displays generic graphics pertaining to TSR Speed Limit 1.
* TSR\_Speed\_Limit\_2\_Detail\_MC, displays detailed graphics pertaining to TSR Speed Limit 2.
* TSR\_Speed\_Limit\_2\_Generic\_MC, displays generic graphics pertaining to TSR Speed Limit 2.
* TSR\_Fault\_Warn\_MC\_Status\_Flag, internal flag used to control status of TSR fault.
* TSR\_OSW\_CHIME\_SETUP\_MC, controls setting menu display output for TSR overspeed chime setup.
* TSR\_OSW\_CHIME\_Status\_Flag, output chime flag for TSR overspeed chime.

#### MUX signals on the CAN Bus

##### SIG-REQ-312857/A-MsgCntrDsplyOp\_D\_Rq Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| MsgCntrDsplyOp\_D\_Rq | 3 |  | SED | 1 | 0 |  | 0  (0x0) | 7  (0x7) |
|  |  | NULL |  |  |  | 0x0 |  |  |
|  |  | QUERY |  |  |  | 0x1 |  |  |
|  |  | SET |  |  |  | 0x2 |  |  |
|  |  | UPLOAD |  |  |  | 0x3 |  |  |
|  |  | RESTORE |  |  |  | 0x4 |  |  |
|  |  | COPY |  |  |  | 0x5 |  |  |
|  |  | Unused |  |  |  | 0x6 |  |  |
|  |  | Unused |  |  |  | 0x7 |  |  |

.

##### SIG-REQ-312858/A-MsgCntrFeatConfigRq Signal

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

##### SIG-REQ-312859/A-MsgCntrFeatNoRq Signal

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

##### SIG-REQ-312860/A-MsgCntrPersIndex\_D\_Rq Signal

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

## Function/Performance

### F-REQ-312906/A-Operational Modes

|  |  |
| --- | --- |
| **Mode** | **Differentiating Vehicle Conditions** |
| Sleep Mode | TSR Display Messages Disabled |
| Limited Mode | TSR Display Messages Disabled |
| Normal Mode | TSR Display Messages Enabled / Disabled - ability to change the TSR settings |
| Crank Mode | TSR Display Messages Enabled / Disabled - ability to change the TSR settings |

### 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

##### Traffic Sign Location

* In SLOIF (NonNCAP and NCAP mode), up to two traffic signs can be displayed in two locations.

###### Primary

HMI-REQ-312863/A-Location

* + The primary speed limit shall be displayed in the first location. (Speed Limit 1)

F-REQ-312864/A-Input Signal

* + Input signal related to the primary speed limit:
  + TsrVl1PrmntMsgTxt\_D\_Rq, TsrVl1StatMsgTxt\_D\_Rq,
  + TsrVl1RstrcMsgTxt2\_D\_Rq, TsrVLim1MsgTxt\_D\_Rq

###### Secondary

HMI-REQ-312865/A-Location

* + The secondary speed limit and the no-passing sign shall be displayed in the second location (Speed Limit 2 / No Passing Info)

F-REQ-312866/A-Input Signal

* + Input signals related to the secondary speed limit:
  + TsrVl2PrmntMsgTxt\_D\_Rq, TsrVl2StatMsgTxt\_D\_Rq,
  + TsrVl2RstrcMsgTxt2\_D\_Rq, TsrVLim2MsgTxt\_D\_Rq

###### No Pass

F-REQ-312867/A-Input signals related to the No-passing sign:

* + TsrOvtkMsgTxt2\_D\_Rq, TsrOvtkMsgTxt\_D\_Rq, TsrOvtkStatMsgTxt\_D\_Rq

HMI-REQ-312868/A-No-passing Sign Information

* + In case valid no-passing sign and secondary speed limit information is received, the no-passing sign information shall be displayed (as per requirement F-REQ-312901)

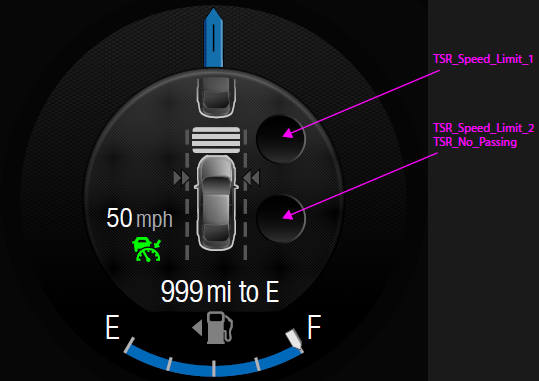
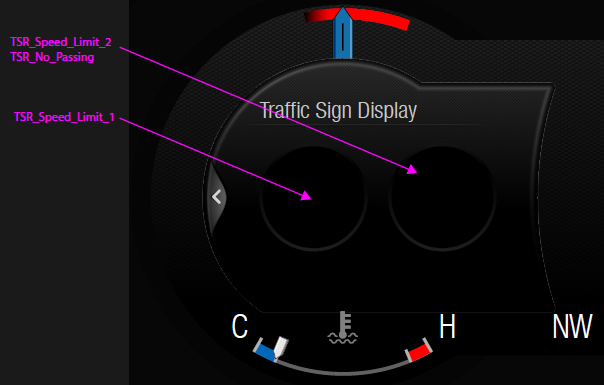
HMI-REQ-312869/A-Blank

If no traffic sign is being displayed, two placeholders (blank) shall be displayed.

###### HMI-REQ-312872/A-Conflicts between Secondary Speed Limit Information and No-Passing Sign

* Note: The IPMA (control module) will avoid conflicts between the secondary speed limit information and no-passing sign display by transmitting the appropriate states over the input signals. The cluster shall simply display the information based on these inputs.

###### Example Graphics



###### HMI-REQ-312871/A-Display in SLIF (reduced TSR) mode

* In SLIF (reduced TSR) mode, only the primary speed limit can be displayed. If no speed limit is being commanded, one blank placeholder is displayed.

##### Indicator Graphics / Display Format

###### Reference

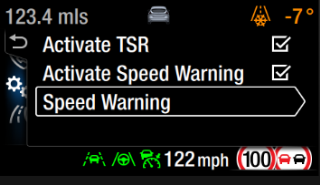
Please refer to the program specific menu structure for exact graphics.

###### Example Menu Structure for SLOIF non-NCAP mode

**Only displayed if TSR\_Cfg = 0x1 (Enabled), SLIF\_Cfg = 0x0 (Disabled), TSR\_NCAP\_Adaptations\_Cfg = 0x0 (Disabled)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Menu level 0** | **Menu level 1** | **Menu level 2** | **Menu level 3** | **Menu level 4** |
| Driver Assist | Traffic Signs | Always On | On (Indications are enabled) | |
| Off (Indicatios are disabled) | |
| Speed Warning | Speed Warning | On  Off |
| Up to 65 kmh / 35 mph | Speed Warning Tolerance (Scrolling Numbers) |
| Above 65 km/h / 35 mph | Speed Warning Tolerance (Scrolling Numbers) |
|  Chime | On |
| Off |

\*Respective mph values will be provided in the program wallpaper/graphics library.



###### Example Graphic for the Over Speed Threshold Selection Menu



###### Overspeed Warning Activation

HMI-REQ-312870/A-Condition

Once the Overspeed warning activation for either >65 kmh (35 mph) or <65 kmh (35 mph) is selected, the display should advance to a subsequent screen where the threshold can be selected as per the setup menu.

Once the displayed value is selected, it becomes the trigger point for the TSR over speed activation.

Reference

Please refer to program specific menu structure and data library for accurate graphics.

###### Example Menu Structure for SLOIF NCAP mode:

**Only displayed if TSR\_Cfg = 0x1 (Enabled), SLIF\_Cfg = 0x0 (Disabled) TSR\_NCAP\_Adaptations\_Cfg = 0x1 (Enabled)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Menu level 0** | **Menu level 1** | **Menu level 2** | **Menu level 3** | **Menu level 4** |
| Driver Assist | Traffic Signs | Activate Speed Warning | On  Off | |
|  | Tolerance | Speed Warning Tolerance (Scrolling Numbers) |
| Overspeed Chime | On  Off |

###### Example

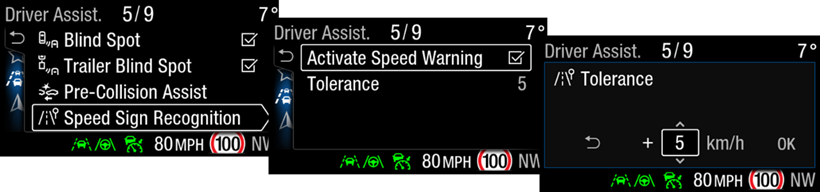


###### Example Menu Structure for SLIF mode:

**Only displayed if TSR\_Cfg = 0x0 (Disabled), SLIF\_Cfg = 0x1 (Enabled)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Menu level 0** | **Menu level 1** | **Menu level 2** | **Menu level 3** | **Menu level 4** |
| Driver Assist | Traffic Signs | Activate Speed Warning | On  Off | |
|  | Tolerance | Speed Warning Tolerance (Scrolling Numbers) |

###### Example



##### Indicator Color Coordinates

Refer to program specific HMI requirements for styling direction.

##### Indicator Characteristics

As per program specific HMI theme.

#### HMI-REQ-312905/A-Audio

TSR\_OSW\_CHIME\_Status\_Flag as per F-REQ-312928

#### Switch Control Logic

Consumer access to the Traffic Sign Recognition Configuration shall be as specified in 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-312907/A-System Accuracy

Within a 100msec of receiving a message that results in a change of state the cluster will update the display to the proper status.

### Operation: Performance and Functional

#### Subsystem Algorithm Flowchart / State Diagram

##### F-REQ-312873/A-TSR Configuration Parameters to Functionality Matrix

The following matrix provides an overview about relevant feature configurations:

|  |  |  |  |
| --- | --- | --- | --- |
| **TSR\_Cfg** | **Slif\_Cfg** | **TSR\_NCAP\_ Adaptions\_Cfg** | **Function  Behavior** |
| Enabled (0x1) | Disabled (0x0) | Disabled (0x0) | TSR ON (full TSR menu displayed)  **SLOIF NonNCAP Mode** |
| Enabled (0x1) | Disabled (0x0) | Enabled (0x1) | TSR ON (NCAP menu displayed)  **SLOIF NCAP Mode** |
| Disabled (0x0) | Enabled (0x1) | Don’t care | TSR ON (SLIF menu displayed)  **SLIF Mode** |
| All Other Cases | | | TSR Off (no traffic sign menu displayed in the cluster) |

##### F-REQ-312874/A-Traffic Sign Recognition Diagnostic Configuration Flowchart



##### F-REQ-312875/A-TSR input request Flowcharts



##### F-REQ-312876/B-TSR (SLOIF non-NCAP) output SET request Flowchart



**(continued from F-REQ-312876): SLIF and TSR NCAP (SLOIF NCAP) output SET request Flowchart** 

##### F-REQ-312877/A-TSR INFO Setup State Assignment – corresponds to “Always Shown” or “Activate TSR” in Menu Structure

**(enable/disable generic indication graphics)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **FeatNoIpmaActl Signal** | **FeatConfigIpmaActl Signal** | **PersIndexIpma\_D\_Actl Signal** | **TSR\_INFO\_SETUP\_MC** | **Current\_PERS (3)** |
| 0x0809 (1) | 0x0000 (OFF) | 0x0 – 0x4 | 0x00 | 0x0 – 0x4 | |
| 0x0001 (ON) | 0x0 – 0x4 | 0x01 | 0x0 – 0x4 | |
| Other (2) | | 0x02 (Error) | Last Known | |
| Missing per Section 1.4.1 (2) | | |

(1) TSR Customer EnableFeature Number. Reference is Feat Num table in “Vehicle Personalization FS”

(2) Message Response is Faulted

(3) Equal to the received “PersIndex<--->” signal value . When faulted Keep last known value.

##### F-REQ-312878/A-TSR INFO Setup Request Messages based upon TSR\_INFO\_SETUP\_MC – corresponds to “Always Shown” in Menu Structure

**(enable/disable indication display)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TSR\_INFO\_**  **SETUP\_MC** | **Display Menu** | **M/C Switch Selection Event** | **MsgCntrDsplyOp\_D\_Rq Signal** | **MsgCntrFeatNoRq**  **Signal** | **MsgCntrFeatConfigRq**  **Signal** | **MsgCntrPers**  **Index\_D\_Rq**  **Signal** |
| 0x00 |  | Up/Down + OK (Select On) | SET (0x2) | 0x0809 | 0x0001 (if ON is Selected) | Current\_PERS |
| 0x01 |  | Up/Down + OK (Select Off) | SET (0x2) | 0x0809 | 0x0000 (if OFF is Selected) | Current\_PERS |
| 0x02 |  | Up/Down + OK (Select On or Off) | SET (0x2) | 0x0809 | 0x0000 (if OFF is Selected)  0x0001 (if ON is Selected) | Current\_PERS |

Note: This menu is displayed in TSR SLOIF Non-NCAP mode only.

