Research & Vehicle Technology
"Infotainment Systems Product Development"

Feature –Climate Control

APIM Infotainment Subsystem Part Specific Specification (SPSS)

Version 1.0

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Revision History

Date	Version	Notes	
May 28, 2021	1.0	Initial Release	

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1 Overview

This SPSS will cover Climate Control features.

2 General Requirements

2.1 REQ-389331/A-Message names

All CAN message names included in this Climate System Interface SPSS shall be considered as reference only. Depending on a variety of factors such as vehicle architecture, program content, message packing etc. the specific signals in each requirement may be included in different messages than those specified and/or the message names may be appended with a suffix designating the source bus. Consequently, transmitting and receiving modules shall ensure support of all requirements based on signal names. The program specific CANdb should be consulted to confirm official message name(s) as necessary.

2.2 REQ-389332/A-Invalid Signal state response

Whenever a system interface requirement calls for a signal state to be ignored, the last valid signal state received shall be used unless otherwise specified

2.3 REQ-389333/A-Left hand side vs Right Hand side convention

Unless otherwise specified, all messages/signals/states/designations for Left hand side vs. Right hand side within a system interface requirement shall be interpreted literally and considered independently relative to type of vehicle - Left hand drive vs. Right hand drive.

2.4 REQ-389334/A-Driver side vs Passenger side convention

Unless otherwise specified, all messages/signals/states/designations for Driver vs. Passenger shall be interpreted literally and must be considered relative to type of vehicle - Left hand drive vs. Right hand drive. i.e. if receiving a signal denoted as driver, the receiving module is responsible for applying to proper side based on type of vehicle - Left hand drive vs. Right hand drive

2.5 REQ-389584/A-Initialization

The user interface(s) shall default all climate status displays and indications to off during initialization**.**

2.6 REQ-389582/A-Latency for User Inputs

Timing for any user input (hard or soft) for features such as "press & hold" operation shall comply with requirements described in CX-0027.

2.7 REQ-389345/A-Multiple simultaneous selections - Touchscreen

Signals: Frt_Btn_Status_2nd and Rr_Btn_Status_2nd within **Message**: Clmt_Button_Stat4 are included to support recognition of simultaneous climate selection of up to two functions at a time.

2.8 REQ-392434/A-Stuck Input - Definition

An external interface shall have the ability to determine if any of the climate control inputs are "stuck". A climate input shall be considered "stuck" any time it is reported as having been in a pressed state continuously for $\geq$ 120s

2.9 REQ-389349/A-Stuck Input - Response

If any climate control input is determined to be "stuck", it shall be ignored (i.e. Pressed state for that function shall no longer be transmitted) for the duration of time it is "stuck". Other inputs shall be conditionally accepted per the following:

If all inputs used to direct air to the windshield (i.e. Windscreen and/or Max Defrost) that are part of an external interface become "stuck", the user interface shall continuously transmit:

- Max_Defrost_Pressed state to the climate module for the duration of time that ALL these inputs are "stuck". (If equipped with the Max Defrost function)

- Defrost_Pressed state to the climate module for the duration of time that ALL these inputs are "stuck" (If NOT equipped with the Max Defrost function)

2.10 REQ-389350/A-Stuck Input - Recovery

The status and any associated limitations defined for a "stuck" input shall be cleared when that button/input is no longer considered "stuck".

2.11 REQ-389351/A-Stuck Input – DTCs

The climate module shall not set a stuck button DTC for any input received via a network message. The module sending the press status message to climate module shall set a stuck button DTC as applicable.

3 Functional Definition

3.1 FUN-REQ-410092/A-External interfaces – Front Climate System

3.1.1 Air Quality status display(s)

3.1.1.1 REQ-389359/A-Current Cabin Air Quality

The determination of the actual, current cabin air quality shall be made by the climate module and used in any front or rear interfaces designed to display this information to the user.

Message	Signal	State(s)	Description
ParticulateMatterData2	PmCabn_Conc_Actl	0-500	A user interface shall display this value received (numerically and/or graphically) as the current cabin air quality
		501-509	These signal states are included as a design protect only. Consequently, the climate module shall never transmit these states. If a user interface receives these states, it shall respond as if it has received 'No_Data_Exists' state.
		No_Data_Exists	A user interface shall refer to *Cabin Air Quality Sensor Diagnostic* requirements and update display(s) accordingly.
		Faulty	This signal state is included as a design protect only. Consequently, the climate module shall never transmit this state. If a user interface receives this state it shall respond as if it has received 'No_Data_Exists' state.

3.1.1.2 REQ-389360/A-Historical Cabin Air Quality

The determination of the historical cabin air quality shall be made by the climate module.

Message	Signal	State(s)	Description
ParticulateMatterData1	PmCabn02Mnte_Conc_Actl PmCabn04Mnte_Conc_Actl PmCabn06Mnte_Conc_Actl PmCabn08Mnte_Conc_Actl PmCabn10Mnte_Conc_Actl	0-500	A user interface shall display this value received (numerically and/or graphically) as the cabin air quality associated with the applicable time (previous 2-10 minutes as defined per the signal name).
		No_Data_Exists	A user interface shall blank out any data that would normally be displayed in the area where the associated Cabin data would normally be displayed or graphed
		Faulty	This signal state is included as a design protect only. Consequently, the climate module shall never transmit this state. If a user interface receives this state it shall respond as if it has received 'No_Data_Exists' state.

Message	Signal	State(s)	Description
ParticulateMatterData2	PmCabn12Mnte_Conc_Actl PmCabn14Mnte_Conc_Actl PmCabn16Mnte_Conc_Actl PmCabn18Mnte_Conc_Actl PmCabn20Mnte_Conc_Actl	0-500	A user interface shall display this value received (numerically and/or graphically) as the cabin air quality associated with the applicable time (previous 12-20 minutes as defined per the signal name).
		No_Data_Exists	A user interface shall blank out any data that would normally be displayed in the area where the associated Cabin data would normally be displayed or graphed
		Faulty	This signal state is included as a design protect only. Consequently, the climate module shall never transmit this state. If a user interface receives this state it shall respond as if it has received 'No_Data_Exists' state.

3.1.1.3 REQ-389361/A-Historical Cabin Air Quality – Display timing

Requirements for specific display appearance, labeling, layout, size, duration etc. for the above data are outside the scope of this requirement. However, it is recommended for a user interface to include a 5-10s delay before reading and displaying any of the historical quality data it receives from the climate module and/or to continuously read this data to eliminate possibility of timing offsets and display issues.

3.1.1.4 REQ-389362/A-Cabin Air Quality Sensor Diagnostics

The Climate module shall support the transmission of a signal based on diagnosis of current cabin sensor status. Any front or rear interface designed to display air quality status to the user shall use this information to determine if additional information should be displayed in addition to, or in place of, the current air quality data.

Message	Signal	State(s)	Description
ParticulateMatterData2	PmSnsCabn_D_Stat	Initializing	A user interface shall display the text "Initializing" (and/or approved alternative) in the area(s) where the current cabin data would normally be displayed.
		Unsupported	This signal state is included as a design protect only. Consequently, the climate module shall never transmit this state. If a user interface receives this state it shall respond as if it has received 'Blank_Field' state
		Clean_Sensor	A user interface shall display the text "Sensor Dirty" (and/or approved alternative) in the area(s) where the current cabin data would normally be displayed.
		Replace_Sensor	A user interface shall display the text "Replace the sensor" (and/or approved alternative) in the area(s) where the current cabin data would normally be displayed.
		Blank_Field	A user interface shall blank out any data that would normally be displayed in the area(s) where the current cabin data would normally be displayed.
		No_Issue	A user interface shall display the numerical value 0-500 it receives for *Current Cabin Air Quality* if available. Otherwise, it shall blank out any data that would normally be displayed in the area(s) where the current cabin data would normally be displayed.
		Intermittent_Inhibit	A user interface shall display the text "environmental limit reached" (and/or approved alternative) in the area(s) where the current cabin data would normally be displayed.
		Not_Used_1	This signal state is included as a design protect only. Consequently, the climate module shall never transmit this state. If a user interface receives this state it shall respond as if it has received 'No_Issue' state.

3.1.2 Climate Control Access

3.1.2.1 REQ-389354/B-Climate Menu activation

The user interface(s) may also use the Climate Menu selection signals to support toggling the climate menus both on and off. The user interface shall only toggle the climate menus (on, if currently off or vice versa) when a pressed state is preceded by a different state within the same signal.

3.1.2.2 REQ-389355/A-Front Climate Menu Indication – No CAN transmission

The user interface shall not include a dedicated indication on either the front and/or air distribution menu controls. These controls are not associated with any specific climate function or status and are only included to support opening and closing of climate interfaces.

3.1.2.3 REQ-389356/A-Rear Climate Menu Indication – Climate Module CAN transmission

The user interface shall include a dedicated indication on the rear menu control to provide status on rear climate power status. The Climate Module shall transmit the applicable state for the Indicator status signal based on the rear power state and the rear power state shall be determined per the applicable state logic section(s) of the Climate Module Functional Specification.

Message	Signal	State(s)	Description
Clmt_Button_Stat3	Rr_Power_Btn_Stt	Enabled_Inactive	A control panel with a physical rear climate menu button shall set the associated indicator to off, if Signal: Rr_Third_Power_Btn_Stt is either Enabled_Inactive or Disabled_Inactive. Otherwise it shall set the associated indicator to on
		Enabled_Active	A control panel with a physical rear climate menu button shall set the associated indicator to on
		Disabled_Inactive	A control panel with a physical rear climate menu button shall set the associated indicator to off, if Signal: Rr_Third_Power_Btn_Stt is either Enabled_Inactive or Disabled_Inactive. Otherwise it shall set the associated indicator to on
		Disabled_Active	A control panel with a physical rear climate menu button shall set the associated indicator to on
Clmt_Button_Stat7	Rr_Third_Power_Btn_Stt	Enabled_Inactive	A control panel with a physical rear climate menu button shall set the associated indicator to off, if Signal: Rr_Power_Btn_Stt is either Enabled_Inactive or Disabled_Inactive. Otherwise it shall set the associated indicator to on
		Enabled_Active	A control panel with a physical rear climate menu button shall set the associated indicator to on
		Disabled_Inactive	A control panel with a physical rear climate menu button shall set the associated indicator to off, if Signal: Rr_Power_Btn_Stt is either Enabled_Inactive or Disabled_Inactive. Otherwise it shall set the associated indicator to on
		Disabled_Active	A control panel with a physical rear climate menu button shall set the associated indicator to on

3.1.2.4 REQ-389353/A-Climate Menu selections – Control Panel CAN transmission

The user interface shall only use these states within these signals. All other signals and states within this message shall be ignored

Message	Signal(s)	State(s)	Description
Remote_Climate_Data	E_Frt_Btn_Status_1st E_Frt_Btn_Status_2nd	FrtMnu_Pressed	A control panel with a physical climate menu button shall transmit this state whenever the button is pressed/selected. The user interface shall open and display (or close) the front climate interface.
		MdeMnu_Pressed	A control panel with a physical climate air distribution menu button shall transmit this state whenever the button is pressed/selected The user interface shall open and display (or close) air distribution interface
		RearMnu_Pressed	A control panel with a physical rear climate menu button shall transmit this state whenever the button is pressed/selected The user interface shall open and display (or close) the rear climate interface

3.1.2.5 REQ-402803/A-Climate Menu selections – Climate Module CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat1	FrontMnu_Buttn_Stat	Not_Pressed	The climate module shall transmit this signal state anytime conditions for transmitting the Pressed state within this signal are not satisfied.
		Pressed	A climate module with a physical climate menu button shall transmit this state whenever the button is pressed/selected The user interface shall open and display (or close) the front climate interface
	MdeMnu_Buttn_Stat	Not_Pressed	The climate module shall transmit this signal state anytime conditions for transmitting the Pressed state within this signal are not satisfied.
		Pressed	A climate module with a physical climate air distribution menu button shall transmit this state whenever the button is pressed/selected The user interface shall open and display (or close) air distribution interface
	RearMnu_Buttn_Stat	Not_Pressed	The climate module shall transmit this signal state anytime conditions for transmitting the Pressed state within this signal are not satisfied.
		Pressed	A climate module with a physical rear climate menu button shall transmit this state whenever the button is pressed/selected The user interface shall open and display (or close) the rear climate interface

3.1.2.6 REQ-389357/A-Persistent climate content

Whenever the vehicle is in a normal run state the following climate status information and functions must always be visible and accessible within 5s of a transition to the normal run state and remain visible and accessible at all times.

Driver and Passenger Setpoint Displays for automatic climate systems
Defrost icon
Blower icon
Conditioned seats control and icon(s) if feature included on vehicle
Rear Zone climate control if feature included on vehicle

3.1.3 Temperature Displays

3.1.3.1 REQ-389363/A-Temperature Setting Display – Manual Climate Control Systems

The display for a specific temperature setting shall be in the form of a graphic showing the relative position along a range of possible settings from Full Cool to Full Heat.

3.1.3.1.1 REQ-389364/A-Manual Temperature Setting Display – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
BCP_Status_Message	Manual_Temp_Setting	Off	A user interface shall indicate via graphical expression that climate control power is off and eliminate any indication/display for a specific temperature setting. The climate module shall transmit this state whenever the climate control power is off
		Full_Cool	A user interface shall display temperature setting associated with the coolest position on the temperature range which shall be at lowest, extreme end of the range. At this end of the range the graphics must be colored blue.

		Setting_2	A user interface shall display temperature setting associated with 2nd coolest position on the temperature range
		Setting_3	A user interface shall display temperature setting associated with 3rd coolest position on the temperature range
		Setting_4	A user interface shall display temperature setting associated with 4th coolest position on the temperature range
		Setting_5	A user interface shall display temperature setting associated with 5th coolest position on the temperature range
		Setting_6	A user interface shall display temperature setting associated with 6th coolest position on the temperature range
		Setting_7	A user interface shall display temperature setting associated with 7th coolest position on the temperature range
		Setting_8	A user interface shall display temperature setting associated with 8th coolest position on the temperature range
		Setting_9	A user interface shall display temperature setting associated with 9th coolest position on the temperature range
		Setting_10	A user interface shall display temperature setting associated with 10th coolest position on the temperature range
		Setting_11	A user interface shall display temperature setting associated with 11th coolest position on the temperature range
		Setting_12	A user interface shall display temperature setting associated with 12th coolest position on the temperature range
		Setting_13	A user interface shall display temperature setting associated with 13th coolest position on the temperature range
		Setting_14	A user interface shall display temperature setting associated with 14th coolest position on the temperature range
		Setting_15	A user interface shall display temperature setting associated with 15th coolest position on the temperature range
		Setting_16	A user interface shall display temperature setting associated with 16th coolest (midpoint) position on the temperature range
		Setting_17	A user interface shall display temperature setting associated with 17th coolest (15th hottest) position on the temperature range
		Setting_18	A user interface shall display temperature setting associated with 18th coolest (14th hottest) position on the temperature range
		Setting_19	A user interface shall display temperature setting associated with 19th coolest (13th hottest) position on the temperature range
		Setting_20	A user interface shall display temperature setting associated with 20th coolest (12th hottest) position on the temperature range
		Setting_21	A user interface shall display temperature setting associated with 21st coolest (11th hottest) position on the temperature range
		Setting_22	A user interface shall display temperature setting associated with 22nd coolest (10th hottest) position on the temperature range

		Setting_23	A user interface shall display temperature setting associated with 23rd coolest (9th hottest) position on the temperature range
		Setting_24	A user interface shall display temperature setting associated with 24th coolest (8th hottest) position on the temperature range
		Setting_25	A user interface shall display temperature setting associated with 25th coolest (7th hottest) position on the temperature range
		Setting_26	A user interface shall display temperature setting associated with 26th coolest (6th hottest) position on the temperature range
		Setting_27	A user interface shall display temperature setting associated with 27th coolest (5th hottest) position on the temperature range
		Setting_28	A user interface shall display temperature setting associated with 28th coolest (4th hottest) position on the temperature range
		Setting_29	A user interface shall display temperature setting associated with 29th coolest (3rd hottest) position on the temperature range
		Setting_30	A user interface shall display temperature setting associated with 30th coolest (2nd hottest) position on the temperature range
		Full_Heat	A user interface shall display temperature setting associated with the hottest position on the temperature range which shall be at highest, extreme end of the range. At this end of the range the graphics must be colored red

3.1.3.2 REQ-389365/A-Temperature Setpoint Display – Automatic Climate Control Systems

The user interface for displaying Automatic climate system temperature setpoint(s) shall be capable of displaying all alphanumeric characters and as many non-alphanumeric characters as possible. If a non-alphanumeric character cannot be displayed due to constraints on display font etc., the user interface shall replace the character with a blank.

