# Steering Wheel Horizon Controller Control Function – FNV2

## Functional Description

Steering Wheel Horizon Controller Control Function provides contextual switches to the driver. The switches will be physically located on the steering wheel. The function of the switches will be indicated with icons in the HHDD (High Heads Down Display). ADAS functions will be controlled on the primary switch. Functions controlled by the secondary switch include vehicle messages (warnings and ETM), driver adjustments (mirror, steering wheel, and pedal), phone, text, and media.

The Steering Wheel Horizon Controller Control Function feature correlates the StewSwtchPrimPos\_D\_St, StewSwtchPrim\_D\_Stat, StewSwtchScndPos\_D\_St, StewSwtchScnd\_D\_Stat, CcStat\_D\_Actl, AccStopStat\_D\_DSPLY, AslIconDsply\_D\_Rq, CcOvrrdActv\_B\_Actl, AccMemEnbl\_B\_RqDrv, Veh\_V\_ActlEng, and VehVActlEng\_D\_Qf CAN signals, VRM\_BTPhoneSts\_St and VRM\_NewSMS internal signals from SYNC, Message\_Center\_Disp\_Interface\_Cfg, ASLD\_Cfg, and Driver\_Adjustment\_Cfg configuration bits, and the Operational\_Mode to display the appropriate active switch menu..

## Interfaces

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



Steering Wheel Horizon Controller Control Function Context Diagram

### Inputs

#### INTERNAL:

* Operational\_Mode
* #P (from Warning Arbitrator)
* #S (from Warning Arbitrator)
* Global Alert status (from Warning Arbitrator)
* Warning status (from Warning Arbitrator)
* VRM\_BTPhoneSts\_St (from SYNC)
* VRM\_NewSMS Signal (from SYNC)
* ASLD\_Cfg
* Driver\_Adjustment\_Cfg
* Message\_Center\_Disp\_Interface\_Cfg

#### MUX message from the CAN bus

##### StewSwtchPrimPos\_D\_St Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| StewSwtchPrimPos\_D\_St | 4 |  | SED | 1 | 0 |  | 0 (0x0) | 15 (0xF) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | One |  |  |  | 0x1 |  |  |
|  |  | Two |  |  |  | 0x2 |  |  |
|  |  | Three |  |  |  | 0x3 |  |  |
|  |  | Four |  |  |  | 0x4 |  |  |
|  |  | Five |  |  |  | 0x5 |  |  |
|  |  | Six |  |  |  | 0x6 |  |  |
|  |  | Seven |  |  |  | 0x7 |  |  |
|  |  | Eight |  |  |  | 0x8 |  |  |
|  |  | Nine |  |  |  | 0x9 |  |  |
|  |  | NotUsed\_1 |  |  |  | 0xA |  |  |
|  |  | NotUsed\_2 |  |  |  | 0xB |  |  |
|  |  | NotUsed\_3 |  |  |  | 0xC |  |  |
|  |  | NotUsed\_4 |  |  |  | 0xD |  |  |
|  |  | NotUsed\_5 |  |  |  | 0xE |  |  |
|  |  | Faulty |  |  |  | 0xF |  |  |

##### StewSwtchPrim\_D\_Stat Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| StewSwtchPrim\_D\_Stat | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Not pressed |  |  |  | 0x0 |  |  |
|  |  | Pressed |  |  |  | 0x1 |  |  |

##### StewSwtchScndPos\_D\_St Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| StewSwtchScndPos\_D\_St | 4 |  | SED | 1 | 0 |  | 0 (0x0) | 15 (0xF) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | One |  |  |  | 0x1 |  |  |
|  |  | Two |  |  |  | 0x2 |  |  |
|  |  | Three |  |  |  | 0x3 |  |  |
|  |  | Four |  |  |  | 0x4 |  |  |
|  |  | Five |  |  |  | 0x5 |  |  |
|  |  | Six |  |  |  | 0x6 |  |  |
|  |  | Seven |  |  |  | 0x7 |  |  |
|  |  | Eight |  |  |  | 0x8 |  |  |
|  |  | Nine |  |  |  | 0x9 |  |  |
|  |  | NotUsed\_1 |  |  |  | 0xA |  |  |
|  |  | NotUsed\_2 |  |  |  | 0xB |  |  |
|  |  | NotUsed\_3 |  |  |  | 0xC |  |  |
|  |  | NotUsed\_4 |  |  |  | 0xD |  |  |
|  |  | NotUsed\_5 |  |  |  | 0xE |  |  |
|  |  | Faulty |  |  |  | 0xF |  |  |

##### StewSwtchScnd\_D\_Stat Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| StewSwtchScnd\_D\_Stat | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Not pressed |  |  |  | 0x0 |  |  |
|  |  | Pressed |  |  |  | 0x1 |  |  |

##### CcStat\_D\_Actl Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CcStat\_D\_Actl | 3 |  | SED | 1 | 0 |  | 0 (0x0) | 7 (0x7) |
|  |  | Off |  |  |  | 0x0 |  |  |
|  |  | Denied |  |  |  | 0x1 |  |  |
|  |  | Standby Denied |  |  |  | 0x2 |  |  |
|  |  | Standby |  |  |  | 0x3 |  |  |
|  |  | Active Que Assist |  |  |  | 0x4 |  |  |
|  |  | Active |  |  |  | 0x5 |  |  |
|  |  | Undefined |  |  |  | 0x6 |  |  |
|  |  | Undefined |  |  |  | 0x7 |  |  |

##### AccStopStat\_D\_DSPLY Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AccStopStat\_D\_DSPLY | 2 |  | SED | 1 | 0 |  | 0 (0x0) | 3 (0x3) |
|  |  | NoDisplay |  |  |  | 0x0 |  |  |
|  |  | ResumeReady |  |  |  | 0x1 |  |  |
|  |  | Stopped |  |  |  | 0x2 |  |  |
|  |  | PressResume |  |  |  | 0x3 |  |  |

##### AslIconDsply\_D\_Rq Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AslIconDsply\_D\_Rq | 2 |  | SED | 1 | 0 |  | 0 (0x0) | 3 (0x3) |
|  |  | Off |  |  |  | 0x0 |  |  |
|  |  | On - passive |  |  |  | 0x1 |  |  |
|  |  | On - active |  |  |  | 0x2 |  |  |
|  |  | On - passive - overridden |  |  |  | 0x3 |  |  |

##### CcOvrrdActv\_B\_Actl Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CcOvrrdActv\_B\_Actl | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Deactivate |  |  |  | 0x0 |  |  |
|  |  | Activate |  |  |  | 0x1 |  |  |

##### AccMemEnbl\_B\_RqDrv Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AccMemEnbl\_B\_RqDrv | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Normal Cruise |  |  |  | 0x0 |  |  |
|  |  | Adaptive Cruise |  |  |  | 0x1 |  |  |

##### VRM\_BTPhoneSts\_St Signal

| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| VRM\_BTPhoneSts\_St | 5 |  | Unitless | 1 | 0 |  | 0 (0x0) | 31 (0x1F) |
|  |  | Invalid |  |  |  | 0x0 |  |  |
|  |  | Idle |  |  |  | 0x1 |  |  |
|  |  | Dialing |  |  |  | 0x2 |  |  |
|  |  | Connected |  |  |  | 0x3 |  |  |
|  |  | CradlephNotReady |  |  |  | 0x4 |  |  |
|  |  | NumUnobtainable |  |  |  | 0x5 |  |  |
|  |  | IncomCall |  |  |  | 0x6 |  |  |
|  |  | NoLinkToBt |  |  |  | 0x7 |  |  |
|  |  | InitBtCon |  |  |  | 0x8 |  |  |
|  |  | PhoneBusy |  |  |  | 0x9 |  |  |
|  |  | PhoneVr |  |  |  | 0xA |  |  |
|  |  | NotSupported |  |  |  | 0xB |  |  |
|  |  | BtPhPriv |  |  |  | 0xC |  |  |
|  |  | ConfCall |  |  |  | 0xD |  |  |
|  |  | Conference\_2ndIncCall |  |  |  | 0xE |  |  |
|  |  | Conference\_OtherCallOnHold |  |  |  | 0xF |  |  |
|  |  | Connected\_Call\_on\_hold |  |  |  | 0x10 |  |  |

##### VRM\_NewSMS Signal

| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State Encoded** | **Min** | **Max** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| VRM\_NewSMS | 2 |  | Unitless | 1 | 0 |  | 0 (0x0) | 3 (0x3) |
|  |  | Invalid |  |  |  | 0x0 |  |  |
|  |  | NewSmsAvailable |  |  |  | 0x1 |  |  |
|  |  | NoNewSmsAvailable |  |  |  | 0x2 |  |  |
|  |  | UnreadSMSMessagesAvailable |  |  |  | 0x3 |  |  |

##### Veh\_V\_ActlEng Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Veh\_V\_ActlEng | 16 |  | KPH | 0.01 | 0 |  | -0  (0x0000) | 655.35 (0xFFFF) |

##### VehVActlEng\_D\_Qf Signal

| **Signal Name** | **Size (bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min** | **Max** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| VehVActlEng\_D\_Qf | 2 |  | SED | 1 | 0 |  | 0 (0x0) | 3 (0x3) |
|  |  | Faulty |  |  |  | (0x0) |  |  |
|  |  | No\_Data\_Exists |  |  |  | (0x1) |  |  |
|  |  | Not\_Within\_Specifications |  |  |  | (0x2) |  |  |
|  |  | OK |  |  |  | (0x3) |  |  |

### Outputs

#### INTERNAL

* L\_CursorDown\_Switch\_Press
* L\_CursorUp\_Switch\_Press
* L\_OK\_Switch\_Press
* ButtonID (to SYNC)
* ButtonActivationState (to SYNC)
* Primary\_Switch\_Display
* Primary\_Switch\_Highlight
* Primary\_Switch\_Press
* Secondary\_Switch\_Display
* Secondary\_Switch\_Highlight
* Secondary\_Switch\_Press

#### MUX message to the CAN bus

##### AccButtnGapDecPress4Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AccButtnGapDecPress4 | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Not pressed |  |  |  | 0x0 |  |  |
|  |  | Pressed |  |  |  | 0x1 |  |  |

##### AccButtnGapIncPress4Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AccButtnGapIncPress4 | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Not pressed |  |  |  | 0x0 |  |  |
|  |  | Pressed |  |  |  | 0x1 |  |  |

##### TjaButtnOnOffPress4Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TjaButtnOnOffPress4 | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Not pressed |  |  |  | 0x0 |  |  |
|  |  | Pressed |  |  |  | 0x1 |  |  |

##### PdlSwtch\_Stat Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PdlSwtch\_Stat | 2 |  | SED | 1 | 0 |  | 0 (0x0) | 3 (0x3) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | Forward |  |  |  | 0x1 |  |  |
|  |  | Rearward |  |  |  | 0x2 |  |  |
|  |  | Not Used |  |  |  | 0x3 |  |  |

##### StewPosAdjTel\_D\_Rq Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| StewPosAdjTel\_D\_Rq | 2 |  | SED | 1 | 0 |  | 0 (0x0) | 3 (0x3) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | Out |  |  |  | 0x1 |  |  |
|  |  | In |  |  |  | 0x2 |  |  |
|  |  | NotUsed\_1 |  |  |  | 0x3 |  |  |

##### StewPosAdjTlt\_D\_Rq Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| StewPosAdjTlt\_D\_Rq | 2 |  | SED | 1 | 0 |  | 0 (0x0) | 3 (0x3) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | Up |  |  |  | 0x1 |  |  |
|  |  | Down |  |  |  | 0x2 |  |  |
|  |  | Not used |  |  |  | 0x3 |  |  |

##### MirrorSelFold\_D\_Rq Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MirrorSelFold\_D\_Rq | 2 |  | SED | 1 | 0 |  | 0 (0x0) | 3 (0x3) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | Left |  |  |  | 0x1 |  |  |
|  |  | Right |  |  |  | 0x2 |  |  |
|  |  | Fold\_Unfold |  |  |  | 0x3 |  |  |

##### ExtMirrorAdj\_D\_Rq Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ExtMirrorAdj\_D\_Rq | 3 |  | SED | 1 | 0 |  | 0 (0x0) | 7 (0x7) |
|  |  | Null |  |  |  | 0x0 |  |  |
|  |  | Down |  |  |  | 0x1 |  |  |
|  |  | Up |  |  |  | 0x2 |  |  |
|  |  | Left |  |  |  | 0x3 |  |  |
|  |  | Right |  |  |  | 0x4 |  |  |
|  |  | NotUsed\_1 |  |  |  | 0x5 |  |  |
|  |  | NotUsed\_2 |  |  |  | 0x6 |  |  |
|  |  | NotUsed\_3 |  |  |  | 0x7 |  |  |

