# Warnings – Retractable Tow Bar – CGEA1.3

## Functional Description

The Retractable Tow Bar Warnings provide indication to the driver through the message center that the retractable tow bar is not locked or has detected significant errors.

The Retractable Tow Bar Warnings correlate the TowBarMsgTxt\_D\_Rq signal from the TRM module and the Operational\_Mode to display the appropriate message center warnings.

The warnings include:

1. Informing the customer that the retractable tow bar has detected a significant error which cannot be fixed by the customer.
2. Informing the customer that the retractable tow bar needs a certain supply voltage for a successful swivel cycle. At low temperatures or with an old battery, this condition can be present.
3. The tow bar should be swiveled into store position if not in use for insurance reasons.

This specification is currently applicable on the CDxxx E program only.

## Interfaces

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

**Figure 1 Warning – Retractable Tow Bar Warning Messages Context Diagram**

### 

### Inputs

* + - * INTERNAL:
    - Operational\_Mode
* MUX message from the CAN bus

1. TrlrBrkDcnnt\_B\_Actl Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min.** | **Max.** |
| TowBarMsgTxt\_D\_Rq | 3 |  | SED | 1 | 0 |  | 0 (0x0) | 7(0x7) |
|  | Null |  |  |  | 0x0 |  |  |
|  | Check\_Tow\_Bar |  |  |  | 0x1 |  |  |
|  | Start\_Engine\_Swivel |  |  |  | 0x2 |  |  |
|  | Error\_Dealer\_Fix |  |  |  | 0x3 |  |  |
|  | TowBar\_Ext\_No\_Trlr |  |  |  | 0x4 |  |  |
|  | NotUsed1 |  |  |  | 0x5 |  |  |
|  | NotUsed2 |  |  |  | 0x6 |  |  |
|  | NotUsed3 |  |  |  | 0x7 |  |  |

### Outputs

* Tow\_Bar\_Unlocked\_MC\_Status\_Flag
* Tow\_Bar\_Fault\_MC\_Status\_Flag
* Tow\_Bar\_Not\_Activated\_MC\_Status\_Flag
* Tow\_Bar\_Extended\_MC\_Status\_Flag
* Message\_Center\_Informational\_Chime\_Status\_Flag

## Function/Performance

### Operational Modes

|  |  |
| --- | --- |
| **Mode** | **Differentiating Vehicle Conditions** |
| Sleep Mode | Retractable Tow Bar Warnings Inactive |
| Limited Mode | Retractable Tow Bar Warnings Inactive |
| Normal Mode | Retractable Tow Bar Warnings Active/Inactive |
| Crank Mode | Retractable Tow Bar Warnings Active/Inactive |

The above table references the setting of the Warning flags as per this section. However, the actual warning display operational modes are defined in the Message Center section of this SPSS.

### Voltage Levels

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

### Human-Machine Interface

#### Visual

###### 1.3.3.1.1 Indicator Graphics / Display Format

Message Center Text Warning Message as defined in section 1.3.5.7 of this document.

###### 1.3.3.1.2 Indicator Color Coordinates

Reference section COLOR & ILLUMINATION REQUIREMENTS (GRAPHICS).

#### Audio

Message Center Informational Warning Chime is associated with some of the warnings in this STSS .

#### Switch Control Logic

None.

### System Accuracy

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

### Operation: Performance and Functional

#### Subsystem Algorithm Flowchart / State Diagram

1. State Matrix for Retractable Tow Bar Warning MC Status Flags

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Operational\_Mode** | | TowBarMsgTxt\_D\_Rq  Signal | **Tow\_Bar\_Unlocked\_MC\_**  **Status\_Flag** | | **Tow\_Bar\_Fault\_MC\_**  **Status\_Flag** | | **Tow\_Bar\_Not\_Activated\_**  **MC\_Status\_Flag** | | **Tow\_Bar\_Extended\_MC\_**  **Status\_Flag** | |
| Normal or Crank | | Check\_Tow\_Bar  (0x1) | **ACTIVE** | | Inactive | | Inactive | | Inactive | |
| Error\_Dealer\_Fix  (0x3) | Inactive | | **ACTIVE** | | Inactive | | Inactive | |
| Start\_Engine\_Swivel  (0x2) | Inactive | | Inactive | | **ACTIVE** | | Inactive | |
| TowBar\_Ext\_No\_Trlr  (0x4) | Inactive | | Inactive | | Inactive | | **ACTIVE** | |
| Normal | | Missing as per 1.4.1 | Inactive | | Inactive | | Inactive | | Inactive | |
| All Other Cases | | | Inactive | | Inactive | | Inactive | | Inactive | |

Table 1.2 Retractable Tow Bar MC Status Flags to MC Warning Chime

|  |  |  |  |
| --- | --- | --- | --- |
| **MC\_Status\_Flag** | | **Active Chime\_Status\_Flag** | |
| Tow\_Bar\_Unlocked\_MC\_Status\_Flag | | Message\_Center\_Informational\_  Chime\_Status\_Flag | |
| Tow\_Bar\_Fault\_MC\_Status\_Flag | | Message\_Center\_Informational\_  Chime\_Status\_Flag | |
| Tow\_Bar\_Not\_Activated\_MC\_Status\_Flag | | Message\_Center\_Informational\_  Chime\_Status\_Flag | |
| Tow\_Bar\_Extended\_MC\_Status\_Flag | | Message\_Center\_Informational\_  Chime\_Status\_Flag | |

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

Table 1.3 Retractable Tow Bar MC Status Flags to MC Warning Message ID

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tow\_Bar\_Unlocked \_MC\_Status\_Flag | Tow\_Bar\_Fault  \_MC\_Status\_Flag | Tow\_Bar\_Not\_Activated  \_MC\_Status\_Flag | Tow\_Bar\_Extended  \_MC\_Status\_Flag | MC Warning ID |
| **Active** | Inactive | Inactive | Inactive | W2030 |
| Inactive | **Active** | Inactive | Inactive | W2031 |
| Inactive | Inactive | **Active** | Inactive | W2032 |
| Inactive | Inactive | Inactive | **Active** | W2033 |

* For definition of how the Message Center arbitrates and displays Active warnings, see the Warning / Alert Display Logic Diagram, located in the Message Center – X Display with W Button Interface section of this SPSS (where X and W are appropriate values in this document).
* This system's "OK" status is NOT reported in the Message Center SYSTEM CHECK.
* For description of MC INFORMATIONAL WARNING CHIME see the Chime Arbitrator Section of this SPSS.