TSR\_Cfg = Enabled (0x1) and

SLIF\_Cfg = 0x0 (Disabled) and

TSR\_NCAP\_Adaptations\_Cfg = Disabled (0x0) S

##### F-REQ-312879/A-TSR Overspeed Warning Setup State Assignment

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **FeatNoIpmaActl Signal** | **FeatConfigIpmaActl Signal** | | **PersIndexIpma\_D\_Actl Signal** | | **TSR\_OSW\_**  **SETUP\_MC** | | **Current\_PERS (3)** | |
| 0x080D (1) | | 0x0000 (Off) | | 0x0 – 0x4 | | 0x00 | | 0x0 – 0x4 | | |
| 0x0001 (On) | | 0x0 – 0x4 | | 0x01 | | 0x0 – 0x4 | |
| Other (2) | | | | Error  (0x2) | | Last Known | |
| Missing per Section 1.4.1 (2) | | | | | |

(1) TSR Overspeed Warning Setup Feature Number. Reference is Feat Num table in “Vehicle Personalization FS”

(2) Message Response is Faulted

(3) Equal to the received “PersIndex<--->” signal value. When faulted Keep last known value.

##### F-REQ-312880/A-TSR Overspeed Warning Setup Request Messages based upon TSR\_OSW\_SETUP\_MC

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **TSR\_INFO\_SETUP\_MC** | **TSR\_OSW\_**  **SETUP\_MC** | **Display Menu** | **M/C Switch Selection Event** | **MsgCntrDsplyOp\_**  **D\_Rq Signal** | **MsgCntrFeatNoRq**  **Signal** | **MsgCntrFeatConfigRq**  **Signal** | **MsgCntrPersIndex\_D\_Rq Signal** |
| 0x01 (ON) | 0x00 |  | Up/Down + OK (Select On) | SET (0x2) | 0x080D | 0x0001  (On is selected) | Current\_PERS |
| 0x01 |  | Up/Down + OK (Select Off) | SET (0x2) | 0x080D | 0x0000  (If Off is selected) | Current\_PERS |
| 0x02 |  | Up/Down + OK (Select Any) | SET (0x2) | 0x080D | 0x0000 (If On is selected)  0x0001 (If Off is selected) | Current\_PERS |

**Note: TSR\_Cfg or SLIF\_Cfg must be set to Enabled (0x1) to display this menu**

##### F-REQ-312881/A-TSR Overspeed Threshold Unit Determination Flowchart



**F-REQ-312882, F-REQ-312883, F-REQ-312884 and F-REQ-312885 to be implemented only in SLOIF nonNCAP (as per F-REQ-312873)**

##### F-REQ-312882/A-TSR Overspeed Warning Threshold 1 Setup State Assignment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **FeatNoIpmaActl Signal** | **FeatConfigIpmaActl Signal** | | **PersIndexIpma\_D\_Actl Signal** | | **TSR\_OSW\_**  **THRESHOLD\_1\_MC** | **Current\_PERS (3)** |
| 0x080E (1) | | 0x0000 – 0x000F (Inactive) | | 0x0 – 0x4 | 0x00 | 0x0 – 0x4 | |
| 0x0010 – 0x0038 (valid speed thresholds in Metric units)  0x0010 – 0x0029 (valid speed thresholds in English units) | | 0x0 – 0x4 | 0x00 – 0x28 (for Metric units)  0x00 – 0x19 (for English units) | 0x0 – 0x4 | |
| Other (2) | | | 0x00  (Display 0) | Last Known | |
| Missing per Section 1.4.1 (2) | | | | |

(1) TSR Overspeed Warning Threshold Setup 1 Feature Number. Reference is Feat Num table in “Vehicle Personalization FS”

(2) Message Response is Faulted

(3) Equal to the received “PersIndex<--->” signal value. When faulted Keep last known value.

##### F-REQ-312883/A-TSR Overspeed Warning Threshold 1 Setup Request Messages based upon TSR\_OSW\_THRESHOLD\_1\_MC

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **TSR\_OSW\_SETUP**  **\_MC** | **TSR\_OSW\_**  **THRESHOLD\_1\_MC** | **Display Menu** | **M/C Switch Selection Event** | **MsgCntrDsplyOp\_D\_Rq**  **Signal** | **MsgCntrFeatNoRq**  **Signal** | **MsgCntrFeatConfigRq**  **Signal** | **MsgCntrPersIndex\_D\_Rq**  **Signal** |
| 0x01  (Enabled) | 0x00 |  | Based on HMI direction (Select Any valid value) | SET (0x2) | 0x080E | 0x11 – 0x38 ( If any valid speed threshold selected in metric units)  0x11 – 0x29 (If any valid speed threshold selected in English units) | Current\_PERS |
| 0x01 |  | Based on HMI direction (Select Any valid value) | SET (0x2) | 0x080E | 0x10 – 0x38 (If any valid speed threshold selected in metric units)  0x10 – 0x29 (If any valid speed threshold selected in English units) | Current\_PERS |
| **….** | **….** | Based on HMI direction (Select Any valid value) | SET (0x2) | 0x080E | 0x10 – 0x38 (If any valid speed threshold selected in metric units)  0x10 – 0x29 (If any valid speed threshold selected in English units) | Current\_PERS |
| 0x28 (for metric units)  0x19 (for English units) |  | Based on HMI direction (Select Any valid value) | SET (0x2) | 0x080E | 0x10 – 0x37 (If any valid speed threshold is selected in metric units)  0x10 – 0x28 (If any valid speed threshold is selected in English units) | Current\_PERS |

Note: TSR\_OSW\_SETUP\_MC must be Enabled (0x1) to display this menu.

Note: The over speed threshold values in the Display Menu above are in 1 unit increments.

Note: The graphics shown under the “Display Menu” column are shown as examples.

Note: The display of the scrolling numbers of the over speed warning shall be limited to the values between 0 - 40 kph and 0 - 25 mph.

##### F-REQ-312884/A-TSR Overspeed Warning Threshold Setup 2 State Assignment

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **FeatNoIpmaActl Signal** | **FeatConfigIpmaActl Signal** | | **PersIndexIpma\_D\_Actl Signal** | | **TSR\_OSW\_**  **THRESHOLD\_2\_MC** | | **Current\_PERS (3)** |
| 0x0811 (1) | | 0x0000 x 0x000F (Inactive) | | 0x0 – 0x4 | | 0x00 | 0x0 – 0x4 | |
| 0x0010 – 0x0038 (valid speed thresholds in Metric units)  0x0010 – 0x0029 (valid speed thresholds in English units) | | 0x0 – 0x4 | | 0x00 – 0x29 (for Metric units)  0x00 – 0x19 (for English units) | 0x0 – 0x4 | |
| Other (2) | | | | 0x00  (Display 0) | Last Known | |
| Missing per Section 1.4.1 (2) | | | | | |

(1) TSR Overspeed Warning Threshold Setup 2 Feature Number. Reference is Feat Num table in “Vehicle Personalization FS”

(2) Message Response is Faulted

(3) Equal to the received “PersIndex<--->” signal value. When faulted Keep last known value.

##### F-REQ-312885/A-TSR Overspeed Warning Threshold 2 Setup Request Messages based upon TSR\_OSW\_THRESHOLD\_2\_MC

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **TSR\_OSW\_SETUP**  **\_MC** | **TSR\_OSW\_**  **THRESHOLD\_2\_MC** | **Display Menu** | **M/C Switch Selection Event** | **MsgCntrDsplyOp\_D\_Rq**  **Signal** | **MsgCntrFeatNoRq**  **Signal** | **MsgCntrFeatConfigRq**  **Signal** | **MsgCntrPersIndex\_D\_Rq**  **Signal** |
| 0x01  (Enabled) | 0x00 |  | Based on HMI direction (Select Any valid value) | SET (0x2) | 0x0811 | 0x11 – 0x38 (If any valid speed threshold selected in metric units)  0x11 – 0x29 (If any valid speed threshold selected in English units) | Current\_PERS |
| 0x01 |  | Based on HMI direction (Select Any valid value) | SET (0x2) | 0x0811 | 0x10 – 0x38 (If any valid speed threshold selected in metric units)  0x10 – 0x29 (If any valid speed threshold selected in English units) | Current\_PERS |
| **….** | **….** | Based on HMI direction (Select Any valid value) | SET (0x2) | 0x0811 | 0x10 – 0x38 (If any valid speed threshold selected in metric units)  0x10 – 0x29 (If any valid speed threshold selected in English units) | Current\_PERS |
| 0x28 (for metric units)  0x19 (for English units) |  | Based on HMI direction (Select Any valid value) | SET (0x2) | 0x0811 | 0x10 – 0x37 (If any valid speed threshold is selected in metric units)  0x10 – 0x28 (If any valid speed threshold is selected in English units) | Current\_PERS |

Note: TSR\_OSW\_SETUP\_MC must be Enabled (0x1) to display this menu.

Note: The over speed threshold values in the Display Menu above are in 1 unit increments.

Note: The graphics shown under the “Display Menu” column are shown as examples.

Note: The display of the scrolling numbers of the over speed warning shall be limited to the values between 0 - 40 kph and 0 - 25 mph.

**F-REQ-312886, F-REQ-312887, to be implemented in SLIF or SLOIF NCAP mode (as per F-REQ-312873)**

##### F-REQ-312886/A-TSR Overspeed Warning Threshold 1 Setup State Assignment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **FeatNoIpmaActl Signal** | **FeatConfigIpmaActl Signal** | | **PersIndexIpma\_D\_Actl Signal** | | **TSR\_OSW\_**  **THRESHOLD\_1\_MC** | **Current\_PERS (3)** |
| 0x080E  &  0x0811 (1) | | 0x0000 – 0x000F (Inactive) | | 0x0 – 0x4 | 0x00 | 0x0 – 0x4 | |
| 0x0010 – 0x001A(valid speed thresholds in Metric units)  0x0010 – 0x0015 (valid speed thresholds in English units) | | 0x0 – 0x4 | 0x00 – 0x0A (for Metric units)  0x00 – 0x05(for English units) | 0x0 – 0x4 | |
| Other (2) | | | 0x0  (Display 0) | Last Known | |
| Missing per Section 1.4.1 (2) | | | | |

(1) TSR Overspeed Warning Threshold 1 and 2 Setup Feature Number. Reference is Feat Num table in “Vehicle Personalization FS”

(2) Message Response is Faulted

(3) Equal to the received “PersIndex<--->” signal value. When faulted Keep last known value.

##### F-REQ-312887/A-TSR Overspeed Warning Threshold 1 Setup Request Messages based upon TSR\_OSW\_THRESHOLD\_1\_MC

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **TSR\_OSW\_SETUP**  **\_MC** | **TSR\_OSW\_**  **THRESHOLD\_1\_MC** | **Display Menu** | **M/C Switch Selection Event** | **MsgCntrDsplyOp\_D\_Rq**  **Signal** | **MsgCntrFeatNoRq**  **Signal** | **MsgCntrFeatConfigRq**  **Signal** | **MsgCntrPersIndex\_D\_Rq**  **Signal** |
| 0x01  (Enabled) | 0x00 |  | Based on HMI direction (Select Any valid value) | SET (0x2) | 0x080E  &  0x0811 | 0x11 – 0x1A ( If any valid speed threshold is selected in metric units)  0x0011 – 0x15 (If any valid speed threshold is selected in English units) | Current\_PERS |
| 0x01 |  | Based on HMI direction (Select Any valid value) | SET (0x2) | 0x080E  &  0x0811 | 0x10 – 0x1A (If any valid speed threshold is selected in metric units)  0x10 – 0x15 (If any valid speed threshold is selected in English units) | Current\_PERS |
| **….** | **….** | Based on HMI direction (Select Any valid value) | SET (0x2) | 0x080E  &  0x0811 | 0x10 – 0x1A (If any valid speed threshold is selected in metric units)  0x10 – 0x15 (If any valid speed threshold is selected in English units) | Current\_PERS |
| 0x0A (for metric units)  0x05 (for English units) |  | Based on HMI direction (Select Any valid value) | SET (0x2) | 0x080E  &  0x0811 | 0x10 – 0x19 (If any valid speed threshold is selected in metric units)  0x10 – 0x14 (If any valid speed threshold is selected in English units) | Current\_PERS |

Note: TSR\_OSW\_SETUP\_MC must be Enabled (0x1) to display this menu.

Note: The over speed threshold values in the Display Menu above are in 1 unit increments.

Note: The graphics shown under the “Display Menu” column are shown as examples.

Note: The display of the scrolling numbers of the over speed warning shall be limited to the values between 0 - 10 kph and 0 - 5 mph.

##### F-REQ-313443/A-Simplify logic in the HUD to prevent TSR NCAP misconfigurations between the IPC and HUD

To simplify logic in the HUD and to prevent TSR NCAP misconfigurations between the IPC and HUD, it was decided that even though only one speed threshold is available to the user in NCAP markets, the cluster internally will transmit the threshold 1 value over threshold 2 variable as well. This value will be picked up by the HUD.