##### CcButtnOnOffPress3Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CcButtnOnOffPress3 | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Not pressed |  |  |  | 0x0 |  |  |
|  |  | Pressed |  |  |  | 0x1 |  |  |

##### CcAslButtnSetDecPress3Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CcAslButtnSetDecPress3 | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Not pressed |  |  |  | 0x0 |  |  |
|  |  | Pressed |  |  |  | 0x1 |  |  |

##### CcAslButtnSetIncPress3Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CcAslButtnSetIncPress3 | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Not pressed |  |  |  | 0x0 |  |  |
|  |  | Pressed |  |  |  | 0x1 |  |  |

##### AslButtnOnOffPress3Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AslButtnOnOffPress3 | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Not pressed |  |  |  | 0x0 |  |  |
|  |  | Pressed |  |  |  | 0x1 |  |  |

##### CcAsllButtnResPress3Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CcAsllButtnResPress3 | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Not pressed |  |  |  | 0x0 |  |  |
|  |  | Pressed |  |  |  | 0x1 |  |  |

##### CcAslButtnCnclPress3Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CcAslButtnCnclPress3 | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | Not pressed |  |  |  | 0x0 |  |  |
|  |  | Pressed |  |  |  | 0x1 |  |  |

##### CcAslButtnDeny\_B\_Actl3Signal

| **Signal Name** | **Size**  **(bits)** | **Detail** | **Units** | **Res.** | **Offset** | **State**  **Encoded** | **Min.** | **Max.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CcAslButtnDeny\_B\_Actl3 | 1 |  | SED | 1 | 0 |  | 0 (0x0) | 1 (0x1) |
|  |  | No |  |  |  | 0x0 |  |  |
|  |  | Yes |  |  |  | 0x1 |  |  |

## Function/Performance

### Operational Modes

|  |  |
| --- | --- |
| **Mode** | **Differentiating Vehicle Conditions** |
| Sleep Mode | Inactive |
| Limited Mode | Steering Wheel Horizon Controller Active/Inactive |
| Normal Mode | Steering Wheel Horizon Controller Active/Inactive |
| Crank Mode | Steering Wheel Horizon Controller Active/Inactive |

### 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

Switch Menu as defined in section 1.3.5.1 of this document.

###### Active Display Controls Example



##### Indicator Color Coordinates

Reference section COLOR & ILLUMINATION REQUIREMENTS (GRAPHICS)

##### Indicator Characteristics

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

#### Audio

None.

#### Switch Control Logic

None.

### System Accuracy

The state of the message center flags shall change within 100 msec of a state change as indicated in the state matrix found in section 1.3.5.1 of this document.

### Operation: Performance and Functional

#### Subsystem Algorithm Flowchart / State Diagram

##### Primary\_Active\_Menu State Diagram



##### Flags for secondary menu control

###### Global\_Alert\_Flag State Diagram



Reference Warning Arbitrator.

###### Warning\_Flag and Warning\_OK\_Flag State Diagram



Reference Warning Arbitrator.

###### Phone\_State\_Flag State Diagram



###### New\_Text\_Flag State Diagram



###### Media\_Flag State Diagram



##### Secondary\_Active\_Menu State Table

| **ETM\_Pending\_Flag** | **Global\_Alert\_Flag** | **Warning\_Flag** | **Warning\_OK\_Flag** | **Driver\_Adjustment\_Flag** | **Steering\_Wheel\_Adjust\_Flag** | **Left\_Mirror\_Adjust\_Flag** | **Right\_Mirror\_Adjust\_Flag** | **Pedal\_Adjust\_Flag** | **Phone\_State\_Flag** | **New\_Text\_Flag** | **ETM\_Mode** | **Media\_Flag** | **Secondary\_Active\_Menu** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0x0 (False) | 0x1 (True) | X | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x1 (Global Alert) |
| 0x0 (False) | 0x1 (True) | X | X | 0x1 (True) | X | X | X | X | X | X | X | X | 0x3 (Driver Adjustment Menu) |
| 0x0 (False) | 0x1 (True) | X | X | 0x0 (False) | 0x1 (True) | X | X | X | X | X | X | X | 0x4 (Steering Wheel Adjust) |
| 0x0 (False) | 0x1 (True) | X | X | 0x0 (False) | 0x0 (False) | 0x1 (True) | X | X | X | X | X | X | 0x5 (Left Mirror Adjust) |
| 0x0 (False) | 0x1 (True) | X | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x1 (True) | X | X | X | X | X | 0x6 (Right Mirror Adjust) |
| 0x0 (False) | 0x1 (True) | X | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x1 (True) | X | X | X | X | 0x7 (Pedal Adjust) |
| 0x0 (False) | 0x1 (True) | X | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x1 (Incoming Call) | X | X | X | 0x8 (Phone – Incoming Call) |
| 0x0 (False) | 0x1 (True) | X | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x2 (In Call) | X | X | X | 0x9 (Phone – In Call) |
| 0x0 (False) | 0x1 (True) | X | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) | 0x1 (True) | X | X | 0xA (Text Message Control) |
| X | 0x1 (True) | X | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) | 0x0 (False) | 0x1 (True) | X | 0xB (ETM/ Media Control) |
| X | 0x1 (True) | X | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) | 0x0 (False) | 0x0 (False) | 0x1 (True) | 0xC (Media Control) |
| X | 0x0 (False) | 0x1 (True) | 0x1 (True) | X | X | X | X | X | X | X | X | X | 0x2 (Warning) |
| 0x0 (False) | 0x0 (False) | 0x1 (True) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) |
| 0x0 (False) | 0x0 (False) | 0x1 (True) | 0x0 (False) | 0x1 (True) | X | X | X | X | X | X | X | X | 0x3 (Driver Adjustment) |
| 0x0 (False) | 0x0 (False) | 0x1 (True) | 0x0 (False) | 0x0 (False) | 0x1 (True) | X | X | X | X | X | X | X | 0x4 (Steering Wheel Adjust) |
| 0x0 (False) | 0x0 (False) | 0x1 (True) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x1 (True) | X | X | X | X | X | X | 0x5 (Left Mirror Adjust) |
| 0x0 (False) | 0x0 (False) | 0x1 (True) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x1 (True) | X | X | X | X | X | 0x6 (Right Mirror Adjust) |
| 0x0 (False) | 0x0 (False) | 0x1 (True) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x1 (True) | X | X | X | X | 0x7 (Pedal Adjust) |
| 0x0 (False) | 0x0 (False) | 0x1 (True) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x1 (Incoming Call) | X | X | X | 0x8 (Phone – Incoming Call) |
| 0x0 (False) | 0x0 (False) | 0x1 (True) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x2 (In Call) | X | X | X | 0x9 (Phone – In Call) |
| 0x0 (False) | 0x0 (False) | 0x1 (True) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) | 0x1 (True) | X | X | 0xA (Text Message Control) |
| X | 0x0 (False) | 0x1 (True) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) | 0x0 (False) | 0x1 (True) | X | 0xB (ETM/ Media Control) |
| X | 0x0 (False) | 0x1 (True) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) | 0x0 (False) | 0x0 (False) | 0x1 (True) | 0xC (Media Control) |
| 0x0 (False) | 0x0 (False) | 0x0 (False) | X | 0x1 (True) | X | X | X | X | X | X | X | X | 0x3 (Driver Adjustment) |
| 0x0 (False) | 0x0 (False) | 0x0 (False) | X | 0x0 (False) | 0x1 (True) | X | X | X | X | X | X | X | 0x4 (Steering Wheel Adjust) |
| 0x0 (False) | 0x0 (False) | 0x0 (False) | X | 0x0 (False) | 0x0 (False) | 0x1 (True) | X | X | X | X | X | X | 0x5 (Left Mirror Adjust) |
| 0x0 (False) | 0x0 (False) | 0x0 (False) | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x1 (True) | X | X | X | X | X | 0x6 (Right Mirror Adjust) |
| 0x0 (False) | 0x0 (False) | 0x0 (False) | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x1 (True) | X | X | X | X | 0x7 (Pedal Adjust) |
| 0x0 (False) | 0x0 (False) | 0x0 (False) | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x1 (Incoming Call) | X | X | X | 0x8 (Phone – Incoming Call) |
| 0x0 (False) | 0x0 (False) | 0x0 (False) | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x2 (In Call) | X | X | X | 0x9 (Phone – In Call) |
| 0x0 (False) | 0x0 (False) | 0x0 (False) | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) | 0x1 (True) | X | X | 0xA (Text Message Control) |
| X | 0x0 (False) | 0x0 (False) | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) | 0x0 (False) | 0x1 (True) | X | 0xB (ETM/ Media Control) |
| X | 0x0 (False) | 0x0 (False) | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) | 0x0 (False) | 0x0 (False) | 0x1 (True) | 0xC (Media Control) |
| X | 0x0 (False) | 0x0 (False) | X | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) | 0x0 (False) | 0x0 (False) | 0x0 (False) | 0x0 (Inactive) |

##### Flags for Active Switch control

###### GAP\_Menu\_Flag (Shows GAP+/GAP-) State Diagram



###### GAP\_Adjust\_Flag (Shows switch to get to GAP Menu) State Diagram



###### Warning\_Switch\_Flag State Table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Warning\_Flag** | **Warning\_OK\_Flag** | **#P** | **#S** | **Warning\_Switch\_Flag** |
| 0x0 (False) | 0x0 (False) | X | X | 0x0 (Inactive) |
| 0x1 (True) | 0x0 (False) | X | X | 0x0 (Inactive) |
| 0x1 (True) | 0x1 (True) | 1 | 0 | 0x1 (Active – With OK) |
| 0x1 (True) | 0x1 (True) | > 1 | X | 0x2 (Active – With Up/Down/OK) |
| 0x1 (True) | 0x1 (True) | X | > 0 | 0x2 (Active – With Up/Down/OK) |

Note: Warning\_Switch\_Flag = 0x3 (Active – With Up/Down) is for NR warning type with arrows for scrolling. This state is not currently allowed in HHDD.

###### Speed\_Locked\_Setting\_Flag State Table

|  |  |  |  |
| --- | --- | --- | --- |
| **Operational Mode** | **VehVActlEng\_D\_Qf** | **Veh\_V\_ActlEng** | **Speed\_Locked\_Setting\_Flag** |
| Normal or  Crank | 0x2 (Not\_Within\_Specifications) |  0x3 (OK) | <5 km/h  (< 0x1F4) | 0x0 (False) |
| X | Missing as per 1.4.1 | 0x1 (True) |
| !(0x2 (Not\_Within\_Specifications) |  0x3 (OK)) | X | 0x1 (True) |
| All Other Cases | | | 0x1 (True) |

