# Warning - Exit Rock Crawl to Exit 4Low - CGEA1.3

## Functional Description

The purpose of the “Exit Rock Crawl Mode to Exit 4Low” warning is to inform the operator that the Rock Crawl mode must be disabled if 4Low is to be disabled. The vehicle will remain in 4Low for as long as Rock Crawl mode is active. TCCM shall be the control module for this warning, the cluster simply displays it.

**This function is ONLY approved for vehicles (e.g. MY 2020 P558 application and beyond), which use the current architecture that supports a non-CAN based 4x4 switch. This strategy is currently limited to P558 and must not be proliferated to other programs without going through DI Change Control Process.**

The “Exit Rock Crawl Mode to Exit 4Low” correlates the AwdStat\_D\_RqDsply signal and the Operational\_Mode to determine when to display the warning.

## Interfaces

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

**Figure 1: Warning – Exit Rock Crawl Mode to Exit 4Low Context Diagram**



### Inputs

#### INTERNAL:

* + - Operational\_Mode

#### MUX message on the CAN Bus

1. AwdStat\_D\_RqDsply Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min.** | **Max.** |
| AwdStat\_D\_RqDsply | 5 |  | SED | 1 | 0 |  | 0 (0x0) | 31 (0x1F) |
|  |  | Normal\_No\_\_Message |  |  |  | 0x0 |  |  |
|  |  | Into\_4Low\_Speed |  |  |  | 0x1 |  |  |
|  |  | Into\_4Low\_Brake |  |  |  | 0X2 |  |  |
|  |  | Into\_4Low\_Neutral |  |  |  | 0X3 |  |  |
|  |  | Into\_4Low\_Clutch |  |  |  | 0x4 |  |  |
|  |  | Out\_of\_4Low\_Speed |  |  |  | 0x5 |  |  |
|  |  | Out\_of\_4Low\_Brake |  |  |  | 0x6 |  |  |
|  |  | Out\_of\_4Low\_Neutral |  |  |  | 0x7 |  |  |
|  |  | Out\_of\_4Low\_Clutch |  |  |  | 0x8 |  |  |
|  |  | Shift\_In\_Progress |  |  |  | 0x9 |  |  |
|  |  | \_4x4\_Locked\_ Temporarily |  |  |  | 0xA |  |  |
|  |  | \_4x4\_Disabled\_ Temporarily |  |  |  | 0xB |  |  |
|  |  | \_4x4\_Auto\_ Restored |  |  |  | 0xC |  |  |
|  |  | Blocked\_Shift\_ Assist |  |  |  | 0xD |  |  |
|  |  | \_4x4\_Off\_Road\_ Mode |  |  |  | 0xE |  |  |
|  |  | \_4x4\_Exiting\_Off\_ Road |  |  |  | 0xF |  |  |
|  |  | \_4x4\_Extreme\_Off\_Road\_Mode |  |  |  | 0x10 |  |  |
|  |  | \_4x4\_Off\_Road\_ Speed |  |  |  | 0x11 |  |  |
|  |  | AWD\_OFF |  |  |  | 0x12 |  |  |
|  |  | Neutral\_Tow\_Enabled |  |  |  | 0x13 |  |  |
|  |  | Neutral\_Tow\_Disabled |  |  |  | 0x14 |  |  |
|  |  | Change\_AWD\_PTU\_Oil |  |  |  | 0x15 |  |  |
|  |  | AWD\_PTU\_Oil\_Changed |  |  |  | 0x16 |  |  |
|  |  | Out\_of\_4Low\_Crawl |  |  |  | 0x17 |  |  |
|  |  | \_4x4\_Mode\_Unavail\_TMS |  |  |  | 0x18 |  |  |
|  |  | Lkr\_Mode\_Unavail\_TMS |  |  |  | 0x19 |  |  |
|  |  | Shift\_To\_Neutral |  |  |  | 0x1A |  |  |
|  |  | To\_Engage\_4x4\_Slow\_To\_3MPH |  |  |  | 0x1B |  |  |
|  |  | To\_Engage\_4x4\_Release\_Aped |  |  |  | 0x1C |  |  |
|  |  | Cfg\_Perf\_Redc\_See\_Manual |  |  |  | 0x1D |  |  |
|  |  | \_4wd\_Lock\_Required |  |  |  | 0x1E |  |  |
|  |  | Rear\_Diff\_Lock\_Not\_Avail |  |  |  | 0x1F |  |  |

### Output

* Exit\_Rock\_Crawl\_Mode\_MC\_Warn\_Status\_Flag, which is used to control the state of the text

warning message.

## Function/Performance

### Operational Modes

|  |  |
| --- | --- |
| **Mode** | **Differentiating Vehicle Conditions** |
| Sleep Mode | MC\_Warn\_Status\_Flag = Inactive |
| Limited Mode | MC\_Warn\_Status\_Flag = Inactive |
| Normal Mode | MC\_Warn\_Status\_Flag = Inactive/Active |
| Crank Mode | MC\_Warn\_Status\_Flag = Inactive/Active |

The above table references the setting of the Warning flag as per this section. However, the actual warning display operational modes are displayed 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

###### 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

None

#### 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

##### State Matrix for Exit Rock Crawl Mode Warning

|  |  |  |
| --- | --- | --- |
| **Operational**  **\_Mode** | **AwdStat\_D\_RqDsply**  **Signal** | **Exit\_Rock\_Crawl\_Mode**  **\_MC\_Warn\_Status \_Flag** |
| Normal or Crank | Out\_of\_4Low\_Crawl (0x17) | **Active** |
| All Other Cases | | Inactive |

##### Exit Rock Crawl MC Status Flag to Message ID and Chime

|  |  |  |
| --- | --- | --- |
| **Exit\_Rock\_Crawl\_Mode\_MC\_Warn\_Status\_Flag** | **MC Message ID** | **Associated Chime Status Flag(1)** |
| Inactive | None | None |
| **Active** | W993 | Message Center Informational Chime Status Flag |

1. Set to active while associated MC\_Status\_Flag is Active otherwise Inactive.

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

* 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).

#### Function Safety Classification (EMC)

Class B

#### Memory Storage

##### Memory Storage Table

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter Name** | **Description** | **Value at**  **Battery Connect** | **Value at**  **Module Wake-up** |
| AwdStat\_D\_RqDsply | CAN Signal sent from the TCCM Module | Normal\_No\_Message (0x0) | Normal\_No\_Message (0x0) |
| Exit\_Rock\_Crawl\_Mode\_MC\_Warn\_Status\_Flag | State variable used by M/C Warning 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

As per table 3.0

## Error Handling

### Missing Message Strategy

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

No DTCs are logged 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-0017 TELLTALE AND INTERIOR ILLUMINATION – COLOR AND INTENSITY

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 -0047 TELLTALE, INDICATOR AND DISPLAY LIGHT INTENSITY

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 Release  DI CC approval: 9/13/2018  Feature owner: David Robertson | 9/17/2018 |
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