In F-REQ-312885 and F-REQ-312886, the menu item associated with TSR\_OSW\_THRESHOLD\_2\_MC (feature ID: 0x0811) is not displayed. However, TSR\_OSW\_THRESHOLD\_2\_MC assumes the value of TSR\_OSW\_THRESHOLD\_1\_MC and the cluster will internally transmit the SET request to HUD and IPMA. The HUD will take this information and apply it to its logic.

When multiple features (e.g. two over speed thresholds) are being set at the same time, as in the case of simplified menus, SET commands for the group of features should be sent in quick succession, ~ 50-100 ms apart.

**F-REQ-312888, F-REQ-312889, to be implemented in SLOIF NCAP and non-NCAP modes (as per F-REQ-312873)**

##### F-REQ-312888/A-TSR Overspeed Chime Setup State Assignment

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **FeatNoIpmaActl Signal** | **FeatConfigIpmaActl Signal** | | **PersIndexIpma\_D\_Actl Signal** | | **TSR\_OSW\_**  **CHIME\_SETUP\_MC** | | **Current\_PERS (3)** | |
| 0x0830 (1) | | 0x0000 (Off) | | 0x0 – 0x4 | | 0x00 | | 0x0 – 0x4 | | |
| 0x0001 (On) | | 0x0 – 0x4 | | 0x01 | | 0x0 – 0x4 | |
| Other (2) | | | | Error  (0x2) | | Last Known | |
| Missing per Section 1.4.1 (2) | | | | | |

(1) TSR Overspeed Warning Setup Feature Number. Reference is Feat Num table in “Vehicle Personalization FS”

(2) Message Response is Faulted

(3) Equal to the received “PersIndex<--->” signal value. When faulted Keep last known value.

##### F-REQ-312889/A-TSR Overspeed Chime Setup Request Messages based upon TSR\_OSW\_CHIME\_SETUP\_MC

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **TSR\_OSW\_SETUP\_MC** | **TSR\_OSW\_**  **CHIME\_SETUP\_MC** | **Display Menu** | **M/C Switch Selection Event** | **MsgCntrDsplyOp\_D\_Rq**  **Signal** | **MsgCntrFeatNoRq**  **Signal** | **MsgCntrFeatConfigRq**  **Signal** | **MsgCntrPersIndex\_D\_Rq**  **Signal** |
| 0x01  (Enabled) | 0x00 |  | Up/Down + OK (Select Enabled) | SET (0x2) | 0x0830 | 0x0001 (Enabled is selected) | Current\_PERS |
| 0x01 |  | Up/Down + OK (Select Off) | SET (0x2) | 0x0830 | 0x0000 (If Disabled is selected) | Current\_PERS |
| 0x02 |  | Up/Down + OK (Select Any) | SET (0x2) | 0x0830 | 0x0000 (If Disabled is selected)  0x0001 (If Enabled is selected) | Current\_PERS |

Note: TSR\_Overspeed\_Chime\_Cfg must be set to Enabled (0x1) to display this menu.

Note: TSR\_OSW\_SETUP\_MC must be Enabled (0x1) to display this menu.

##### F-REQ-312890/A-Intelligent Speed Assistance (ISA) with TSR

When ISA or iACC are active (ASLD\_RTT\_MC\_Status\_Flag = ISA\_Standby (0x3) or ISA\_Active (0x4)), the TSR information is displayed regardless of the status of TSR\_INFO\_SETUP\_MC. The TSR over speed indication, however, shall be inactive and the TSR indication icons shall not flash to show TSR over speed indication as shown in requirement F-REQ-312900

Please refer to the “Adjustable Speed Limiter Device (with optional Intelligent Speed Assistance) – CGEA1.3 STSS for more information on the ASLD\_RTT\_MC\_Status\_Flag and CADS feature specification document on IACC\_Func\_Disp\_Thin flag.

##### F-REQ-312891/B-TSR Information Display Process Function



##### F-REQ-312892/A-Mapping of TSR indication graphics based on different markets

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **TSR Notification** | **Default Graphic (EU market)** | **China Market graphic** | **FSAO market graphic** | | **North American market graphic** |
| No Passing Active |  | C:\Users\koepen\Pictures\China_NPS.png | |  | Not Applicable |
| No Passing Canceled |  |  | |  | Not Applicable |
| Speed Limit |  | Not Available | | Not Available | 800px-MUTCD_R2-1 |

Graphics to be applied based on country code, which is to be determined by the program team and/or the cluster D&R.

No passing graphics are relevant for TSR/SLOIF only. The IPMA will not request no-passing signs in SLIF mode.

##### F-REQ-312893/A-State Matrix and for Active/Highlighted TSR\_No\_Passing\_Generic\_Ind\_MC

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Operational\_**  **Mode** | **TSR\_cfg** | **SLIF\_Cfg** | **TsrOvtkStatMsgTxt\_D\_Rq Signal** | **TsrOvtkMsgTxt\_D\_Rq**  **Signal** | **TsrVlUnitMsgTxt\_D\_Rq Signal** | | **TSR\_No\_Passing\_**  **Generic\_Ind\_MC**    **(example graphics)** | | |
| Normal or Crank | Enabled (0x1) | Disabled  (0x0) | LimitChanged (0x1) | OvertakingAllowed (0x1) | X | | |  | |
| LimAllWithoutRestriction (0x2) | Mph (0x2) | | |  | |
| All other cases | | |  | |
| LimAllWithoutQlfdRstrc (0x3) | Mph (0x2) | | |  | |
| All other cases | | |  | |
| LimAllCancelled (0x4) | X | | |  | |
| LimForTrucksWithoutRstrc (0x5) | Mph (0x2) | | |  | |
| All other cases | | |  | |
| LimForTrucksWoQlfdRstrc (0x6) | Mph (0x2) | | |  | |
| All other cases | | |  | |
| LimForTrucksCancelled (0x7) | Mph (0x2) | | |  | |
| All other cases | | |  | |
| Missing as per 1.4.1 | X | | |  | |
| All Other Cases | | X | | |  | |

**Notes:**

* The graphics shown above are for example purposes only. Please refer to program specific display menu and/or graphics library for accurate graphics.
* The TSR\_No\_Passing\_Generic\_Ind\_MC shall be displayed in the second location. Please refer to the program specific wallpaper for TSR indication positions.
* No passing indication graphics are relevant to SLOIF (full TSR) only.

##### F-REQ-312894/A-State Matrix and for Active/Highlighted TSR\_No\_Passing\_Detail\_Ind\_MC

| **Operational\_**  **Mode** | **TSR\_cfg** | **SLIF\_Cfg** | **TsrOvtkStatMsgTxt\_D\_Rq Signal** | **TsrOvtkMsgTxt2\_D\_Rq**  **Signal** | **TsrVlUnitMsgTxt\_D\_Rq Signal** | **TSR\_No\_Passing\_**  **Detail\_Ind\_MC** | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Normal or Crank | Enabled (0x1) | Disabled  (0x0) | LimitChanged (0x1) | OvertakingAllowed (0x0) | X | |  |
| LimAllWithoutRestriction (0x1) | Mph (0x2) | |  |
| All other cases | |  |
| LimAllWithoutQlfdRstrc (0x2) | Mph (0x2) | |  |
| All other cases | |  |
| LimAllWithRstrcRain (0x3) | Mph (0x2) | |  |
| All other cases | |  |
| LimAllWithRstrcSnow (0x4) | Mph (0x2) | |  |
| All other cases | |  |
| LimAllWithRstrcTrailer (0x5) | Mph (0x2) | |  |
| All other cases | |  |
| LimAllWithRstrcTime (0x6) | Mph (0x2) | |  |
| All other cases | |  |
| LimAllCancelled (0x7) | X | |  |
| LimForTrucksWithoutRstrc (0x8) | Mph (0x2) | |  |
| All other cases | |  |
| LimForTrucksWoQlfdRstrc (0x9) | Mph (0x2) | |  |
| All other cases | |  |
| LimForTrucksCancelled (0xA) | Mph (0x2) | |  |
| All other cases | |  |
| Missing as per 1.4.1 | X | |  |
| All Other Cases | X | |  |

**Notes:**

* The graphics shown above are for example purposes only. Please refer to program specific display menu and/or graphics library for accurate graphics.
* The TSR\_No\_Passing\_Detail\_Ind\_MC shall be displayed in the second location. Please refer to the program specific wallpaper for TSR indication positions.
* No passing graphics are relevant in SLOIF (full TSR) mode only.

##### F-REQ-312895/A-State Matrix for Reliable TSR\_No\_Passing\_Generic\_Ind\_MC

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Operational\_**  **Mode** | **TSR\_cfg** | **SLIF\_Cfg** | **TsrOvtkStatMsgTxt\_D\_Rq Signal** | **TsrOvtkMsgTxt\_D\_Rq**  **Signal** | **TsrVlUnitMsgTxt\_D\_Rq Signal** | **TSR\_No\_Passing\_**  **Generic\_Ind\_MC** |
| Normal or Crank | Enabled (0x1) | Disabled  (0x0) | LimitReliable (0x2) | OvertakingAllowed (0x1) | X |  |
| LimAllWithoutRestriction (0x2) | Mph (0x2) |  |
| All other cases |  |
| LimAllWithoutQlfdRstrc (0x3) | Mph (0x2) |  |
| All other cases |  |
| LimAllCancelled (0x4) | X |  |
| LimForTrucksWithoutRstrc (0x5) | Mph (0x2) |  |
| All other cases |  |
| LimForTrucksWoQlfdRstrc (0x6) | Mph  (0x2) |  |
| All other cases |  |
| LimForTrucksCancelled (0x7) | Mph  (0x2) |  |
| All other cases |  |
| Missing as per 1.4.1 | X |  |
| All Other Cases | X |  |

**Notes:**

* The graphics shown above are for example purposes only. Please refer to program specific display menu and/or graphics library for accurate graphics.
* The TSR\_No\_Passing\_Generic\_Ind\_MC shall be displayed in the second location. Please refer to the program specific wallpaper for TSR indication positions.
* No passing indication graphics are relevant to SLOIF (full TSR) only.

##### F-REQ-312896/A-State Matrix for Reliable TSR\_No\_Passing\_Detail\_Ind\_MC

| **Operational\_**  **Mode** | **TSR\_cfg** | **SLIF\_Cfg** | **TsrOvtkStatMsgTxt\_D\_Rq Signal** | **TsrOvtkMsgTxt2\_D\_Rq**  **Signal** | **TsrVlUnitMsgTxt\_D\_Rq Signal** | **TSR\_No\_Passing\_**  **Detail\_Ind\_MC** | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Normal or Crank | Enabled (0x1) | Disabled  (0x0) | LimitReliable (0x2) | OvertakingAllowed (0x0) | X | |  |
| LimAllWithoutRestriction (0x1) | Mph (0x2) | |  |
| All other cases | |  |
| LimAllWithoutQlfdRstrc (0x2) | Mph (0x2) | |  |
| All other cases | |  |
| LimAllWithRstrcRain (0x3) | Mph (0x2) | |  |
| All other cases | |  |
| LimAllWithRstrcSnow (0x4) | Mph (0x2) | |  |
| All other cases | |  |
| LimAllWithRstrcTrailer (0x5) | Mph (0x2) | |  |
| All other cases | |  |
| LimAllWithRstrcTime (0x6) | Mph (0x2) | |  |
| All other cases | |  |
| LimAllCancelled (0x7) | X | |  |
| LimForTrucksWithoutRstrc (0x8) | Mph (0x2) | |  |
| All other cases | |  |
| LimForTrucksWoQlfdRstrc (0x9) | Mph (0x2) | |  |
| All other cases | |  |
| LimForTrucksCancelled (0xA) | Mph (0x2) | |  |
| All other cases | |  |
| Missing as per 1.4.1 | X | |  |
| All Other Cases | X | |  |

**Notes:**

* The graphics shown above are for example purposes only. Please refer to program specific display menu and/or graphics library for accurate graphics.
* The TSR\_No\_Passing\_Detail\_Ind\_MC shall be displayed in the second location. Please refer to the program specific wallpaper for TSR indication positions.
* No passing graphics are relevant in SLOIF (full TSR) mode only

##### F-REQ-312897/A-State Matrix for OUTDATED TSR\_No\_Passing\_Generic\_Ind\_MC

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Operational\_Mode** | **TSR\_cfg** | **SLIF\_Cfg** | **TsrOvtkStatMsg**  **Txt\_D\_Rq Signal** | **TsrOvtkMsgTxt\_D\_Rq**  **Signal** | **TsrVlUnitMsgTxt\_D\_Rq Signal** | **TSR\_No\_Passing\_**  **Generic\_Ind\_MC** |
| Normal or Crank | Enabled (0x1) | Disabled  (0x0) | LimitOutdated (0x3) | OvertakingAllowed  (0x1) | X |  |
| LimAllWithoutRestriction (0x2) | X |  |
| LimAllWithoutQlfdRstrc  (0x3) | X |  |
| LimAllCancelled  (0x4) | X |  |
| LimForTrucksWithoutRstrc (0x5) | Mph  (0x2) |  |
| All other cases |  |
| LimForTrucksWoQlfdRstrc (0x6) | Mph  (0x2) |  |
| All other cases |  |
| LimForTrucksCancelled  (0x7) | Mph  (0x2) |  |
| All other cases |  |
| Missing as per 1.4.1 | X |  |
| All Other Cases | X |  |

**Notes:**

* The graphics shown above are for example purposes only. Please refer to program specific display menu and/or graphics library for accurate graphics.
* The TSR\_No\_Passing\_Generic\_Ind\_MC shall be displayed in the second location. Please refer to the program specific wallpaper for TSR indication positions.