###### Position\_x\_Function State Table

| **Switch Graphic**  **(Reference Only)** | **AccMemEnbl**  **\_B\_RqDrv** | **CcStat\_D\_Actl** | **AccStopStat\_D\_DSPLY** | **CcOvrrdActv\_B\_Actl** | **AslIconDsply\_D\_Rq** | **GAP\_Menu\_Flag** | **GAP\_Adjust\_Flag** | **Position\_1\_**  **Function** | **Position\_2\_**  **Function** | **Position\_4\_**  **Function** | **Position\_5\_**  **Function** | **Position\_7\_**  **Function** | **Position\_8\_**  **Function** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ACC/CC/ALS Off | X | 0x0 (Off) |  0x1 (Denied) | X | 0x0 (Deactivate) | 0x0 (Off) | 0x0 (Inactive) | 0x0 (Inactive) | 0x0 (Blank) | 0x0 (Blank) | 0x0 (Blank) | 0x0 (Blank) | 0x0 (Blank) | 0x0 (Blank) |
| GAP Adjustment | 0x1 (Adaptive Cruise) | 0x2 (Standby Denied) |  0x3 (Standby) |  0x4 (Active Que Assist) |  0x5 (Active) | X | X | 0x0 (Off) | 0x1 (Active) | 0x1 (Active) | 0x1 (GAP+) | 0x0 (Blank) | 0x1 (GAP Adjust) | 0x0 (Blank) | 0x1 (GAP-) | 0x0 (Blank) |
| ACC On | 0x1 (Adaptive Cruise) | 0x5 (Active) | X | 0x0 (Deactivate) | 0x0 (Off) | 0x0 (Inactive) | 0x1 (Active) | 0x0 (Blank) | 0x1 (SET+) | 0x1 (GAP Adjust) | 0x1 (CNCL) | 0x0 (Blank) | 0x1 (SET-) |
| ACC Standby | 0x1 (Adaptive Cruise) | 0x2 (Standby Denied) |  0x3 (Standby) | X | 0x0 (Deactivate) | 0x0 (Off) | 0x0 (Inactive) | 0x1 (Active) | 0x0 (Blank) | 0x2 (SET) | 0x1 (GAP Adjust) | 0x2 (RES) | 0x0 (Blank) | 0x0 (Blank) |
| ACC Que Assist  – auto resume | 0x1 (Adaptive Cruise) | 0x4 (Active Que Assist) | 0x0 (NoDisplay) |  0x1 (ResumeReady) | 0x0 (Deactivate) | 0x0 (Off) | 0x0 (Inactive) | 0x1 (Active) | 0x0 (Blank) | 0x1 (SET+) | 0x1 (GAP Adjust) | 0x1 (CNCL) | 0x0 (Blank) | 0x1 (SET-) |
| ACC Que Assist  – manual resume | 0x1 (Adaptive Cruise) | 0x4 (Active Que Assist) | 0x2 (Stopped) |  0x3 (PressResume) | 0x0 (Deactivate) | 0x0 (Off) | 0x0 (Inactive) | 0x1 (Active) | 0x0 (Blank) | 0x1 (SET+) | 0x1 (GAP Adjust) | 0x2 (RES) | 0x0 (Blank) | 0x1 (SET-) |
| ACC Override | 0x1 (Adaptive Cruise) | 0x5 (Active) | X | 0x1 (Activate) | 0x0 (Off) | 0x0 (Inactive) | 0x1 (Active) | 0x0 (Blank) | 0x2 (SET) | 0x1 (GAP Adjust) | 0x1 (CNCL) | 0x0 (Blank) | 0x0 (Blank) |
| ASL On | X | 0x0 (Off) |  0x1 (Denied) | X | X | 0x2 (On – active) | 0x0 (Inactive) | 0x0 (Inactive) | 0x0 (Blank) | 0x1 (SET+) | 0x0 (Blank) | 0x1 (CNCL) | 0x0 (Blank) | 0x1 (SET-) |
| ASL Standby | X | 0x0 (Off) |  0x1 (Denied) | X | X | 0x1 (On – passive) | 0x0 (Inactive) | 0x0 (Inactive) | 0x0 (Blank) | 0x2 (SET) | 0x0 (Blank) | 0x2 (RES) | 0x0 (Blank) | 0x0 (Blank) |
| ASL Override | X | 0x0 (Off) |  0x1 (Denied) | X | X | 0x3 (On - passive – overridden) | 0x0 (Inactive) | 0x0 (Inactive) | 0x0 (Blank) | 0x2 (SET) | 0x0 (Blank) | 0x1 (CNCL) | 0x0 (Blank) | 0x2 (RES) |
| Classic Cruise On | 0x0 (Normal Cruise) | 0x5 (Active) | X | 0x0 (Deactivate) | 0x0 (Off) | 0x0 (Inactive) | 0x0 (Inactive) | 0x0 (Blank) | 0x1 (SET+) | 0x0 (Blank) | 0x1 (CNCL) | 0x0 (Blank) | 0x1 (SET-) |
| Classic Cruise  Standby | 0x0 (Normal Cruise) | 0x2 (Standby Denied) |  0x3 (Standby) | X | 0x0 (Deactivate) | 0x0 (Off) | 0x0 (Inactive) | 0x0 (Inactive) | 0x0 (Blank) | 0x2 (SET) | 0x0 (Blank) | 0x2 (RES) | 0x0 (Blank) | 0x0 (Blank) |
| Classic Cruise  Override | 0x0 (Normal Cruise) | 0x5 (Active) | X | 0x1 (Activate) | 0x0 (Off) | 0x0 (Inactive) | 0x0 (Inactive) | 0x0 (Blank) | 0x2 (SET) | 0x0 (Blank) | 0x1 (CNCL) | 0x0 (Blank) | 0x0 (Blank) |

##### Active Switch State Tables

###### Primary\_Active\_Switch State Table

| **Primary\_Active\_Menu** | **Primary\_**  **Switch\_**  **Highlight** | **ASLD\_Cfg** | **Position\_1\_Function** | **Position\_2\_Function** | **Position\_4\_Function** | **Position\_5\_Function** | **Position\_7\_Function** | **Position\_8\_Function** | **Primary\_Active\_Switch** | **ICON** | **Primary\_Press\_**  **Inhibit\_Flag** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0x0 (Inactive) | 0x0 | X | X | X | X | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
|  | 0x1 | X | X | X | X | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
|  | 0x2 | X | X | X | X | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
|  | 0x3 | X | X | X | X | X | X | X | 0x00 (Null) | Blank | 0x1 (True) |
|  | 0x4 | X | X | X | X | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
|  | 0x5 | X | X | X | X | X | X | X | 0x00 (Null) | Blank | 0x1 (True) |
|  | 0x6 | X | X | X | X | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
|  | 0x7 | X | X | X | X | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
|  | 0x8 | X | X | X | X | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
|  | 0x9 | X | X | X | X | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
|  | 0xA-0xF | X | X | X | X | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
| 0x1 (ADAS Control) | 0x0 | X | X | X | X | X | X | X | 0x10 (Null) | Blank | 0x0 (False) |
|  | 0x1 | X | 0x0 | X | X | X | X | X | 0x10 (Null) | Blank | 0x0 (False) |
|  | 0x1 | X | 0x1 | X | X | X | X | X | 0x11 (GAP+) |  | 0x0 (False) |
|  | 0x2 | X | X | 0x0 | X | X | X | X | 0x20 (Null) | Blank | 0x0 (False) |
|  | 0x2 | X | X | 0x1 | X | X | X | X | 0x21 (Set+) |  | 0x0 (False) |
|  | 0x2 | X | X | 0x2 | X | X | X | X | 0x22 (Set) |  | 0x0 (False) |
|  | 0x3 | X | X | X | X | X | X | X | 0x30 (ACC On/Off Toggle) |  | 0x1 (True) |
|  | 0x4 | X | X | X | 0x0 | X | X | X | 0x40 (Null) | Blank | 0x0 (False) |
|  | 0x4 | X | X | X | 0x1 | X | X | X | 0x41 (Gap Adjust) |  | 0x0 (False) |
|  | 0x5 | X | X | X | X | 0x0 | X | X | 0x50 (Null) | Blank | 0x1 (True) |
|  | 0x5 | X | X | X | X | 0x1 | X | X | 0x51 (Cancel) |  | 0x1 (True) |
|  | 0x5 | X | X | X | X | 0x2 | X | X | 0x52 (Resume) |  | 0x1 (True) |
|  | 0x6 | 0x0 | X | X | X | X | X | X | 0x60 (Null) | Blank | 0x0 (False) |
|  | 0x6 | 0x1 | X | X | X | X | X | X | 0x61 (Speed Limiter) |  | 0x0 (False) |
|  | 0x7 | X | X | X | X | X | 0x0 | X | 0x70 (Null) | Blank | 0x0 (False) |
|  | 0x7 | X | X | X | X | X | 0x1 | X | 0x71 (GAP-) |  | 0x0 (False) |
|  | 0x8 | X | X | X | X | X | X | 0x0 | 0x80 (Null) | Blank | 0x0 (False) |
|  | 0x8 | X | X | X | X | X | X | 0x1 | 0x81 (Set-) |  | 0x0 (False) |
|  | 0x8 | X | X | X | X | X | X | 0x2 | 0x82 (Resume) |  | 0x0 (False) |
|  | 0x9 | X | X | X | X | X | X | X | 0x90 (Lane Keep System On/Off) |  | 0x0 (False) |
|  | 0xA-0xF | X | X | X | X | X | X | X | 0x10 (Null) | Blank | 0x0 (False) |