3.1.3.2.1 REQ-389366/A-Automatic Left Hand Side(LHS) Temperature Setpoint Display – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification.
This LHS temperature display will typically be associated with driver's setpoint, but may be associated with passenger's setpoint in certain regions.

Message	Signal	State(s)	Description
Clmt_Button_Stat2	LHS_Temp_Display_Digit1	"ASCII" encoding	A user interface shall display the corresponding ASCII character.
	LHS_Temp_Display_Digit2	"ASCII" encoding	A user interface shall display the corresponding ASCII character.
	LHS_Temp_Display_Digit3	Off	A user interface shall not display a third digit for the associated setpoint. This state shall be transmitted whenever temperature setting is °F, LO or HI.
		_0	A user interface shall display .0 (decimal point followed by zero) as the third digit
		_5	A user interface shall display .5 (decimal point followed by five) as the third digit
		Unused	This signal state is included as a placeholder and shall never be transmitted by the climate module. If a user interface receives this state it shall not display a third digit for the associated setpoint

	EATC_LHS_Units	Off	A user interface shall not display anything following the applicable setpoint value
		Celsius	A user interface shall display °C following the applicable setpoint value
		Farenheit	A user interface shall display °F following the applicable setpoint value
		Unused	This signal state is included as a placeholder and shall never be transmitted by the climate module. If a user interface receives this state it shall not display anything following the applicable setpoint value

3.1.3.2.2 REQ-389367/A-Automatic Right Hand Side(RHS) Temperature Setpoint Display – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification.

Message	Signal	State(s)	Description
Clmt_Button_Stat2	RHS_Temp_Display_Digit1	"ASCII" encoding	A user interface shall display the corresponding ASCII character.
	RHS_Temp_Display_Digit2	"ASCII" encoding	A user interface shall display the corresponding ASCII character.
	RHS_Temp_Display_Digit3	Off	A user interface shall not display a third digit for the associated setpoint. This state shall be transmitted whenever temperature setting is °F, LO or HI.
		_0	A user interface shall display .0 (decimal point followed by zero) as the third digit
		_5	A user interface shall display .5 (decimal point followed by five) as the third digit
		Unused	This signal state is included as a placeholder and shall never be transmitted by the climate module. If a user interface receives this state it shall not display a third digit for the associated setpoint
	EATC_RHS_Units	Off	A user interface shall not display anything following the applicable setpoint value
		Celsius	A user interface shall display °C following the applicable setpoint value
		Farenheit	A user interface shall display °F following the applicable setpoint value
		Unused	This signal state is included as a placeholder and shall never be transmitted by the climate module. If a user interface receives this state it shall not display anything following the applicable setpoint value

3.1.3.2.3 REQ-389368/A-Dual Zone Automatic Temperature Setpoint Display – single zone operation

Both Left hand and Right hand side setpoints shall be displayed per applicable requirements whenever the automatic climate controls are turned on, regardless of whether the system is operating in single or dual zone mode.

3.1.3.2.4 REQ-389369/A-Single Zone Automatic Climate Control Systems

For automatic climate systems that only support a single setpoint, the setpoint display shall always be communicated via the Left Hand Side signal states. The user interface shall not display any Right Hand Side setpoint and shall ignore any Right Hand Side setpoint signals

3.1.4 Temperature Selection – up/down (via buttons or continuous knob rotation)

3.1.4.1 REQ-392440/A-Temperature Selection via up/down buttons - Press and hold support

Temperature selection via up/down buttons shall support press and hold functionality. Consequently, the user interface shall transmit applicable signal state upon initial press/selection and continue to transmit while user presses the button.

3.1.4.2 REQ-389371/A-Temperature Selection via up/down interface – Manual Climate Control Systems

For manual climate systems, temperature selection shall always be communicated via the Left Hand Side signal states and the Right Hand Side signal states shall never be transmitted

3.1.4.3 REQ-389372/A-Temperature Selection via up/down interface – Single Zone Automatic Climate Control Systems

For automatic climate systems that only support a single setpoint, temperature selection shall always be communicated via the Left Hand Side signal states and the Right Hand Side signal states shall never be transmitted

3.1.4.4 REQ-389373/A-Left Hand Side Temperature Setting via up/down interface – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		LHS_Temp_Inc_Pressed	If a touchscreen is configured with up and down controls for the LHS setting, it shall transmit this state whenever the LHS temperature 'Up' control is pressed/selected to increase the LHS setting
		LHS_Temp_Dec_Pressed	If a touchscreen is configured with up and down controls for the LHS setting, it shall transmit this state whenever the LHS temperature 'Down' control is pressed/selected to decrease the LHS setting

3.1.4.5 REQ-389376/A-Right Hand Side Temperature Setting via up/down interface – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		RHS_Temp_Inc_Pressed	If a touchscreen is configured with up and down controls for the RHS setting, it shall transmit this state whenever the RHS temperature 'Up' control is pressed/selected to increase the RHS setting
		RHS_Temp_Dec_Pressed	If a touchscreen is configured with up and down controls for the RHS setting, it shall transmit this state whenever the RHS temperature 'Down' control is pressed/selected to decrease the RHS setting

3.1.5 Temperature Selection – direct/slider interface

3.1.5.1 REQ-392439/A-Temperature Selection via direct/slider interface - Usage

The user interface shall transmit signals and states per direct/slider requirements when a temperature setting(Manual system) or temperature setpoint(Auto system) adjustment has been requested via any of the following methods:

- Selection of specific setting or setpoint by press of a button/location within a range of temperatures
- Movement of a temperature "slider" across a range of temperatures
- Voice command for a valid temperature setting (ref voice command requirements for additional details)
- Selection of a particular user profile and/or user selection from within a phone app etc.

3.1.5.2 REQ-389380/A-Temperature Selection via direct/slider interface – Manual Climate Control Systems

For manual climate systems, all temperature adjustments shall always be communicated via the Drv_Set_Temp and/or Drv_Set_Temp2 signals only. State of Psngr_Set_Temp signal shall always be set = No_Request. In the event climate module receives Psngr_Set_Temp signal state ≠ No_Request, it shall treat as if it has received No_Request.

3.1.5.3 REQ-389381/A-Temperature Selection via direct/slider interface – Single Zone Automatic Climate Control Systems

For automatic climate systems that only support a single setpoint, all temperature adjustments shall always be communicated via the Drv_Set_Temp and/or Drv_Set_Temp2 signals only. State of Psngr_Set_Temp signal shall always be set = No_Request. In the event climate module receives Psngr_Set_Temp signal state ≠ No_Request, it shall treat as if it has received No_Request

3.1.5.4 REQ-389384/A-Driver Setpoint via direct/slider interface - Touchscreen CAN transmission

The touchscreen shall convert and only transmit commands for a specific temperature in units of °C per the valid signal states.

Message	Signal	State(s)	Description
Clmt_Button_Stat4	Drv_Set_Temp	No_Request	A user interface shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		LO	A user interface shall transmit this state whenever the user issues a request for full cool(Manual system) or LO/ minimum temperature setpoint(Auto system)
		15_5	A user interface shall transmit this state whenever the user issues a request for 2nd coolest position(Manual system), 15.5 °C or 60°F temperature setpoint(Auto system)
		16_0	A user interface shall transmit this state whenever the user issues a request for 3rd coolest position(Manual system), 16°C or 61°F temperature setpoint(Auto system)
		16_5	A user interface shall transmit this state whenever the user issues a request for 4th coolest position(Manual system), 16.5 °C or 62°F temperature setpoint(Auto system)
		17_0	A user interface shall transmit this state whenever the user issues a request for 5th coolest position(Manual system), 17°C or 63°F temperature setpoint(Auto system)
		17_5	A user interface shall transmit this state whenever the user issues a request for 6th coolest position(Manual system), 17.5 °C temperature setpoint(Auto system)
		18_0	A user interface shall transmit this state whenever the user issues a request for 7th coolest position(Manual system), 18°C or 64°F temperature setpoint(Auto system)
		18_5	A user interface shall transmit this state whenever the user issues a request for 8th coolest position(Manual system), 18.5 °C or 65°F temperature setpoint(Auto system)
		19_0	A user interface shall transmit this state whenever the user issues a request for 9th coolest position(Manual system), 19°C or 66°F temperature setpoint(Auto system)
		19_5	A user interface shall transmit this state whenever the user issues a request for 10th coolest position(Manual system), 19.5°C or 67°F temperature setpoint(Auto system)
		20_0	A user interface shall transmit this state whenever the user issues a request for 11th coolest position(Manual system), 20°C or 68°F temperature setpoint(Auto system)

		20_5	A user interface shall transmit this state whenever the user issues a request for 12th coolest position(Manual system), 20.5°C or 69°F temperature setpoint(Auto system)
		21_0	A user interface shall transmit this state whenever the user issues a request for 13th coolest position(Manual system), 21°C or 70°F temperature setpoint(Auto system)
		21_5	A user interface shall transmit this state whenever the user issues a request for 14th coolest position(Manual system), 21.5°C or 61°F temperature setpoint(Auto system)
		22_0	A user interface shall transmit this state whenever the user issues a request for 15th coolest position(Manual system), 22°C or 72°F temperature setpoint(Auto system)
		22_5	A user interface shall transmit this state whenever the user issues a request for 16th coolest position(Manual system), 22.5 °C temperature setpoint(Auto system)
		23_0	A user interface shall transmit this state whenever the user issues a request for 17th coolest position(Manual system), 23°C or 73°F temperature setpoint(Auto system)
		23_5	A user interface shall transmit this state whenever the user issues a request for 18th coolest position(Manual system), 23.5°C or 74°F temperature setpoint(Auto system)
		24_0	A user interface shall transmit this state whenever the user issues a request for 19th coolest position(Manual system), 24°C or 75°F temperature setpoint(Auto system)
		24_5	A user interface shall transmit this state whenever the user issues a request for 20th coolest position(Manual system), 24.5°C or 76°F temperature setpoint(Auto system)
		25_0	A user interface shall transmit this state whenever the user issues a request for 21st coolest position(Manual system), 25°C or 77°F temperature setpoint(Auto system)
		25_5	A user interface shall transmit this state whenever the user issues a request for 22nd coolest position(Manual system), 25.5°C or 78°F temperature setpoint(Auto system)
		26_0	A user interface shall transmit this state whenever the user issues a request for 23rd coolest position(Manual system), 26C or 79°F temperature setpoint(Auto system)
		26_5	A user interface shall transmit this state whenever the user issues a request for 24th coolest position(Manual system), 26.5°C or 80°F temperature setpoint(Auto system)
		27_0	A user interface shall transmit this state whenever the user issues a request for 25th coolest position(Manual system), 27°C or 81°F temperature setpoint(Auto system)
		27_5	A user interface shall transmit this state whenever the user issues a request for 26th coolest position(Manual system), 27.5°C temperature setpoint(Auto system)
		28_0	A user interface shall transmit this state whenever the user issues a request for 27th coolest position(Manual system), 28°C or 82°F temperature setpoint(Auto system)
		28_5	A user interface shall transmit this state whenever the user issues a request for 28th coolest position(Manual

			system), 28.5°C or 83°F temperature setpoint(Auto system)
		29_0	A user interface shall transmit this state whenever the user issues a request for 29th coolest position(Manual system), 29°C or 84°F temperature setpoint(Auto system)
		29_5	A user interface shall transmit this state whenever the user issues a request for 30th coolest position(Manual system), 29.5°C or 85°F temperature setpoint(Auto system)
		HI	A user interface shall transmit this state whenever the user issues a request for full heat(Manual system) or HI/ maximum temperature setpoint(Auto system)

3.1.5.5 REQ-389385/A-Passenger Setpoint via direct/slider interface - Touchscreen CAN transmission

The touchscreen shall convert and only transmit commands for a specific temperature in units of °C per the valid signal states.

Message	Signal	State(s)	Description
Clmt_Button_Stat4	Psngr_Set_Temp	No_Request	A user interface shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		LO	A user interface shall transmit this state whenever the user issues a request for full cool(Manual system) or LO/ minimum temperature setpoint(Auto system)
		15_5	A user interface shall transmit this state whenever the user issues a request for 2nd coolest position(Manual system), 15.5 °C or 60°F temperature setpoint(Auto system)
		16_0	A user interface shall transmit this state whenever the user issues a request for 3rd coolest position(Manual system), 16°C or 61°F temperature setpoint(Auto system)
		16_5	A user interface shall transmit this state whenever the user issues a request for 4th coolest position(Manual system), 16.5 °C or 62°F temperature setpoint(Auto system)
		17_0	A user interface shall transmit this state whenever the user issues a request for 5th coolest position(Manual system), 17°C or 63°F temperature setpoint(Auto system)
		17_5	A user interface shall transmit this state whenever the user issues a request for 6th coolest position(Manual system), 17.5 °C temperature setpoint(Auto system)
		18_0	A user interface shall transmit this state whenever the user issues a request for 7th coolest position(Manual system), 18°C or 64°F temperature setpoint(Auto system)
		18_5	A user interface shall transmit this state whenever the user issues a request for 8th coolest position(Manual system), 18.5 °C or 65°F temperature setpoint(Auto system)
		19_0	A user interface shall transmit this state whenever the user issues a request for 9th coolest position(Manual system), 19°C or 66°F temperature setpoint(Auto system)
		19_5	A user interface shall transmit this state whenever the user issues a request for 10th coolest position(Manual system), 19.5°C or 67°F temperature setpoint(Auto system)

		20_0	A user interface shall transmit this state whenever the user issues a request for 11th coolest position(Manual system), 20°C or 68°F temperature setpoint(Auto system)
		20_5	A user interface shall transmit this state whenever the user issues a request for 12th coolest position(Manual system), 20.5°C or 69°F temperature setpoint(Auto system)
		21_0	A user interface shall transmit this state whenever the user issues a request for 13th coolest position(Manual system), 21°C or 70°F temperature setpoint(Auto system)
		21_5	A user interface shall transmit this state whenever the user issues a request for 14th coolest position(Manual system), 21.5°C or 61°F temperature setpoint(Auto system)
		22_0	A user interface shall transmit this state whenever the user issues a request for 15th coolest position(Manual system), 22°C or 72°F temperature setpoint(Auto system)
		22_5	A user interface shall transmit this state whenever the user issues a request for 16th coolest position(Manual system), 22.5 °C temperature setpoint(Auto system)
		23_0	A user interface shall transmit this state whenever the user issues a request for 17th coolest position(Manual system), 23°C or 73°F temperature setpoint(Auto system)
		23_5	A user interface shall transmit this state whenever the user issues a request for 18th coolest position(Manual system), 23.5°C or 74°F temperature setpoint(Auto system)
		24_0	A user interface shall transmit this state whenever the user issues a request for 19th coolest position(Manual system), 24°C or 75°F temperature setpoint(Auto system)
		24_5	A user interface shall transmit this state whenever the user issues a request for 20th coolest position(Manual system), 24.5°C or 76°F temperature setpoint(Auto system)
		25_0	A user interface shall transmit this state whenever the user issues a request for 21st coolest position(Manual system), 25°C or 77°F temperature setpoint(Auto system)
		25_5	A user interface shall transmit this state whenever the user issues a request for 22nd coolest position(Manual system), 25.5°C or 78°F temperature setpoint(Auto system)
		26_0	A user interface shall transmit this state whenever the user issues a request for 23rd coolest position(Manual system), 26C or 79°F temperature setpoint(Auto system)
		26_5	A user interface shall transmit this state whenever the user issues a request for 24th coolest position(Manual system), 26.5°C or 80°F temperature setpoint(Auto system)
		27_0	A user interface shall transmit this state whenever the user issues a request for 25th coolest position(Manual system), 27°C or 81°F temperature setpoint(Auto system)
		27_5	A user interface shall transmit this state whenever the user issues a request for 26th coolest position(Manual system), 27.5°C temperature setpoint(Auto system)
		28_0	A user interface shall transmit this state whenever the user issues a request for 27th coolest position(Manual

			system), 28°C or 82°F temperature setpoint(Auto system)
		28_5	A user interface shall transmit this state whenever the user issues a request for 28th coolest position(Manual system), 28.5°C or 83°F temperature setpoint(Auto system)
		29_0	A user interface shall transmit this state whenever the user issues a request for 29th coolest position(Manual system), 29°C or 84°F temperature setpoint(Auto system)
		29_5	A user interface shall transmit this state whenever the user issues a request for 30th coolest position(Manual system), 29.5°C or 85°F temperature setpoint(Auto system)
		HI	A user interface shall transmit this state whenever the user issues a request for full heat(Manual system) or HI/ maximum temperature setpoint(Auto system)

3.1.5.6 REQ-389382/A-Temperature Selection via direct/slider interface – User Interface, CAN transmission rate

When a user interface includes a "slider" type control for temperature adjustment, the user may change the temperature very quickly and pass thru many temperatures in a short period of time. Consequently, the user interface shall limit transmission of signals to no quicker than once every 20 msec +/-10%.