No passing indication graphics are relevant to SLOIF (full TSR) only.

##### F-REQ-312898/A-State Matrix for OUTDATED TSR\_No\_Passing\_Detail\_Ind\_MC

| **Operational\_**  **Mode** | **TSR\_cfg** | **SLIF\_Cfg** | **TsrOvtkStatMsgTxt\_D\_Rq Signal** | **TsrOvtkMsgTxt2\_D\_Rq**  **Signal** | **TsrVlUnitMsgTxt\_D\_Rq Signal** | **TSR\_No\_Passing\_**  **Detail\_Ind\_MC** | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Normal or Crank | Enabled (0x1) | Disabled  (0x0) | LimitOutdated (0x3) | OvertakingAllowed (0x0) | X | |  |
| LimAllWithoutRestriction (0x1) | X | |  |
| LimAllWithoutQlfdRstrc (0x2) | X | |  |
| LimAllWithRstrcRain (0x3) | X | |  |
| LimAllWithRstrcSnow (0x4) | X | |  |
| LimAllWithRstrcTrailer (0x5) | X | |  |
| LimAllWithRstrcTime (0x6) | X | |  |
| LimAllCancelled (0x7) | X | |  |
| LimForTrucksWithoutRstrc (0x8) | Mph (0x2) | |  |
| All other cases | |  |
| LimForTrucksWoQlfdRstrc (0x9) | Mph (0x2) | |  |
| All other cases | |  |
| LimForTrucksCancelled (0xA) | Mph (0x2) | |  |
| All other cases | |  |
| Missing as per 1.4.1 | X | |  |
| All Other Cases | X | |  |

**Notes:**

* The graphics shown above are for example purposes only. Please refer to program specific display menu and/or graphics library for accurate graphics.
* The TSR\_No\_Passing\_Generic\_Ind\_MC shall be displayed in the second location. Please refer to the program specific wallpaper for TSR indication positions.
* No passing indication graphics are relevant to SLOIF (full TSR) only.

##### F-REQ-312899/A-State Matrix for TSR\_Speed\_Limit\_1\_Generic\_MC

| **Operational\_Mode** | **TSR\_cfg or**  **SLIF\_Cfg** | **TsrVl1StatMsg**  **Txt\_D\_Rq Signal** | **TsrVl1RstrcMsgTxt2\_D\_Rq Signal** | **TsrVl1PrmntMsgTxt\_D\_Rq Signal** | **TsrVLim1MsgTxt\_D\_Rq Signal** | **TSR\_Speed\_**  **Limit\_1\_Generic\_MC** |
| --- | --- | --- | --- | --- | --- | --- |
| Normal or Crank | Enabled (0x1) | LimitChanged (0x1) | NoSpeedLimitRestriction (0x1)  NoRecognizableRestrctn  (0x2),  RainWet (0x3),  Snow (0x4),  Trailer (0x5),  Time (0x6) | ShowPermanentlyWithoutSupp (0x1) | <> (0x00, 0xFB, 0xFC, 0xFD, 0xFE, 0xFF) |  |
| ShowPermanentlyWithSupp  (0x2) |  |
| LimitReliable (0x2) | NoSpeedLimitRestriction (0x1)  NoRecognizableRestrctn  (0x2),  RainWet (0x3),  Snow (0x4),  Trailer (0x5),  Time (0x6) | ShowPermanentlyWithoutSupp (0x1) |  |
| ShowPermanentlyWithSupp  (0x2) |  |
| LimitOutdated (0x3) | NoSpeedLimitRestriction (0x1)  NoRecognizableRestrctn  (0x2),  RainWet (0x3),  Snow (0x4),  Trailer (0x5),  Time (0x6) | ShowPermanentlyWithoutSupp (0x1) |  |
| ShowPermanentlyWithSupp  (0x2) |  |
| LimitChanged (0x1) | X | X | LimitCancelled (0xFB) |  |
| LimitReliable (0x2) || LimitOutdated (0x3) | LimitCancelled (0xFB) |  |
| X | X | X | NoLimit (0xFF)  ||  NotToBeDisplayed (0xFC) |  |
| X | X | X | Missing as per 1.4.1 |  |
| All Other Cases | | | |  |

**Notes:**

* TSR\_Speed\_Limit\_1\_Generic\_MC shall be displayed in the first location. The graphics shown above are for example purposes only. Please refer to program specific display menu and/or wallpaper for accurate graphics and TSR indicator positions.
* The value in the circle of the indicator graphic shall be replaced by the value received in the TsrVLim1MsgTxt\_D\_Rq input signal.

##### F-REQ-312900/A-State Matrix for TSR\_Speed\_Limit\_1\_Detail\_MC

| **Operational\_Mode** | **TSR\_Cfg**  **Or**  **SLIF\_Cfg** | **TsrVl1StatMsg**  **Txt\_D\_Rq Signal** | **TsrVl1RstrcMsgTxt2\_D\_Rq Signal** | **TsrVl1PrmntMsgTxt\_D\_Rq Signal** | **TsrVLim1MsgTxt\_D\_Rq Signal** | **TSR\_Speed\_**  **Limit\_1\_**  **Detail\_MC** |
| --- | --- | --- | --- | --- | --- | --- |
| Normal or Crank | Enabled (0x1) | LimitChanged (0x1) | NoSpeedLimitRestriction (0x1) | <> NotUsed (0x3) | <> (0x00, 0xFB, 0xFC, 0xFD, 0xFE, 0xFF) |  |
| NoRecognizableRestrctn  (0x2) |  |
| RainWet (0x3) |  |
| Snow (0x4) |  |
| Trailer (0x5) |  |
| Time (0x6) |  |
| LimitReliable (0x2) | NoSpeedLimitRestriction (0x1) | <> NotUsed (0x3) |  |
| NoRecognizableRestrctn  (0x2) |  |
| RainWet (0x3) |  |
| Snow (0x4) |  |
| Trailer (0x5) |  |
| Time (0x6) |  |
| LimitOutdated (0x3) | NoSpeedLimitRestriction (0x1) | <> NotUsed (0x3) |  |
| NoRecognizableRestrctn  (0x2) |  |
| RainWet (0x3) |  |
| Snow (0x4) |  |
| Trailer (0x5) |  |
| Time (0x6) |  |
| LimitChanged (0x1) | X | X | LimitCancelled (0xFB) |  |
| LimitReliable (0x2) || LimitOutdated (0x3) | X | LimitCancelled (0xFB) |  |
| X | X | X | NoLimit (0xFF)  ||  NotToBeDisplayed (0xFC) |  |
| X | X | X | Missing as per 1.4.1 |  |
| All Other Cases | | | |  |

**Notes:**

* TSR\_Speed\_Limit\_1\_Detail\_MC shall be displayed in the first location. The graphics shown above are for example purposes only. Please refer to program specific display menu and/or wallpaper for accurate graphics and display position..
* The value in the circle of the indicator graphic shall be replaced by the value received in the TsrVLim1MsgTxt\_D\_Rq input signal.

##### F-REQ-312901/A-TSR pre-conditions to activate TSR Speed Limit 2 Information



##### F-REQ-312902/A-State Matrix for TSR\_Speed\_Limit\_2\_Generic\_MC

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Operational\_Mode** | **TSR\_cfg** | **SLIF\_Cfg** | **TsrVl2StatMsg**  **Txt\_D\_Rq Signal** | **TsrVl2RstrcMsgTxt2\_D\_Rq Signal** | **TsrVl2PrmntMsgTxt\_D\_Rq Signal** | **TsrVLim2MsgTxt\_D\_Rq Signal** | **TSR\_Speed\_**  **Limit\_2\_Generic\_MC** | |
| Normal or Crank | Enabled (0x1) | Disabled  (0x0) | LimitChanged (0x1) | NoSpeedLimitRestriction (0x1)  NoRecognizableRestrctn  (0x2),  RainWet (0x3),  Snow (0x4),  Trailer (0x5),  Time (0x6) | ShowPermanentlyWithoutSupp (0x1) | <> (0x00, 0xFB, 0xFC, 0xFD, 0xFE, 0xFF) |  | |
| ShowPermanentlyWithSupp  (0x2) |  |
| LimitReliable (0x2) | NoSpeedLimitRestriction (0x1)  NoRecognizableRestrctn  (0x2),  RainWet (0x3),  Snow (0x4),  Trailer (0x5),  Time (0x6) | ShowPermanentlyWithoutSupp (0x1) |  |
| ShowPermanentlyWithSupp  (0x2) |  |
| LimitOutdated (0x3) | NoSpeedLimitRestriction (0x1)  NoRecognizableRestrctn  (0x2),  RainWet (0x3),  Snow (0x4),  Trailer (0x5),  Time (0x6) | ShowPermanentlyWithoutSupp (0x1) |  |
| ShowPermanentlyWithSupp  (0x2) |  |
| X | X | X | LimitCancelled (0xFB)  ||  NotToBeDisplayed (0xFC)  ||  NoLimit (0xFF) |  |
| X | X | X | Missing as per 1.4.1 |  |
| All Other Cases | | | |  |

**Notes:**

* TSR\_Speed\_Limit\_2\_Generic\_MC shall be displayed in the second location. The graphics shown above are for example purposes only. Please refer to program specific display menu and/or wallpaper for accurate graphics and display position.
* The value in the circle of the indication graphic shall be replaced by the value received in the TsrVLim2MsgTxt\_D\_Rq input signal.
* It is assumed that the information for No Passing and/or Speed Limit 1 has not been received in these example graphics.

##### F-REQ-312903/A-State Matrix for TSR\_Speed\_Limit\_2\_Detail\_MC

| **Operational\_Mode** | **TSR\_cfg** | **SLIF\_Cfg** | **TsrVl2StatMsg**  **Txt\_D\_Rq Signal** | **TsrVl2RstrcMsgTxt2\_D\_Rq Signal** | **TsrVl2PrmntMsgTxt\_D\_Rq Signal** | **TsrVLim2MsgTxt\_D\_Rq Signal** | **TSR\_Speed\_**  **Limit\_2\_**  **Detail\_MC** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Normal or Crank | Enabled (0x1) | Disabled  (0x0) | LimitChanged (0x1) | NoSpeedLimitRestriction (0x1) | <> NotUsed (0x3) | <> (0x00, 0xFB, 0xFC, 0xFD, 0xFE, 0xFF) |  |
| NoRecognizableRestrctn  (0x2) |  |
| RainWet (0x3) |  |
| Snow (0x4) |  |
| Trailer (0x5) |  |
| Time (0x6) |  |
| LimitReliable (0x2) | NoSpeedLimitRestriction (0x1) | <> NotUsed (0x3) |  |
| NoRecognizableRestrctn  (0x2) |  |
| RainWet (0x3) |  |
| Snow (0x4) |  |
| Trailer (0x5) |  |
| Time (0x6) |  |
| LimitOutdated (0x3) | NoSpeedLimitRestriction (0x1) | <> NotUsed (0x3) |  |
| NoRecognizableRestrctn  (0x2) |  |
| RainWet (0x3) |  |
| Snow (0x4) |  |
| Trailer (0x5) |  |
| Time (0x6) |  |
| X | X | X | LimitCancelled (0xFB)  ||  NotToBeDisplayed (0xFC)  ||  NoLimit (0xFF) |  |
| X | X | X | Missing as per 1.4.1 |  |
| All Other Cases | | | |  |

**Notes:**

* TSR\_Speed\_Limit\_2\_Detail\_MC shall be displayed in the second location. The graphics shown above are for example purposes only. Please refer to program specific display menu and/or wallpaper for accurate graphics and display position.
* The value in the circles shall be replaced by the value received in the TsrVLim2MsgTxt\_D\_Rq input signals.

##### State Matrix and Example graphics for TSR\_Fault\_MC\_Warn\_Status\_Flag

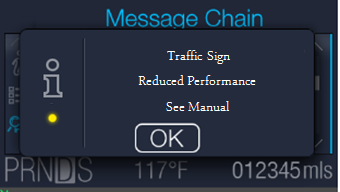
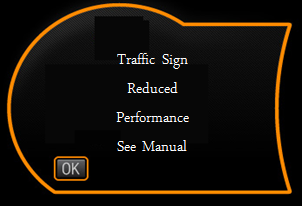
###### F-REQ-313442/A-State Matrix

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Operational\_Mode** | **TSR\_cfg**  **Or**  **SLIF\_Cfg** | **MC\_Display\_Status** | **TsrMsgTxt\_D\_Rq Signal** | **TSR\_Fault\_MC\_Warn\_Status\_Flag**  **(W1950 – TA\*)** |
| Normal or Crank | Enabled (0x1) | TSR Settings Menu | NoNavDataAvailable (0x3)  ||  WrngNavDatIncompDatCarrier (0x4)  ||  CountryNotSupported (0x5) | **Active** |
| All Other Cases | | | | Inactive |

**Notes:**

* The graphics shown below are for example purposes only.
* Please refer to program specific display menu and/or graphics library for accurate graphics.