###### Secondary\_Active\_Switch State Table

| **Secondary\_Active\_Menu** | **Secondary\_**  **Switch\_Highlight** | **Warning\_Switch\_Flag** | **Speed\_Locked\_**  **Setting\_Flag** | **Driver\_**  **Adjustment\_Cfg** | **Secondary\_**  **Active\_Switch** | **ICON** | **Secondary\_Press\_**  **Inhibit\_Flag** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 0x0 (Inactive) | 0x0 | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
| 0x1 | X | X | X | 0x00 (Null) | Blank | 0x1 (True) |
| 0x2 | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
| 0x3 | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
| 0x4 | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
| 0x5 | X | X | X | 0x00 (Null) | Blank | 0x1 (True) |
| 0x6 | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
| 0x7 | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
| 0x8 | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
| 0x9 | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
| 0xA-0xF | X | X | X | 0x00 (Null) | Blank | 0x0 (False) |
| 0x1 (Global Alert) | 0x0 | X | X | X | 0x10 (Null) | Blank | 0x0 (False) |
| 0x1 | X | X | X | 0x10 (Null) | Blank | 0x1 (True) |
| 0x2 | X | X | X | 0x10 (Null) | Blank | 0x0 (False) |
| 0x3 | X | X | X | 0x10 (Null) | Blank | 0x0 (False) |
| 0x4 | X | X | X | 0x10 (Null) | Blank | 0x0 (False) |
| 0x5 | X | X | X | 0x10 (Null) | Blank | 0x1 (True) |
| 0x6 | X | X | X | 0x10 (Null) | Blank | 0x0 (False) |
| 0x7 | X | X | X | 0x10 (Null) | Blank | 0x0 (False) |
| 0x8 | X | X | X | 0x10 (Null) | Blank | 0x0 (False) |
| 0x9 | X | X | X | 0x10 (Null) | Blank | 0x0 (False) |
| 0xA-0xF | X | X | X | 0x10 (Null) | Blank | 0x0 (False) |
| 0x2 (Warning) | 0x0 | X | X | X | 0x20 (Null) | Blank | 0x0 (False) |
| 0x1 | X | X | X | 0x20 (Null) | Blank | 0x1 (True) |
| 0x2 | 0x0 | X | X | 0x20 (Null) | Blank | 0x0 (False) |
| 0x2 | 0x2 (Up/Down/OK) | X | X | 0x22 (Up) |  | 0x0 (False) |
| 0x3 | X | X | X | 0x20 (Null) | Blank | 0x0 (False) |
| 0x4 | X | X | X | 0x20 (Null) | Blank | 0x0 (False) |
| 0x5 | 0x0 | X | X | 0x20 (Null) | Blank | 0x1 (True) |
| 0x5 | 0x1 (OK) |  0x2 (Up/Down/OK) | X | X | 0x25 (OK) |  | 0x1 (True) |
| 0x6 | X | X | X | 0x20 (Null) | Blank | 0x0 (False) |
| 0x7 | X | X | X | 0x20 (Null) | Blank | 0x0 (False) |
| 0x8 | 0x0 | X | X | 0x20 (Null) | Blank | 0x0 (False) |
| 0x8 | 0x2 (Up/Down/OK) | X | X | 0x28 (Down) |  | 0x0 (False) |
| 0x9 | X | X | X | 0x20 (Null) | Blank | 0x0 (False) |
| 0xA-0xF | X | X | X | 0x20 (Null) | Blank | 0x0 (False) |
| 0x3 (Driver Adjustment Menu) | 0x0 | X | X | X | 0x30 (Null) | Blank | 0x0 (False) |
| 0x1 | X | X | X | 0x31 (Back) |  | 0x1 (True) |
| 0x2 | X | X | X | 0x32 (Steering Wheel Adjust) |  | 0x0 (False) |
| 0x3 | X | X | X | 0x30 (Null) | Blank | 0x0 (False) |
| 0x4 | X | X | (0x0 |0x3) | 0x30 (Null) | Blank | 0x0 (False) |
| 0x4 | X | X | (0x1 |0x2) | 0x34 (Left Mirror Adjust) |  | 0x0 (False) |
| 0x5 | X | X | X | 0x30 (Null) | Blank | 0x1 (True) |
| 0x6 | X | X | (0x0 |0x3) | 0x30 (Null) | Blank | 0x0 (False) |
| 0x6 | X | X | (0x1 |0x2) | 0x36 (Right Mirror Adjust) |  | 0x0 (False) |
| 0x7 | X | X | (0x0 |0x2 | 0x3) | 0x30 (Null) | Blank | 0x0 (False) |
| 0x7 | X | X | (0x1) | 0x37 (Mirror Fold) |  | 0x0 (False) |
| 0x8 | X | X | (0x2) | 0x381 (Mirror Fold) |  | 0x0 (False) |
| 0x8 | X | X | (0x1 | 0x3) | 0x382 (Pedal Adjust) |  | 0x0 (False) |
| 0x9 | X | X | X | 0x30 (Null) | Blank | 0x0 (False) |
| 0xA-0xF | X | X | X | 0x30 (Null) | Blank | 0x0 (False) |
| 0x4 (Steering Wheel Adjust) | 0x0 | X | X | X | 0x40 (Null) | Blank | 0x0 (False) |
| 0x1 | X | X | X | 0x41 (Back) |  | 0x1 (True) |
| 0x2 | X | X | X | 0x42 (Adjust Up) |  | 0x0 (False) |
| 0x3 | X | X | X | 0x40 (Null) | Blank | 0x0 (False) |
| 0x4 | X | X | X | 0x44 (Adjust In) |  | 0x0 (False) |
| 0x5 | X | X | X | 0x40 (Null) | Blank | 0x1 (True) |
| 0x6 | X | X | X | 0x46 (Adjust Out) |  | 0x0 (False) |
| 0x7 | X | X | X | 0x40 (Null) | Blank | 0x0 (False) |
| 0x8 | X | X | X | 0x48 (Adjust Down) |  | 0x0 (False) |
| 0x9 | X | X | X | 0x40 (Null) | Blank | 0x0 (False) |
| 0xA-0xF | X | X | X | 0x40 (Null) | Blank | 0x0 (False) |
| 0x5 (Left Mirror Adjust) | 0x0 | X | X | X | 0x50 (Null) | Blank | 0x0 (False) |
| 0x1 | X | X | X | 0x51 (Back) |  | 0x1 (True) |
| 0x2 | X | X | X | 0x52 (Up) |  | 0x0 (False) |
| 0x3 | X | X | X | 0x50 (Null) | Blank | 0x0 (False) |
| 0x4 | X | X | X | 0x54 (Left) |  | 0x0 (False) |
| 0x5 | X | X | X | 0x55 (Toggle Mirror) |  | 0x1 (True) |
| 0x6 | X | X | X | 0x56 (Right) |  | 0x0 (False) |
| 0x7 | X | X | X | 0x50 (Null) | Blank | 0x0 (False) |
| 0x8 | X | X | X | 0x58 (Down) |  | 0x0 (False) |
| 0x9 | X | X | X | 0x50 (Null) | Blank | 0x0 (False) |
| 0xA-0xF | X | X | X | 0x50 (Null) | Blank | 0x0 (False) |
| 0x6 (Right Mirror Adjust) | 0x0 | X | X | X | 0x60 (Null) | Blank | 0x0 (False) |
| 0x1 | X | X | X | 0x61 (Back) |  | 0x1 (True) |
| 0x2 | X | X | X | 0x62 (Up) |  | 0x0 (False) |
| 0x3 | X | X | X | 0x60 (Null) | Blank | 0x0 (False) |
| 0x4 | X | X | X | 0x64 (Left) |  | 0x0 (False) |
| 0x5 | X | X | X | 0x65 (Toggle Mirror) |  | 0x1 (True) |
| 0x6 | X | X | X | 0x66 (Right) |  | 0x0 (False) |
| 0x7 | X | X | X | 0x60 (Null) | Blank | 0x0 (False) |
| 0x8 | X | X | X | 0x68 (Down) |  | 0x0 (False) |
| 0x9 | X | X | X | 0x60 (Null) | Blank | 0x0 (False) |
| 0xA-0xF | X | X | X | 0x60 (Null) | Blank | 0x0 (False) |
| 0x7 (Pedal Adjust) | 0x0 | X | X | X | 0x70 (Null) | Blank | 0x0 (False) |
| 0x1 | X | X | X | 0x71 (Back) |  | 0x1 (True) |
| 0x2 | X | X | X | 0x72 (Adjust In) |  | 0x0 (False) |
| 0x3 | X | X | X | 0x70 (Null) | Blank | 0x0 (False) |
| 0x4 | X | X | X | 0x70 (Null) | Blank | 0x0 (False) |
| 0x5 | X | X | X | 0x70 (Null) | Blank | 0x1 (True) |
| 0x6 | X | X | X | 0x70 (Null) | Blank | 0x0 (False) |
| 0x7 | X | X | X | 0x70 (Null) | Blank | 0x0 (False) |
| 0x8 | X | X | X | 0x78 (Adjust Out) |  | 0x0 (False) |
| 0x9 | X | X | X | 0x70 (Null) | Blank | 0x0 (False) |
| 0xA-0xF | X | X | X | 0x70 (Null) | Blank | 0x0 (False) |
| 0x8 (Phone – Incoming Call) | 0x0 | X | X | X | 0x80 (Null) | Blank | 0x0 (False) |
| 0x1 | X | X | X | 0x80 (Null) | Blank | 0x1 (True) |
| 0x2 | X | X | X | 0x82 (Accept) |  | 0x0 (False) |
| 0x3 | X | X | X | 0x80 (Null) | Blank | 0x0 (False) |
| 0x4 | X | X | X | 0x80 (Null) | Blank | 0x0 (False) |
| 0x5 | X | X | X | 0x85 (Reject) |  | 0x1 (True) |
| 0x6 | X | X | X | 0x80 (Null) | Blank | 0x0 (False) |
| 0x7 | X | X | X | 0x80 (Null) | Blank | 0x0 (False) |
| 0x8 | X | X | X | 0x80 (Null) | Blank | 0x0 (False) |
| 0x9 | X | X | X | 0x80 (Null) | Blank | 0x0 (False) |
| 0xA-0xF | X | X | X | 0x80 (Null) | Blank | 0x0 (False) |
| 0x9 (Phone – In Call) | 0x0 | X | X | X | 0x90 (Null) | Blank | 0x0 (False) |
| 0x1 | X | X | (0x0) | 0x90 (Null) | Blank | 0x1 (True) |
| 0x1 | X | X | (0x1 | 0x2 | 0x3) | 0x91 (Drive Adjustments) |  | 0x1 (True) |
| 0x2 | X | X | X | 0x92 (Call volume Up) |  | 0x0 (False) |
| 0x3 | X | X | X | 0x90 (Null) | Blank | 0x0 (False) |
| 0x4 | X | X | X | 0x94 (Privacy) |  | 0x0 (False) |
| 0x5 | X | X | X | 0x95 (End Call) |  | 0x1 (True) |
| 0x6 | X | X | X | 0x96 (Mute) |  | 0x0 (False) |
| 0x7 | X | X | X | 0x90 (Null) | Blank | 0x0 (False) |
| 0x8 | X | X | X | 0x98 (Call Volume Down) |  | 0x0 (False) |
| 0x9 | X | X | X | 0x90 (Null) | Blank | 0x0 (False) |
| 0xA-0xF | X | X | X | 0x90 (Null) | Blank | 0x0 (False) |
| 0xA (Text Message Control) | 0x0 | X | X | X | 0xA0 (Null) | Blank | 0x0 (False) |
| 0x1 | X | X | (0x0) | 0xA0 (Null) | Blank | 0x1 (True) |
| 0x1 | X | X | (0x1 | 0x2 | 0x3) | 0xA1 (Drive Adjustments) |  | 0x1 (True) |
| 0x2 | X | X | X | 0xA2 (Hear It) |  | 0x0 (False) |
| 0x3 | X | X | X | 0xA0 (Null) | Blank | 0x0 (False) |
| 0x4 | X | X | X | 0xA4 (Call) |  | 0x0 (False) |
| 0x5 | X | X | X | 0xA5 (Dismiss) |  | 0x1 (True) |
| 0x6 | X | X | X | 0xA6 (Reply) |  | 0x0 (False) |
| 0x7 | X | X | X | 0xA0 (Null) | Blank | 0x0 (False) |
| 0x8 | X | 0x0 (False) | X | 0xA8 (Read It) |  | 0x0 (False) |
| 0x8 | X | 0x1 (True) | X | 0xA0 (Null) | Blank | 0x0 (False) |
| 0x9 | X | X | X | 0xA0 (Null) | Blank | 0x0 (False) |
| 0xA-0xF | X | X | X | 0xA0 (Null) | Blank | 0x0 (False) |
| 0xB (ETM/Media Control) | 0x0 | X | X | X | 0xB0 (Null) | Blank | 0x0 (False) |
| 0x1 | X | X | (0x0) | 0xB0 (Null) | Blank | 0x1 (True) |
| 0x1 | X | X | (0x1 | 0x2 | 0x3) | 0xB1 (Drive Adjustments) |  | 0x1 (True) |
| 0x2 | X | X | X | 0xB2 (Up) |  | 0x0 (False) |
| 0x3 | X | X | X | 0xB3 (Volume Up) |  | 0x0 (False) |
| 0x4 | X | X | X | 0xB4 (Seek Backward) |  | 0x0 (False) |
| 0x5 | X | X | X | 0xB5 (OK) |  | 0x1 (True) |
| 0x6 | X | X | X | 0xB6 (Seek Forward) |  | 0x0 (False) |
| 0x7 | X | X | X | 0xB7 (Push to Talk, aka Digital Assistant) |  | 0x0 (False) |
| 0x8 | X | X | X | 0xB8 (Down) |  | 0x0 (False) |
| 0x9 | X | X | X | 0xB9 (Volume Down) |  | 0x0 (False) |
| 0xA-0xF | X | X | X | 0xB0 (Null) | Blank | 0x0 (False) |
| 0xC (Media Control) | 0x0 | X | X | X | 0xC0 (Null) | Blank | 0x0 (False) |
| 0x1 | X | X | (0x0) | 0xC0 (Null) | Blank | 0x1 (True) |
| 0x1 | X | X | (0x1 | 0x2 | 0x3) | 0xC1 (Drive Adjustments) |  | 0x1 (True) |
| 0x2 | X | X | X | 0xC2 (Volume Up) |  | 0x0 (False) |
| 0x3 | X | X | X | 0xC0 (Null) | Blank | 0x0 (False) |
| 0x4 | X | X | X | 0xC4 (Seek Backward) |  | 0x0 (False) |
| 0x5 | X | X | X | 0xC5 (ETM) | Blank | 0x1 (True) |
| 0x6 | X | X | X | 0xC6 (Seek Forward) |  | 0x0 (False) |
| 0x7 | X | X | X | 0xC7 (Push to Talk, aka Digital Assistant) |  | 0x0 (False) |
| 0x8 | X | X | X | 0xC8 (Volume Down) |  | 0x0 (False) |
| 0x9 | X | X | X | 0xC0 (Null) | Blank | 0x0 (False) |
| 0xA-0xF | X | X | X | 0xC0 (Null) | Blank | 0x0 (False) |

##### Active Switch Menu Timers

###### Primary\_Switch\_Timer State Table

| **Primary\_Active\_Menu** | **Primary\_Switch\_Timer** |
| --- | --- |
| 0x0 (Inactive) | N/A |
| 0x1 (ADAS Control) | ADAS\_Control\_TO |

###### Secondary\_Switch\_Timer State Table

| **Secondary\_Active\_Menu** | **Secondary\_Switch\_Timer** |
| --- | --- |
| 0x0 (Inactive) | Inactive\_TO |
| 0x1 (Global Alert) | Inactive\_TO |
| 0x2 (Warning) | Vehicle\_Message\_Control\_TO |
| 0x3 (Driver Adjustment Menu) | Driver\_Adjustments\_Level\_1\_TO |
| 0x4 (Steering Wheel Adjust) | Driver\_Adjustments\_Level\_2\_TO |
| 0x5 (Left Mirror Adjust) | Driver\_Adjustments\_Level\_2\_TO |
| 0x6 (Right Mirror Adjust) | Driver\_Adjustments\_Level\_2\_TO |
| 0x7 (Pedal Adjust) | Driver\_Adjustments\_Level\_2\_TO |
| 0x8 (Phone – Incoming Call) | Phone\_Incoming\_Call\_TO |
| 0x9 (Phone – In Call) | Phone\_In\_Call\_TO |
| 0xA (Text Message Control) | Text\_Message\_Control\_TO |
| 0xB (ETM/Media Control) | ETM\_TO |
| 0xC (Media Control) | Media\_Control\_TO |

##### Switch Press State Diagrams

###### Primary\_Switch\_Press State Diagram



###### Secondary\_Switch\_Press State Diagram



##### Switch Action on Press

###### Primary\_Switch\_Press Action on Press

AccButtnGapDecPress4 State Table

| **Primary\_Active\_Switch** | **Primary\_Switch\_Press** | **AccButtnGapDecPress4** |
| --- | --- | --- |
| 0x11 (GAP+) | 0x1 (True) | 0x1 (Pressed) |
| 0x0 (False) | 0x0 (Not pressed) |
| All Other Cases | | 0x0 (Not pressed) |

