# Hill Start Assist Telltale – CGEA1.3

## Functional Description

The purpose of the Hill Start Assist (HSA) Telltale is illuminate or extinguish an LED telltale, which informs the driver of a Hill Start Assist system failure that requires service.

This STSS only applies to low content (non-message center) clusters; IPCs that have MC capability, should use the “Hill Start Assist Control Function” specification, and Hill Start Assist Telltale should not be implemented.

## Interfaces

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

Hill Start Assist Telltale Context Diagram



### Inputs

#### IR-REQ-343781/A-INTERNAL:

Operational\_Mode

DIAG\_SESSION\_TIMER

DIAG\_DID\_61CE,2,2 (Hill Launch Assist Telltale)

DIAG\_DID\_61A5,4,6 (All Warnings Lamp)

ETM\_Bulb\_Check\_State

Self\_Test\_Entry\_Bulb\_Check\_Timer

HSA\_TT\_Cfg

#### MUX messages on the CAN bus:

##### SIG-REQ-343774/A-HsaStat\_D\_Actl Signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| HsaStat\_D\_Actl | 3 |  | SED | 1 | 0 |  | 0 (0x0) | 7 (0x7) |
|  |  | Inactive |  |  |  | 0x0 |  |  |
|  |  | FindingGradient |  |  |  | 0x1 |  |  |
|  |  | ActiveBrakePedalPressed |  |  |  | 0x2 |  |  |
|  |  | ActiveBrakePedalReleased |  |  |  | 0x3 |  |  |
|  |  | FastRelease |  |  |  | 0x4 |  |  |
|  |  | SlowRelease |  |  |  | 0x5 |  |  |
|  |  | Failed |  |  |  | 0x6 |  |  |
|  |  | Undefined |  |  |  | 0x7 |  |  |

### IR-REQ-343790/A-Outputs

HSA\_Telltale, which is used to control the state of the LED.

## Function/Performance

### F-REQ-343789/A-Operational Modes

| **Mode** | **Differentiating Vehicle Conditions** |
| --- | --- |
| Sleep Mode | HSA\_Telltale OFF |
| Limited Mode | HSA\_Telltale OFF |
| Normal Mode | HSA\_Telltale OFF/ON |
| Crank Mode | HSA\_Telltale OFF/ON |

### 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

#### HMI-REQ-343782/A-Indicator Graphics / Display Format



For actual symbol definition refer to Approved Symbols and Abbreviations List,

Symbol B.928 (Hill Holding Car).

##### HMI-REQ-343775/A-Indicator Color Coordinates

Amber - Reference SDS IL-0017/IS-0379.

##### HMI-REQ-343776/A-Indicator Characteristics

LED – Hill Start Assist Telltale.

#### Audio

None.

#### Switch Control Logic

Not Applicable.

### PFM-REQ-343788/A-System Accuracy

The HSA\_Telltale shall change the state of the telltale within 100msec of a state change as indicated in the state matrix reference 1.3.5.1 Subsystem Algorithm Flowchart/ State Diagram

### Operation: Performance and Functional

#### Subsystem Algorithm Flowchart / State Diagram

##### F-REQ-343777/A-Hill Start Assist Telltale DID Flowchart



##### F-REQ-343778/A-State Matrix for HSA\_Telltale

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Operational**  **\_Mode** | **HSA\_TT \_Cfg** | **ETM Bulb\_Check**  **\_State** | **DIAG\_**  **SESSION\_TIMER** | **Self\_Test\_ Entry\_**  **Bulb\_Check\_Timer** | **DIAG\_DID\_61CE,2,2 (Hill Launch Assist Telltale)** | **DIAG\_DID\_61A5,4,6**  **(All Warnings Lamp)** | **Bulb\_Proveout**  **\_Timer** | **HsaStat\_D\_Actl Signal** | **HSA\_Telltale** |
| **Normal or**  **Crank** | **Enabled** | X | **Not Active** | X | X | X | **Active** | X | **ON** |
| X | **Not Active** | X | X | X | X | **Failed (0x6)** | **ON** |
| X | **Active** | X | **Not Received** | **Not Received** | X | **Failed (0x6)** | **ON** |
| X | **Active** | X | **ON (0x1)** | X | X | X | **ON** |
| X | **Active** | X | X | **ON (0x1)** | X | X | **ON** |
| X | **Active** | **Active** | X | X | X | X | **ON** |
| **ON (0x1)** | **Not Active** | X | X | X | X | X | **ON** |
| **OFF (0x0)** | X | **Not Active** | **Not Received** | **Not Received** | X | **Missing as per Section 1.4.1** | **ON** |
| **All Other Cases** | | | | | | | | | **OFF** |

X = Don’t Care

Not Received = The state when a DIAG\_SESSION\_TIMER is active and the PID has not been received

