# Auto High Beam Fixed/Dedicated RTT, Non-Toggle RTT - CGEA1.3

## Functional Description

The purpose of the Auto High Beam RTT and the Adaptive Drive Beam RTT (On NA markets starting MY2020) is to inform the driver that the Auto High Beam or Adaptive Drive Beam feature is on and may change the state of the vehicle high beams or Adaptive Drive Beam. This RTT is incremental to the high beam telltale and is now required on all markets. Previously, it was required only per regulation ECE 48.

The Auto High Beam RTT or the Adaptive Drive Beam RTT correlates the AhbcStat\_B\_Dsply Signal from the IPMA or AhbStat\_B\_Dsply signal from the SCCM (based on configuration), AutoHighBeam\_Menu\_Cfg and the Operational\_Mode to illuminate or extinguish the Auto High Beam or the Adaptive Drive Beam RTT.

The Auto High Beam or the Adaptive Drive Beam RTT shall provide an iconic representation that will illuminate or extinguish to inform the driver that the Auto High Beam or the Adaptive Drive Beam feature is on and may change the state of the vehicle high beams or Adaptive Drive Beam.

Direction is for the Auto High beam RTT to be white in color, whereas the Adaptive Drive Beam RTT is green in color. As currently there is no color cordinate definitions for a white LED telltale this feature is limited to a Fixed/Dedicated RTT or Non-Toggle RTT with the Fixed/Dedicated RTT being the preferred implementation.

## Interfaces

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

Auto High Beam RTT Interface Context Diagram



### Inputs

#### IR-REQ-299285/A-INTERNAL

* Operational\_Mode
* AHB\_RTT\_Cfg
* AutoHighBeam\_Menu\_Cfg – Refer to AutoHighBeam Control Function – CGEA1.3 v2.1 and later for more information on this variable.

#### MUX message on the CAN Bus

##### SIG-REQ-299281/A-AhbcStat\_B\_Dsply Signal (From IPMA)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| AhbcStat\_B\_Dsply | 1 |  | SED | 1 | 0 |  | 0  (0x0) | 1 (0x1) |
|  | Off |  |  |  | 0x0 |  |  |
|  | On |  |  |  | 0x1 |  |  |

##### SIG-REQ-299282/A-AhbStat\_B\_Dsply Signal (From SCCM)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| AhbStat\_B\_Dsply | 1 |  | SED | 1 | 0 |  | 0  (0x0) | 1 (0x1) |
|  | Off |  |  |  | 0x0 |  |  |
|  | On |  |  |  | 0x1 |  |  |

### IR-REQ-299292/A-Outputs

Auto\_High\_Beam\_RTT, which is used to control the state of the Auto High Beam RTT. Adaptive\_Drive\_Beam\_RTT, which is used to control the state of the Glare Free Beam RTT.

## Function/Performance

### F-REQ-299293/A-Operational Modes

|  |  |
| --- | --- |
| **Mode** | **Differentiating Vehicle Conditions** |
| Sleep Mode | Auto High Beam RTT OFF |
| Limited Mode | Auto High Beam RTT OFF |
| Normal Mode | Auto High Beam RTT ON / OFF |
| Crank Mode | Auto High Beam RTT ON / OFF |

### Voltage Levels

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

### Human-Machine Interface

#### Visual

##### Indicator Graphics / Display Format

For actual symbol definition refer to database # A.903 of the 03-0685 ARL requirement.

###### HMI-REQ-299274/A-Indicator Color Coordinates

White – As per HMI/Studio Graphics (for Auto High Beams)

Green – As per HMI/Studio Graphics (for Adaptive Drive Beam)

###### HMI-REQ-299275/A-Indicator Characteristics

LCD – Auto High Beam Fixed/Dedicated RTT or Non-Toggle RTT. (Rotating RTT cannot be used per reg ECE 48)

#### Audio

None.

### PFM-REQ-299290/A-System Accuracy

The Auto\_High\_Beam\_RTT and the Adaptive\_Drive\_Beam\_RTT shall change the state of the RTT within 100msec of a state change as indicated in the state matrix reference 1.3.5.1.1 Subsystem Algorithm Flowchart/ State Diagram

### Operation: Performance and Functional

#### Subsystem Algorithm Flowchart / State Diagram

##### F-REQ-299283/A-Auto High Beam RTT Configuration Change Flowchart



##### F-REQ-299284/A-State Matrix for Fixed/Dedicated Auto High Beam and Adaptive Drive Beam RTT

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Operational\_**  **Mode** | **AutoHighBeam\_Menu\_Cfg** | **AHB\_RTT\_Cfg** | **AhbcStat\_B\_Dsply Signal** | **AhbStat\_B\_Dsply**  **Signal** | **Auto\_High\_Beam**  **\_RTT**  **(White)** | **Adaptive Drive Beam\_RTT**  **(Green)** |
| Normal or  Crank | 0x1 (AHBC)  OR  0x2 (GFHB) | Enabled via IPMA (0x1) | ON (0x1) | X | **ON** | OFF |
| Missing as per 1.4.1 | X | OFF |
| Enabled via SCCM (0x2) | X | On (0x1) | **ON** |
| X | Missing as per 1.4.1 | OFF |
| 0x3 (ADB) | Enabled via IPMA (0x1) | ON (0x1) | X | OFF | **ON** |
| Missing as per 1.4.1 | X | OFF |
| Enabled via SCCM (0x2) | X | On (0x1) | **ON** |
| X | Missing as per 1.4.1 | OFF |
| All Other Cases | | | | | OFF | OFF |