CcAslButtnSetIncPress3 State Table

| **Primary\_Active\_Switch** | **Primary\_Switch\_Press** | **CcAslButtnSetIncPress3** |
| --- | --- | --- |
| 0x21 (Set+) |  0x22 (Set) | 0x1 (True) | 0x1 (Pressed) |
| 0x0 (False) | 0x0 (Not pressed) |
| All Other Cases | | 0x0 (Not pressed) |

CcButtnOnOffPress3 State Table

| **Primary\_Active\_Switch** | **Primary\_Switch\_Press** | **CcButtnOnOffPress3** |
| --- | --- | --- |
| 0x30 (ACC On/Off Toggle) | 0x1 (True) | 0x1 (Pressed) |
| 0x0 (False) | 0x0 (Not pressed) |
| All Other Cases | | 0x0 (Not pressed) |

GAP\_Menu\_Toggle State Table

| **Primary\_Active\_Switch** | **Primary\_Switch\_Press** | **GAP\_Menu\_Toggle** |
| --- | --- | --- |
| 0x41 (Gap Adjust) | 0x1 (True) | 0x1 (True) |
| 0x0 (False) | No State Change |
| All Other Cases | | No State Change |

CcAslButtnCnclPress3 State Table

| **Primary\_Active\_Switch** | **Primary\_Switch\_Press** | **CcAslButtnCnclPress3** |
| --- | --- | --- |
| 0x51 (Cancel) | 0x1 (True) | 0x1 (Pressed) |
| 0x0 (False) | 0x0 (Not pressed) |
| All Other Cases | | 0x0 (Not pressed) |

CcAsllButtnResPress3 State Table

| **Primary\_Active\_Switch** | **Primary\_Switch\_Press** | **CcAsllButtnResPress3** |
| --- | --- | --- |
| 0x52 (Resume) |  0x82 (Resume) | 0x1 (True) | 0x1 (Pressed) |
| 0x0 (False) | 0x0 (Not pressed) |
| All Other Cases | | 0x0 (Not pressed) |

AslButtnOnOffPress3 State Table

| **Primary\_Active\_Switch** | **Primary\_Switch\_Press** | **AslButtnOnOffPress3** |
| --- | --- | --- |
| 0x61 (Speed Limiter) | 0x1 (True) | 0x1 (Pressed) |
| 0x0 (False) | 0x0 (Not pressed) |
| All Other Cases | | 0x0 (Not pressed) |

AccButtnGapIncPress4 State Table

| **Primary\_Active\_Switch** | **Primary\_Switch\_Press** | **AccButtnGapIncPress4** |
| --- | --- | --- |
| 0x71 (GAP-) | 0x1 (True) | 0x1 (Pressed) |
| 0x0 (False) | 0x0 (Not pressed) |
| All Other Cases | | 0x0 (Not pressed) |

CcAslButtnSetDecPress3 State Table

| **Primary\_Active\_Switch** | **Primary\_Switch\_Press** | **CcAslButtnSetDecPress3** |
| --- | --- | --- |
| 0x81 (Set-) | 0x1 (True) | 0x1 (Pressed) |
| 0x0 (False) | 0x0 (Not pressed) |
| All Other Cases | | 0x0 (Not pressed) |

TjaButtnOnOffPress4 State Table

| **Primary\_Active\_Switch** | **Primary\_Switch\_Press** | **TjaButtnOnOffPress4** |
| --- | --- | --- |
| 0x90 (Lane Keep System On/Off) | 0x1 (True) | 0x1 (Pressed) |
| 0x0 (False) | 0x0 (Not pressed) |
| All Other Cases | | 0x0 (Not pressed) |

###### Secondary\_Switch\_Press Action on Press

Some state tables have a row that looks for a transition away from the Active switch. This is necessary to stop the current action if the Active switch changes before the button press becomes 0x0 (False). Examples include a new Active\_Menu or when the Press and Touch end at the same time because when the Touch ends then Secondary\_Active\_Switch = 0x0 (Inactive).

ETM\_Mode State Diagram



ETM\_Switch\_Hold\_Timer = 0 s condition will not prevent setting Secondary\_Active\_Menu = 0x2 (Warning) if a warning is Active in the during the Secondary\_Press\_Inhibit\_Timer period after Ignition transitions to Normal | Crank. Therefore, the OK press is OR’ed the with the ETM switch press. The ETM\_Pending\_Flag = 0x0 (False) condition is used to prevent other switch menus from taking over switches when actively trying to enter ETM.

L\_OK\_Switch\_Hold\_Timer State Diagram



ETM\_Switch\_Hold\_Timer State Diagram



L\_CursorUp\_Switch\_Press State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **L\_CursorUp\_Switch\_Press** |
| --- | --- | --- |
| 0x22 (Up) |  0xB2 (Up) | 0x1 (True) | 0x1 (True) |
| 0x0 (False) | 0x0 (False) |
| All Other Cases | | 0x0 (False) |

L\_OK\_Switch\_Press State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **L\_OK\_Switch\_Press** |
| --- | --- | --- |
| 0x25 (OK) |  0xB5 (OK) | 0x1 (True) | 0x1 (True) |
| 0x0 (False) | 0x0 (False) |
| All Other Cases | | 0x0 (False) |

L\_CursorDown\_Switch\_Press State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **L\_CursorDown\_Switch\_Press** |
| --- | --- | --- |
| 0x28 (Down) |  0xB8 (Down) | 0x1 (True) | 0x1 (True) |
| 0x0 (False) | 0x0 (False) |
| All Other Cases | | 0x0 (False) |

Driver\_Adjustment\_Flag State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **Driver\_Adjustment\_Flag** |
| --- | --- | --- |
| 0x31 (Back) | 0x1 (True) | 0x0 (False) |
| 0x0 (False) | 0x1 (True) |
| All Other Cases | | No State Change |

Steering\_Wheel\_Adjust\_Flag State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **Driver\_Adjustment\_Flag** | **Steering\_Wheel\_Adjust\_Flag** |
| --- | --- | --- | --- |
| 0x32 (Steering Wheel Adjust) | 0x1 (True) | 0x0 (False) | 0x1 (True) |
| 0x0 (False) | 0x1 (True) | 0x0 (False) |
| All Other Cases | | No State Change | No State Change |

Left\_Mirror\_Adjust\_Flag State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **MirrorSelFold\_D\_Rq** | **Driver\_Adjustment\_Flag** | **Left\_Mirror\_Adjust\_Flag** |
| --- | --- | --- | --- | --- |
| 0x34 (Left Mirror Adjust) | 0x1 (True) | 0x1 (Left) | 0x0 (False) | 0x1 (True) |
| 0x0 (False) | 0x0 (Null) | 0x1 (True) | 0x0 (False) |
| All Other Cases | | No State Change | No State Change | No State Change |

Right\_Mirror\_Adjust\_Flag State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **MirrorSelFold\_D\_Rq** | **Driver\_Adjustment\_Flag** | **Right\_Mirror\_Adjust\_Flag** |
| --- | --- | --- | --- | --- |
| 0x36 (Right Mirror Adjust) | 0x1 (True) | 0x2 (Right) | 0x0 (False) | 0x1 (True) |
| 0x0 (False) | 0x0 (Null) | 0x1 (True) | 0x0 (False) |
| All Other Cases | | No State Change | No State Change | No State Change |

Mirror Fold State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **MirrorSelFold\_D\_Rq** |
| --- | --- | --- |
| 0x37 (Mirror Fold) | 0x1 (True) | 0x3 (Fold\_Unfold) |
| 0x0 (False) | 0x0 (Null) |
| 0x37 (Mirror Fold) 🡪  ! 0x37 (Mirror Fold) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Mirror Fold State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **MirrorSelFold\_D\_Rq** |
| --- | --- | --- |
| 0x381 (Mirror Fold) | 0x1 (True) | 0x3 (Fold\_Unfold) |
| 0x0 (False) | 0x0 (Null) |
| 0x381 (Mirror Fold) 🡪  ! 0x381 (Mirror Fold) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Pedal\_Adjust\_Flag State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **Driver\_Adjustment\_Flag** | **Pedal\_Adjust\_Flag** |
| --- | --- | --- | --- |
| 0x382 (Pedal Adjust) | 0x1 (True) | 0x0 (False) | 0x1 (True) |
| 0x0 (False) | 0x1 (True) | 0x0 (False) |
| All Other Cases | | No State Change | No State Change |

Back Press From Steering Wheel Adjust State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **StewPosAdjTel\_D\_Rq** | **StewPosAdjTlt\_D\_Rq** | **Driver\_Adjustment\_Flag** | **Steering\_Wheel\_**  **Adjust\_Flag** |
| --- | --- | --- | --- | --- | --- |
| 0x41 (Back) | 0x1 (True) | 0x0 (Null) | 0x0 (Null) | 0x1 (True) | 0x0 (False) |
| 0x0 (False) | No State Change | No State Change | 0x0 (False) | 0x1 (True) |
| All Other Cases | | No State Change | No State Change | No State Change | No State Change |

Steering Wheel Up State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **StewPosAdjTlt\_D\_Rq** |
| --- | --- | --- |
| 0x42 (Adjust Up) | 0x1 (True) | 0x1 (Up) |
| 0x0 (False) | 0x0 (Null) |
| 0x42 (Adjust Up) 🡪  ! 0x42 (Adjust Up) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Steering Wheel In State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **StewPosAdjTel\_D\_Rq** |
| --- | --- | --- |
| 0x44 (Adjust In) | 0x1 (True) | 0x2 (In) |
| 0x0 (False) | 0x0 (Null) |
| 0x44 (Adjust In) 🡪  ! 0x44 (Adjust In) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Steering Wheel Out State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **StewPosAdjTel\_D\_Rq** |
| --- | --- | --- |
| 0x46 (Adjust Out) | 0x1 (True) | 0x1 (Out) |
| 0x0 (False) | 0x0 (Null) |
| 0x46 (Adjust Out) 🡪  ! 0x46 (Adjust Out) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Steering Wheel Down State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **StewPosAdjTlt\_D\_Rq** |
| --- | --- | --- |
| 0x48 (Adjust Down) | 0x1 (True) | 0x2 (Down) |
| 0x0 (False) | 0x0 (Null) |
| 0x48 (Adjust Down) 🡪  ! 0x48 (Adjust Down) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Back Press From Left Mirror Adjust State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **MirrorSelFold\_D\_Rq** | **ExtMirrorAdj\_D\_Rq** | **Driver\_Adjustment\_Flag** | **Left\_Mirror\_**  **Adjust\_Flag** |
| --- | --- | --- | --- | --- | --- |
| 0x51 (Back) | 0x1 (True) | 0x0 (Null) | 0x0 (Null) | 0x1 (True) | 0x0 (False) |
| 0x0 (False) | No State Change | No State Change | 0x0 (False) | 0x1 (True) |
| All Other Cases | | No State Change | No State Change | No State Change | No State Change |

Left Mirror Up State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ExtMirrorAdj\_D\_Rq** |
| --- | --- | --- |
| 0x52 (Up) | 0x1 (True) | 0x2 (Up) |
| 0x0 (False) | 0x0 (Null) |
| 0x52 (Up) 🡪  ! 0x52 (Up) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Left Mirror Left State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ExtMirrorAdj\_D\_Rq** |
| --- | --- | --- |
| 0x54 (Left) | 0x1 (True) | 0x3 (Left) |
| 0x0 (False) | 0x0 (Null) |
| 0x54 (Left) 🡪  ! 0x54 (Left) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Mirror Toggle State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **MirrorSelFold\_D\_Rq** | **Left\_Mirror\_Adjust\_Flag** | **Right\_Mirror\_Adjust\_Flag** |
| --- | --- | --- | --- | --- |
| 0x55 (Toggle Mirror) | 0x1 (True) | 0x2 (Right) | 0x0 (False) | 0x1 (True) |
| 0x0 (False) | No State Change | 0x1 (True) | 0x0 (False) |
| All Other Cases | | No State Change | No State Change | No State Change |