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

See State Matrix for HSA\_Telltale in Section 1.3.5.1

#### FS-REQ-343791/A-Function Safety Classification (EMC)

Class B

#### Memory Storage

##### NVM-REQ-343779/A-Storage Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter Name** | **Description** | **Value at**  **Battery Connect** | **Value at**  **Module Wake-up** |
| HSA\_TT\_Cfg | Internal flag to indicate if HSA telltale is present in the cluster. | Use Stored Value | Use Stored Value |
| HsaStat\_D\_Actl (CAN) | CAN signal sent from ABS module, which describes the state of the HSA system. | Inactive (0x0) | Inactive (0x0) |
| DIAG\_DID\_61CE,2,2 (Hill Launch Assist Telltale) | Warning Lamp "B" Status, byte 2, bit 2 (Hill Launch Assist Telltale) | OFF (0x0) | OFF (0x0) |
| DIAG\_DID\_61A5,4,6 (All Warnings Lamp) | Warning Lamp Status 2, byte 4, bit 6  (All Warnings Lamp) | OFF (0x0) | OFF (0x0) |
| ETM\_Bulb\_Check\_State | State indicator for warning bulbs in ETM. | OFF (0x0) | OFF (0x0) |
| Operational\_Mode | 4 state indicator for cluster operational mode. | Limited | Limited, Normal or Crank |
| HSA\_Telltale | Used to control the state of the Hill Start Assist Telltale LED. | OFF (0x0) | OFF (0x0) |

##### NVM-REQ-343780/A-Timer Table

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter Name** | **Description** | **Value at**  **Battery Connect** | **Value at**  **Module Wake-up** |
| DIAG\_SESSION\_TIMER | Timer used to time-out a diagnostic session. | Inactive | Inactive |
| Self\_Entry\_Bulb\_Check\_Timer | Timer used in diagnostic session to do a self-check of telltales, including non-prove out telltales. | Inactive | Inactive |

#### F-REQ-343783/A-Prove Out

3.0 +/- 0.1 seconds as per bulb prove out section. Cluster controls prove out.

#### Reconfigurable Telltale

Not applicable.

#### Message Center

None – this STSS is not implemented if the IPC is equipped with M/C.

## Error Handling

### Missing Message Strategy

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.

## Diagnostics

### DIS-REQ-343787/A-Self Test

Bulb illuminated during self test as per Self\_Entry\_Bulb\_Check\_Timer

### Engineering Test Mode

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

### Part II Performance

#### DID-REQ-343784/A-Supported Diagnostic PIDs (Service $22 and $2F)

|  |  |  |
| --- | --- | --- |
| **Number** | **PID / Common ID Name** | **PID Type** |
| 61A5 | Warning Lamp Status 2, byte 4, bit 6 (All Warnings Lamp) | Bit Mapped |
| 61CE | Warning Lamp "B" Status, byte 2, bit 2 (Hill Launch Assist Telltale) | Bit Mapped |

#### DCR-REQ-343785/A-DID DE01:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Block**  **Num** | **Block Description** | **Size (bits)** | **Type** | **State: Description** | **"0"** | **"1"** | **Default** | **Comments/Information** |
| PACKETED BLOCKS | |  |  |  |  |  |  |  |
| $01 | Option Content (B&A) | 1 | 1 | Hill Start Assist (HSA) Telltale | Disabled | Enabled | Enabled | Disabled means the feature is not present in the vehicle |
|  | \*Byte and bit location to be identified in Part II Specification for this cluster | | |  |  |  |  |  |

#### DTC-REQ-343786/A-Supported Diagnostic Trouble Codes (DTCs)

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

|  |  |
| --- | --- |
| **DTC** | **Description** |
| C12100 | Lost Communication With Anti-Lock Brake System (ABS) Control Module |
| C41500 | Invalid Data Received From Anti-Lock Brake System (ABS) Control Module |

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

## Reference Specifications

IS-0001 WARNINGS/INDICATORS/DISPLAYS PROVEOUT

IS-0046 INSTRUMENTATION MATERIAL RESISTANCE TO CLEANING

IS-0052 OPERATING VOLTAGES - FUNCTIONAL/PERFORMANCE

IS-0069 FUNCTIONAL IMPORTANCE CLASS

IS-0324 WINDSHIELD & OTHER REFLECTIONS

IS-0327 WARNING INDICATOR EVALUATION

IS-0329 FLICKERING OF LAMPS

IS-0379 NORTH AMERICAN WARNINGS AND INDICATORS STRATEGY

IL-0017 TELLTALE AND INTERIOR ILLUMINATION COLOR

IL-0021 CRAFTSMANSHIP - DISPLAYS

IL-0023 CLARITY/LEGIBILITY/READABILITY

IL-0025 INTERIOR ILLUMINATION INTENSITY

IL -0027 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

**STSS Module Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Revision** | **Name** | **Change Description** | **Date** |
| 1.0 | M. Ehlert | Initial release for low content, non-message center applications only. Leveraged from “Hill Start Assist Control Function – CGEA 1.3\_v1.0” and input from Kevin Zhou. | 1/25/2013 |
| 1.1 | M. Ehlert | Updated Section 1.5.3 Supported DTCs to account for signals with an update bit. | 3/1/2013 |
| 1.2 | V. Patel | Initial release for VSEM requirements migration | 2/26/2019 |
|  |  |  |  |
|  |  |  |  |