###### Example Graphics

**M1 Graphic (W1950) M2 (HEV) Graphic (W1950) M3 Graphic (W1950)**   

##### Over Speed Warning

###### Activation Menu

The Over Speed Warning can be activated by the driver in the TSR or SLIF menu.

###### Visual Over Speed Warning:

F-REQ-312908/A-State Change

If the Over Speed Warning is activated, the greater displayed speed limit flashes while the stat message (TsrVl1StatMsgTxt\_D\_Rq Signal or TsrVl2StatMsgTxt\_D\_Rq Signal)is "Changed" (0x1) or "Reliable" (0x2).

F-REQ-312909/A-Frequency

The frequency of the flashing shall be 1Hz at 50% DC.

F-REQ-312910/A-TSR/SLIF Indication and ASLD RTTs flashing at the same time

In the event of TSR/SLIF indication and ASLD RTTs flashing at the same time, the two flashing indications shall be synchronized.

F-REQ-312911/A-RTTs NOT Flash

The RTTs shall NOT flash for overspeed conditions if ASLD\_RTT\_MC\_Status\_Flag = ISA\_Standby (0x3) or ISA\_Active (0x4) or ISA\_Standby\_Override (0x5) as shown in requirement F-REQ- 312898 below.

###### Over Speed Warning Chime:

The TSR Overspeed warning chime shall only get activated if the chime has been enabled from the TSR Setup menu thru the TSR\_OSW\_CHIME\_SETUP\_MC.

**This flowchart to be implemented in SLOIF non-NCAP mode (as per requirement F-REQ-312873)**

##### F-REQ-312925/B-TSR Overspeed Warning Indication Determination Process



**This flowchart to be implemented in SLOIF NCAP mode and SLIF mode (as per requirement F-REQ-312873)**

##### F-REQ-312926/B-TSR Overspeed Warning Indication Determination Process



##### F-REQ-312927/B-State Matrix for flashing TSR Overspeed Information

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Operational\_**  **Mode** | **TSR\_Config**  **Or**  **SLIF\_Cfg** | **TSR\_OSW\_**  **SETUP\_MC** | **TsrOswWarnMsgTxt**  **\_D\_Rq**  **Signal** | **TsrVl1StatMsgTxt\_D\_Rq Signal** | **TsrVl1RstrcMgTxt2\_D\_Rq Signal**  **(to be used to determine the state of TSR\_Speed\_Limit\_1\_Detail\_MC)** | **TsrVl1PrmntMsgTxt\_D\_Rq**  **Signal**  **(to be used to determine state of TSR\_Speed\_Limit\_1\_Generic\_MC)** | **TSR\_OSW\_Condition** | **TSR\_Speed\_Limit\_1\_Detail\_MC**  **Flash?**  **(Yes or No)** | **TSR\_Speed\_Limit\_1\_Generic\_MC**  **Flash?**  **(Yes or No)** |
| Normal or Crank | Enabled (0x1) | On (0x1) | != True (0x2) | X | X | X | False (0x0) | No | No |
| LimitChanged (0x1) | NoSpeedLimitRestriction (0x1) | X | True  (0x1) | Yes | Inactive (not displayed) |
| NoRecognizableRestriction (0x2) | X | True  (0x1) | No | Inactive (not displayed) |
| X | ShowPermanently  WithoutSupp (0x1) | True  (0x1) | Inactive (not displayed) | Yes |
| X | ShowPermanently  WithSupp (0x2) | True  (0x1) | Inactive (not displayed) | No |
| LimitReliable (0x2) | NoSpeedLimitRestriction (0x1) | X | True  (0x1) | Yes | Inactive (not displayed) |
| NoRecognizableRestriction (0x2) | X | True  (0x1) | No | Inactive (not displayed) |
| X | ShowPermanently  WithoutSupp (0x1) | True  (0x1) | Inactive (not displayed) | Yes |
| X | ShowPermanently  WithSupp (0x2) | True  (0x1) | Inactive (not displayed) | No |
| LimitOutdated (0x3) | NoSpeedLimitRestriction (0x1) | ShowPermanently  WithoutSupp (0x1) | True  (0x1) | No | Inactive (not displayed) |
| NoRecognizableRestriction (0x2) | ShowPermanently  WithSupp (0x2) | True  (0x1) | No | Inactive (not displayed) |
| NoSpeedLimitRestriction (0x1) | ShowPermanently  WithoutSupp (0x1) | True  (0x1) | Inactive (not displayed) | No |
| NoRecognizableRestriction (0x2) | ShowPermanently  WithSupp (0x2) | True  (0x1) | Inactive (not displayed) | No |
| X  (Don’t Care) | True (0x2) | X | X | X | X | Or    **\*\*** | Yes |
| All Other Cases | | | | | | | | No | No |

**Notes:**The graphics shown above are for example purposes only.

* IPMA will always send the higher value on Speed Limit 1, hence CAN signals pertaining to speed limit 1 are used.
* Inactive (not displayed) = Since the generic and detailed indication are mutually exclusive, only one can be displayed at a given time. So, if detailed indications are active, the other is inactive and vice-versa.
* The display of two speed limits is not visualized. In that case just the sign with the higher speed limit value is relevant for the Over Speed Warning.
* The entire RTT (outlined circle and speed value) should flash at a rate of 1 Hz.
* \*\* = Flashing states will be triggered by IPMA for changed and reliable signs without supplementary signs. IPMA hosts this logic and will take care that no flashing for supplementary signs or outdated signs is triggered

##### F-REQ-312928/A-State Matrix for TSR Overspeed Chime Status flag

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Operational Mode** | **TSR\_Cfg** | **SLIF\_Cfg** | **TSR\_Overspeed\_**  **Chime\_Cfg** | **TSR\_OSW\_CHIME\_**  **SETUP\_MC** | **TSR Speed Limit 1 indication flashing?** | **TSR\_OSW\_CHIME\_**  **Status\_Flag**  **(CHIME\_30)** |
| Normal or Crank | 0x1  (Enabled) | 0x0  (Disabled) | Enabled (0x1) | Enabled (0x1) | YES | Active |
| NO | Inactive |
| All Other Cases | | | | | | Inactive |

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

##### F-REQ-312929/A-Dedicated Indication Locations

* There are up to two (depending on configuration) dedicated indication locations for displaying 3 TSR related icons. One location is dedicated for Speed limit 1 information. In full TSR (SLOIF) mode, the second location is shared between the No Passing Information and Speed Limit 2 information. In SLIF mode, the second location is unused.

##### F-REQ-312930/A-Indication Display in TSR/SLOIF NCAP mode

* In the TSR/SLOIF NCAP mode (TSR\_NCAP\_Adaptations\_Cfg = Enabled), the user shall not have the capability disable the display of speed indications.

##### F-REQ-312931/A-Arbitration of the TSR Speed Limit

* The front camera (IPMA) module controls all of the processing and arbitration of the TSR speed limit information. Hence the cluster is not required to determine if Speed Limit 2 information needs to be displayed based on Speed Limit 1.

##### F-REQ-312932/A-Cluster Responsibility

* The instrument cluster is responsible for displaying the information per HMI direction.

##### F-REQ-312920/A-Logic handled in the IPMA

* IPMA will always transmit the higher value on speed limit 1, hence only this limit is considered for indicating over speed conditions. (logic handled in the IPMA)

##### F-REQ-312921/A-Event Synchronization

* In the event of TSR indication and ASLD RTT flashing at the same time, the two shall be synchronized.

##### F-REQ-312922/A-Indication based on Display Type

* The TSR generic indications and the detailed indications are mutually exclusive. The indications are displayed based on the cluster display type, which is determined by the HMI team.

##### F-REQ-312923/A-TSR Indication

* If ISA or iACC are active (ASLD\_RTT\_MC\_Status\_Flag = ISA\_Standby (0x3) or ISA\_Active (0x4) or ISA\_Standby\_Override (0x5)), then the TSR indications shall be active regardless of the status of TSR\_INFO\_SETUP\_MC, TSR\_OSW\_SETUP\_MC, TSR\_OSW\_THRESHOLD\_1\_MC OR TSR\_OSW\_THRESHOLD\_2\_MC.

##### F-REQ-312924/A-All Valid Signal Transmission

* In the event that all 3 signals (TsrVLim1MsgTxt\_D\_Rq, TsrVLim2MsgTxt\_D\_Rq and TsrOvtkMsgTxt2\_D\_Rq) transmit valid data, the cluster will display information for Speed Limit 1 and Passing lane information. The cluster will ignore information for Speed Limit 2 signal.

In this context “valid” means:

TsrVLim1MsgTxt\_D\_Rq <> (0x00, 0xFC, 0xFD, 0xFE, 0xFF)

TsrVLim2MsgTxt\_D\_Rq <> (0x00, 0xFB, 0xFC, 0xFD, 0xFE, 0xFF)

TsrOvtkMsgTxt\_D\_Rq <> (0x0, 0x1) – for generic indications

TsrOvtkMsgTxt2\_D\_Rq <> (0x0, 0xB- 0xF) – **for detailed indications**

##### OverSpeed Threshold Setup for NCAP markets:

###### F-REQ-312912/A-User Preference

* + The user can only set up one speed threshold for the SLIF function.

###### F-REQ-312913/A-Simplification

* + However, this STSS has defined 2 speed thresholds. This is to simplify functionality in the HUD and to prevent misconfiguration between the cluster and the HUD.

###### F-REQ-312914/A-Menu Display

* + The value of SLIF\_OSW\_THRESHOLD\_2\_MC is not displayed in the menu. However, SLIF\_OSW\_THRESHOLD\_2\_MC takes the value of SLIF\_OSW\_THRESHOLD\_1\_MC, and both “SET” commands are transmitted by the IPC consecutively.

###### F-REQ-312915/A-Timing

* + When multiple features are being set at the same time, as in the case of simplified menus, SET commands for the group of features should be sent in quick succession, ~ 50-100 ms apart.

##### OverSpeed Warning Thresholds and Units changes

###### F-REQ-312916/A-Numerical Value

* The numerical value of the overspeed threshold shall remain constant even if TSR units are changed.

###### F-REQ-312917/A-TSR Speed Unit Change

* In the case of TSR speed unit changing) the IPMA will send updated OSW thresholds to the IPC. This will ensure that the threshold ranges are not exceeded (e.g. 25 mph in SLOIF NonNCAP Mode).

###### F-REQ-312918/A-Update OSW Value

* The IPC shall update the OSW values according to the IPMA’s request.

###### F-REQ-312919/A-Error Value

* Error values shall be displayed as 0 for threshold selection.