Left Mirror Right State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ExtMirrorAdj\_D\_Rq** |
| --- | --- | --- |
| 0x56 (Right) | 0x1 (True) | 0x4 (Right) |
| 0x0 (False) | 0x0 (Null) |
| 0x56 (Right) 🡪  ! 0x56 (Right) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Left Mirror Down State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ExtMirrorAdj\_D\_Rq** |
| --- | --- | --- |
| 0x58 (Down) | 0x1 (True) | 0x1 (Down) |
| 0x0 (False) | 0x0 (Null) |
| 0x58 (Down) 🡪  ! 0x58 (Down) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Back Press from Right Mirror Adjust State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **MirrorSelFold\_D\_Rq** | **ExtMirrorAdj\_D\_Rq** | **Driver\_Adjustment\_Flag** | **Right\_Mirror\_**  **Adjust\_Flag** |
| --- | --- | --- | --- | --- | --- |
| 0x61 (Back) | 0x1 (True) | 0x0 (Null) | 0x0 (Null) | 0x1 (True) | 0x0 (False) |
| 0x0 (False) | No State Change | No State Change | 0x0 (False) | 0x1 (True) |
| All Other Cases | | No State Change | No State Change | No State Change | No State Change |

Right Mirror Up State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ExtMirrorAdj\_D\_Rq** |
| --- | --- | --- |
| 0x62 (Up) | 0x1 (True) | 0x2 (Up) |
| 0x0 (False) | 0x0 (Null) |
| 0x62 (Up) 🡪  ! 0x62 (Up) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Right Mirror Left State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ExtMirrorAdj\_D\_Rq** |
| --- | --- | --- |
| 0x64 (Left) | 0x1 (True) | 0x3 (Left) |
| 0x0 (False) | 0x0 (Null) |
| 0x64 (Left) 🡪  ! 0x64 (Left) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Mirror Toggle State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **MirrorSelFold\_D\_Rq** | **Left\_Mirror\_Adjust\_Flag** | **Right\_Mirror\_Adjust\_Flag** |
| --- | --- | --- | --- | --- |
| 0x65 (Toggle Mirror) | 0x1 (True) | 0x1 (Left) | 0x1 (True) | 0x0 (False) |
| 0x0 (False) | No State Change | 0x0 (False) | 0x1 (True) |
| All Other Cases | | No State Change | No State Change | No State Change |

Right Mirror Right State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ExtMirrorAdj\_D\_Rq** |
| --- | --- | --- |
| 0x66 (Right) | 0x1 (True) | 0x4 (Right) |
| 0x0 (False) | 0x0 (Null) |
| 0x66 (Right) 🡪  ! 0x66 (Right) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Right Mirror Down State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ExtMirrorAdj\_D\_Rq** |
| --- | --- | --- |
| 0x68 (Down) | 0x1 (True) | 0x1 (Down) |
| 0x0 (False) | 0x0 (Null) |
| 0x68 (Down) 🡪  ! 0x68 (Down) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Back Press From Pedal Adjust State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **PdlSwtch\_Stat** | **Driver\_Adjustment\_Flag** | **Pedal\_Adjust\_Flag** |
| --- | --- | --- | --- | --- |
| 0x71 (Back) | 0x1 (True) | 0x0 (Null) | 0x1 (True) | 0x0 (False) |
| 0x0 (False) | No State Change | 0x0 (False) | 0x1 (True) |
| All Other Cases | | No State Change | No State Change | No State Change |

Pedal In State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **PdlSwtch\_Stat** |
| --- | --- | --- |
| 0x72 (Adjust In) | 0x1 (True) | 0x1 (Forward) |
| 0x0 (False) | 0x0 (Null) |
| 0x72 (Adjust In) 🡪  ! 0x72 (Adjust In) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Pedal Out State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **PdlSwtch\_Stat** |
| --- | --- | --- |
| 0x78 (Adjust Out) | 0x1 (True) | 0x2 (Rearward) |
| 0x0 (False) | 0x0 (Null) |
| 0x78 (Adjust Out) 🡪  ! 0x78 (Adjust Out) | X | 0x0 (Null) |
| All Other Cases | | No State Change |

Accept Call State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0x82 (Accept) | 0x1 (True) | 0x45 (Send) | 0x1 (Pressed) |
| 0x0 (False) | 0x45 (Send) | 0x0 (Not\_Pressed) |
| 0x82 (Accept) 🡪  ! 0x82 (Accept) | X | 0x45 (Send) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Reject Call State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0x85 (Reject) | 0x1 (True) | 0x46 (End) | 0x1 (Pressed) |
| 0x0 (False) | 0x46 (End) | 0x0 (Not\_Pressed) |
| 0x85 (Reject) 🡪  ! 0x85 (Reject) | X | 0x46 (End) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Drive Adjustment State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **Driver\_Adjustment\_Flag** |
| --- | --- | --- |
| 0x91 (Drive Adjustments) | 0x1 (True) | 0x1 (True) |
| 0x0 (False) | 0x0 (False) |
| All Other Cases | | No State Change |

Call volume Up State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0x92 (Call volume Up) | 0x1 (True) | 0xFD (Volume Up) | 0x1 (Pressed) |
| 0x0 (False) | 0xFD (Volume Up) | 0x0 (Not\_Pressed) |
| 0x92 (Call volume Up) 🡪  ! 0x92 (Call volume Up) | X | 0xFD (Volume Up) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Privacy State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0x94 (Privacy) | 0x1 (True) | 0x98 (Phone\_Privacy) | 0x1 (Pressed) |
| 0x0 (False) | 0x98 (Phone\_Privacy) | 0x0 (Not\_Pressed) |
| 0x94 (Privacy) 🡪  ! 0x94 (Privacy) | X | 0x98 (Phone\_Privacy) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

End Call State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0x95 (End Call) | 0x1 (True) | 0x46 (End) | 0x1 (Pressed) |
| 0x0 (False) | 0x46 (End) | 0x0 (Not\_Pressed) |
| 0x95 (End Call) 🡪  ! 0x95 (End Call) | X | 0x46 (End) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Mute State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0x96 (Mute) | 0x1 (True) | 0x44 (Mute) | 0x1 (Pressed) |
| 0x0 (False) | 0x44 (Mute) | 0x0 (Not\_Pressed) |
| 0x96 (Mute) 🡪  ! 0x96 (Mute) | X | 0x44 (Mute) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Call Volume Down State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0x98 (Call Volume Down) | 0x1 (True) | 0xFE (Volume Down) | 0x1 (Pressed) |
| 0x0 (False) | 0xFE (Volume Down) | 0x0 (Not\_Pressed) |
| 0x98 (Call Volume Down) 🡪  ! 0x98 (Call Volume Down) | X | 0xFE (Volume Down) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Drive Adjustment State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **Driver\_Adjustment\_Flag** |
| --- | --- | --- |
| 0xA1 (Drive Adjustments) | 0x1 (True) | 0x1 (True) |
| 0x0 (False) | 0x0 (False) |
| All Other Cases | | No State Change |

Hear It State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0xA2 (Hear It) | 0x1 (True) | 0x99 (Listen\_Text) | 0x1 (Pressed) |
| 0x0 (False) | 0x99 (Listen\_Text) | 0x0 (Not\_Pressed) |
| 0xA2 (Hear It) 🡪  ! 0xA2 (Hear It) | X | 0x99 (Listen\_Text) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Call State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0xA4 (Call) | 0x1 (True) | 0x9D (Call Text) | 0x1 (Pressed) |
| 0x0 (False) | 0x9D (Call Text) | 0x0 (Not\_Pressed) |
| 0xA4 (Call) 🡪  ! 0xA4 (Call) | X | 0x9D (Call Text) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Dismiss State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0xA5 (Dismiss) | 0x1 (True) | 0x9C (Dismiss\_Text) | 0x1 (Pressed) |
| 0x0 (False) | 0x9C (Dismiss\_Text) | 0x0 (Not\_Pressed) |
| 0xA5 (Dismiss) 🡪  ! 0xA5 (Dismiss) | X | 0x9C (Dismiss\_Text) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Reply State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0xA6 (Reply) | 0x1 (True) | 0x9B (Reply\_To\_Text) | 0x1 (Pressed) |
| 0x0 (False) | 0x9B (Reply\_To\_Text) | 0x0 (Not\_Pressed) |
| 0xA6 (Reply) 🡪  ! 0xA6 (Reply) | X | 0x9B (Reply\_To\_Text) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Read It State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0xA8 (Read It) | 0x1 (True) | 0x9A (Read\_Text) | 0x1 (Pressed) |
| 0x0 (False) | 0x9A (Read\_Text) | 0x0 (Not\_Pressed) |
| 0xA8 (Read It) 🡪  ! 0xA8 (Read It) | X | 0x9A (Read\_Text) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Drive Adjustment State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **Driver\_Adjustment\_Flag** |
| --- | --- | --- |
| 0xB1 (Drive Adjustments) |  0xC1 (Drive Adjustments) | 0x1 (True) | 0x1 (True) |
| 0x0 (False) | 0x0 (False) |
| All Other Cases | | No State Change |

Volume Up State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0xB3 (Volume Up) |  0xC2 (Volume Up) | 0x1 (True) | 0xFD (Volume Up) | 0x1 (Pressed) |
| 0x0 (False) | 0xFD (Volume Up) | 0x0 (Not\_Pressed) |
| (0xB3 (Volume Up) 🡪  ! 0xB3 (Volume Up)) |  (0xC2 (Volume Up) 🡪  ! 0xC2 (Volume Up)) | X | 0xFD (Volume Up) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Seek Backward State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0xB4 (Seek Backward) |  0xC4 (Seek Backward) | 0x1 (True) | 0x32 (Seek\_Left) | 0x1 (Pressed) |
| 0x0 (False) | 0x32 (Seek\_Left) | 0x0 (Not\_Pressed) |
| (0xB4 (Seek Backward) 🡪  ! 0xB4 (Seek Backward)) |  (0xC4 (Seek Backward) 🡪  ! 0xC4 (Seek Backward)) | X | 0x32 (Seek\_Left) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

ETM State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ETM\_Pending\_Timer** | **ETM\_Switch\_Press** |
| --- | --- | --- | --- |
| 0xC5 (ETM) | 0x1 (True) | Running | 0x1 (True) |
| All Other Cases | | X | 0x0 (False) |

Seek Forward State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0xB6 (Seek Forward) |  0xC6 (Seek Forward) | 0x1 (True) | 0x33 (Seek\_Right) | 0x1 (Pressed) |
| 0x0 (False) | 0x33 (Seek\_Right) | 0x0 (Not\_Pressed) |
| (0xB6 (Seek Forward) 🡪  ! 0xB6 (Seek Forward)) |  (0xC6 (Seek Forward) 🡪  ! 0xC6 (Seek Forward)) | X | 0x33 (Seek\_Right) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Push to Talk State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0xB7 (Push to Talk) |  0xC7 (Push to Talk) | 0x1 (True) | 0x30 (Voice\_PTT) | 0x1 (Pressed) |
| 0x0 (False) | 0x30 (Voice\_PTT) | 0x0 (Not\_Pressed) |
| (0xB7 (Push to Talk) 🡪  ! 0xB7 (Push to Talk)) |  (0xC7 (Push to Talk) 🡪  ! 0xC7 (Push to Talk)) | X | 0x30 (Voice\_PTT) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

Volume Down State Table

| **Secondary\_Active\_Switch** | **Secondary\_Switch\_Press** | **ButtonID** | **ButtonActivationState** |
| --- | --- | --- | --- |
| 0xB9 (Volume Down) |  0xC8 (Volume Down) | 0x1 (True) | 0xFE (Volume Down) | 0x1 (Pressed) |
| 0x0 (False) | 0xFE (Volume Down) | 0x0 (Not\_Pressed) |
| (0xB9 (Volume Down) 🡪  ! 0xB9 (Volume Down)) |  (0xC8 (Volume Down) 🡪  ! 0xC8 (Volume Down)) | X | 0xFE (Volume Down) | 0x0 (Not\_Pressed) |
| All Other Cases | | No State Change | No State Change |

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

##### Primary\_Active\_Switch

* When the ACC On/Off Toggle button is pressed, a request to toggle the state of ACC/CC shall be sent.
* When the Cancel button is pressed, a request to cancel ACC/CC/ASL shall be sent.
* When the GAP- button is pressed, a request to decrease the ACC gap shall be sent.
* When the Gap Adjust button is pressed, a request to display the Gap Adjust menu shall be sent.
* When the GAP+ button is pressed, a request to increase the ACC gap shall be sent.
* When the Lane Keep System On/Off button is pressed, a request to toggle the state of LKS shall be sent.
* When the Resume button is pressed, a request to resume ACC/CC/ASL shall be sent.
* When the Set button is pressed, a request to set ACC/CC/ASL speed shall be sent.
* When the Set- button is pressed, a request to decrease ACC/CC/ASL set speed shall be sent.
* When the Set+ button is pressed, a request to increase ACC/CC/ASL set speed shall be sent.
* When the Speed Limiter button is pressed, a request to toggle ASL state shall be sent.