3.1.5.7 REQ-389383/A-Temperature Selection via direct/slider interface – Display updates

While a slider type control is being used to adjust temperature and the associated signal(s) are being transmitted, the user interface shall continue to update the temperature display(s) per the applicable signal states it receives from the climate module.

For example, if the driver's setpoint is 16°C and the user drags slider to increase by 10°C (i.e. to 26°C) in 100 msec then only 5 Drv_Set_Temp updates would be sent out 20 msec +/- 10% apart and the setpoint display would be updated to reflect these same changes. This would work as follows (assuming 60ms latency between setpoint request and display update over CAN for simplicity):

a) **20 msec after first starting to move slider from 16°C Drv_Set_Temp = 17.5°C →**
b) **20 msec later Drv_Set_Temp = 19.5°C →**
c) **20 msec later Drv_Set_Temp = 22.0°C →**
d) **20 msec later Drv_Set_Temp = 24.5°C - Display changes from 16°C to 17.5°C →**
e) **20 msec later Drv_Set_Temp = 26.0°C when the user removes finger from touchscreen - Display changes from 17.5°C to 19.5°C→**
f) **20 msec later Display changes from 19.5°C to 22.0°C→**
g) **20 msec later Display changes from 22.0°C to 24.5°C→**
h) **20 msec later Display changes from 24.5°C to 26.0°C (display reflects final setpoint selection within maximum allowable time per latency requirements – 60msec in this example)**

3.1.6 Blower Speed Displays

3.1.6.1 REQ-389393/A-Blower Speed Display – Manual and Automatic Climate systems

Indication/display shall be in the form of a blower graphic along with the appropriate number of manual blower bars/indicators.

3.1.6.2 REQ-389394/A-Blower Speed Display – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat2	Front_Blower_Indicate	Indicators_Off	A user interface shall indicate via graphical expression that blower speed is 0. The climate

			module shall transmit this state whenever the user selects a blower speed of 0.
		1_Indicator_On	A user interface shall indicate that blower speed is 1 by turning on 1 blower bar/indication starting from left to right or from bottom to top.
		2_Indicators_On	A user interface shall indicate that blower speed is 2 by turning on 2 blower bars/indications starting from left to right or from bottom to top.
		3_Indicators_On	A user interface shall indicate that blower speed is 3 by turning on 3 blower bars/indications starting from left to right or from bottom to top.
		4_Indicators_On	A user interface shall indicate that blower speed is 4 by turning on 4 blower bars/indications starting from left to right or from bottom to top.
		5_Indicators_On	A user interface shall indicate that blower speed is 5 by turning on 5 blower bars/indications starting from left to right or from bottom to top.
		6_Indicators_On	A user interface shall indicate that blower speed is 6 by turning on 6 blower bars/indications starting from left to right or from bottom to top.
		7_Indicators_On	A user interface shall indicate that blower speed is 7 by turning on 7 blower bars/indications starting from left to right or from bottom to top.
		8_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		9_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		10_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		11_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		12_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		13_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		14_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		Display_Blank	A user interface shall blank off the blower display i.e. no blower bar/indication visible at all. The climate module shall transmit this state whenever the blower is being automatically controlled or the climate power is off.

3.1.7 Blower Speed Selection - up/down (via buttons or continuous knob rotation)

3.1.7.1 REQ-389395/A-Blower Speed Selection via up/down buttons - Press and hold support

Blower speed selection via up/down buttons shall support press and hold functionality. Consequently, the user interface shall transmit applicable signal state upon initial press/selection and continue to transmit while user presses the button.

3.1.7.2 REQ-389396/A-Blower Speed via up/down interface – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Blwr_Inc_Pressed	If a touchscreen is configured with up and down controls for the blower speed, it shall transmit this state whenever the blower speed 'Up' control is pressed/selected to increase the blower speed
		Blwr_Dec_Pressed	If a touchscreen is configured with up and down controls for the blower speed, it shall transmit this state whenever the blower speed 'Down' control is pressed/selected to decrease the blower speed

3.1.8 Blower Speed Selection - direct/slider interface

3.1.8.1 REQ-389398/A-Blower Speed Selection via direct/slider interface - Usage

The user interface shall transmit signals and states per direct/slider requirements when a blower speed adjustment has been requested via any of the following methods:

- Selection of specific blower speed by press of a button/location within a range of speeds
- Movement of a blower "slider" across a range of blower speeds
- Voice command for a valid blower speed (ref voice command requirements for additional details)

3.1.8.2 REQ-389401/A-Blower Speed via direct/slider interface - Touchscreen CAN transmission

Message	Signal	State(s)	Description
Clmt_Button_Stat4	Frt_Blower_Speed2	No_Request	A user interface shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Blower_Speed_1	A user interface shall transmit this state whenever the user issues a request for blower speed 1
		Blower_Speed_2	A user interface shall transmit this state whenever the user issues a request for blower speed 2
		Blower_Speed_3	A user interface shall transmit this state whenever the user issues a request for blower speed 3
		Blower_Speed_4	A user interface shall transmit this state whenever the user issues a request for blower speed 4
		Blower_Speed_5	A user interface shall transmit this state whenever the user issues a request for blower speed 5
		Blower_Speed_6	A user interface shall transmit this state whenever the user issues a request for blower speed 6
		Blower_Speed_7	A user interface shall transmit this state whenever the user issues a request for blower speed 7
		Min_Blower	A user interface shall transmit this state whenever the user issues a voice command for minimum blower speed
		Max_Blower	A user interface shall transmit this state whenever the user issues a voice command for maximum blower speed
		Zero_Blower	A user interface shall transmit this state whenever the user issues a request for blower speed 0
		Not _Used	These states are included as a design protect only. In the event any of these states are received, the user interface shall treat as if it has received No_Request state

3.1.8.3 REQ-389399/A-Blower Speed Selection via direct/slider interface – User Interface, CAN transmission rate

When a user interface includes a "slider" type control for blower speed adjustment, the user may change the blower speed very quickly and pass thru many speeds in a short period of time. Consequently, the user interface shall limit transmission of signals to no quicker than once every 20 msec +/-10%.

3.1.8.4 REQ-389400/A-Blower Speed Selection via direct/slider interface – Display updates

While a slider type control is being used to adjust blower speed and the associated signal(s) are being transmitted, the user interface shall continue to update the blower speed display(s) per the applicable signal states it receives from the climate module.

For example, if the blower speed is 1 and the user drags slider to increase to 7 within 80 msec then only 4 Frt_Blower_Speed2 updates would be sent out 20 msec +/- 10% apart and the blower speed display would be updated to reflect these same changes. This would work as follows (assuming 60ms latency between speed request and display update over CAN for simplicity - 60msec in this example):

a) **20 msec after first starting to move slider from 1 Frt_Blower_Speed2 = 2 →**
b) **20 msec later Frt_Blower_Speed2= 4 →**
c) **20 msec later Frt_Blower_Speed2= 6 →**
d) **20 msec later Frt_Blower_Speed2= 7 when the user removes finger from touchscreen - Display changes from 1 to 2 →**
e) **20 msec later Display changes from 2 to 4→**
f) **20 msec later Display changes from 4 to 6→**
g) **20 msec later Display changes from 6 to 7 (display reflects final selection within maximum allowable time per latency requirements)**

3.1.9 Defrost function

3.1.9.1 REQ-389430/A-Defrost Indication – Climate Module CAN transmission

A dedicated defrost control is not supported and this signal shall not be transmitted by the climate module.

Message	Signal	State(s)	Description
Clmt_Button_Stat1	Defrost_Btn_Stt	Enabled_Inactive	The user interface shall ignore this signal.
		Enabled_Active	The user interface shall ignore this signal.
		Disabled_Inactive	The user interface shall ignore this signal.
		Disabled_Active	The user interface shall ignore this signal.

3.1.9.2 REQ-389428/B-Defrost selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Defrost_Pressed	A dedicated defrost control is not supported within a touchscreen. This signal state is included as a design protect only and shall never be transmitted by the touchscreen.

3.1.10 Front Power function

3.1.10.1 REQ-389407/A-Front Power selection – Touchscreen CAN transmission

The front power control is also used in special control sequences to enable selection of user preferences and shall support press and hold functionality. Consequently, the user interface shall transmit applicable signal state upon initial press/selection and continue to transmit while user presses the button.

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Front_Power_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.10.2 REQ-389409/A-Front Power Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	Front_Power_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off. Additionally, the user interface shall use graphical expression to communicate that the climate system has been turned off and ensure all temperature setting displays and blower speed indications are off.
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off. Additionally, the user interface shall use graphical expression to communicate that the climate system has been turned off and ensure all temperature setting displays and blower speed indications are off.
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.1.11 Driver Focused Mode (DFM)

3.1.11.1 REQ-389441/A-Driver Focused Mode selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		DrvrFcsdMde_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.11.2 REQ-389443/B-Driver Focused Mode Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat7	DrvrFcsdMde_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.1.12 Heated Front Windshield function

3.1.12.1 REQ-389466/A-Heated Front Windshield selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Htd_Frt_Wsh_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.12.2 REQ-389468/A-Heated Front Windshield Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	Htd_Frt_Wsh_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.1.13 A/C function

3.1.13.1 REQ-389450/A-AC selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description

Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		AC_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.13.2 REQ-389452/A-AC Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	AC_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.1.14 Recirc function

3.1.14.1 REQ-389458/A-Recirc selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Recirc_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected
		Auto_Recirc_Pressed	Included as a design protect only and shall never be transmitted. In the event this state is received, the Climate Module shall treat as if it has received the None_Pressed state
		Outside_Pressed	Included as a design protect only and shall never be transmitted. In the event this state is received, the Climate Module shall treat as if it has received the None_Pressed state

3.1.14.2 REQ-389460/A-Recirc Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	Recirc_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off

		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on
	Auto_Recirc_Btn_Stt	n/a	Included as a design protect only and shall never be transmitted. A touchscreen and/or Control Panel shall ignore these signals
	Outside_Btn_Stt	n/a	Included as a design protect only and shall never be transmitted. A touchscreen and/or Control Panel shall ignore these signals

3.1.15 Max Defrost function

3.1.15.1 REQ-389422/A-Max Defrost selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	Max_Defrost_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.15.2 REQ-389424/A-Max Defrost Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	Max_Defrost_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.1.15.3 REQ-389425/A-Max Defrost Indication – Telltale color

Per regulatory requirements, the user interface(s) shall ensure that whenever the Max Defrost function is included, an indicator is displayed as part of the control/button and that the color of the indication is yellow

3.1.16 Rear Defrost function

3.1.16.1 REQ-389445/A-Rear Defrost selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Rear_Defrost_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.16.2 REQ-389447/A-Rear Defrost Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	Rear_Defrost_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.1.16.3 REQ-389448/A-Rear Defrost Indication – Telltale color

Per regulatory requirements, the user interface(s) shall ensure that whenever the Rear Defrost function is included, an indicator is displayed as part of the control/button and that the color of the indication is yellow

3.1.17 Cabin Air Refresh (CAR) function

3.1.17.1 REQ-389462/A-Cabin Air Refresh selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		AAR_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.17.2 REQ-389464/A-Cabin Air Refresh Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat7	AAR_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.1.18 Air Distribution functions

3.1.18.1 REQ-392770/A-Air Distribution functions - User Interface

Manual selection for all air distribution modes (including Windscreen) within a user interface shall be via three separate air distribution controls. These three air distribution modes shall be selectable in any combination – Windscreen, Panel and Floor.

3.1.18.2 REQ-389414/A-Windscreen Indication – Telltale color

Per regulatory requirements if a defrost icon is included on the Windscreen control, the user interface(s) shall ensure that an indicator is displayed as part of the control/button and that the color of the indication is yellow.

3.1.18.3 REQ-389411/A-Windscreen selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Windscreen_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.18.4 REQ-389413/A-Windscreen Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	Windscreen_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change

			expression to reflect a pressed state. Any included indicator shall be set to on

3.1.18.5 REQ-389415/A-Panel selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Panel_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.18.6 REQ-389417/A-Panel Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	Panel_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.1.18.7 REQ-389418/A-Floor selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Floor_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.18.8 REQ-389420/A-Floor Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	Floor_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on

		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.1.19 Heat function

3.1.19.1 REQ-389454/A-Heat selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Heat_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.19.2 REQ-389456/B-Heat Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat7	Heat_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.1.20 Dual function

3.1.20.1 REQ-389436/A-Dual selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Dual_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.20.2 REQ-389438/A-Dual Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	Dual_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

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3.1.21 Link function

3.1.21.1 REQ-392614/A-Link - Translation vs Dual

Dedicated signal/states for a Link function/press are not supported. In the event a Link function is included as a replacement for the Dual function, the Touchscreen and/or Control Panel shall utilize the signal states for the Dual function, translating the Dual_Button_Stt state it receives to properly set indication for a Link function i.e. when Dual function indication would be set to On, Link function shall be set to Off and vice versa. The Touchscreen and/or Control Panel shall never transmit a Link_Pressed state and never react to a Link_Button_Stt signal.