#### FS-REQ-312942/A;1-Function Safety Classification (EMC)

Class B

#### Memory Storage

##### NVM-REQ-312933/A-Parameter Storage

| **Parameter Name** | **Description** | **Value at**  **Battery Connect** | **Value at**  **Wake-up** |
| --- | --- | --- | --- |
| 1. TSR\_INFO\_SETUP\_MC 2. TSR\_OSW\_SETUP\_MC 3. TSR\_OSW\_THRESHOLD\_1\_MC 4. TSR\_OSW\_THRESHOLD\_2\_MC 5. TSR\_No\_Passing\_Detail\_Ind\_MC 6. TSR\_No\_Passing\_Generic\_Ind\_MC 7. TSR\_Speed\_Limit\_1\_Detail\_MC 8. TSR\_Speed\_Limit\_1\_Generic\_MC 9. TSR\_Speed\_Limit\_2\_Detail\_MC 10. TSR\_Speed\_Limit\_2\_Generic\_MC 11. TSR\_OSW\_CHIME\_SETUP\_MC 12. TSR\_Fault\_Warn\_MC\_Status\_Flag | Output(s) displayed in the message center | Inactive | Inactive |
| TSR\_OSW\_CHIME\_Status\_Flag | Output chime status flag to the chime arbitrator. | Inactive | Inactive |
| Current\_PERS | Current Personality Profile | Vehicle (0x4) | Do Not Init |
| MsgCntrDsplyOp\_D\_Rq Signal | Output Signal to indicate Request Type. | NULL (0x0) | Do Not Init |
| MsgCntrFeatNoRq Signal | Output Signal to indicate Feature Number. | (0x0000) | Do Not Init |
| MsgCntrFeatConfigRq Signal | Output Signal to Specify the desired feature Value. | (0x0000) | Do Not Init |
| MsgCntrPersIndex\_D\_Rq Signal | Output Signal to indicate which personality profile is being accessed. | Vehicle (0x4) | Do Not Init |
| FeatNoIpmaActl Signal | Input signal sent from Ipma to indicate Feature Number. | (0x0000) | Do Not Init |
| FeatConfigIpmaActl Signal | Input signal sent from Ipma to indicate current value of the feature setting for the feature that is being set or queried. | (0x0000) | Do Not Init |
| PersIndexIpma\_D\_Actl Signal | Input signal sent from Ipma to indicate which personality profile is being reported. | Vehicle (0x4) | Do Not Init |
| Settings\_Menu\_Cfg | Configures cluster to display items in the Settings menu (Set to “cluster” at cluster supplier manufacturer plant) | Use Stored Value | Use Stored Value |
| SLIF\_Cfg | State indicator for feature presence controlled via CAN at EOL at VO plant. Set to disabled at Cluster Supplier Manufacturing Plant | Use Stored Value | Use Stored Value |
| TsrOvtkStatMsgTxt\_D\_Rq Signal  TsrOvtkMsgTxt\_D\_Rq Signal  TsrOvtkTypeMsgTxt\_D\_Rq Signal  TsrOvtkMsgTxt2\_D\_Rq Signal | Input signals sent from IPMA to process No passing information. | 0x0  0x1  0x0  0x0 | 0x0  0x1  0x0  0x0 |
| TsrMsgTxt\_D\_Rq Signal | Input signal sent from IPMA to activate a warning if TSR performance has been compromised. | 0x1 | 0x1 |
| TsrVLim1MsgTxt\_D\_Rq Signal  TsrVl1StatMsgTxt\_D\_Rq Signal  TsrVl1RstrcMsgTxt2\_D\_Rq Signal  TsrVl1TypeMsgTxt\_D\_Rq Signal  TsrVl1PrmntMsgTxt\_D\_Rq Signal | Input signals sent from IPMA to process information for Speed Limit 1 displays | 0xFF  0x0  0x0  0x0  0x0 | 0xFF  0x0  0x0  0x0  0x0 |
| TsrVLim2MsgTxt\_D\_Rq Signal  TsrVl2StatMsgTxt\_D\_Rq Signal  TsrVl2RstrcMsgTxt2\_D\_Rq Signal  TsrVl2TypeMsgTxt\_D\_Rq Signal  TsrVl2PrmntMsgTxt\_D\_Rq Signal | Input signals sent from IPMA to process information for Speed Limit 2 displays | 0xFF  0x0  0x0  0x0  0x0 | 0xFF  0x0  0x0  0x0  0x0 |
| TsrVlUnitMsgTxt\_D\_Rq Signal | Input signal sent from IPMA to factor in the units when setting overspeed offset. | 0x1 (kmh) | Use Stored Value |
| TsrOswWarnMsgTxt\_D\_Rq Signal | Signal from IPMA to trigger the OSW indication when Digital speedo is disabled | (0x1) FALSE | (0x1) FALSE |
| TSR\_Cfg | State indicator for feature presence controlled via CAN at EOL at VO plant. Set to disabled at Cluster Supplier Manufacturing Plant | Use Stored Value | Use Stored Value |
| TSR\_Overspeed\_Chime\_Cfg | State indicator for feature presence controlled via CAN at EOL at VO plant. Set to disabled at Cluster Supplier Manufacturing Plant | Use Stored Value | Use Stored Value |
| TSR\_NCAP\_Adaptations\_Cfg | State indicator for feature presence controlled via CAN at EOL at VO plant. Set to disabled at Cluster Supplier Manufacturing Plant | Use Stored Value | Use Stored Value |
| SLIF\_Cfg | State indicator for feature presence controlled via CAN at EOL at VO plant. Set to disabled at Cluster Supplier Manufacturing Plant | Use Stored Value | Use Stored Value |
| M/C\_Display\_Status | State Indicator to identify which text is currently being displayed on Message Center display. See \* | See \* | See\* |
| M/C Switch Event | Event that is indicated as per the switch interface for the Message Center. See \* | See \* | See\* |
| Speedometer\_Gauge  (for analog speed gauge) | Vehicle speed as indicated by the gauge pointer to be used to compare with IPMA calculated speed to determine TSR overspeed condition. | Note 1 | Note 1 |
| Digital\_Speedometer\_MC (for digital speedo) | Digital vehicle speed as displayed on the message center be used to compare with IPMA calculated speed to determine TSR overspeed condition. | Note 2 | Note 2 |
| IACC\_Func\_Disp\_Thin | Output from the CADS reference spec used as an input to the TSR function. | Note 3 | Note 3 |
| Operational\_Mode | 4 state indicator for cluster operational mode | Limited | Limited, Normal or Crank |
| TSR\_NCAP\_Tx\_Flag | Internal variable that determines when to start a delay timer based on ignition transition to Run. This is to transmit the request signals when TSR\_NCAP\_Adaptations\_Cfg is enabled. | Clear | Clear |

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

Note 1: Please refer to the Speedometer Gauge – CGEA1.3 STSS for information

Note 2: Please refer to the Speedometer Gauge Digital – CGEA1.3 STSS for information.

Note 3: Pease refer to the CADS Cluster Interface Specification – ver 022 and newer for information

##### NVM-REQ-312934/A-Timer Details

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter Name** | **Description** | **Range** | **Units** | **Res** | **Init Value** |
| NCAP Tx Timer | Delay upon trans into Run after which request signals are transmitted | 0-30 | sec | 1 | 10 |

#### Reconfigurable Telltale

##### F-REQ-312935/A-Status

Yes

##### Reference

Refer to section 1.2.3 for required RTTs.

#### Prove Out

Not applicable

#### Message Center Msg

##### F-REQ-312953/A-Warning Message

Warning Message W1950

##### Reference

As defined in the HMI / Text Message List section of this SPSS.

## Error Handling

### Missing Message Strategy

#### Reference

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

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

#### SR-REQ-312936/A-DTC Logging Condition Based on Configuration

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

#### SR-REQ-312937/A-Missing Signal

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

#### DTC-REQ-312938/A-Supported Diagnostic Trouble Codes (DTCs)

|  |  |
| --- | --- |
| **DTC** | **Description** |
| C23A00 | Lost Communication with IPMA (Image Processing Module “A”) |

#### DCR-REQ-312939/A-DID DExx

| **Block**  **Num** | **Block Description** | **Byte(s)** | **Bits** | **State: Description** | **"0"** | **"1"** | **Default** | **Comments/**  **Information** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PACKETED BLOCKS | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| $02 | Option Content (B&A) | \* | 1 | Traffic Sign Recognition | Disabled | Enabled | 0x0 | This option is enabled on FoE variants only.  This parameter allows the TSR settings menu to be displayed in the cluster, as well as warnings and information. The settings menu can be over-ridden by the Settings Menu config. |
| $03 | Option Content (B&A) | \* | 1 | TSR Overspeed Chime | Disabled | Enabled | 0x0 | Disabled by default, not available in TSR menu. |
| $09 | Option Content (B&A) | \* | 1 | TSR NCAP Adaptations | Disabled | Enabled | 0x0 | Enable for all NCAP markets, else Disable. |
| $09 | Option Content (B&A) | \* | \* | 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. |
| $08 | Option Content (B&A) | \* | 1 | SLIF | Disabled | Enabled | 0x0 | This parameter allows the Speed Limit Information Function (SLIF) settings menu to be displayed in the cluster, as well as warnings and information. The settings menu can be over-ridden by the Settings Menu config. |
| \*Byte and bit location to be identified in Part II Specification for this cluster | | | | | | | | |

Note: Please consult with your D&R engineer to determine when the TSR NCAP Adaptations parameter needs to be Enabled.