##### Secondary\_Active\_Switch

* When the Up button is pressed, a request to scroll up shall be sent.
* When the OK button is pressed, a request to acknowledge a warning or make a selection shall be sent.
* When the Down button is pressed, a request to scroll down shall be sent.
* When the Back button is pressed, a request to return to the previous menu shall be sent.
* When the Steering Wheel Adjust button is pressed, a request to go to the Steering Wheel Adjust menu shall be sent.
* When the Left Mirror Adjust button is pressed, a request to go to the Left Mirror Adjust menu shall be sent.
* When the Right Mirror Adjust button is pressed, a request to go to the Right Mirror Adjust menu shall be sent.
* When the Mirror Fold button is pressed, a request to toggle the fold state of the mirror shall be sent.
* When the Pedal Adjust button is pressed, a request to go to the Pedal Adjust menu shall be sent.
* When the Adjust Up button is pressed, a request to adjust the steering wheel up shall be sent.
* When the Adjust In button is pressed, a request to adjust the steering wheel in shall be sent.
* When the Adjust Out button is pressed, a request to adjust the steering wheel out shall be sent.
* When the Adjust Down button is pressed, a request to adjust the steering wheel down shall be sent.
* When the Up button is pressed, a request to adjust the selected mirror up shall be sent.
* When the Left button is pressed, a request to adjust the selected mirror left shall be sent.
* When the Toggle Mirror button is pressed, a request to toggle the selected mirror shall be sent.
* When the Right button is pressed, a request to adjust the selected mirror right shall be sent.
* When the Down button is pressed, a request to adjust the selected mirror down shall be sent.
* When the Adjust In button is pressed, a request to adjust the pedal in shall be sent.
* When the Adjust Out button is pressed, a request to adjust the pedal out shall be sent.
* When the Accept button is pressed, a request to accept the incoming phone call shall be sent.
* When the Reject button is pressed, a request to reject the incoming phone call shall be sent.
* When the Drive Adjustments button is pressed, a request to go to the Drive Adjustments menu shall be sent.
* When the Call volume Up button is pressed, a request to increase call volume shall be sent.
* When the Privacy button is pressed, a request to toggle privacy state shall be sent.
* When the End Call button is pressed, a request to end call shall be sent.
* When the Mute button is pressed, a request to toggle call mute state shall be sent.
* When the Call Volume Down button is pressed, a request to decrease call volume shall be sent.
* When the Hear It button is pressed, a request to hear new text shall be sent.
* When the Call button is pressed, a request to call text sender shall be sent.
* When the Dismiss button is pressed, a request to dismiss new text shall be sent.
* When the Reply button is pressed, a request to reply to text shall be sent.
* When the Read It button is pressed, a request to display text message shall be sent.
* When the Volume Up button is pressed, a request to increase media volume shall be sent.
* When the Seek Backward button is pressed, a request to seek backwards shall be sent.
* When the Seek Forward button is pressed, a request to seek forwards shall be sent.
* When the Push to Talk, aka Digital Assistant button is pressed, a request to active digital assistant shall be sent.
* When the Volume Down button is pressed, a request to decrease media volume shall be sent.
* When the ETM button is pressed, a request to enter ETM shall be sent.

##### General

* This feature is only supported when Message\_Center\_Disp\_Interface\_Cfg = 0x4 (Panoramic Display).
* Switch menu content is based on vehicle configuration and feature status. Driver Adjustment features (steering wheel, mirror, pedal) and ASLD (Speed Limiter ) are EOL configurable.
* When a switch is touched, the active switch menu shall be displayed. The active switch menu is determined by the arbitration table.
* When a switch is touched but not pressed, the display shall indicate the switch position touched.
* When a switch is pressed, the display shall indicate the switch position pressed.
* The position shall not change while the switch is pressed. If the switch position changes while the switch is pressed, the associated switch fault flag shall be set, the switch output shall be Inactive, and the display of the switch shall be removed. Switch function shall recover when the switch state changes to Not Pressed. Switch defaults to Not Pressed at Battery Connect, Module wakeup, and switch menu interrupt by a high priority switch menu.
* Each switch menu shall timeout after a defined period of inactivity (i.e. no switch touch).
* A switch position with an assigned graphic in the switch menu shall generate a response when the switch state transitions from 0x0 (Not Pressed) to 0x1 (Pressed).
* Global\_Alert\_Flag shall be set to 0x1 (True) when there is an Active, Not-Reset Global Alert.
* Warning\_Flag shall be set to 0x1 (True) when there is an Active, Not-Reset warning.
* Warning\_OK\_Flag = 0x1 (True) when any Resettable warning is Active and Not Reset.
* Phone\_State\_Flag shall indicate the current state of the phone (ex. Inactive, Incoming Call, or In Call).
* New\_Text\_Flag shall be set to 0x1 (True) when there is a new SMS text available.
* Media\_Flag shall be set to 0x1 (True) when the secondary switch is touched while Inactive.
* If a primary digital switch has been displayed for less than “X” and a position 3 or 5 is pressed on the primary steering wheel switch, the press shall be ignored. If a secondary digital switch has been displayed for less than “Y” and a position 1 or 5 is pressed on the secondary steering wheel switch, the press shall be ignored. “X” and “Y” shall each be configurable and can be set to any value from 0 ms to 500 ms.
* Switches displayed in the switch menu may be accompanied by coaching (ex. control mirror graphic or descriptive text) as defined by HMI.
* The Veh\_V\_ActlEng signal value shall be considered as valid data only when VehVActlEng\_D\_Qf has a value of 0x3 (OK) or 0x2 (Not\_Within\_Specifications).
* The Veh\_V\_ActlEng signal value shall be considered as 0 for this feature when data is invalid.
* The ”Read It” switch shall not be displayed when Speed\_Locked\_Setting\_Flag = 0x1 (True).
* The Speed Limiter switch shall not be displayed when ASLD\_Cfg = 0x0 (Disabled)

#### Function Safety Classification (EMC)

Class B

#### Memory Storage

Output signal on Inter Processor Communication layer

| **Parameter Name** | **Description** | **Value at Battery Connect** | **Value at Module Wakeup** |
| --- | --- | --- | --- |
| #P | Number of pages in the warning. | 1 | 1 |
| #S | Number of selections in the warning, with #S = 0 indicating no selections in the warning. | 0 | 0 |
| AccButtnGapDecPress4 | Output CAN Signal | 0x0 (Not Pressed) | 0x0 (Not Pressed) |
| AccButtnGapIncPress4 | Output CAN Signal | 0x0 (Not Pressed) | 0x0 (Not Pressed) |
| AccMemEnbl\_B\_RqDrv | Input CAN Signal | 0x0 (Normal Cruise) | 0x0 (Normal Cruise) |
| AccStopStat\_D\_DSPLY | Input CAN Signal | 0x0 (NoDisplay) | 0x0 (NoDisplay) |
| AslButtnOnOffPress3 | Output CAN Signal | 0x0 (Not Pressed) | 0x0 (Not Pressed) |
| ASLD\_Cfg | Cfg bit for ASLD | Use stored value | Do Not Init |
| AslIconDsply\_D\_Rq | Input CAN Signal | 0x0 (Off) | 0x0 (Off) |
| ButtonActivationState | Output signal on Inter Processor Communication layer | 0x0 (Not\_Pressed) | 0x0 (Not\_Pressed) |
| ButtonID | Output signal on Inter Processor Communication layer | 0xFF (Inactive) | 0xFF (Inactive) |
| CcAslButtnCnclPress3 | Output CAN Signal | 0x0 (Not Pressed) | 0x0 (Not Pressed) |
| CcAslButtnDeny\_B\_Actl3 | Output CAN Signal | 0x0 (No) | 0x0 (No) |
| CcAslButtnSetDecPress3 | Output CAN Signal | 0x0 (Not Pressed) | 0x0 (Not Pressed) |
| CcAslButtnSetIncPress3 | Output CAN Signal | 0x0 (Not Pressed) | 0x0 (Not Pressed) |
| CcAsllButtnResPress3 | Output CAN Signal | 0x0 (Not Pressed) | 0x0 (Not Pressed) |
| CcButtnOnOffPress3 | Output CAN Signal | 0x0 (Not Pressed) | 0x0 (Not Pressed) |
| CcOvrrdActv\_B\_Actl | Input CAN Signal | 0x0 (Deactivate) | 0x0 (Deactivate) |
| CcStat\_D\_Actl | Input CAN Signal | 0x0 (Off) | 0x0 (Off) |
| Driver\_Adjustment\_Cfg | Cfg bit for driver adjustment features. | Use stored value | Do Not Init |
| Driver\_Adjustment\_Flag | Flag indicating if the Driver Adjustment switch menu is Active. | 0x0 (False) | 0x0 (False) |
| ETM\_Mode | Flag indicating state of ETM Mode. | 0x0 (False) | 0x0 (False) |
| ETM\_Pending\_Flag | Flag indicating an attempt to enter ETM is in progress. | 0x0 (False) | 0x0 (False) |
| ETM\_Switch\_Hold\_Timer | Timer for duration of ETM switch press. | 0s | 0s |
| ETM\_Switch\_Press | Flag indicating state of ETM switch. | 0x0 (False) | 0x0 (False) |
| ExtMirrorAdj\_D\_Rq | Output CAN Signal | 0x0 (Null) | 0x0 (Null) |
| GAP\_Adjust\_Flag | Flag indicating of the GAP Adjustment menu button is shown in the primary switch menu. | 0x0 (Inactive) | 0x0 (Inactive) |
| GAP\_Menu\_Flag | Flag indicating if GAP+/GAP- is shown in the primary switch menu. | 0x0 (Inactive) | 0x0 (Inactive) |
| GAP\_Menu\_Toggle | Flag indicating if the display of the GAP menu should toggle to displayed/not displayed. | 0x0 (False) | 0x0 (False) |
| Global\_Alert\_Flag | Flag indicting if there are any Active, Not-Reset Global Alerts. | 0x0 (False) | 0x0 (False) |
| L\_CursorDown\_Switch\_Press | Flag indicating state of Down switch. | 0x0 (False) | 0x0 (False) |
| L\_CursorUp\_Switch\_Press | Flag indicating state of Up switch. | 0x0 (False) | 0x0 (False) |
| L\_OK\_Switch\_Hold\_Timer | Timer for duration of OK switch press. | 0s | 0s |
| L\_OK\_Switch\_Press | Flag indicating state of OK switch. | 0x0 (False) | 0x0 (False) |
| Left\_Mirror\_Adjust\_Flag | Flag indicating if the Left Mirror Adjust switch menu is Active. | 0x0 (False) | 0x0 (False) |
| Media\_Flag | Flag indicating if the Media switch menu is Active. | 0x0 (False) | 0x0 (False) |
| Message\_Center\_Disp\_Interface\_Cfg | Cfg bit for Message Center Display Interface. | Use stored value | Use stored value |
| MirrorSelFold\_D\_Rq | Output CAN Signal | 0x0 (Null) | 0x0 (Null) |
| New\_Text\_Flag | Flag indicating if the state of New Text. | 0x0 (False) | 0x0 (False) |
| Operational\_Mode | 4-state indicator for cluster operational mode | Limited | Limited, Normal or Crank |
| PdlSwtch\_Stat | Output CAN Signal | 0x0 (Null) | 0x0 (Null) |
| Pedal\_Adjust\_Flag | Flag indicating if the Pedal Adjust switch menu is Active. | 0x0 (False) | 0x0 (False) |
| Phone\_State\_Flag | Flag indicating if the state of the Phone. | 0x0 (Inactive) | 0x0 (Inactive) |
| Position\_1\_Function | Indicates the current function of the secondary switch menu in position 1. | 0x0 (Blank) | 0x0 (Blank) |
| Position\_2\_Function | Indicates the current function of the secondary switch menu in position 2. | 0x0 (Blank) | 0x0 (Blank) |
| Position\_4\_Function | Indicates the current function of the secondary switch menu in position 4. | 0x0 (Blank) | 0x0 (Blank) |
| Position\_5\_Function | Indicates the current function of the secondary switch menu in position 5. | 0x0 (Blank) | 0x0 (Blank) |
| Position\_7\_Function | Indicates the current function of the secondary switch menu in position 7. | 0x0 (Blank) | 0x0 (Blank) |
| Position\_8\_Function | Indicates the current function of the secondary switch menu in position 8. | 0x0 (Blank) | 0x0 (Blank) |
| Previous\_Primary\_Active\_Menu | Flag indicating which primary switch menu was previously Active. | 0x0 (Inactive) | 0x0 (Inactive) |
| Previous\_Secondary\_Active\_Menu | Flag indicating which secondary switch menu was previously Active. | 0x0 (Inactive) | 0x0 (Inactive) |
| Primary\_Active\_Menu | Flag indicting the current active switch menu of the primary switch. | 0x0 (Inactive) | 0x0 (Inactive) |
| Primary\_Active\_Switch | Flag indicating which primary switch position is Active. | 0x0 (Inactive) | 0x0 (Inactive) |
| Primary\_Press\_Inhibit\_Flag | Flag indicating if primary switch position Press is temporarily inhibited on initial display. | 0x1 (True) | 0x1 (True) |
| Primary\_Switch\_Display | Flag indicating which primary switch menu is displayed.  Output signal on Inter Processor Communication layer. | 0x0 (Inactive) | 0x0 (Inactive) |
| Primary\_Switch\_Fault\_Flag | Flag indicating a primary switch fault. | 0x0 (False) | 0x0 (False) |
| Primary\_Switch\_Highlight | Flag indicating which primary switch position is highlighted.  Output signal on Inter Processor Communication layer. | 0x0 (Null) | 0x0 (Null) |
| Primary\_Switch\_Interrupt\_Flag | Flag indicating the previously primary active menu has been interrupted by a higher priority switch menu. | 0x0 (False) | 0x0 (False) |
| Primary\_Switch\_Press | Flag indicating the press status of the Primary\_Active\_Switch.  Output signal on Inter Processor Communication layer. | 0x0 (False) | 0x0 (False) |
| Primary\_Switch\_Timer | Timeout of the Primary\_Active\_Menu. | 0s | 0s |
| Right\_Mirror\_Adjust\_Flag | Flag indicating if the Right Mirror Adjust switch menu is Active. | 0x0 (False) | 0x0 (False) |
| Secondary\_Active\_Menu | Flag indicting the current active switch menu of the secondary switch. | 0x0 (Inactive) | 0x0 (Inactive) |
| Secondary\_Active\_Switch | Flag indicating which secondary switch position is Active. | 0x0 (Inactive) | 0x0 (Inactive) |
| Secondary\_Press\_Inhibit\_Flag | Flag indicating if secondary switch position Press is temporarily inhibited on initial display. | 0x1 (True) | 0x1 (True) |
| Secondary\_Switch\_Display | Flag indicating which secondary switch menu is displayed.  Output signal on Inter Processor Communication layer. | 0x0 (Inactive) | 0x0 (Inactive) |
| Secondary\_Switch\_Fault\_Flag | Flag indicating a secondary switch fault. | 0x0 (False) | 0x0 (False) |
| Secondary\_Switch\_Highlight | Flag indicating which secondary switch position is highlighted.  Output signal on Inter Processor Communication layer. | 0x0 (Null) | 0x0 (Null) |
| Secondary\_Switch\_Interrupt\_Flag | Flag indicating the previously secondary active menu has been interrupted by a higher priority switch menu. | 0x0 (False) | 0x0 (False) |
| Secondary\_Switch\_Press | Flag indicating the press status of the Secondary\_Active\_Switch.  Output signal on Inter Processor Communication layer. | 0x0 (False) | 0x0 (False) |
| Secondary\_Switch\_Timer | Timeout of the Secondary\_Active\_Menu. | 0s | 0s |
| Speed\_Locked\_Setting\_Flag | Used to control entry to/exit from Speed\_Locked features | 0x0 (False) | 0x0 (False) |
| Steering\_Wheel\_Adjust\_Flag | Flag indicating if the Steering Wheel Adjust switch menu is Active. | 0x0 (False) | 0x0 (False) |
| StewPosAdjTel\_D\_Rq | Output CAN Signal | 0x0 (Null) | 0x0 (Null) |
| StewPosAdjTlt\_D\_Rq | Output CAN Signal | 0x0 (Null) | 0x0 (Null) |
| StewSwtchPrim\_D\_Stat | Input CAN Signal | 0x0 (Not Pressed) | 0x0 (Not Pressed) |
| StewSwtchPrimPos\_D\_St | Input CAN Signal | 0x0 (Null) | 0x0 (Null) |
| StewSwtchScnd\_D\_Stat | Input CAN Signal | 0x0 (Not Pressed) | 0x0 (Not Pressed) |
| StewSwtchScndPos\_D\_St | Input CAN Signal | 0x0 (Null) | 0x0 (Null) |
| TjaButtnOnOffPress4 | Output CAN Signal | 0x0 (Not Pressed) | 0x0 (Not Pressed) |
| Veh\_V\_ActlEng | Input CAN Signal | 0x0 | 0x0 |
| VehVActlEng\_D\_Qf | Input CAN Signal | 0x1 (No\_Data\_Exists) | 0x1 (No\_Data\_Exists) |
| VRM\_BTPhoneSts\_St | Input signal on Inter Processor Communication layer | 0x0 (Invalid) | 0x0 (Invalid) |
| VRM\_NewSMS Signal | Input signal on Inter Processor Communication layer | 0x0 (Invalid) | 0x0 (Invalid) |
| Warning\_Flag | Flag indicting if there are any Active, Not-Reset Warnings. | 0x0 (False) | 0x0 (False) |
| Warning\_OK\_Flag | Flag indicting if there are any Active Warnings that require an OK button. | 0x0 (False) | 0x0 (False) |
| Warning\_Switch\_Flag | Flag indicating which switches should be displayed in the Warning switch menu. | 0x0 (Inactive) | 0x0 (Inactive) |