3.1.22 Max A/C function

3.1.22.1 REQ-389432/A-Max AC selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Max_AC_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.22.2 REQ-389434/A-Max AC Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	Max_AC_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change

			expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.1.23 Auto function

3.1.23.1 REQ-389470/A-Auto selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Auto_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected to turn on the Auto function and/or change the Auto blower setting
		Auto_Lo_Pressed	If a touchscreen is configured with separate controls for each of the Auto blower settings, it shall transmit this state whenever the Low setting is pressed/ selected
		Auto_Med_Pressed	If a touchscreen is configured with separate controls for each of the Auto blower settings, it shall transmit this state whenever the Medium setting is pressed/ selected
		Auto_Hi_Pressed	If a touchscreen is configured with separate controls for each of the Auto blower settings, it shall transmit this state whenever the High setting is pressed/ selected
		Auto_Inc_Pressed	If a touchscreen is configured with up and down controls for the Auto blower settings, it shall transmit this state whenever the Auto 'Up' control is pressed/selected to increase the Auto blower setting
		Auto_Dec_Pressed	If a touchscreen is configured with up and down controls for the Auto blower settings, it shall transmit this state whenever the Auto 'Down' control is pressed/selected to decrease the Auto blower setting

3.1.23.2 REQ-389473/A-Auto Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	Front_AUTO_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change

			expression to reflect a pressed state. Any included indicator shall be set to on
	Front_AUTO_Label	Off	The Climate module shall transmit this state whenever system is not operating in any form of auto state. The user interface shall display information per the other Auto Indication requirements with no additional Auto labels or verbiage
		Blower	The Climate module shall transmit this state whenever system is operating in a 'partial' auto state where blower speed is being controlled automatically while air distribution has been manually selected. The user interface may include shading or other graphical method(s) to make it clear that only the blower speed is being automatically controlled automatically
		Mode	The Climate module shall transmit this state whenever system is operating in a 'partial' auto state where air distribution mode is being controlled automatically while blower speed has been manually selected. The user interface may include shading or other graphical method(s) to make it clear that only the air distribution mode is being automatically controlled automatically
		Full	The Climate module shall transmit this state whenever system is operating in a 'full' auto state where both air distribution mode and the blower speed are controlled automatically. The user interface may include shading or other graphical method(s) to make it clear that both the air distribution mode and blower are being automatically controlled
	Front_AUTO_Blwr_Lvl	None	The Climate module shall transmit this state whenever the system is NOT in a 'full' Auto mode (Front_AUTO_Btn_Stt = Enabled_Inactive or Disabled_Inactive) The user interface shall ensure all Auto blower indications are set to Off.
		Low	The Climate module shall transmit this state whenever the system is a 'full' Auto mode (Front_AUTO_Btn_Stt = Enabled_Active or Disabled_Active) and user has selected a Low Auto blower setting. The user interface shall set the left (or bottom) most indication for Auto blower to On and/or list the Auto blower setting as 'Low' within any applicable pop-ups or dialog boxes
		Medium	The Climate module shall transmit this state whenever the system is a 'full' Auto mode (Front_AUTO_Btn_Stt = Enabled_Active or Disabled_Active) and user has selected a Medium Auto blower setting. The user interface shall set the left and middle (or bottom and middle) indication for Auto blower to On and/or list the Auto blower setting as 'Medium' within any applicable pop-ups or dialog boxes
		High	The Climate module shall transmit this state whenever the system is a 'full' Auto mode (Front_AUTO_Btn_Stt = Enabled_Active or Disabled_Active) and user has selected a High Auto blower setting. The user interface shall set all three indications for Auto blower to On and/or list the Auto blower setting as 'High' within any applicable pop-ups or dialog boxes

3.1.24 Heated Steering Wheel

3.1.24.1 REQ-389487/A-Heated Steering Wheel selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Htd_Strg_Whl_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.1.24.2 REQ-389489/A-Heated Steering Wheel indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification. This status signal is only transmitted to control indication within user interface(s). It shall not be used by the Heated Steering Wheel module to turn the actual function on or off.

Message	Signal	State(s)	Description
Clmt_Button_Stat1	Htd_Strg_Whl_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.1.24.3 REQ-389490/A-Heated Steering Wheel indication – Climate Power

Heated Steering Wheel status is independent from climate module power on/off state. The user interface(s) shall continue to display status per indicator signal (Ref REQ) even if climate module power is turned off.

3.1.25 Front Conditioned Seats

3.1.25.1 REQ-389476/A-Front Heated and/or cooled seat indicator consistency

Orientation of heated and/or cooled seat indicators shall be the same across all applicable interfaces.

3.1.25.2 REQ-389477/A-Front Left Hand Side Conditioned Seat selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		LHS_Htd_Seat_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected to change the left, front heated seat setting

		LHS_Htd_Seat1_Pressed	A touchscreen that is configured to support separate control for each of the left, front heated seat settings shall transmit this state whenever heating level 1 is pressed/selected
		LHS_Htd_Seat2_Pressed	A touchscreen that is configured to support separate control for each of the left, front heated seat settings shall transmit this state whenever heating level 2 is pressed/selected
		LHS_Htd_Seat3_Pressed	A touchscreen that is configured to support separate control for each of the left, front heated seat settings shall transmit this state whenever heating level 3 is pressed/selected
		LHS_Cld_Seat_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected to change the left, front cooled seat setting
		LHS_Cld_Seat1_Pressed	A touchscreen that is configured to support separate control for each of the left, front cooled seat settings shall transmit this state whenever cooling level 1 is pressed/selected
		LHS_Cld_Seat2_Pressed	A touchscreen that is configured to support separate control for each of the left, front cooled seat settings shall transmit this state whenever cooling level 2 is pressed/selected
		LHS_Cld_Seat3_Pressed	A touchscreen that is configured to support separate control for each of the left, front cooled seat settings shall transmit this state whenever cooling level 3 is pressed/selected
		LHS_Seat_Off_Pressed	A touchscreen that is configured to support separate control for each of the left, front conditioned seat settings shall transmit this state whenever either heating and/or cooling off state is pressed/selected
		LHS_Auto_Seat_Pressed	A touchscreen that is configured to support a separate control for activating the auto function for left, front seat shall transmit this state whenever the associated control is pressed/ selected

3.1.25.3 <u>REQ-389480/A-Front Right Hand Side Conditioned Seat selection – Touchscreen CAN transmission</u>

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		RHS_Htd_Seat_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected to change the right, front heated seat setting
		RHS_Htd_Seat1_Pressed	A touchscreen that is configured to support separate control for each of the right, front heated seat settings shall transmit this state whenever heating level 1 is pressed/selected
		RHS_Htd_Seat2_Pressed	A touchscreen that is configured to support separate control for each of the right, front heated seat settings shall transmit this state whenever heating level 2 is pressed/selected
		RHS_Htd_Seat3_Pressed	A touchscreen that is configured to support separate control for each of the right, front heated seat settings shall transmit this state whenever heating level 3 is pressed/selected

		RHS_Cld_Seat_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected to change the right, front cooled seat setting
		RHS_Cld_Seat1_Pressed	A touchscreen that is configured to support separate control for each of the right, front cooled seat settings shall transmit this state whenever cooling level 1 is pressed/selected
		RHS_Cld_Seat2_Pressed	A touchscreen that is configured to support separate control for each of the right, front cooled seat settings shall transmit this state whenever cooling level 2 is pressed/selected
		RHS_Cld_Seat3_Pressed	A touchscreen that is configured to support separate control for each of the right, front cooled seat settings shall transmit this state whenever cooling level 3 is pressed/selected
		RHS_Seat_Off_Pressed	A touchscreen that is configured to support separate control for each of the right, front conditioned seat settings shall transmit this state whenever either heating and/or cooling off state is pressed/selected
		RHS_Auto_Seat_Pressed	A touchscreen that is configured to support a separate control for activating the auto function for right, front seat shall transmit this state whenever the associated control is pressed/ selected

3.1.25.4 REQ-389483/A-Front Left Hand Side Auto Seat indication – Climate Module CAN transmission

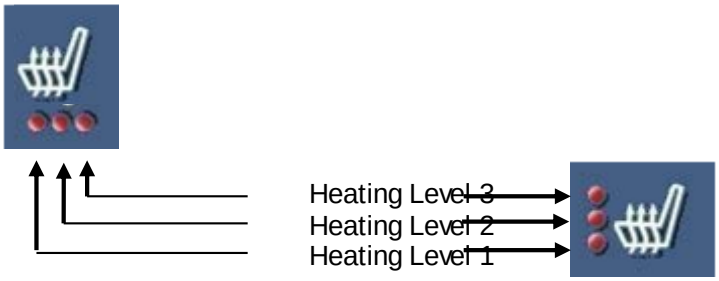
Message	Signal	State(s)	Description
Clmt_Button_Stat2	LHS_Auto_Seat_Btn_Stt	Enabled_Inactive	The Climate module shall transmit this state whenever the left, front auto seat function can be activated but is turned off *i.e. the seat setting is being manually controlled by the user*. The user interface shall use graphical expression to communicate that the left, front auto seat control is selectable and set any included indication to off.
		Enabled_Active	The Climate module shall transmit this state whenever the left, front auto seat function can be activated and is turned on *i.e. the seat setting is being automatically controlled*. The user interface shall use graphical expression to communicate that the left, front auto seat control is selectable and set any included indication to on.
		Disabled_Inactive	The Climate module shall transmit this state whenever the left, front auto seat function cannot be activated and is turned off *i.e. the seat setting is being manually controlled by the user*. The user interface shall use graphical expression to communicate that the left, front auto seat control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off.
		Disabled_Active	The Climate module shall transmit this state whenever the left, front auto seat function cannot be activated but is turned on *i.e. the seat setting is being automatically controlled*. The user interface shall use graphical expression to communicate that the left, front auto seat control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off.

3.1.25.5 REQ-389484/A-Front Right Hand Side Auto Seat indication – Climate Module CAN transmission

Message	Signal	State(s)	Description
Clmt_Button_Stat2	RHS_Auto_Seat_Btn_Stt	Enabled_Inactive	The Climate module shall transmit this state whenever the right, front auto seat function can be activated but is turned off *i.e. the seat setting is being manually controlled by the user*. The user interface shall use graphical expression to communicate that the right, front auto seat control is selectable and set any included indication to off.
		Enabled_Active	The Climate module shall transmit this state whenever the right, front auto seat function can be activated and is turned on *i.e. the seat setting is being automatically controlled*. The user interface shall use graphical expression to communicate that the right, front auto seat control is selectable and set any included indication to on.
		Disabled_Inactive	The Climate module shall transmit this state whenever the right, front auto seat function cannot be activated and is turned off *i.e. the seat setting is being manually controlled by the user*. The user interface shall use graphical expression to communicate that the right, front auto seat control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off.
		Disabled_Active	The Climate module shall transmit this state whenever the right, front auto seat function cannot be activated but is turned on *i.e. the seat setting is being automatically controlled*. The user interface shall use graphical expression to communicate that the right, front auto seat control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off.

3.1.25.6 REQ-389475/A-Front conditioned seat indicator orientation

Any indicators used to provide status of heated and/or cooled seat function shall be orientated with indication for warmest or coolest setting positioned on right (for horizontal display) or at top (for vertical display) - see example for heated seat below



3.1.25.7 REQ-389479/A-Front Left Hand Side Conditioned Seat indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	LHS_Htd_Seat_Btn_Stt	Enabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as*

			specified elsewhere to determine control and indicator settings
		Enabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
	LHS_Cld_Seat_Btn_Stt	Enabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Enabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
	LHS_Cond_Seat_Status	Off	The Climate module shall transmit this state whenever the left, front conditioned seat (both heating and cooling) is turned off. The user interface shall ensure all heated and cooled seat indicators are set to off and use graphical expression to communicate that the left, front conditioned seat controls are selectable
		Level_1_Cooling	The Climate module shall transmit this state whenever the left, front **cooled** seat is turned on at the lowest setting. The user interface shall ensure all heated seat indicators are set to off and shall turn on a single cooled seat indicator to signify a setting of 1. The user interface shall also use graphical expression to communicate that the left, front conditioned seat control(s) are selectable
		Level_2_Cooling	The Climate module shall transmit this state whenever the left, front **cooled** seat is turned on at the second from lowest setting. The user interface shall ensure all heated seat indicators are set to off and shall turn on two cooled seat indicators to signify a setting of 2. The user interface shall also use graphical expression to communicate that the left, front conditioned seat control(s) are selectable
		Level_3_Cooling	The Climate module shall transmit this state whenever the left, front **cooled** seat is turned on at the second from highest setting.

			The user interface shall ensure all heated seat indicators are set to off and shall turn on three cooled seat indicators to signify a setting of 3. The user interface shall also use graphical expression to communicate that the left, front conditioned seat control(s) are selectable
		Level_1_Heating	The Climate module shall transmit this state whenever the left, front heated seat is turned on at the lowest setting. The user interface shall ensure all cooled seat indicators are set to off and shall turn on a single heated seat indicator to signify a setting of 1. The user interface shall also use graphical expression to communicate that the left, front conditioned seat control(s) are selectable
		Level_2_Heating	The Climate module shall transmit this state whenever the left, front heated seat is turned on at the second from lowest setting. The user interface shall ensure all cooled seat indicators are set to off and shall turn on two heated seat indicators to signify a setting of 2. The user interface shall also use graphical expression to communicate that the left, front conditioned seat control(s) are selectable
		Level_3_Heating	The Climate module shall transmit this state whenever the left, front heated seat is turned on at the second from lowest setting. The user interface shall ensure all cooled seat indicators are set to off and shall turn on three heated seat indicators to signify a setting of 3. The user interface shall also use graphical expression to communicate that the left, front conditioned seat control(s) are selectable
		Disabled	The user interface shall use graphical expression to communicate that the left, front conditioned seat control(s) cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. All heated and cooled seat indicators shall be set to off.

3.1.25.8 REQ-389485/A-Front seat Auto capability

Auto heated and/or cooled seat functionality may not be supported on all programs. If vehicle does not support auto control, the signal states associated with Auto seat selection shall never be transmitted by the user interface and the user interface shall ignore the signals from the climate module associated with Auto seat indication (REQ reference).

3.1.25.9 REQ-389482/A-Front Right Hand Side Conditioned Seat indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat1	RHS_Htd_Seat_Btn_Stt	Enabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Enabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as*

			specified elsewhere to determine control and indicator settings
		Disabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
	RHS_Cld_Seat_Btn_Stt	Enabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Enabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
	RHS_Cond_Seat_Status	Off	The Climate module shall transmit this state whenever the right, front conditioned seat (both heating and cooling) is turned off. The user interface shall ensure all heated and cooled seat indicators are set to off and use graphical expression to communicate that the right, front conditioned seat controls are selectable
		Level_1_Cooling	The Climate module shall transmit this state whenever the right, front **cooled** seat is turned on at the lowest setting. The user interface shall ensure all heated seat indicators are set to off and shall turn on a single cooled seat indicator to signify a setting of 1. The user interface shall also use graphical expression to communicate that the right, front conditioned seat control(s) are selectable
		Level_2_Cooling	The Climate module shall transmit this state whenever the right, front **cooled** seat is turned on at the second from lowest setting. The user interface shall ensure all heated seat indicators are set to off and shall turn on two cooled seat indicators to signify a setting of 2. The user interface shall also use graphical expression to communicate that the right, front conditioned seat control(s) are selectable
		Level_3_Cooling	The Climate module shall transmit this state whenever the right, front **cooled** seat is turned on at the second from highest setting. The user interface shall ensure all heated seat indicators are set to off and shall turn on three cooled seat indicators to signify a setting of 3. The user interface shall also use graphical expression to

			communicate that the right, front conditioned seat control(s) are selectable
		Level_1_Heating	The Climate module shall transmit this state whenever the right, front heated seat is turned on at the lowest setting. The user interface shall ensure all cooled seat indicators are set to off and shall turn on a single heated seat indicator to signify a setting of 1. The user interface shall also use graphical expression to communicate that the right, front conditioned seat control(s) are selectable
		Level_2_Heating	The Climate module shall transmit this state whenever the right, front heated seat is turned on at the second from lowest setting. The user interface shall ensure all cooled seat indicators are set to off and shall turn on two heated seat indicators to signify a setting of 2. The user interface shall also use graphical expression to communicate that the right, front conditioned seat control(s) are selectable
		Level_3_Heating	The Climate module shall transmit this state whenever the right, front heated seat is turned on at the second from lowest setting. The user interface shall ensure all cooled seat indicators are set to off and shall turn on three heated seat indicators to signify a setting of 3. The user interface shall also use graphical expression to communicate that the right, front conditioned seat control(s) are selectable
		Disabled	The user interface shall use graphical expression to communicate that the right, front conditioned seat control(s) cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. All heated and cooled seat indicators shall be set to off.

3.2 FUN-REQ-410141/A-External Interfaces – Rear Climate System

3.2.1 Rear Temperature Displays

3.2.1.1 REQ-389492/A-Rear Temperature Setting Display – Manual Climate Control Systems

The display for a specific rear temperature setting shall be in the form of a graphic showing the relative position along a range of nine possible settings from Full Cool to Full Heat.