##### F-REQ-299280/A-State Matrix for Non-Toggle Auto High Beam RTT

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Operational\_Mode** | **AutoHighBeam\_Menu\_Cfg** | **AHB\_RTT\_Cfg** | **AhbcStat\_B\_Dsply Signal** | **AhbStat\_B\_Dsply**  **Signal** | **Auto\_High\_Beam**  **\_RTT**  **(White)** | **Adaptive Drive Beam\_RTT**  **(Green)** |
| Normal or  Crank | 0x1 (AHBC)  OR  0x2 (GFHB) | Enabled via IPMA (0x1) | On (0x1) | X | Active | Inactive |
| Enabled via SCCM (0x2) | X | On (0x1) | Active |
| 0x3 (ADB) | Enabled via IPMA (0x1) | On (0x1) | X | Inactive | Active |
| Enabled via SCCM (0x2) | X | On (0x1) | Active |
| All Other Cases | | | | | Inactive | Inactive |

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

##### Implementation Priority

###### F-REQ-299276/A-Highly Recommended

* Dedicated / Fixed RTT – Very highly recommended

###### F-REQ-299277/A-Second Recommendation

* Non-Toggle RTT (only if Dedicated / Fixed RTT space is not feasible.

###### F-REQ-299278/A-LED Telltale

* Fixed LED Telltale: Not used for this application. Interior Harmony SDS requirement currently does NOT have color coordinates defined for a white LED telltale. If an LED telltale is to be used for this feature, Interior Harmony group must develop color coordinates and update IH SDS requirement IH-0001. Feature limited to M2 and M3 level clusters.

###### F-REQ-299279/A-Auto High Beam Indication Implementation for Different Markets

* The auto-highbeam indication shall be implemented on all markets.

#### FS-REQ-299294/A;1- Function Safety Classification (EMC)

B

#### NVM-REQ-299286/A- Memory Storage

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter Name** | **Description** | **Value at**  **Battery Connect** | **Value at**  **Module Wake-up** |
| Auto\_High\_Beam\_RTT | Used to control the state of the RTT | Inactive | Inactive |
| Adaptive\_Drive\_Beam\_RTT | Used to control the state of the RTT | Inactive | Inactive |
| AhbcStat\_B\_Dsply Signal | CAN signal sent from the IPMA | OFF (0x0) | Off (0x0) |
| AhbStat\_B\_Dsply Signal | CAN signal sent from the SCCM | Off (0x0) | Off (0x0) |
| AHB\_RTT\_Cfg | Configures cluster to allow Auto\_High\_Beam\_RTT to be active. Set to Disabled at Cluster Supplier Manufacturing Plant. | Use Stored Value | Use Stored Value |
| AutoHighBeam\_Menu\_Cfg | Refer to AutoHighBeam Control Function for Init values of this variable. | | |
| Operational\_Mode | 4 state indicator for cluster operational mode | Limited | Limited, Normal or Crank |

#### Prove Out

None

#### F-REQ-299287/A-Reconfigurable RTT

Yes (as per HMI graphics)

#### Message Center Msg

None

## 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

### DIR-REQ-299291/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

#### DTC-REQ-299288/A-Supported Diagnostic Trouble Codes (DTCs)

DTCs shall be logged as per the diagnostic section of this SPSS.

|  |  |
| --- | --- |
| **DTC** | **Description** |
| C23A00 | Lost Communication with Image Processing Module A (IPMA) |
| C21200 | Lost Communication With Steering Column Control Module (SCCM) |

#### DCR-REQ-299289/B-DID DE08

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Block**  **Num** | **Block Description** | **Size**  **(bits)** | **Type** | **State: Description** | **"0"** | **"1"** | **Default** | **Comments/**  **Information** |
| PACKETED BLOCKS | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| $08 | Option Content (B&A) | 2 | 1 | Auto High Beam Telltale | Disabled | Enabled | 01 |  |
|  |  |  |  | 00 | Encoded | Encoded |  | Disabled |
|  |  |  |  | 01 | Encoded | Encoded |  | IPMA as source module |
|  |  |  |  | 02 | Encoded | Encoded |  | SCCM as source module |
|  |  |  |  | 03 | Encoded | Encoded |  | Unused |
|  |  |  |  |  |  |  |  |  |
| $09 | Option Content (B&A) | 2 | \* | AutoHighBeam Menu | Encoded | Encoded |  | **This parameter allows the appropriate Auto HighBeams settings menu to be displayed in the cluster. It can be over-ridden by the Settings Menu Config**  **This parameter to be used on vehicles MY2020 and later.** |
|  |  |  |  | 0x0 = Disabled | Encoded | Encoded |  |
|  |  |  |  | 0x1 = Auto HighBeams | Encoded | Encoded |  |
|  |  |  |  | 0x2 = Glarefree High Beams | Encoded | Encoded |  |
|  |  |  |  | 0x3 = Adaptive Driving Beams | Encoded | Encoded |  | As of Jan 2019, this menu item to be enabled for Canadian market only. |
|  |  |  |  |  |  |  |  |  |
| \*Byte and bit location to be identified in Part II Specification for this cluster | | | | | | | | |