| **Timeout** | **Default** | **Range** | **Resolution** | **Units** |
| --- | --- | --- | --- | --- |
| Inactive\_TO | 0 | 0-15 | 1 | s |
| Vehicle\_Message\_Control\_TO | Infinity | 0-Infinity | 1 | s |
| Driver\_Adjustments\_Level\_1\_TO | 10 | 0-15 | 1 | s |
| Driver\_Adjustments\_Level\_2\_TO | 10 | 0-15 | 1 | s |
| Phone\_Incoming\_Call\_TO | 4 | 0-15 | 1 | s |
| Phone\_In\_Call\_TO | 4 | 0-15 | 1 | s |
| Text\_Message\_Control\_TO | 8 | 0-15 | 1 | s |
| ETM\_TO | 4 | 0-15 | 1 | s |
| Media\_Control\_TO | 4 | 0-15 | 1 | s |
| ADAS\_Control\_TO | 4 | 0-15 | 1 | s |
| Primary\_Press\_Inhibit\_Timer | 450 | 0-500 | 1 | ms |
| Secondary\_Press\_Inhibit\_Timer | 450 | 0-500 | 1 | ms |
| ETM\_Pending\_Timer | 8 | 0-10 | 1 | s |

#### Prove Out

No.

#### Reconfigurable Telltale

No.

#### Message Center Msg

None.

## Error Handling

### Missing Message/Undefined Data 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.

If AccMemEnbl\_B\_RqDrv signal is declared missing, the value shall default to 0x0 (Normal Cruise).

If AccStopStat\_D\_DSPLY signal is declared missing, the value shall default to 0x0 (NoDisplay).

If AslIconDsply\_D\_Rq signal is declared missing, the value shall default to 0x0 (Off).

If CcOvrrdActv\_B\_Actl signal is declared missing, the value shall default to 0x0 (Deactivate).

If CcStat\_D\_Actl signal is declared missing, the value shall default to 0x0 (Off).

If StewSwtchPrim\_D\_Stat signal is declared missing, the value shall default to 0x0 (Not Pressed).

If StewSwtchPrimPos\_D\_St signal is declared missing, the value shall default to 0x0 (Null).

If StewSwtchScnd\_D\_Stat signal is declared missing, the value shall default to 0x0 (Not Pressed).

If StewSwtchScndPos\_D\_St signal is declared missing, the value shall default to 0x0 (Null).

If Veh\_V\_ActlEng signal is declared missing, the value shall default to 0x0 for this feature.

### Invalid Message Strategy

The Veh\_V\_ActlEng signal value shall be considered as valid data only when VehVActlEng\_D\_Qf has a value of 0x3 (OK) or 0x2 (Not\_Within\_Specifications). The Veh\_V\_ActlEng signal value shall be considered as 0 for this feature when data is invalid.

## Diagnostics

### Self Test

None

### Engineering Test Mode

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

### Part II Performance

#### Supported Diagnostic DIDs (Service $22 and $2F)

#### Supported Diagnostic Trouble Codes (DTCs)

| **DTC** | **Description** | **When Logged** |
| --- | --- | --- |
| C23A | Lost Communication With Image Processing Module A | Message missing for more than 5 seconds and configuration enabled. |
| C294 | Lost Communication With Powertrain Control Monitor Module | Message missing for more than 5 seconds and configuration enabled. |
| C212 | Lost Communication With Steering Column Control Module | Message missing for more than 5 seconds and configuration enabled. |

#### DID DExx Configuration

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Block**  **Num** | **Block Description** | **State: Description** | **"0"** | **"1"** | **Default** | **Comments/Information** |
| PACKETED BLOCKS | |  |  |  |  |  |
|  |  |  |  |  |  |  |
| $xx | Option Content (B&A) | SHC Driver Adjustments |  |  | 0x0 | Disabled means feature is not present in the vehicle. Bits are enabled only if feature is present on the vehicle and controlled by SHC. |
|  |  | 0x0 (Disabled) | Encoded | Encoded |  |  |
|  |  | 0x1 (Steering Column, Mirror, Pedal) | Encoded | Encoded |  |  |
|  |  | 0x2 (Steering Column, Mirror) | Encoded | Encoded |  |  |
|  |  | 0x3 (Steering Column, Pedal) | Encoded | Encoded |  |  |
|  |  | 0x4 (Mirror, Pedal) | Encoded | Encoded |  |  |
|  |  | 0x5 (Steering Column) | Encoded | Encoded |  |  |
|  |  | 0x6 (Mirror) | Encoded | Encoded |  |  |
|  |  | 0x7 (Pedal) | Encoded | Encoded |  |  |
|  |  |  |  |  |  |  |
| $00 | Option Content (B&A) | ASLD | Disabled | Enabled | Disabled | Disabled means feature is not present in the vehicle. This feature is only enabled on European vehicles. |
|  |  |  |  |  |  |  |
| $0B | Option Content  (B&A) | Message Center Display Interface | Encoded | Encoded | 0000 | Phoenix program-specific Message center display and Steering wheel interface  SW to treat  0101–1111 as 0000 |
|  |  | 0000 - S-Family Display Interface | Encoded | Encoded |  |  |
|  |  | 0001 - Display with Vision Wheel Interface | Encoded | Encoded |  |  |
|  |  | 0010 - Display with QAM Button Interface | Encoded | Encoded |  |  |
|  |  | 0011 - Mustang Display with QAM Button Interface | Encoded | Encoded |  |  |
|  |  | 0100 – Panoramic Display | Encoded | Encoded |  |  |
|  |  | 0101–1111 - Not Used |  |  |  |  |
|  |  |  |  |  |  | \*Byte and bit location to be identified in Part II Specification for this cluster |

## 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

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FunctionGroupSpec\_SHC\_GE2variant\_v1.0

## Revision History

**SPSS Module Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Revision Level** | **Name** | **Change Description** | **Date** |
| 1.0 | J. Gregoire | Initial Release.  **Peer Review:** Scott Watkins  **DI CC Approval:** 08/30/2021 (Offline)  **Lead program:** MY24 CDX74X, MY24 CDX707, MY25 Y71X, Phoenix  **Change Requester:** Atherton, Brian (B.) [BATHERT5@ford.com](mailto:BATHERT5@ford.com), Li, Richard (R.Y.) [rli13@ford.com](mailto:rli13@ford.com)  **Feature Owner:** Atherton, Brian (B.) [BATHERT5@ford.com](mailto:BATHERT5@ford.com), Li, Richard (R.Y.) [rli13@ford.com](mailto:rli13@ford.com)  **Spec Name:** Steering Wheel Horizon Controller Control Function – FNV2\_v1.0  **VSEM FM Link:**  **VSEM RM Link:**  **Signal Change:** Yes  **Change Request ID:** 696  **Change Request Description:** Initial Release. | DRAFT |
|  |  |  |  |
|  |  |  |  |