3.2.1.1.1 REQ-389493/A-Rear Manual Temperature Setting Display – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the status signal per the applicable section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat3	Rr_Temp_Detents	No_Bars	A user interface shall ensure all temp bars used to indicate the rear temperature setting are visible, but are all turned off.
		4_Cool_Bars	A user interface shall turn on the neutral temp bar along with the all four cool bars to the left(or below) the neutral bar.
		3_Cool_Bars	A user interface shall turn on the neutral temp bar along with the next three cool bars to the left(or below) the neutral bar.
		2_Cool_Bars	A user interface shall turn on the neutral temp bar along with the next two cool bars to the left(or below) the neutral bar.

		1_Cool_Bar	A user interface shall turn on the neutral temp bar along with the next single cool bar to the left(or below) the neutral bar.
		Nuetral_Bar_Only	A user interface shall turn on the neutral temp bar only. No cool or heat bars shall be turned on.
		1_Heat_Bar	A user interface shall turn on the neutral temp bar along with the next single heat bar to the right(or above) the neutral bar.
		2_Heat_Bars	A user interface shall turn on the neutral temp bar along with the next two heat bars to the right(or above) the neutral bar
		3_Heat_Bars	A user interface shall turn on the neutral temp bar along with the next three heat bars to the right(or above) the neutral bar
		4_Heat_Bars	A user interface shall turn on the neutral temp bar along with all four of the heat bars to the right(or above) the neutral bar
		Display_Blank	A user interface shall completely blank out the area used to display the temperature setting.
		Unused	These states are included as a placeholder and should never be transmitted. A user interface shall respond as if No_Bars state was received

3.2.1.2 REQ-389494/A-Rear Temperature Setpoint Display – Automatic Climate Control Systems

The user interface for displaying rear temperature setpoint(s) for an automatic climate system shall be capable of displaying numbers 0-9 and letters H, I, L and O.

3.2.1.2.1 REQ-389495/A-Rear Automatic Left Hand Side(LHS) Temperature Setpoint Display – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the setpoint signal per the applicable section(s) of the Climate Module Functional Specification.
In cases where a rear climate system is configured to support separate setpoints for multiple rows, The Rear LHS temperature display shall be associated with the 2nd row.

Message	Signal	State(s)	Description
Clmt_Button_Stat3	Rr_LHS_Set_Temp_Dig1	0	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		1	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		2	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		3	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		4	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		5	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		6	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		7	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint

		8	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		9	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		L	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		O	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		H	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		I	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		Blank	A user interface shall not display anything in area designated for digit 1 of the associated setpoint
		Blank	A user interface shall not display anything in area designated for digit 1 of the associated setpoint
	Rr_LHS_Set_Temp_Dig2	0	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		1	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		2	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		3	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		4	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		5	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		6	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		7	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		8	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		9	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		L	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		O	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		H	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		I	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint

		Blank	A user interface shall not display anything in area designated for digit 2 of the associated setpoint
		Blank	A user interface shall not display anything in area designated for digit 2 of the associated setpoint
	Rr_LHS_Set_Temp_Dig3	Off	A user interface shall not display a third digit for the associated setpoint. This state shall be transmitted whenever temperature setting is LO or HI.
		_0	A user interface shall display .0 (decimal point followed by zero) as the third digit
		_5	A user interface shall display .5 (decimal point followed by five) as the third digit
		Unused	This signal state is included as a placeholder and shall never be transmitted by the climate module. If a user interface receives this state it shall not display a third digit for the associated setpoint
	Rr_Set_Temp_Units	Off	A user interface shall not display anything following the applicable setpoint value
		Celsius	A user interface shall display °C following the applicable setpoint value
		Farenheit	A user interface shall display °F following the applicable setpoint value
		Unused	This signal state is included as a placeholder and shall never be transmitted by the climate module. If a user interface receives this state it shall not display anything following the applicable setpoint value

3.2.1.2.2 REQ-389496/A-Rear Automatic Right Hand Side(RHS) Temperature Setpoint Display – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification.
In cases where a rear climate system is configured to support separate setpoints for multiple rows, The Rear RHS temperature display shall be associated with the 3rd row.

Message	Signal	State(s)	Description
Clmt_Button_Stat3	Rr_RHS_Set_Temp_Dig1	0	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		1	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		2	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		3	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		4	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		5	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		6	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		7	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		8	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint

		9	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		L	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		O	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		H	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		I	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 1 of the associated setpoint
		Blank	A user interface shall not display anything in area designated for digit 1 of the associated setpoint
		Blank	A user interface shall not display anything in area designated for digit 1 of the associated setpoint
	Rr_RHS_Set_Temp_Dig2	0	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		1	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		2	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		3	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		4	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		5	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		6	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		7	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		8	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		9	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		L	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		O	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		H	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		I	A user interface shall display the number or letter corresponding to the signal state in the area designated for digit 2 of the associated setpoint
		Blank	A user interface shall not display anything in area designated for digit 2 of the associated setpoint

		Blank	A user interface shall not display anything in area designated for digit 2 of the associated setpoint
	Rr_RHS_Set_Temp_Dig3	Off	A user interface shall not display a third digit for the associated setpoint. This state shall be transmitted whenever temperature setting is LO or HI.
		_0	A user interface shall display .0 (decimal point followed by zero) as the third digit
		_5	A user interface shall display .5 (decimal point followed by five) as the third digit
		Unused	This signal state is included as a placeholder and shall never be transmitted by the climate module. If a user interface receives this state it shall not display a third digit for the associated setpoint
	Rr_Set_Temp_Units	Off	A user interface shall not display anything following the applicable setpoint value
		Celsius	A user interface shall display °C following the applicable setpoint value
		Farenheit	A user interface shall display °F following the applicable setpoint value
		Unused	This signal state is included as a placeholder and shall never be transmitted by the climate module. If a user interface receives this state it shall not display anything following the applicable setpoint value

3.2.1.2.3 REQ-389497/A-Dual Zone Rear Automatic Temperature Setpoint Displays – single zone operation

Both Left hand and Right hand side setpoints shall be displayed per applicable requirements whenever the rear automatic climate controls are turned on, regardless of whether the system is operating in single or dual zone mode.

3.2.1.2.4 REQ-389498/A-Single Zone Rear Automatic Temperature Setpoint Displays

For rear automatic climate systems that only support a single setpoint, the setpoint display shall always be communicated via the rear Left Hand Side signal states. The user interface shall not display any rear Right Hand Side setpoint and shall ignore any rear Right Hand Side setpoint signals.

3.2.2 Rear Temperature Selection – up/down buttons

3.2.2.1 REQ-398698/A-Rear Temperature Selection via up/down buttons - Press and hold support

Rear temperature selection via up/down buttons shall support press and hold functionality. Consequently, the user interface shall transmit applicable signal state upon initial press/selection and continue to transmit while user presses the button.

3.2.2.2 REQ-389500/A-Rear Temperature Selection via up/down buttons – Rear Manual Climate Control Systems

For rear manual climate systems, temperature selection shall always be communicated via the Left Hand Side signal states and the Right Hand Side signal states shall never be transmitted

3.2.2.3 REQ-389501/A-Rear Temperature Selection via up/down buttons – Single Zone Rear Automatic Climate Control Systems

For rear automatic climate systems that only support a single setpoint, temperature selection shall always be communicated via the Left Hand Side signal states and the Right Hand Side signal states shall never be transmitted

3.2.2.4 REQ-389502/A-Rear Left Hand Side Temperature Setting via up/down buttons – Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate setpoints for multiple rows, The LHS signal states shall be associated with the 2nd row.

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Rr_Btn_Status_1st Rr_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		LHS_Temp_Inc_Pressed	If a touchscreen is configured with up and down controls for the LHS setting, it shall transmit this state whenever the LHS temperature 'Up' control is pressed/selected to increase the LHS setting
		LHS_Temp_Dec_Pressed	If a touchscreen is configured with up and down controls for the LHS setting, it shall transmit this state whenever the LHS temperature 'Down' control is pressed/selected to decrease the LHS setting

3.2.2.5 REQ-389503/A-Rear Right Hand Side Temperature Setting via up/down buttons – Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate setpoints for multiple rows, The RHS signal states shall be associated with the 3rd row.

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Frt_Btn_Status_1st Frt_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		RHS_Temp_Inc_Pressed	If a touchscreen is configured with up and down controls for the RHS setting, it shall transmit this state whenever the RHS temperature 'Up' control is pressed/selected to increase the RHS setting
		RHS_Temp_Dec_Pressed	If a touchscreen is configured with up and down controls for the RHS setting, it shall transmit this state whenever the RHS temperature 'Down' control is pressed/selected to decrease the RHS setting

3.2.3 Rear Temperature Selection - direct/slider interface

3.2.3.1 REQ-396818/A-Rear Temperature Selection via direct/slider interface - Usage

A user interface shall transmit signals and states per direct/slider requirements when a rear temperature setting(Manual system) or rear temperature setpoint(Auto system) adjustment has been requested via any of the following methods:

- Selection of specific setting or setpoint by press of a button/location within a range of temperatures
- Movement of a temperature "slider" across a range of temperatures
- Voice command for a valid temperature setting (ref voice command requirements for additional details)
- Selection of a particular user profile and/or user selection from within a phone app etc.

3.2.3.2 REQ-389505/A-Rear Temperature Setting via direct/slider interface - Touchscreen CAN transmission

Message	Signal	State(s)	Description
APIM_Send_Signals_6	Rear_Temp	No_Request	A user interface shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Max_Cooling	A user interface shall transmit this state whenever the user issues a request for the Maximum Cooling temperature setting
		Level_3_Cooling	A user interface shall transmit this state whenever the user issues a request for the Level 3 Cooling temperature setting
		Level_2_Cooling	A user interface shall transmit this state whenever the user issues a request for the Level 2 Cooling temperature setting

		Level_1_Cooling	A user interface shall transmit this state whenever the user issues a request for the Level 1 Cooling temperature setting
		No_Heating_Cooling	A user interface shall transmit this state whenever the user issues a request for the Midpoint temperature setting
		Level_1_Heating	A user interface shall transmit this state whenever the user issues a request for the Level 1 Heating temperature setting
		Level_2_Heating	A user interface shall transmit this state whenever the user issues a request for the Level 2 Heating temperature setting
		Level_3_Heating	A user interface shall transmit this state whenever the user issues a request for the Level 3 Heating temperature setting
		Max_Heating	A user interface shall transmit this state whenever the user issues a request for the Maximum Heating temperature setting
		Not_Used	These states are included as a design protect only. In the event any of these states are received, the user interface shall treat as if it has received No_Request state

3.2.3.3 REQ-389507/A-Rear Temperature Selection via direct/slider interface – Single Zone Rear Automatic Climate Control Systems

For rear automatic climate systems that only support a single rear setpoint, temperature adjustments shall always be communicated via the Left Hand side signals only. The state of the Right Hand side signals shall always be set = No_Request. In the event climate module receives a Right Hand side signal state ≠ No_Request, it shall treat as if it has received No_Request.

3.2.3.4 REQ-389508/A-Rear Left Hand Side Setpoint via direct/slider interface - Touchscreen CAN transmission

The touchscreen shall convert and only transmit commands for a specific temperature in units of °C per the valid signal states.
In cases where a rear climate system is configured to support separate setpoints for multiple rows, The Rear_Set_Temp signal states shall be associated with the 2nd row.

Message	Signal	State(s)	Description
APIM_Send_Signals_6	Rear_Set_Temp	No_Request	A user interface shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		LO	A user interface shall transmit this state whenever the user issues a request for LO/ minimum temperature setpoint
		15_5	A user interface shall transmit this state whenever the user issues a request for 15.5 °C or 60°F temperature setpoint
		16_0	A user interface shall transmit this state whenever the user issues a request for 16°C or 61°F temperature setpoint
		16_5	A user interface shall transmit this state whenever the user issues a request for 16.5 °C or 62°F temperature setpoint
		17_0	A user interface shall transmit this state whenever the user issues a request for 17°C or 63°F temperature setpoint
		17_5	A user interface shall transmit this state whenever the user issues a request for 17.5 °C temperature setpoint
		18_0	A user interface shall transmit this state whenever the user issues a request for 18°C or 64°F temperature setpoint

		18_5	A user interface shall transmit this state whenever the user issues a request for 18.5 °C or 65°F temperature setpoint
		19_0	A user interface shall transmit this state whenever the user issues a request for 19°C or 66°F temperature setpoint
		19_5	A user interface shall transmit this state whenever the user issues a request for 19.5°C or 67°F temperature setpoint
		20_0	A user interface shall transmit this state whenever the user issues a request for 20°C or 68°F temperature setpoint
		20_5	A user interface shall transmit this state whenever the user issues a request for 20.5°C or 69°F temperature setpoint
		21_0	A user interface shall transmit this state whenever the user issues a request for 21°C or 70°F temperature setpoint
		21_5	A user interface shall transmit this state whenever the user issues a request for 21.5°C or 61°F temperature setpoint
		22_0	A user interface shall transmit this state whenever the user issues a request for 22°C or 72°F temperature setpoint
		22_5	A user interface shall transmit this state whenever the user issues a request for 22.5 °C temperature setpoint
		23_0	A user interface shall transmit this state whenever the user issues a request for 23°C or 73°F temperature setpoint
		23_5	A user interface shall transmit this state whenever the user issues a request for 23.5°C or 74°F temperature setpoint
		24_0	A user interface shall transmit this state whenever the user issues a request for 24°C or 75°F temperature setpoint
		24_5	A user interface shall transmit this state whenever the user issues a request for 24.5°C or 76°F temperature setpoint
		25_0	A user interface shall transmit this state whenever the user issues a request for 25°C or 77°F temperature setpoint
		25_5	A user interface shall transmit this state whenever the user issues a request for 25.5°C or 78°F temperature setpoint
		26_0	A user interface shall transmit this state whenever the user issues a request for 26C or 79°F temperature setpoint
		26_5	A user interface shall transmit this state whenever the user issues a request for 26.5°C or 80°F temperature setpoint
		27_0	A user interface shall transmit this state whenever the user issues a request for 27°C or 81°F temperature setpoint
		27_5	A user interface shall transmit this state whenever the user issues a request for 27.5°C temperature setpoint
		28_0	A user interface shall transmit this state whenever the user issues a request for 28°C or 82°F temperature setpoint
		28_5	A user interface shall transmit this state whenever the user issues a request for 28.5°C or 83°F temperature setpoint
		29_0	A user interface shall transmit this state whenever the user issues a request for 29°C or 84°F temperature setpoint

		29_5	A user interface shall transmit this state whenever the user issues a request for 29.5°C or 85°F temperature setpoint
		HI	A user interface shall transmit this state whenever the user issues a request for HI/ maximum temperature setpoint

3.2.3.5 REQ-389509/A-Rear Right Hand Side Setpoint via direct/slider interface - Touchscreen CAN transmission

The touchscreen shall convert and only transmit commands for a specific temperature in units of °C per the valid signal states.