## Reference Specification

None

## Revision History

**SPSS Module Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Revision Level** | **Name** | **Change Description** | **Date** |
| 1.0 | V. Patel | Initial draft. Based on ES received from FoE. | 11/23/2010 |
| 1.1 | V. Patel | 1. Corrected mistakes found by Marc Rober:  * Section 1.2.2 – Added tables for two input signals. * Previously 2 OSW Settings and 1 OSW Threshold setting was defined. Changed it to 1 OSW setting and 2 settings for thresholds. Updated all sections that required this change. * Fixed typos in a few places. | 11/24/2010 |
| 1.2 | V. Patel | Renamed all input signals coming from the IPMA module to match Netcom approved signal names. | 12/13/2010 |
| 1.3 | S. Rosenberg | All changes marked in yellow   * Update of Functional Description (chapter 1.1) * Input and Output signals (names, units, descriptions, etc) checked and updated * Description of Visual HMI (chapter 1.3.3.1) added * Example Graphic of Cluster Menu (chapter 1.3.3.2) updated * Description of Audio HMI (chapter 1.3.3.3) changed * Tables 1.29 to 1.35 and respective notes updated * Parameter names and initial values in Table 1.36 corrected | 08/03/2011 |
| 1.4 | S. Rosenberg | Changes are marked in pink   * Parameter added for flashing frequency (OSW) * Lowest intensity at "Highlighted" mode (OSW) * Lowest intensity at "Reliable" mode (OSW) | 08/15/2011 |
| 2.0 | S. Rosenberg | Changed to one document for all three cluster variants. Main changes are marked in cyan:   * On Demand Screen configurable * Warning Messages (configurable) added * Driving Style dependent overtaking signs added * Display values for Over Speed Warning offsets added * Menu structure updated * Over Speed Warning Chime deleted due to introduction postponed to future programs | 04/11/2012 |
| 2.1 | S. Rosenberg | Changes after Denso rework/clarification. Changes are marked in purple:   * “Valid” signal values defined (section 1.3.5.3) * Clarification added in Table 1.33 concerning priority * Clarification for signals declared as missing (1.4.1) | 06/08/2012 |
| 2.2 | S. Rosenberg/ V. Patel | Cleaned up the spec in various areas. Added figure 5 in section 1.3.5.3.1 to define/clarify preconditions required to display information related to Speed Limit 2. | 08/21/2012 |
| 2.3 | S. Rosenberg/ V. Patel/  T. Budzier | Section 1.3.5.3.1:   * Table 1.35 – Redeveloped entire table. Originally assumed warnings are no longer valid. Replaced it with new warning message ID W1950 – Traffic Sign Reduced Performance See Manual. * Added TSR\_Fault\_MD\_Warn\_Status\_Flag to figure 1 and in section 1.2.3 * Figure 5: Moved the “TSR\_ENABLE\_MC” decision diamond down just before the action blocks. TSR RTTs are actively displayed only if TSR has been enabled thru the settings menu. This matches with the text below table 1.33 * Table 1.36: Added a Column for “TSR\_OSW\_SETUP\_MC”. TSR Overspeed setting needs to be enabled for the RTTs to be flashed for overspeed conditions.   Section 1.3.5.2: Added 0xFB as a state to check for TsrVLim2MsgTxt\_D\_Rq signal (value marked in Red).   * Removed TSR\_OvrSpeed\_Warn\_MC\_Status\_Flag from the document. There is no text warning for TSR Overspeed condition. Deleted last column from table 1.36 * All typos and updates highlighted in RED. | 12/19/2012 |
| 2.4 | V. Patel | Section 1.3.3.2:   * Added example graphic and clarification of how the overspeed threshold is mapped to the menu structure. Added text is in blue. * Added option to turn over speed indication Off/On in the menu structure example graphic. Added text is in blue.   Section 1.3.5.2:   * Added requirement about TSR RTTs being displayed only when TSR IOD (info on-demand) screen is not actively displayed. Requirement highlighted in blue. * Added requirement that if TSR and ASLD RTTs are flashing at the same time, they shall be synchronized (direction from Thorsten Steckstor). Requirement highlighted in blue.   Section 1.3.5.1:   * Table 1.35: Added the text “Settings” in the 3rd column to clarify that warning is displayed only when conditions are met while in the TSR Settings menu. * Table 1.36: Received confirmation from feature owner (**S. Rosenberg**) that if the TSR information is actively displayed on the IOD screen, the TSR RTTs are not displayed. In this case, the TSR overspeed information on the IOD screen needs to flash. * Added TSR\_Speed\_Limit\_X\_IOD\_MC to the outputs of the table to capture the above mentioned requirement. Also added a note below table 1.36 * Overspeed warning: Defined the flashing parameters (icon opacity when flashing) for the two conditions when TSR over speed icons need to be flashed. (Updated requirement in Blue.) | 1/10/2013 |
| 2.5 | V. Patel | Section 1.3.3.2:   * Updated menu structure to match latest CD4.2 HMI revision.   Section 1.3.5.1:   * Tables 1.25, 1.26, 1.27 and 1.28 – Modified tables to remove “Inactive” state for TSR\_OSW\_THRESHOLD\_1\_MC and TSR\_OSW\_THRESHOLD\_1\_MC as per direction from Brian Wolski and Stephanie Rosenberg. Inactive should not be displayed as a speed offset selection. * Modified column 2 in table 1.26 and 1.28 to clarify that offset values   are scrolling numbers and not radio buttons.   * Table 1.36 – Provided clarification in notes below that TSR\_OSW\_SETUP\_MC is not required to be “ON” for displaying IOD information and TSR icons flashing in the IOD screen.   Section 1.3.5.2:   * Added requirement (in bold red) to clarify use case. Use case described below section 1.4.1   Section 1.3.5.4:   * Added 0x00 as a state to check for TsrOvtkMsgTxt\_D\_Rq | 3/7/2013 |
| 2.6 | V. Patel | Several updates have been made to have TSR interact with ISA feature. TSR menu is grayed out for certain ISA states, which is the major update as per direction from ISA feature owner Andreas Ediger.  Also added setup menu item for TSR chime setup as per direction from TSR feature owner Stephanie Rosenberg.   * Section 1.2.1,   + Figure 1: Added ASLD\_RTT\_MC\_Status\_Flag as an input.   + Figure 1: Added two more outputs, TSR\_OSW\_CHIME\_SETUP\_MC and TSR\_OSW\_CHIME\_Status\_Flag * Section 1.2.3: Added two outputs - TSR\_OSW\_CHIME\_SETUP\_MC and TSR\_OSW\_CHIME\_Status\_Flag * Section 1.3.3.2: Added a row for Overspeed chime in the example menu structure. (highlighted in **Red**). * Section1.3.5.4: Added two outputs - SR\_OSW\_CHIME\_SETUP\_MC and TSR\_OSW\_CHIME\_Status\_Flag * Section 1.3.5.1, figure 3: Modified flowchart to show that TSR sub-menu is grayed out if ISA is Active or in Standby mode. Added TSR\_OSW\_CHIME\_SETUP\_MC to be grayed out. * Section 1.3.5.1,   + Created tabled 1.29 and 1.30 for the TSR\_OSW\_CHIME\_SETUP\_MC personalization states.   + table 1.38: Added row (highlighted in green) to include ASLD\_RTT\_MC\_Status\_Flag on the input side. This is to disable the TSR overspeed indication under ISA\_Standby and ISA\_Active conditions. (No flashing RTTs).   + Added output column for TSR\_OSW\_CHIME\_Status\_Flag   + Tables 1.25, 1.26, 1.27, 1.28 – Updated tables to capture values for English and Metric units. * Added requirement regarding TSR RTTs and/or IOD screen being active for ISA below table 1.28. Added notes for the same below tables 1.31, 1.32, 1.33, 1.34 and 1.35 * Section 1.3.5.2: Added requirement (in green text) that the TSR RTTs or the IOD is forced ON if ISA is Active or Standby regardless of the status of the TSR setup items. * Section 1.3.5.2: Added requirements to provide clarification regarding overspeed threshold selection and units changes. (last bullet point) | 8/23/2013 |
| 2.7 |  | * Added TSR\_Overspeed\_Chime\_Cfg in figure 1, and in section 1.3.5.4   Section 1.3.3.3.: Mentioned table 1.39 as applicable for audio.  Section 1.3.5.1:   * Table 1.24: Added left most column to include TSR\_SETUP\_MC as an input. TSR\_OSW\_SETUP\_MC can only be changed if TSR\_SETUP\_MC is enabled. (Per direction from global HMI team) * Tables 1.26, 1.28, 1.30: Added left most column including TSR\_OSW\_SETUP\_MC as an input. Over speed Thresholds and chime are available for selection only if the Warning setup item is enabled. * Table 1.26, 1.28: Modified text in cells of 4th column that threshold values are selected and request is sent as per HMI direction. * Description above table 1.38 (Overspeed RTT Flashing): Removed the dimming intensity for overspeed RTT while flashing. This will now be captured in the HMI graphics. STSS does not specify the brightness of the flashing RTTs. * Table 1.39: Created new table to separate the overspeed chime flag from the flashing RTT. This is because the chime can be disabled thru a DEXX config bit and also thru the TSR menu if enabled. * Modified notes under tables 1.31, 1.32, 1.33 to clarify that RTT positions are determined by program specific graphics library. * Added use case below section 1.4 for flashing speed limit RTT condition. * Tables 1.31 – 1.35: Removed “(if IOD is disabled)” from the first highlighted sentence to clarify the display of TSR RTTs if ASLD is active. | 10/10/2013 |
| 2.8 | V. Patel | The purpose of this update is to resolve the issue caused due to lack of sync between the TSR overspeed indication with the digital speedometer display. The TSR overspeed warning is now processed in the cluster as a resolution to the issue.   * Removed TsrOswWarnMsgTxt\_D\_Rq signal from figure 1, section 1.2.2 and memory storage table in section 1.3.5.4 since cluster does not need to receive it anymore. * Section 1.3.5.1: Added (figure 6) to determine if TSR overspeed warning indication is true or false. * Table 1.36: Replaced TsrOswWarnMsgTxt\_D\_Rq with TSR\_OSW\_Condition internal variable that is checked to activate the TSR OSW indication. Removed the column that checked for “TsrVLim1MsgTxt\_D\_Rq” input signal since it is now processed in figure 6. * Table 1.36: Changed TSR overspeed flashing information from Yes to **No** in rows 3 and 5 based on direction from feature owner (Stephanie Rosenberg). The overspeed info should not flash when the TsrVl1RstrcMsgTxt\_D\_Rq or TsrVl2RstrcMsgTxt\_D\_Rq signal state is NoRecognizableRestriction (0x2) | 2/7/2014 |
| 3.0 | V. Patel | Major updates for this version. Most significant changes are the introduction of additional supplementary grahpics. 3 new CAN signals introduced and 2 existing signals were modified to accommodate all the changes.  Section 1.2.1, figure 1: Added the new CAN signals (in red). Added 1 new output (TSR\_IOD\_SETUP\_MC) and modified one more (TSR\_RTT\_SETUP\_MC)  Changed table and figure numbers as required throughout the document due to introduction of new tables and figures/flowcharts.   * Section 1.2.2: Added the new CAN signals (in red) * Section 1.2.3: Changed the name of TSR\_SETUP\_MC to TSR\_RTT\_SETUP\_MC and added a new output for TSR\_IOD\_SETUP\_MC * Section 1.3.5.1:   + Figure 4 - Updated flowchart to reflect change in outputs (in red).   + Table 1.23: Added table for TSR\_IOD\_SETUP\_MC   + Table 1.24: Changed the name of the output MC variable to TSR\_RTT\_SETUP\_MC   + Table 1.28, 1.30: Fixed value of “Other” and “Missing condition” to be displayed as 0 instead of “Error”. (in red)   + Figure 6: Introduce new flowchart to explain how TSR interacts with ASLD different conditions under which the TSR information is displayed via RTT or IOD screens.   + Table 1.35, 1.37, 1.39: Added a column for new CAN signal (in red) required to display No Passing IOD information. Also updated example graphics column.   + Table 1.40, 1.41: Added a column for new CAN signal and modified another column (both in red) required to display Speed Limit 1 RTT information. Also updated example graphics column.   + Figure 7: Modified flowchart to remove checking for Speed Limit 1 condition to display Speed Limit 2. That is already done by the IPMA module and therefore not required by the cluster. (Also added requirement in section 1.3.5.2 to capture this).   + Table 1.42, 1.43: Added a column for new CAN signal and modified another column (both in red) required to display Speed Limit 1 RTT information. Also updated example graphics column.   + Obsolete table 1.36: Removed what used to be table 1.36 in previous version of STSS. (TSR\_System\_Info\_MC). Information in that is no longer required to be displayed by the cluster. Removed TSR\_System\_Info\_MC variable from all relevant sections in the document. * Section 1.3.5.2: Added requirement to explain the reason behind modification made to figure 7. * Section 1.3.5.4: Added TSR\_IOD\_SETUP\_MC output and changed the TSR\_SETUP\_MC to TSR\_RTT\_SETUP\_MC. Added new CAN input signals. | 3/13/2014 |
| 3.1 | V. Patel | * Main purpose of the update is to remove the TSR\_IOD\_SETUP\_MC as a Setup item that can be changed by the user. It is not a Setup item as previously specified in this STSS, it is in the menu as a trigger to activate the On Demand screens. **This now matches the HMI menu structure**.   + Deleted what used to be table 1.23   + Figure 6: Removed the check of “TSR\_IOD\_SETUP\_MC” since it is not a user controlled setting option. * Reinstated the TsrOswWarnMsgTxt\_D\_Rq signal wherever applicable to process TSR Overspeed indication on clusters where Digital speedo is disabled. (mainly for CD4.1 clusters) * Following are updates based on supplier Q&A, there is no change to feature functionality as a result of these updates.   + Figure 3: Updated figure to separate TSR\_Overspeed\_Chime\_Cfg and TSR\_OSW\_CHIME\_SETUP\_MC from rest of the items in the same figure.   + In several places, the new/updated signal names were not reflected in the Notes section, so fixed the signal names.   + In a few places, the TSR\_SETUP\_MC was not updated to TSR\_RTT\_SETUP\_MC in the Notes section, so fixed that.   + Figure 6: Updated flowchart so the TSR RTTs are displayed if TSR\_IOD\_Cfg is Diabled.   + Fixed typo in signal names in tables 1.36 and 1.38   + Figure 8: Added a decision box to make sure speed limit 2 is valid when considering it for overspeed condition. (in red)   + Table 1.43: Added a column for the TsrVlXPrmntMstTxt\_D\_Rq since it now controls how the TSR RTTs are displayed.   + Updated section 1.3.5.4 with Init values of new signals added in v3.0 of this STSS.   + Fixed signal names in Used Case examples. | 6/17/2014 |
| 3.2 | V. Patel | The purpose of this update is to have a common strategy for TSR Overspeed Indication. Currently, products with digital speedo and analog speedo have different implementations. The common strategy is to follow the implementation that is in place for products with digital speedo. All decisions regarding the TSR overspeed indication is now done within the cluster logic.  Section 1.2.1, figure 1:   * Added an internal input to determine speed indication (numerical or analog). Deleted the TsrOswWarnMsgTxt\_D\_Rq signal input.   Section 1.3.5.1, Figure 8:   * Updated flow chart to delete Digital\_Speedo\_Cfg as it is not required anymore. * Deleted the use of TsrOswWarnMsgTxt\_D\_Rq signal as it is not required anymore. * Added requirements to calculate and compare cluster speed information with TSR speed input to determine TSR overspeed condition.   Section 1.3.5.4: Deleted the TsrOswWarnMsgTxt\_D\_Rq signal input. | 12/09/2014 |