#### Function Safety Classification (EMC)

Class B

#### Memory Storage

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter Name** | **Description** | **Value at**  **Battery Connect** | **Value at**  **Module Wake-up** |
| TowBarMsgTxt\_D\_Rq Signal | CAN Signal sent from the TBC | Null (0x0) | Null (0x0) |
| Tow\_Bar\_Unlocked\_MC\_Status\_Flag | State variable used by M/C Warning Arbitrator | INACTIVE | INACTIVE |
| Tow\_Bar\_Fault\_MC\_Status\_Flag | State variable used by M/C Warning Arbitrator | INACTIVE | INACTIVE |
| Tow\_Bar\_Not\_Activated\_MC\_Status\_Flag | State variable used by M/C Warning Arbitrator | INACTIVE | INACTIVE |
| Tow\_Bar\_Extended\_MC\_Status\_Flag | State variable used by M/C Warning Arbitrator | INACTIVE | INACTIVE |
| Message\_Center\_Informational\_  Chime\_Status\_Flag | Used to control the state of the chime to the Chime Arbitrator | INACTIVE | INACTIVE |
| Operational\_Mode | 4 state indicator for cluster operational mode | Limited | Limited or Normal or Crank |

#### Prove Out

No.

#### Reconfigurable Telltale

###### No.

#### Message Center Msg

Warning Message ID W2030, W2031, W2032 and W2033 as defined in the Text Message List section of this SPSS.

## Error Handling

### Missing Message Strategy

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

No DTC shall be logged for a missing signal for this feature.

## Diagnostics

### Self Test

None

### Engineering Test Mode

Not Applicable

### Part II Performance

**Supported Diagnostic Trouble Codes (DTCs)**

None

## Reference Specification

IS-0001 WARNINGS/INDICATORS/DISPLAYS PROVEOUT

IS-0052 OPERATING VOLTAGES - FUNCTIONAL/PERFORMANCE

IS-0069 FUNCTIONAL IMPORTANCE CLASS

IS-0324 WINDSHIELD & OTHER REFLECTIONS

IS-0327 WARNING INDICATOR EVALUATION

IS-0379 NORTH AMERICAN WARNINGS AND INDICATORS STRATEGY

IL-0019 GENERAL ILLUMINATION DIMMING

IL-0021 CRAFTSMANSHIP – DISPLAYS

IL-0022 GENERAL ILLUMINTATION COLOR

IL-0023 CLARITY/LEGIBILITY/READABILITY/VISUAL CONTRAST

IL -0043 OPERATIONAL ENVIRONMENT FUNCTIONALITY

IL -0045 COLOR

IL -0048 ILLUMINATION ACCEPTABILITY

03-0661  PLACEMENT: CONTROL AND DISPLAY LOCATIONS

03-0662  PLACEMENT: LOGICAL GROUPING FUNCTION AND USAGE

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

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

03-0670  INTERIOR VISIBILITY

03-0671  INTERIOR VISIBILITY: REFLECTIONS FROM COMPONENTS & SURFACES

03-0672  INTERIOR VISIBILITY: REFLECTIONS IN DISPLAYS

03-0673  INTERIOR VISIBILITY: VISUAL OBSCURATIONS

03-0674  INTERIOR VISIBILITY: ILLUMINATION CONTROLS / DISPLAYS

03-0675  INTERIOR VISIBILITY: VEILING GLARE

03-0677  INTERIOR VISIBILITY: SUNLIGHT WASHOUT

03-0681  IDENTIFICATION: CHARACTER AND SYMBOL SIZE

03-0682  IDENTIFICATION: LEGIBILITY

03-0685  IDENTIFICATION: SYMBOLS,  ABBREV FOR CONTROL

03-0721  LOGIC OF OPERATION: OPERATIONAL STEREOTYPES

03-0722  LOGIC OF OPERATION: INTERPRETATION

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

## Revision History

**SPSS Module Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Revision Level** | **Name** | **Change Description** | **Date** |
| 1.0 | V. Patel | Initial revision. Based on DI Change Control Pro-Forma presented by Patrick Fey (feature owner). | 10/22/2012 |
| 1.1 | Ilopezla | This Update is to inform which Chime Status Flag is associated with this warning(all changes are highlighted in light blue)  **Section 1.2.1** Figure 1- Added Message\_Center\_Informational\_Chime\_Status\_Flag  **Section 1.2.3** Added Message\_Center\_Informational\_Chime\_Status\_Flag  **Section 1.3.5** Updated Table 1.2  Changed column’s title from “MC INFORMATIONAL WARNING Chime” to “Active Chime\_Status\_Flag”, added Message\_Center\_Informational\_  Chime\_Status\_Flag  **Section 1.3.5.4** Added Message\_Center\_Informational\_Chime\_Status\_Flag To Memory Storage Table | 1/14/2015 |
|  |  |  |  |
|  |  |  |  |