In cases where a rear climate system is configured to support separate setpoints for multiple rows, the Third_Rear_Set_Temp signal states shall be associated with the 3rd row

Message	Signal	State(s)	Description
APIM_Send_Signals_6	Third_Rear_Set_Temp	No_Request	A user interface shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		LO	A user interface shall transmit this state whenever the user issues a request for LO/ minimum temperature setpoint
		15_5	A user interface shall transmit this state whenever the user issues a request for 15.5 °C or 60°F temperature setpoint
		16_0	A user interface shall transmit this state whenever the user issues a request for 16°C or 61°F temperature setpoint
		16_5	A user interface shall transmit this state whenever the user issues a request for 16.5 °C or 62°F temperature setpoint
		17_0	A user interface shall transmit this state whenever the user issues a request for 17°C or 63°F temperature setpoint
		17_5	A user interface shall transmit this state whenever the user issues a request for 17.5 °C temperature setpoint
		18_0	A user interface shall transmit this state whenever the user issues a request for 18°C or 64°F temperature setpoint
		18_5	A user interface shall transmit this state whenever the user issues a request for 18.5 °C or 65°F temperature setpoint
		19_0	A user interface shall transmit this state whenever the user issues a request for 19°C or 66°F temperature setpoint
		19_5	A user interface shall transmit this state whenever the user issues a request for 19.5°C or 67°F temperature setpoint
		20_0	A user interface shall transmit this state whenever the user issues a request for 20°C or 68°F temperature setpoint
		20_5	A user interface shall transmit this state whenever the user issues a request for 20.5°C or 69°F temperature setpoint
		21_0	A user interface shall transmit this state whenever the user issues a request for 21°C or 70°F temperature setpoint
		21_5	A user interface shall transmit this state whenever the user issues a request for 21.5°C or 61°F temperature setpoint
		22_0	A user interface shall transmit this state whenever the user issues a request for 22°C or 72°F temperature setpoint

		22_5	A user interface shall transmit this state whenever the user issues a request for 22.5 °C temperature setpoint
		23_0	A user interface shall transmit this state whenever the user issues a request for 23°C or 73°F temperature setpoint
		23_5	A user interface shall transmit this state whenever the user issues a request for 23.5°C or 74°F temperature setpoint
		24_0	A user interface shall transmit this state whenever the user issues a request for 24°C or 75°F temperature setpoint
		24_5	A user interface shall transmit this state whenever the user issues a request for 24.5°C or 76°F temperature setpoint
		25_0	A user interface shall transmit this state whenever the user issues a request for 25°C or 77°F temperature setpoint
		25_5	A user interface shall transmit this state whenever the user issues a request for 25.5°C or 78°F temperature setpoint
		26_0	A user interface shall transmit this state whenever the user issues a request for 26C or 79°F temperature setpoint
		26_5	A user interface shall transmit this state whenever the user issues a request for 26.5°C or 80°F temperature setpoint
		27_0	A user interface shall transmit this state whenever the user issues a request for 27°C or 81°F temperature setpoint
		27_5	A user interface shall transmit this state whenever the user issues a request for 27.5°C temperature setpoint
		28_0	A user interface shall transmit this state whenever the user issues a request for 28°C or 82°F temperature setpoint
		28_5	A user interface shall transmit this state whenever the user issues a request for 28.5°C or 83°F temperature setpoint
		29_0	A user interface shall transmit this state whenever the user issues a request for 29°C or 84°F temperature setpoint
		29_5	A user interface shall transmit this state whenever the user issues a request for 29.5°C or 85°F temperature setpoint
		HI	A user interface shall transmit this state whenever the user issues a request for HI/ maximum temperature setpoint

3.2.3.6 REQ-389382/A-Temperature Selection via direct/slider interface – User Interface, CAN transmission rate

When a user interface includes a "slider" type control for temperature adjustment, the user may change the temperature very quickly and pass thru many temperatures in a short period of time. Consequently, the user interface shall limit transmission of signals to no quicker than once every 20 msec +/-10%.

3.2.3.7 REQ-389383/A-Temperature Selection via direct/slider interface – Display updates

While a slider type control is being used to adjust temperature and the associated signal(s) are being transmitted, the user interface shall continue to update the temperature display(s) per the applicable signal states it receives from the climate module.

For example, if the driver's setpoint is 16°C and the user drags slider to increase by 10°C (i.e. to 26°C) in 100 msec then only 5 Drv_Set_Temp updates would be sent out 20 msec +/- 10% apart and the setpoint display would be

updated to reflect these same changes. This would work as follows (assuming 60ms latency between setpoint request and display update over CAN for simplicity):

- **i) 20 msec after first starting to move slider from 16°C Drv_Set_Temp = 17.5°C →**
- **j) 20 msec later Drv_Set_Temp = 19.5°C →**
- **k) 20 msec later Drv_Set_Temp = 22.0°C →**
- **l) 20 msec later Drv_Set_Temp = 24.5°C - Display changes from 16°C to 17.5°C →**
- **m) 20 msec later Drv_Set_Temp = 26.0°C when the user removes finger from touchscreen - Display changes from 17.5°C to 19.5°C→**
- **n) 20 msec later Display changes from 19.5°C to 22.0°C→**
- **o) 20 msec later Display changes from 22.0°C to 24.5°C→**
- **p) 20 msec later Display changes from 24.5°C to 26.0°C (display reflects final setpoint selection within maximum allowable time per latency requirements – 60msec in this example)**

3.2.4 Rear Blower Speed Displays

3.2.4.1 REQ-398708/A-Rear Blower Speed Display – Rear Manual and Automatic Climate systems

Indication/display shall be in the form of a blower graphic along with the appropriate number of manual blower bars/indicators.

3.2.4.2 REQ-389515/A-Rear Manual Climate Control Systems Blower Speed Display - Front Interfaces

For rear manual climate systems, the blower speed display in any front interfaces shall always be based on the Left Hand side signal states (ref REQ389513) and the Right Hand Side signal states shall be ignored.

3.2.4.3 REQ-389516/A-Single Zone Rear Automatic Blower Speed Display

For rear automatic climate systems that only support a single rear zone, the blower display shall always be based on the Left Hand Side signal states and the Right Hand Side signal states shall be ignored

3.2.4.4 REQ-389513/A-Rear Left Hand Side Blower Speed Display – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification

In cases where a rear climate system is configured to support separate setpoints for multiple rows, The LHS blower speed display shall be associated with the 2nd row.

Message	Signal	State(s)	Description
Clmt_Button_Stat3	Rr_Blower_Indicate	Indicators_Off	A user interface shall indicate via graphical expression that blower speed is 0. The climate module shall transmit this state whenever the user selects a blower speed of 0.
		1_Indicator_On	A user interface shall indicate that blower speed is 1 by turning on 1 blower bar/indication starting from left to right or from bottom to top.
		2_Indicators_On	A user interface shall indicate that blower speed is 2 by turning on 2 blower bars/indications starting from left to right or from bottom to top.
		3_Indicators_On	A user interface shall indicate that blower speed is 3 by turning on 3 blower bars/indications starting from left to right or from bottom to top.
		4_Indicators_On	A user interface shall indicate that blower speed is 4 by turning on 4 blower bars/indications starting from left to right or from bottom to top.
		5_Indicators_On	A user interface shall indicate that blower speed is 5 by turning on 5 blower bars/indications starting from left to right or from bottom to top.
		6_Indicators_On	A user interface shall indicate that blower speed is 6 by turning on 6 blower bars/indications starting from left to right or from bottom to top.

		7_Indicators_On	A user interface shall indicate that blower speed is 7 by turning on 7 blower bars/indications starting from left to right or from bottom to top.
		8_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		9_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		10_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		11_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		12_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		13_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		14_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		Display_Blank	A user interface shall blank off the blower display i.e. no blower bar/indication visible at all. The climate module shall transmit this state whenever the blower is being automatically controlled or the climate power is off.

3.2.4.5 <u>REQ-389514/A-Rear Right Hand Side Blower Speed Display – Climate Module CAN transmission</u>

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification

In cases where a rear climate system is configured to support separate setpoints for multiple rows, The RHS blower speed display shall be associated with the 3rd row.

Message	Signal	State(s)	Description
Clmt_Button_Stat7	Rr_RHS_Blower_Indicate	Indicators_Off	A user interface shall indicate via graphical expression that blower speed is 0. The climate module shall transmit this state whenever the user selects a blower speed of 0.
		1_Indicator_On	A user interface shall indicate that blower speed is 1 by turning on 1 blower bar/indication starting from left to right or from bottom to top.
		2_Indicators_On	A user interface shall indicate that blower speed is 2 by turning on 2 blower bars/indications starting from left to right or from bottom to top.
		3_Indicators_On	A user interface shall indicate that blower speed is 3 by turning on 3 blower bars/indications starting from left to right or from bottom to top.
		4_Indicators_On	A user interface shall indicate that blower speed is 4 by turning on 4 blower bars/indications starting from left to right or from bottom to top.
		5_Indicators_On	A user interface shall indicate that blower speed is 5 by turning on 5 blower bars/indications starting from left to right or from bottom to top.
		6_Indicators_On	A user interface shall indicate that blower speed is 6 by turning on 6 blower bars/indications starting from left to right or from bottom to top.

		7_Indicators_On	A user interface shall indicate that blower speed is 7 by turning on 7 blower bars/indications starting from left to right or from bottom to top.
		8_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		9_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		10_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		11_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		12_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		13_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		14_Indicators_On	Included as a design protect only. The climate module shall never transmit this state. A user interface shall treat as if it has received the Display_Blank state
		Display_Blank	A user interface shall blank off the blower display i.e. no blower bar/indication visible at all. The climate module shall transmit this state whenever the blower is being automatically controlled or the climate power is off.

3.2.5 Rear Blower Speed Selection – up/down (via buttons or continuous knob rotation)

3.2.5.1 REQ-398710/A-Rear Blower Speed Selection via up/down buttons - Press and hold support

Rear blower speed selection via up/down buttons shall support press and hold functionality. Consequently, the user interface shall transmit applicable signal state upon initial press/selection and continue to transmit while user presses the button.

3.2.5.2 REQ-389518/A-Rear Blower Speed Selection via up/down interface – Rear Manual Climate Control Systems

For manual rear climate systems, blower speed selection shall always be communicated via the Left Hand Side signal states and the Right Hand Side signal states shall never be transmitted

3.2.5.3 REQ-389519/A-Rear Blower Speed Selection via up/down interface – Single Zone Rear Automatic Climate Control Systems

For automatic rear climate systems that only support a single blower speed, blower speed selection shall always be communicated via the Left Hand Side signal states and the Right Hand Side signal states shall never be transmitted

3.2.5.4 REQ-389520/A-Left Hand Side Rear Blower Speed via up/down interface – Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate blower speeds for multiple rows, The LHS signal states shall be associated with the 2nd row.

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Rr_Btn_Status_1st Rr_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Blwr_Inc_Pressed	If a touchscreen is configured with up and down controls for the LHS rear blower speed, it shall transmit this state whenever the LHS blower speed 'Up' control is pressed/selected to increase the blower speed
		Blwr_Dec_Pressed	If a touchscreen is configured with up and down controls for the LHS rear blower speed, it shall

			transmit this state whenever the LHS rear blower speed 'Down' control is pressed/selected to decrease the blower speed

3.2.5.5 REQ-389521/A-Right Hand Side Rear Blower Speed via up/down interface – Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate blower speeds for multiple rows, The RHS signal states shall be associated with the 3rd row

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Rr_Btn_Status_1st Rr_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Third_Blwr_Inc_Pressed	If a touchscreen is configured with up and down controls for the RHS rear blower speed, it shall transmit this state whenever the blower speed 'Up' control is pressed/selected to increase the RHS rear blower speed
		Third_Blwr_Dec_Pressed	If a touchscreen is configured with up and down controls for the RHS rear blower speed, it shall transmit this state whenever the RHS rear blower speed 'Down' control is pressed/selected to decrease the blower speed

3.2.6 Rear Blower Speed Selection – direct/slider interface

3.2.6.1 REQ-400177/A-Rear Blower Speed Selection via direct/slider interface - Usage

The user interface shall transmit signals and states per direct/slider requirements when a blower speed adjustment has been requested via any of the following methods:

- Selection of specific blower speed by press of a button/location within a range of speeds
- Movement of a blower "slider" across a range of blower speeds
- Voice command for a valid blower speed (ref voice command requirements for additional details)

3.2.6.2 REQ-389523/A-Rear Blower Speed Selection via direct/slider interface – Rear Manual Climate Control Systems

For rear manual climate systems, blower speed selection shall always be communicated via the Left hand side signals. The state of the Right hand side signals shall always be set = No_Request. In the event the climate module receives a Right hand side signal state ≠ No_Request, it shall treat as if it has received No_Request.

3.2.6.3 REQ-389524/A-Rear Blower Speed Selection via direct/slider interface – Single Zone Rear Automatic Climate Control Systems

For automatic rear climate systems that only support a single rear blower speed, blower speed adjustments shall always be communicated via the Left hand side signals. The state of the Right hand side signals shall always be set = No_Request. In the event the climate module receives a Right hand side signal state ≠ No_Request, it shall treat as if it has received No_Request.

3.2.6.4 REQ-389525/A-Rear Left Hand Side Blower Speed via direct/slider interface - Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate blower speeds for multiple rows, The LHS signal states shall be associated with the 2nd row.

Message	Signal	State(s)	Description
Clmt_Button_Stat4	Rear_Blower_Speed	No_Request	A user interface shall transmit this state unless the conditions for one of the other states within this signal are satisfied.

		Blower_Speed_1	A user interface shall transmit this state whenever the user issues a request for blower speed 1
		Blower_Speed_2	A user interface shall transmit this state whenever the user issues a request for blower speed 2
		Blower_Speed_3	A user interface shall transmit this state whenever the user issues a request for blower speed 3
		Blower_Speed_4	A user interface shall transmit this state whenever the user issues a request for blower speed 4
		Blower_Speed_5	A user interface shall transmit this state whenever the user issues a request for blower speed 5
		Blower_Speed_6	A user interface shall transmit this state whenever the user issues a request for blower speed 6
		Blower_Speed_7	A user interface shall transmit this state whenever the user issues a request for blower speed 7
		Min_Blower	A user interface shall transmit this state whenever the user issues a voice command for minimum blower speed
		Max_Blower	A user interface shall transmit this state whenever the user issues a voice command for maximum blower speed
		Zero_Blower	A user interface shall transmit this state whenever the user issues a request for blower speed 0
		Not _Used	These states are included as a design protect only. In the event any of these states are received, the climate module shall treat as if it has received No_Request state

3.2.6.5 REQ-389526/A-Rear Right Hand Side Blower Speed via direct/slider interface - Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate blower speeds for multiple rows, The RHS signal states shall be associated with the 3rd row

Message	Signal	State(s)	Description
Clmt_Button_Stat4	Third_Rear_Blower_Speed	No_Request	A user interface shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Blower_Speed_1	A user interface shall transmit this state whenever the user issues a request for blower speed 1
		Blower_Speed_2	A user interface shall transmit this state whenever the user issues a request for blower speed 2
		Blower_Speed_3	A user interface shall transmit this state whenever the user issues a request for blower speed 3
		Blower_Speed_4	A user interface shall transmit this state whenever the user issues a request for blower speed 4
		Blower_Speed_5	A user interface shall transmit this state whenever the user issues a request for blower speed 5
		Blower_Speed_6	A user interface shall transmit this state whenever the user issues a request for blower speed 6
		Blower_Speed_7	A user interface shall transmit this state whenever the user issues a request for blower speed 7
		Min_Blower	A user interface shall transmit this state whenever the user issues a voice command for minimum blower speed
		Max_Blower	A user interface shall transmit this state whenever the user issues a voice command for maximum blower speed
		Zero_Blower	A user interface shall transmit this state whenever the user issues a request for blower speed 0
		Not _Used	These states are included as a design protect only. In the event any of these states are received, the climate module shall treat as if it has received No_Request state

3.2.6.6 REQ-389399/A-Blower Speed Selection via direct/slider interface – User Interface, CAN transmission rate

When a user interface includes a "slider" type control for blower speed adjustment, the user may change the blower speed very quickly and pass thru many speeds in a short period of time. Consequently, the user interface shall limit transmission of signals to no quicker than once every 20 msec +/-10%.

3.2.6.7 REQ-389400/A-Blower Speed Selection via direct/slider interface – Display updates

While a slider type control is being used to adjust blower speed and the associated signal(s) are being transmitted, the user interface shall continue to update the blower speed display(s) per the applicable signal states it receives from the climate module.

For example, if the blower speed is 1 and the user drags slider to increase to 7 within 80 msec then only 4 Frt_Blower_Speed2 updates would be sent out 20 msec +/- 10% apart and the blower speed display would be updated to reflect these same changes. This would work as follows (assuming 60ms latency between speed request and display update over CAN for simplicity - 60msec in this example):

- **h) 20 msec after first starting to move slider from 1 Frt_Blower_Speed2 = 2 →**
- **i) 20 msec later Frt_Blower_Speed2= 4 →**
- **j) 20 msec later Frt_Blower_Speed2= 6 →**
- **k) 20 msec later Frt_Blower_Speed2= 7 when the user removes finger from touchscreen - Display changes from 1 to 2 →**
- **l) 20 msec later Display changes from 2 to 4→**
- **m) 20 msec later Display changes from 4 to 6→**
- **n) 20 msec later Display changes from 6 to 7 (display reflects final selection within maximum allowable time per latency requirements)**

3.2.7 Rear Auto function

3.2.7.1 REQ-389548/A-Rear Auto – Single Zone Rear Automatic Climate Control Systems

For automatic rear climate systems that only support a single zone or in cases where the rear Synch function is turned on per REQ-395576, the auto selection and indication shall always be communicated via the rear Left Hand Side signal states. The rear Right Hand Side signals shall be ignored.