## Reference Specification

CR-0030 Adaptive Cruise Control Driver Interface

SC-0190 Speed Control RTT

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 RTT 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 RTT; 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 | Jblatchf | Intitial Release – from Auto High Beam TT – CGEA1.3v1.0.doc. File name change only. Function unchanged. File name change to reflect we will not support fixed LED telltale for this feature. | 3/22/2012 |
| 1.1 | Jblatchf | Auto\_High\_Beam\_Cfg inadvertently left out of Table 3. Auto\_High\_Beam\_Cfg added to Table 3. | 6/11/2012 |
| 1.2 | Jblatchf | Changed Auto\_High\_Beam\_Cfg to AHB\_RTT\_Cfg to insure this config variable is not confused with the Auto High Beam Setup config variable. Note it is very clear from the Part II DID DE00 definitions these are separate cfg variables, however, this change eliminates any potential confusion.   * Figure 1: Changed to new config variable. * 1.2.2: Added AHB\_RTT\_Cfg to internal inputs. * 1.3.5.1: Changed to AHB\_RTT\_Cfg in the configuration flowchart. * Table 2: Changed variable to AHB\_RTT\_Cfg. Corrected output variable. * Table 3: Changed variable to AHB\_RTT\_Cfg. * 1.3.5.4: Added AHB\_RTT\_Cfg | 10/3/12 |
| 1.3 | S. Watkins  M. Hakim | This revision is for STSS cleanup to handle open issues. Updates are as follows:  Updated Configuration DID DE00 to DExx throughout the document.  Removed ETM and Self Test Bulb Check, and “all warning lamps” Diag DID throughout the document.  Section 1.2.2 (Inputs) & Section 1.3.5.4 (Memory Storage table): Updated the CAN signal sender from the PCM to the IPMA.  Section 1.3.5.2: Deleted the first bullet point regarding transitioning from Sleep or Limited to Normal or Crank.  Updated document footer. | 9/24/2013 |
| 1.4 | V. Patel | Purpose of this update is to expand the configuration bit to differentiate source of CAN input signal (IPMA vs. SCCM) received by the cluster to illuminate the Auto Highbeam RTT. (DI CC approval date: 8/14/2014)   * Section 1.2.1, figure 1: Added input signal transmitted by the SCCM: AhbStat\_B\_Dsply * Table 2: Created table to define the CAN input signal from SCCM. * Section 1.3.5.1, table 3, 4: Updated tables to process inputs based on configuration (IPMA vs SCCM). * Section 1.3.5.4: Added CAN input signal received from SCCM. * Section 1.5.3: Added missing message DTC for loss of comm. with SCCM. * Updated table to expand DExx configuration to 2 bits to accommodate two input sources. | 2/11/2015 |
| 1.5 | V. Patel | The auto high beam indication shall now be implemented on all markets, it is no longer just an ECE regulation.  DI Change Control approval: 3/24/2016  Section 1.1: Updated functional description.  Section 1.3.5.2: Added a requirement statement that the auto high beam indication shall be implemented on all markets. | 4/11/2016 |
| 1.6 | V. Patel | Adding the Adaptive Drive Beam RTT, which will be used instead of the Auto High Beam RTT on the 2020 U611 program. (All changes are in red)   * Section 1.1: Added Adaptive Drive Beam RTT in the feature description. * Section 1.2.1, figure 1: Add the configuration required to differentiate the Adaptive Drive Beam RTT from the Auto High Beam RTT. * Add Adaptive\_Drive\_Beam\_RTT output variable. * Section 1.2.2: Add description and reference for the “AutoHighBeam\_Menu\_Cfg” parameter. * Section 1.2.3: Add Adaptive\_Drive\_Beam\_RTT as an output variable. * Section 1.3.5.1, table 3, 4: Update matrix to activate the Adaptive\_Drive\_Beam\_RTT based on configurations. * Section 1.3.5.4: Add Adaptive\_Drive\_Beam\_RTT as an output and its init values. Add “AutoHighBeam\_Menu\_Cfg” as an input variable. | 9/6/2017 |
| 1.7 | A. Mishra | Initial VSEM RM Document Revision Release | 2/27/2018 |
| 1.8 | V. Patel | No change in feature functionality. This update adds reference to the AutoHighBeamMenu configuration parameter since the parameter is used in this STSS.  DI CC approval: Scott Watkins (offline)  DI CC Tracker: 100273  DCR-REQ-299289: Added reference to DE09 AutoHighBeamMenu parameter details | 1/31/2019 |
|  |  |  |  |
|  |  |  |  |