| 3.3 | V. Patel,  S. Rosenberg | In order to optimize the feature, a few CAN input signals have been removed since the cluster does not need to process them anymore. This update takes care of this simplification. Also, reference to the HMI graphics have been made more generic to allow product specific changes.   * Section 1.2.1, figure 1, table 1.2.2: Removed following CAN input signals:   TsrVI1TypeMsgTxt\_D\_Rq, TsrVI2TypeMsgTxt\_D\_Rq, TsrOvtkTypeMsgTxt\_D\_Rq  Section 1.3.5.1:   * Table 1.29, 1.30, 1.31, 1.32, 1.33, 1.34 : Removed the column that was previously used to process the TsrOvtkTypeMsgTxt\_D\_Rq signal. * Table 1.35, 1.36, 1.37: Made the note below table more generic when it comes to placement of RTT icons. * Use Case examples below section 1.4: Added one more use case example. | 4/10/2015 |
| 3.4 | V. Patel | The main reason for this update is to incorporate the impact of iACC on Traffic sign recognition. Similar to ISA (Intelligent Speed Assist), the TSR overspeed condition is suppressed if IACC is active. The TSR speed indications also are automatically enabled if IACC is activated. This update also fixes an issue where the TSR overspeed chime was being activated w/o the indication being displayed.  **Feature owners: Rosenberg, Stephanie; Ediger, Andreas; Oepen, Kerstin**   * Section 1.2.1, figure 1: Added IACC\_Func\_Disp\_Thin output from the CADS interface spec as an input to the TSR function. * Section 1.3.5.1, figure 6: Updated flowchart to process the IACC\_Func\_Disp\_Thin condition along with ISA and ASLD to determine if the On Demand and RTT indicators should be displayed. * Section 1.3.5.1, figure 8: Updated flowchart to suppress TSR overspeed process if IACC is active. * Section 1.3.5.1, figure 9: Introduced a new flowchart to determine when the TSR overspeed display is activated (this is to prevent the chime issue since the chime is triggered off the overspeed indication). * Section 1.3.5.1, table 1.40: Updated table to include output from the flowchart above. (Column 3 of the table) * Section 1.3.5.4: Updated memory parameters table to include the IACC\_Func\_Disp\_Thin output from the CADS spec as an input to this STSS. | 12/03/2015 |
| 3.5 | V. Patel | In certain regions, the user is not given an option to disable the TSR notification (RTT) item in the TSR menu. Hence, a new EOL configuration parameter needs to be added for this purpose. If Enabled, the TSR Notification (RTT) item will be displayed in the menu and the user can change the setting. If disabled, the TSR notification is enabled, however, the item is not displayed in the menu so the user cannot disable it.  DI CC approval: 6/16/2016  The graphics for the no passing sign are different in China and some other regions. Hence a table has been provided to map the graphics to different regions.  DI CC approval: 6/23/2016  Un-highlighted all previous updates.  Section 1.2.2, fig 1 and section 1.2.2 – Added the new TSR\_Activation\_Menu\_Cfg parameter as an internal input to the cluster.  Section 1.3.5.1, figure 3, figure 4: Updated flowchart to process TSR\_Activation\_Menu\_Cfg so that if disabled, TSR RTT is enabled by default but is not displayed on the menu.  Section 1.3.5.1, table 1.21: Added a note below table that TSR\_Activation\_Menu\_Cfg also needs to be Enabled to display the menu item.  Table 1.30: Added a new table to map TSR graphics based on markets.  A couple of minor conflicting states have been fixed in tables 1.37 and 1.39 as well. The first row used to have inputs processed to display a “blank” RTT. That row has been deleted from both tables, since it was conflicting with a row further down that displayed “Canceled” RTT, which is the correct one. | 7/15/2016 |
| 4.0 | V. Patel | More changes were approved for NCAP markets, which are incorporated in this version of the STSS. All changes are in red.  Additional NCAP Changes include: Addition of over speed warning. However, there is only one speed threshold. Speed thresholds can be selected between 0-10 kph or 0-5 mph.  DI CC approval: 10/13/2016  Feature owner: Felix Sepcke   * Section 1.2.1, 1.2.2: Changed name of DExx parameter “TSR Activation Menu” to “TSR NCAP Adaptations). Config flag has been renamed to “TSR\_NCAP\_Adaptations\_Cfg”. * Section 1.3.3.2: Created an example menu structure for NCAP markets based on above config. * Section 1.3.5.1   + Figure 3: Added processing of TSR input requests based on TSR\_NCAP\_Adaptations\_Cfg. Over speed warning and Only 1 over speed threshold are supported for NCAP settings.   + Figure 4: Added processing of TSR output SET request based on TSR\_NCAP\_Adaptations\_Cfg. Ensure IPC is always requesting TSR RTTs to be enabled for NCAP markets. (User does not have option to disable it). Added a condition where TSR menu is grayed out (for non NCAP markets as well) if IACC is active.   + Table 1.21: Modified the note under table to rename the NCAP config flag.   + Added a note above table 1.24. Tables 1.24, 1.25, 1.26 and 1.27 are to be implemented for non NCAP markets only.   + Tables 1.28, 1.29: Created these two tables to show HMI and logic interface of the over speed warning threshold for NCAP markets.   + Figure 8: Added a note above the flowchart title about it being implemented for non NCAP markets only.   + Figure 8: Added clarification in the flowchart that the threshold value selected by the user in the cluster menu is to be used for the calculation, not the value of the TSR\_OSW\_THRESHOLD\_X\_MC variable since there is an offset between the two.   + Figure 9: Developed a new flowchart to process the overspeed warning condition for NCAP markets based on one threshold only. * Section 1.3.5.4 and 1.5.3 (DID DExx table): Renamed the NCAP config flag in memory allocation table. | 10/25/2016 |
| 4.1 | V. Patel | To simplify logic in the HUD and to prevent TSR NCAP misconfigurations between the IPC and HUD, it was decided that even though only one speed threshold is available to the user in NCAP markets, the cluster internally will transmit the threshold 1 value over threshold 2 variable as well. This value will be picked up by the HUD.  Section 1.3.5.1, table 1.28, 1.29: Added requirements/comments below table 1.29 explaining the above. | 11/14/2016 |
| 4.2 | Ilopezla | This Update was made to correct a wrong table reference and indicate which Chime\_Status\_Flag is associated with this warning on 1.3.3.3 Audio Section.  Section 1.3.3.3- TSR\_OSW\_CHIME\_Status\_Flag  Change Table Reference from Table 1.46 to Table 1.45 | 11/30/2016 |
| 5.0 | S. Watkins | Starting in MY2019 with U625/U611 the Settings are migrating from the cluster to Centerstack. This STSS update is to support this effort. A configuration is added to ensure backward compatiblity. (Note the graying out of the menu when settings are in the center stack is handled by the APIM)  Changes shown in yellow:   1. Section 1.1 – Updated description to mention Center Stack 2. Section 1.2.1, Figure 1 – Added DE09 Settings Menu 3. Section 1.2.2 – Added Settings\_Menu\_Cfg 4. Section 1.3.1 – Added “Enabled” to Crank mode (defect fix unrelated to other changes) 5. Section 1.3.5.1, Figure 2 – Added DE09 Settings Menu 6. Section 1.3.5.1, Figure 4 – Added decision box for Settings\_Menu\_Cfg 7. Section 1.3.5.4 – Added Settings\_Menu\_Cfg 8. Section 1.5.3 – Added Settings Menu to DE09 | 2/26/2017 |
| 5.1 | V. Patel | This update fixes a couple of bugs. Updates are in blue   1. When TSR\_NCAP\_Adaptations\_Cfg is enabled, the RTT option in the menu is automatically enabled and remains enabled. This request is transmitted by the cluster, however, it only needs to be transmitted once per key cycle since it’s an one-time event. It doesn’t need to be transmitted every 100 msec, which is how it was captured in the requirements. This was taking up too much bandwidth on the CAN bus.  * Section 1.3.5.1: figure 4: Introduced a path in the flowchart 4a) which now transmits the CAN signal once after 10 seconds from when the ignition transitions to Normal/Crank. * Section 1.3.5.4: Set Init value for TSR\_NCAP\_Tx\_Flag variable used in flowchart in figure 4a. * Added 10 second NCAP Tx Timer parameter definition table.  1. There is an issue where one of the ISA (Intelligent speed assist) states under which SLIF is automatically enabled, but the menu is grayed out was missing from the requirements.  * Section 1.3.5.1,   Figure 4, Figure 6, Figure 8, figure 9: added ISA\_Standby\_Override (0x5) state to the decision diamond in the flowchart.   * Section 1.3.5.2: Added ISA\_Standby\_Override (0x5) to the 7th bullet point statement | 5/5/2017 |
| 6.0 | F. Sepcke/  V. Patel | This is a major update to the TSR display function.  With the increasing similarities between SLIF and TSR/SLOIF over the last one year, a decision was made to merge the two specifications into one for simplification purposes. To maintain backward compatibility, the configurations have been kept the same as before.  Also, with the removal of dedicated IOD screens, the SLOIF/SLIF information are displayed as generic (RTTs) and detailed (previously IOD) indications.  The core functionality of the feature, however, has not changed at all.  All updates are shown in blue.  **DI CC approval: 11/2/2017**  **Feature owner: Felix Sepcke**  **Section 1.1**: Added description regarding the different “modes” of TSR, also providing information differentiating TSR/SLOIF, SLIF and NCAP modes.  **Section 1.2.1, 1.2.2, 1.2.3**: Updated context diagram with modified variable names. Also added SLIF\_Cfg as an input.  TSR\_IOD\_SETUP\_MC has now been deleted (not required).  TSR\_RTT\_SETUP\_MC is now TSR\_INFO\_SETUP\_MC  TSR\_No\_Passing\_IOD\_MC is now TSR\_No\_Passing\_Detail\_Ind\_MC  TSR\_No\_Passing\_RTT\_MC is now TSR\_No\_Passing\_Generic\_Ind\_MC  TSR\_Speed\_Limit\_1\_IOD\_MC is now TSR\_Speed\_Limit\_1\_Detail\_MC  TSR\_Speed\_Limit\_1\_RTT\_MC is now TSR\_Speed\_Limit\_1\_Generic\_MC  TSR\_Speed\_Limit\_2\_IOD\_MC is now TSR\_Speed\_Limit\_2\_Detail\_MC  TSR\_Speed\_Limit\_2\_RTT\_MC is now TSR\_Speed\_Limit\_2\_Generic\_MC  Remainding output variables are unchanged.  **Section 1.3.3.1**: Added detailed information for different menus and example menu structures displayed based on configurations.  **Section 1.3.5.1**  Table 1.20: Added a matrix explaining different TSR “modes” based on configuration parameters.  Figure 2: Added SLIF\_Cfg to the diag configuration flowchart.  Figure 3: Modified flowchart to add SLIF configuration and modified flow of input requests for simplifications purposes.  Figure 4: Modified flowchart to add SLIF configuration. Also replaced old variable names with new ones.  Figure 4a: Updated to reflect new variable name.  Table 1.21, 1.22: Updated with new variable names, also changed local variable encoding states to match the CAN signal encoding. Modified the note below table 1.22  Table 1.24: Added SLIF\_Cfg to the note below the matrix.  Table 1.25, 1.26, 1.27, 1.28: Updated with new variable names, also changed local variable encoding states to match CAN signal encoding.  Table 1.29, 1.30: Updated with new variable names, also changed local variable encoding states to match CAN signal encoding.  Figure 6: Added description above the flowchart. Also modified flowchart to remove the IOD screen that was referenced until now.  Table 1.33: Added speed limit graphic examples based on different markets.  Table 1.34 – 1.41: Updated matrix to add SLIF\_Cfg and replaced variable names. Also added notes below tables wherever required.  Table 1.42, 1.43: Updated matrix to add SLIF\_Cfg and replaced variable name. Also merged a few cells (shown in blue) in the table. Modified notes under the table as required.  Table 1.44: Added SLIF\_Cfg to the matrix.  Figure 8: Modified description above the flowchart for over speed conditions. Updated flowchart to remove Speed Limit 2 reference since IPMA will always transmit higher speed and over speed indication over speed limit 1.  Figure 9: Simplified flowchart by removing unnecessary paths.  Table 1.45: Redesigned the matrix to add SLIF\_Cfg and also changed inputs to only reference speed limit 1 CAN signals as inputs. Output have been modified as well. Modified notes below the matrix as well.  Deleted flowchart that used to be figure 10 in previous versions.  **Section 1.3.5.2**: Added a few statements to clarify requirements in section 1.3.5.1  **Section 1.3.5.4**: Replaced old variables with new ones. Also added SLIF\_Cfg.  **Section 1.4.1**: Added SLIF\_Cfg  **Section 1.5.3, DEXX table**: Added definition of the SLIF parameter.  Removed all the use cases that were listed below section 1.4.1 | 11/16/2017 |
| 6.1 | V. Patel | Currently, TSR overspeed indication is disabled when IACC is active. This update is to notify enable the TSR overspeed indication even when IACC is active. (changes in burgundy.)  DI CC approval: 12/14/2017  Feature Owner: Felix Sepcke  Section 1.2.1, figure 1: Added TsrOswWarnMsgTxt\_D\_Rq signal to the context diagram.  Section 1.2.2, table 1.16: Added CAN details for the added signal.  Section 1.3.5.1, table 1.46: Updated matrix, added an input column for processing the TsrOswWarnMsgTxt\_D\_Rq signal.  Section 1.3.5.4: Added init values for the TsrOswWarnMsgTxt\_D\_Rq signal in the memory parameters table. | 12/14/2017 |
| 6.2 | V. Patel | Few small fixes/updates in this version, there is no change to feature functionality.   * Added mph value for speed warning user selectable menu in section 1.3.3.2. * Removed a comment from the SLIF parameter in the DExx table in section 1.5.3. SLIF is no longer just an option on FOE variants, it is a global feature. * Seciton 1.3.5.1, figure 3: The “No” and “Yes” from the second decision diamond in the flowchart were switched. Fixed it so that if SLIF\_Cfg = Enabled or if TSR\_NCAP\_Adaptions\_Cfg = Enabled, then the new “No” path is taken. Else, it follows thru. Fix is highlighted in yellow. * Figure 4: Modified the flowchart to make it SLOIF (full TSR) specific. SLIF and SLOIF NCAP are processed in flowchart in figure 4a. Also added a note that if IACC or ASLD becomes active while the user is trying to change a setting, then the cluster shall revert to the menu one level up. * Figure 4a: Modified the flowchart to make it SLIF and SLOIF NCAP specific. Also added a note that if IACC or ASLD becomes active while the user is trying to change a setting, then the cluster shall revert to the menu one level up. * Figure 8, 9: Deleted two decision diamonds that checked for validity of TsrVIUnitTxtMsg\_D\_Rq since the default is now set to kmh (0x1). * Table 1.46: Changed the state of TsrOswWarnTxtMsg\_D\_Rq in first row from “Don’t Care (X)” to “Not True”. This is because the “Don’t Care” was not mutually exclusive from the other rows. * Section 1.3.5.4: Changed the default value of “TsrVIUnitTxtMsg\_D\_Rq” from mph (0x2) to kmh (0x1). | 5/15/2018 |
| 6.3 | S. Kundu | Initial VSEM RM Release | 6/1/2018 |
| 6.4 | V. Patel | This update provides clarification regarding the TSR overspeed indication user setup as a pre-condition to display the overspeed indication.   * F-REQ-312927: Added a column for “TSR\_OSW\_SETUP\_MC” as a required input to process the overspeed indication. * “OR”ed “IACC\_Func\_Disp” with “IACC\_Func\_Disp\_Thin” variable, wherever used in this document, since both can be used invariably. | 1/17/2019 |