3.2.7.2 REQ-389550/A-Left Hand Side Rear Auto Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification
In cases where a rear climate system is configured to support separate rear auto indicators for multiple rows, these LHS signal states shall be associated with the 2nd row.

Message	Signal	State(s)	Description
Clmt_Button_Stat3	Rr_AUTO_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.2.7.3 REQ-389552/A-Right Hand Side Rear Auto Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification
In cases where a rear climate system is configured to support separate rear auto indicators for multiple rows, these RHS signal states shall be associated with the 3rd row.

Message	Signal	State(s)	Description
Clmt_Button_Stat7	Rr_Third_AUTO_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.2.7.4 REQ-389549/A-Left Hand Side Rear Auto selection – Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate rear auto selection for multiple rows, these LHS signal states shall be associated with the 2nd row.

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Rr_Btn_Status_1st Rr_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		AUTO_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.2.7.5 REQ-389551/A-Right Hand Side Rear Auto selection – Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate rear auto selection for multiple rows, these RHS signal states shall be associated with the 3rd row.

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Rr_Btn_Status_1st Rr_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Third_AUTO_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.2.8 Rear Air Distribution functions

3.2.8.1 REQ-392813/A-Rear Air Distribution functions -User Interface

Manual selection for the rear air distribution modes within a user interface shall be via two separate air distribution controls. These two air distribution modes shall be selectable in any combination – Panel and Floor.

3.2.8.2 REQ-389536/A-Rear Air Distribution – Rear Manual Climate Control Systems

For rear manual climate systems, air distribution selection and indication shall always be communicated via the rear Left Hand Side signal states. The rear Right Hand Side signals shall be ignored

3.2.8.3 REQ-389537/A-Rear Air Distribution – Single Zone Rear Automatic Climate Control Systems

For rear automatic climate systems that only support a single zone or in cases where the rear Synch function is turned on per REQ-395576, the air distribution selection and indication shall always be communicated via the rear Left Hand Side signal states. The rear Right Hand Side signals shall be ignored.

3.2.8.4 REQ-389539/A-Left Hand Side Rear Panel Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

In cases where a rear climate system is configured to support separate rear air distribution modes for multiple rows, The LHS signal states shall be associated with the 2nd row.

Message	Signal	State(s)	Description
Clmt_Button_Stat3	Rr_Panel_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.2.8.5 REQ-389541/A-Right Hand Side Rear Panel Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

In cases where a rear climate system is configured to support separate rear air distribution modes for multiple rows, The RHS signal states shall be associated with the 3rd row.

Message	Signal	State(s)	Description
Clmt_Button_Stat7	Rr_Third_Panel_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.2.8.6 REQ-389538/A-Left Hand Side Rear Panel selection – Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate air distribution modes for multiple rows, The LHS signal states shall be associated with the 2nd row.

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Rr_Btn_Status_1st Rr_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Panel_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.2.8.7 REQ-389540/A-Right Hand Side Rear Panel selection – Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate rear air distribution modes for multiple rows, The RHS signal states shall be associated with the 3rd row.

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Rr_Btn_Status_1st Rr_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Third_Panel_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.2.8.8 REQ-389543/A-Left Hand Side Rear Floor Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

In cases where a rear climate system is configured to support separate rear air distribution modes for multiple rows, The LHS signal states shall be associated with the 2nd row.

Message	Signal	State(s)	Description
Clmt_Button_Stat3	Rr_Floor_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.2.8.9 REQ-389545/A-Right Hand Side Rear Floor Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

In cases where a rear climate system is configured to support separate rear air distribution modes for multiple rows, The RHS signal states shall be associated with the 3rd row.

Message	Signal	State(s)	Description
Clmt_Button_Stat7	Rr_Third_Floor_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.2.8.10 REQ-389542/A-Left Hand Side Rear Floor selection – Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate rear air distribution modes for multiple rows, The LHS signal states shall be associated with the 2nd row.

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Rr_Btn_Status_1st Rr_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Floor_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.2.8.11 REQ-389544/A-Right Hand Side Rear Floor selection – Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate rear air distribution modes for multiple rows, The RHS signal states shall be associated with the 3rd row.

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Rr_Btn_Status_1st Rr_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Third_Floor_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.2.9 Rear Power function

3.2.9.1 REQ-389528/A-Rear Power – Rear Manual Climate Control Systems

For rear manual climate systems, power selection and indication shall always be communicated via the rear Left Hand Side signal states. The rear Right Hand Side signals shall be ignored

3.2.9.2 REQ-389529/A-Rear Power – Single Zone Rear Automatic Climate Control Systems

For rear automatic climate systems that only support a single zone or in cases where the rear Synch function is turned on per REQ-395576, the power selection and indication shall always be communicated via the rear Left Hand Side signal states. The rear Right Hand Side signals shall be ignored.

3.2.9.3 REQ-389531/A-Left Hand Side Rear Power Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

In cases where a rear climate system is configured to support separate rear power indicators for multiple rows, The LHS signal states shall be associated with the 2nd row.

Message	Signal	State(s)	Description
Clmt_Button_Stat3	Rr_Power_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.2.9.4 REQ-389533/A-Right Hand Side Rear Power Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

In cases where a rear climate system is configured to support separate rear power indicators for multiple rows, The RHS signal states shall be associated with the 3rd row.

Message	Signal	State(s)	Description
Clmt_Button_Stat7	Rr_Third_Power_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.2.9.5 REQ-389530/A-Left Hand Side Rear Power selection – Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate rear power selection for multiple rows, The LHS signal states shall be associated with the 2nd row.

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Rr_Btn_Status_1st Rr_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Rear_Power_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.2.9.6 REQ-389532/A-Right Hand Side Rear Power selection – Touchscreen CAN transmission

In cases where a rear climate system is configured to support separate rear power selection for multiple rows, The RHS signal states shall be associated with the 3rd row.

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Rr_Btn_Status_1st Rr_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Third_Rr_Pwr_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.2.10 Rear Lock function

3.2.10.1 REQ-389555/A-Rear Lock Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat3	Rr_Lock_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off
		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on

3.2.10.2 REQ-389554/A-Rear Lock selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Rr_Btn_Status_1st Rr_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Rear_Lock_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.2.11 Rear Synch function

3.2.11.1 REQ-395576/A-Rear Synch Indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable state logic section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat7	Rr_Synch_Btn_Stt	Enabled_Inactive	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to off

		Enabled_Active	The user interface shall use graphical expression to communicate that the associated control is selectable and set any included indicator to on. Furthermore, while receiving this state the user interface shall transmit all user selections for rear climate system via the left hand side signal states per requirements within VSEM section 775120
		Disabled_Inactive	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to off
		Disabled_Active	The user interface shall use graphical expression to communicate that the associated control cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. Any included indicator shall be set to on. Furthermore, while receiving this state the user interface shall transmit all user selections for rear climate system via the left hand side signal states per requirements within VSEM section 775120

3.2.11.2 REQ-395575/A-Rear Synch selection – Touchscreen CAN transmission

Message	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Rr_Btn_Status_1st Rr_Btn_Status_2nd	None_Pressed	A touchscreen shall transmit this state unless the conditions for one of the other states within this signal are satisfied.
		Third_Synch_Pressed	A touchscreen that supports selection of this function shall transmit this state whenever the associated control is pressed/selected

3.2.12 Rear Zone Control Status

3.2.12.1 REQ-401691/A-Rear Zone Control Status – Quad Zone systems

When a vehicle is equipped with a Quad Zone system the rear user interfaces shall support switching between LHS controls, RHS controls and overall status display(if applicable) for the rear climate system. The operational logic for navigation shall be handled by the rear user interfaces. However, the climate module needs to know which view is active to support proper Synchronization control etc. Consequently, the active view shall be determined based on the signals from each rear user interface.

3.2.12.2 REQ-395604/A-Rear Zone Control Status – Touchscreen CAN transmission

	Signal(s)	State(s)	Description
Clmt_Button_Stat4	Climt_RearView R_D_Stat	Not_Displayed	A touchscreen shall transmit this state whenever the user interface is not displaying any rear climate controls and status
		Both	A touchscreen shall transmit this state whenever the user interface is displaying both 2nd and 3rd row climate controls and status at the same time
		Second_Row	A touchscreen shall transmit this state whenever the user interface is displaying the left hand side climate controls and status
		Third_Row	A touchscreen shall transmit this state whenever the user interface is displaying the right hand side climate controls and status

3.2.13 Air Quality status display(s)

3.2.13.1 REQ-389359/A-Current Cabin Air Quality

The determination of the actual, current cabin air quality shall be made by the climate module and used in any front or rear interfaces designed to display this information to the user.

Message	Signal	State(s)	Description
ParticulateMatterData2	PmCabn_Conc_Actl	0-500	A user interface shall display this value received (numerically and/or graphically) as the current cabin air quality
		501-509	These signal states are included as a design protect only. Consequently, the climate module shall never transmit these states. If a user interface receives these states, it shall respond as if it has received 'No_Data_Exists' state.
		No_Data_Exists	A user interface shall refer to *Cabin Air Quality Sensor Diagnostic* requirements and update display(s) accordingly.
		Faulty	This signal state is included as a design protect only. Consequently, the climate module shall never transmit this state. If a user interface receives this state it shall respond as if it has received 'No_Data_Exists' state.

3.2.13.2 REQ-389362/A-Cabin Air Quality Sensor Diagnostics

The Climate module shall support the transmission of a signal based on diagnosis of current cabin sensor status. Any front or rear interface designed to display air quality status to the user shall use this information to determine if additional information should be displayed in addition to, or in place of, the current air quality data.

Message	Signal	State(s)	Description
ParticulateMatterData2	PmSnsCabn_D_Stat	Initializing	A user interface shall display the text "Initializing" (and/or approved alternative) in the area(s) where the current cabin data would normally be displayed.
		Unsupported	This signal state is included as a design protect only. Consequently, the climate module shall never transmit this state. If a user interface receives this state it shall respond as if it has received 'Blank_Field' state
		Clean_Sensor	A user interface shall display the text "Sensor Dirty" (and/or approved alternative) in the area(s) where the current cabin data would normally be displayed.
		Replace_Sensor	A user interface shall display the text "Replace the sensor" (and/or approved alternative) in the area(s) where the current cabin data would normally be displayed.
		Blank_Field	A user interface shall blank out any data that would normally be displayed in the area(s) where the current cabin data would normally be displayed.
		No_Issue	A user interface shall display the numerical value 0-500 it receives for *Current Cabin Air Quality* if available. Otherwise, it shall blank out any data that would normally be displayed in the area(s) where the current cabin data would normally be displayed.
		Intermittent_Inhibit	A user interface shall display the text "environmental limit reached" (and/or approved alternative) in the area(s) where the current cabin data would normally be displayed.
		Not_Used_1	This signal state is included as a design protect only. Consequently, the climate module shall never transmit this state. If a user interface receives this state it shall respond as if it has received 'No_Issue' state.

3.2.13.3 REQ-389556/A-Air Quality Classification - Touchscreen CAN transmission

The main user interface/touchscreen shall support the transmission of signals to provide additional assessments of air quality based on actual Particulate Matter levels and other system information. The rear climate module shall then use this information to change HMI displays and verbiage accordingly.

Message	Signal	State(s)	Description
PartMttrCabn_Stat_Immed	PmCabnLvl_D_Stat	Not_Known	The Rear climate module shall include a default colored highlight or background for the displayed PM data it receives from the front climate module. Additionally, the text "unknown" (or approved alternative) may also be displayed in addition to the actual PM data. The specific color associated with this level is specified by the touchscreen interface in a separate requirement.
		Pm_Level_1_Best	The Rear climate module shall include a colored highlight or background for the displayed PM data it receives from the front climate module. Additionally, a specific classification may also be displayed in addition to the actual PM data. The specific color and classification associated with this level are specified by the touchscreen interface in a separate requirement
		Pm_Level_2	The Rear climate module shall include a colored highlight or background for the displayed PM data it receives from the front climate module. Additionally, a specific classification may also be displayed in addition to the actual PM data. The specific color and classification associated with this level are specified by the touchscreen interface in a separate requirement
		Pm_Level_3	The Rear climate module shall include a colored highlight or background for the displayed PM data it receives from the front climate module. Additionally, a specific classification may also be displayed in addition to the actual PM data. The specific color and classification associated with this level are specified by the touchscreen interface in a separate requirement
		Pm_Level_4	The Rear climate module shall include a colored highlight or background for the displayed PM data it receives from the front climate module. Additionally, a specific classification may also be displayed in addition to the actual PM data. The specific color and classification associated with this level are specified by the touchscreen interface in a separate requirement
		Pm_Level_5	The Rear climate module shall include a colored highlight or background for the displayed PM data it receives from the front climate module. Additionally, a specific classification may also be displayed in addition to the actual PM data. The specific color and classification associated with this level are specified by the touchscreen interface in a separate requirement
		Pm_Level_6_Worst	The Rear climate module shall include a colored highlight or background for the displayed PM data it receives from the front climate module. Additionally, a specific classification may also be displayed in addition to the actual PM data. The specific color and classification associated with this level are specified by the touchscreen interface in a separate requirement
		Not_Used	Included as a design protect only and shall never be transmitted by a touchscreen. If the Rear climate module receives this state it shall respond as if it has received 'Not_Known' state.
	PmCabn_D_Stat	NotKnown	The Rear climate module shall display an icon or other graphic to communicate current status of air filtering system in addition to the PM data it receives from the front climate module. The specific icon or graphic

			associated with this status is specified by the touchscreen interface in a separate requirement.
		Filtering_Off	The Rear climate module shall display an icon or other graphic to communicate current status of air filtering system in addition to the PM data it receives from the front climate module. The specific icon or graphic associated with this status is specified by the touchscreen interface in a separate requirement.
		Filtering_On	The Rear climate module shall display an icon or other graphic to communicate current status of air filtering system in addition to the PM data it receives from the front climate module. The specific icon or graphic associated with this status is specified by the touchscreen interface in a separate requirement.
		Filtering_Complete	The Rear climate module shall display an icon or other graphic to communicate current status of air filtering system in addition to the PM data it receives from the front climate module. The specific icon or graphic associated with this status is specified by the touchscreen interface in a separate requirement.

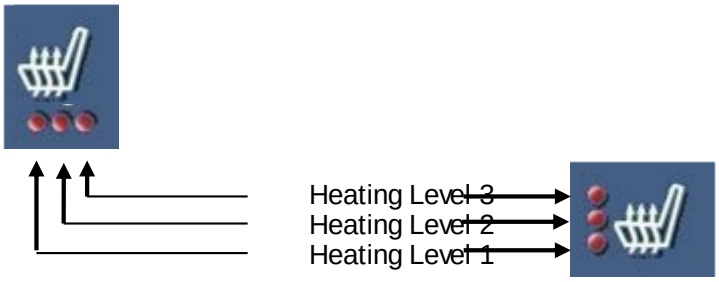
3.2.14 Rear Touchscreen CAN transmission

3.2.14.1 REQ-401695/A-Rear Heated and/or cooled seat indicator consistency

Orientation of rear heated and/or cooled seat indicators shall be the same across all applicable interfaces.

3.2.14.2 REQ-401702/A-Rear conditioned seat indicator orientation

Any indicators used to provide status of heated and/or cooled seat function shall be orientated with indication for warmest or coolest setting positioned on right (for horizontal display) or at top (for vertical display) - see example for heated seat below



3.2.14.3 REQ-401703/A-Rear Left Hand Side Conditioned Seat indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat3	Rr_LH_Htd_Seat_Btn_Stt	Enabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Enabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and*

			xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings
		Disabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
	Rr_LH_Cld_Seat_Btn_Stt	Enabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Enabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
	Rr_LH_Cond_Seat_Stat	Off	The Climate module shall transmit this state whenever the left, rear conditioned seat (both heating and cooling) is turned off. The user interface shall ensure all heated and cooled seat indicators are set to off and use graphical expression to communicate that the left, rear conditioned seat controls are selectable
		Level_1_Cooling	The Climate module shall transmit this state whenever the left, rear **cooled** seat is turned on at the lowest setting. The user interface shall ensure all heated seat indicators are set to off and shall turn on a single cooled seat indicator to signify a setting of 1. The user interface shall also use graphical expression to communicate that the left, rear conditioned seat control(s) are selectable
		Level_2_Cooling	The Climate module shall transmit this state whenever the left, rear **cooled** seat is turned on at the second from lowest setting. The user interface shall ensure all heated seat indicators are set to off and shall turn on two cooled seat indicators to signify a setting of 2. The user interface shall also use graphical expression to communicate that the left, rear conditioned seat control(s) are selectable
		Level_3_Cooling	The Climate module shall transmit this state whenever the left, rear **cooled** seat is turned on at the second from highest setting. The user interface shall ensure all heated seat indicators are set to off and shall turn on three cooled seat indicators to signify a setting of 3. The user interface shall also use graphical expression to communicate that the left, rear conditioned seat control(s) are selectable
		Level_1_Heating	The Climate module shall transmit this state whenever the left, rear heated seat is turned on at the lowest setting.

			The user interface shall ensure all cooled seat indicators are set to off and shall turn on a single heated seat indicator to signify a setting of 1. The user interface shall also use graphical expression to communicate that the left, rear conditioned seat control(s) are selectable
		Level_2_Heating	The Climate module shall transmit this state whenever the left, rear heated seat is turned on at the second from lowest setting. The user interface shall ensure all cooled seat indicators are set to off and shall turn on two heated seat indicators to signify a setting of 2. The user interface shall also use graphical expression to communicate that the left, rear conditioned seat control(s) are selectable
		Level_3_Heating	The Climate module shall transmit this state whenever the left, rear heated seat is turned on at the second from lowest setting. The user interface shall ensure all cooled seat indicators are set to off and shall turn on three heated seat indicators to signify a setting of 3. The user interface shall also use graphical expression to communicate that the left, rear conditioned seat control(s) are selectable
		Unused	The user interface shall use graphical expression to communicate that the left, rear conditioned seat control(s) cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. All heated and cooled seat indicators shall be set to off.

3.2.14.4 REQ-401705/A-Rear Right Hand Side Conditioned Seat indication – Climate Module CAN transmission

The Climate Module shall transmit the applicable state for the Indicator status signal per the applicable section(s) of the Climate Module Functional Specification

Message	Signal	State(s)	Description
Clmt_Button_Stat3	Rr_RH_Htd_Seat_Btn_Stt	Enabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Enabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
	Rr_RH_Cld_Seat_Btn_Stt	Enabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*

		Enabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Inactive	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
		Disabled_Active	This signal is redundant and user interface(s) shall ignore this signal state. *xxx_Cond_Seat_Status and xxx_Auto_Seat_Btn_Stt signals shall be used as specified elsewhere to determine control and indicator settings*
	Rr_RH_Cond_Seat_Status	Off	The Climate module shall transmit this state whenever the right, front conditioned seat (both heating and cooling) is turned off. The user interface shall ensure all heated and cooled seat indicators are set to off and use graphical expression to communicate that the right, front conditioned seat controls are selectable
		Level_1_Cooling	The Climate module shall transmit this state whenever the right, front **cooled** seat is turned on at the lowest setting. The user interface shall ensure all heated seat indicators are set to off and shall turn on a single cooled seat indicator to signify a setting of 1. The user interface shall also use graphical expression to communicate that the right, front conditioned seat control(s) are selectable
		Level_2_Cooling	The Climate module shall transmit this state whenever the right, front **cooled** seat is turned on at the second from lowest setting. The user interface shall ensure all heated seat indicators are set to off and shall turn on two cooled seat indicators to signify a setting of 2. The user interface shall also use graphical expression to communicate that the right, front conditioned seat control(s) are selectable
		Level_3_Cooling	The Climate module shall transmit this state whenever the right, front **cooled** seat is turned on at the second from highest setting. The user interface shall ensure all heated seat indicators are set to off and shall turn on three cooled seat indicators to signify a setting of 3. The user interface shall also use graphical expression to communicate that the right, front conditioned seat control(s) are selectable
		Level_1_Heating	The Climate module shall transmit this state whenever the right, front heated seat is turned on at the lowest setting. The user interface shall ensure all cooled seat indicators are set to off and shall turn on a single heated seat indicator to signify a setting of 1. The user interface shall also use graphical expression to communicate that the right, front conditioned seat control(s) are selectable
		Level_2_Heating	The Climate module shall transmit this state whenever the right, front heated seat is turned on at the second from lowest setting. The user interface shall ensure all cooled seat indicators are set to off and shall turn on two heated seat indicators to signify a setting of 2. The user interface shall also use graphical expression to

			communicate that the right, front conditioned seat control(s) are selectable
		Level_3_Heating	The Climate module shall transmit this state whenever the right, front heated seat is turned on at the second from lowest setting. The user interface shall ensure all cooled seat indicators are set to off and shall turn on three heated seat indicators to signify a setting of 3. The user interface shall also use graphical expression to communicate that the right, front conditioned seat control(s) are selectable
		Disabled	The user interface shall use graphical expression to communicate that the right, front conditioned seat control(s) cannot be selected *(i.e. 'greyed out')* and shall not change expression to reflect a pressed state. All heated and cooled seat indicators shall be set to off.

3.3 FUN-REQ-410157/A-Pop-up Displays

3.3.1 Pop-up Displays

3.3.1.1 REQ-389565/A-Pop-ups - Display priority

When activating a pop-up display, only a pop-up for the function being adjusted shall be displayed. Furthermore, only one pop-up display shall be visible at a time. If two or more applicable functions are being adjusted at the same time (**State** ≠ None in more than one signal), the user interface shall display per the first of these signals it receives.

3.3.1.2 REQ-389563/A-Pop-ups – Display content

A single user selection can result in changes to more than one function. Consequently, whenever a pop-up is triggered, the user interface shall consider all control bits for status signals and update the status for all functions appearing in a single pop-up accordingly.

3.3.1.3 REQ-389559/A-Pop-ups – Climate Module CAN transmission

'None' is the default state for the following signals. Unless specified otherwise any states other than 'None' shall only be set temporarily when the corresponding button/function is selected and/or condition satisfied. The signal state shall return to 'None' after button/function is selected and/or condition is satisfied i.e. next CAN transmission, to enable the triggering of pop-up(s) for subsequent user selections.

Message	Signal	State(s)	Description
Clmt_Button_Stat1	CC_Fr_Btn_User_Adj	None	Transmitted unless the conditions for one of the other states are satisfied
		Save_My_Temp_Selection	This signal state is included as a design protect only. Consequently, the climate module shall never transmit this state. If a user interface receives this state it shall respond as if it has received 'None' state.
		Use_My_Temp_Selection	This signal state is included as a design protect only. Consequently, the climate module shall never transmit this state. If a user interface receives this state it shall respond as if it has received 'None' state.
		Fr_AUTO_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the Auto button, input or voice command.
		AC_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the AC button, input or voice command.

		Recirc_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the Recirc button, input or voice command.
		Fr_Power_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the Front Power button, input or voice command.
		Max_AC_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the Max AC button, input or voice command.
		Fr_Air_Dist_Selection	Transmitted whenever the climate module detects an attempted user adjustment via any of the Air Distribution buttons, inputs or voice commands (Windscreen/Panel/Floor).
		Defrost_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the Defrost button, input or voice command.
		Max_Defrost_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the Max Defrost button, input or voice command.
		Rear_Defrost_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the Rear Defrost button, input or voice command.
		Dual_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the Dual button, input or voice command.
		HSW_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the Heated Steering Wheel button, input or voice command.
		LHS_Htd_St_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the left hand side Heated seat button, input or voice command.
		RHS_Htd_St_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the right hand side Heated seat button, input or voice command.
		Htd_WS_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the Heated Windscreen button, input or voice command.
		UFC_Active	The climate module shall transmit this state after a calibratable delay of (0-30) seconds whenever the it detects either of the following: • Vehicle State transition from 'Remote Start' to 'Normal Run' and Ultra Fresh Cabin(UFC) feature status is 'Active' with ≥ (0-30) seconds remaining on UFC timer as defined within the applicable section(s) of the Climate Module Functional Specification. • Vehicle State transition from 'Off' to 'Normal Run' and UFC feature status is 'Active' as defined within the applicable section(s) of the Climate Module Functional Specification. Upon receipt of this state, the user interface shall temporarily display a pop-up or transient message indicating that the Auto Air Refresh operation is currently active.
		UFC_Complete	The climate module shall transmit this state after a calibratable delay of (0-30) seconds whenever the it detects either of the following: • Vehicle State transition from 'Off' to 'Normal Run' and UFC feature status is 'Complete' as

			defined within the applicable section(s) of the Climate Module Functional Specification. • Vehicle State is 'Normal Run' and UFC feature status has changed from 'Active' to 'Complete' as defined within the applicable section(s) of the Climate Module Functional Specification. Upon receipt of this state, the user interface shall temporarily display a pop-up or transient message indicating that the Auto Air Refresh operation has been successfully completed.
		UFC_Interupted	The climate module shall transmit this state whenever it detects that UFC feature status has changed from 'Active' to 'Incomplete' as defined within the applicable section(s) of the Climate Module Functional Specification. Upon receipt of this state, the user interface shall temporarily display a pop-up or transient message indicating that the Auto Air Refresh operation has been interupted.
		LHS_Cld_St_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the left hand side Cooled seat button, input or voice command.
		RHS_Cld_St_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the right hand side Cooled seat button, input or voice command.

Message	Signal	State(s)	Description
Clmt_Button_Stat2	CC_Fr_Stat_User_Adj	None	Transmitted unless the conditions for one of the other states are satisfied
		FLHS_SetPt_Selection	Transmitted whenever the climate module detects an attempted user adjustment via any of the front left hand side temperature setpoint buttons, knobs, inputs or voice commands.
		FRHS_SetPt_Selection	Transmitted whenever the climate module detects an attempted user adjustment via any of the front right hand side temperature setpoint buttons, knobs, inputs or voice commands.
		Fr_Blwr_Spd_Selection	Transmitted whenever the climate module detects an attempted user adjustment via any of the blower buttons, inputs or voice commands.
		DrvrFcsdMde_Selection	Transmitted whenever the climate module detects an attempted user adjustment via a Driver Focused Mode button, input or voice command.
		LHS_AUTO_St_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the left hand side Auto seat button, input or voice command.
		RHS_AUTO_St_Selection	Transmitted whenever the climate module detects an attempted user adjustment via the right hand side Auto seat button, input or voice command
		Unused	Included as a design protect only and shall never be transmitted by the climate module. If a module receives this state it shall respond as if it has received 'None' state.

Message	Signal	State(s)	Description
Clmt_Button_Stat3	CC_Rr_Stat_User_Adj	None	Transmitted unless the conditions for one of the other states are satisfied
		RLHS_SetPt_Selection	Transmitted whenever the climate module detects an attempted user adjustment via any rear, left hand side temperature setpoint buttons, knobs or inputs located in front of vehicle or any voice command for the same.
		RRHS_SetPt_Selection	Transmitted whenever the climate module detects an attempted user adjustment via any rear, right hand side temperature setpoint buttons, knobs or inputs located in front of vehicle or any voice command for the same.
		Rr_Blwr_Spd_Selection	Transmitted whenever the climate module detects an attempted user adjustment via any rear blower buttons, knobs or inputs located in front of vehicle or any voice command for the same.
		Rr_Power_Selection	Transmitted whenever the climate module detects an attempted user adjustment via a rear power button or input located in front of vehicle or voice command for the same.
		Rr_Control_Selection	Transmitted whenever the climate module detects an attempted user adjustment via a rear control button or input located in front of vehicle or voice command for the same.
		Rr_AUTO_Selection	Transmitted whenever the climate module detects an attempted user adjustment via a rear auto button or input located in front of vehicle or voice command for the same.
		Rr_Mode_Selection	Transmitted whenever the climate module detects an attempted user adjustment via any of the rear air distribution buttons or inputs located in front of vehicle (panel/floor) or voice commands for the same.
		Unused	Included as a design protect only and shall never be transmitted by the climate module. If a module receives this state it shall respond as if it has received 'None' state.

3.3.1.4 REQ-389562/A-Pop-ups – Display response

With the exception of Auto Air Refresh transient messages, climate pop-ups for any function with an applicable trigger signal state shall only be activated via receipt of this state from the climate module.

3.3.1.5 REQ-389564/A-Pop-ups - Display suppression

No pop-ups shall be displayed in response to an adjustment of any control via a touchscreen.

3.4 FUN-REQ-410160/A-Outside Air Temperature(OAT) Display

3.4.1 Outside Air Temperature(OAT) Display

3.4.1.1 REQ-389580/A-OAT display dependence on climate module power

The OAT shall be displayed regardless of whether the climate controls are in an on or off state.

3.4.1.2 REQ-389576/A-OAT – Climate Module CAN transmission

The climate module shall always report the value in °C per the corresponding signal states. The user interface shall be responsible for converting the value it receives from the climate module to °F as applicable per the conversions listed in this requirement.

Message	Signal	State	Outside Temperature Value	
			Celsius	Fahrenheit
Climate_Control_Data	Outside_Air_Temp_Stat	0x00	-40.0	-40
		0x01	-39.5	-39

		0x02	-39.0	-38
		0x03	-38.5	-37
		0x04	-38.0	-36
		0x05	-37.5	-35
		0x06	-37.0	-35
		0x07	-36.5	-34
		0x08	-36.0	-33
		0x09	-35.5	-32
		0x0A	-35.0	-31
		0x0B	-34.5	-30
		0x0C	-34.0	-29
		0x0D	-33.5	-28
		0x0E	-33.0	-27
		0x0F	-32.5	-26
		0x10	-32.0	-26
		0x11	-31.5	-25
		0x12	-31.0	-24
		0x13	-30.5	-23
		0x14	-30.0	-22
		0x15	-29.5	-21
		0x16	-29.0	-20
		0x17	-28.5	-19
		0x18	-28.0	-18
		0x19	-27.5	-17
		0x1A	-27.0	-17
		0x1B	-26.5	-16
		0x1C	-26.0	-15
		0x1D	-25.5	-14
		0x1E	-25.0	-13
		0x1F	-24.5	-12
		0x20	-24.0	-11
		0x21	-23.5	-10
		0x22	-23.0	-9
		0x23	-22.5	-8
		0x24	-22.0	-8
		0x25	-21.5	-7
		0x26	-21.0	-6
		0x27	-20.5	-5
		0x28	-20.0	-4
		0x29	-19.5	-3
		0x2A	-19.0	-2
		0x2B	-18.5	-1
		0x2C	-18.0	0
		0x2D	-17.5	1
		0x2E	-17.0	1
		0x2F	-16.5	2
		0x30	-16.0	3
		0x31	-15.5	4
		0x32	-15.0	5
		0x33	-14.5	6
		0x34	-14.0	7
		0x35	-13.5	8
		0x36	-13.0	9
		0x37	-12.5	10
		0x38	-12.0	10
		0x39	-11.5	11
		0x3A	-11.0	12
		0x3B	-10.5	13
		0x3C	-10.0	14
		0x3D	-9.5	15
		0x3E	-9.0	16
		0x3F	-8.5	17

		0x40	-8.0	18
		0x41	-7.5	19
		0x42	-7.0	19
		0x43	-6.5	20
		0x44	-6.0	21
		0x45	-5.5	22
		0x46	-5.0	23
		0x47	-4.5	24
		0x48	-4.0	25
		0x49	-3.5	26
		0x4A	-3.0	27
		0x4B	-2.5	28
		0x4C	-2.0	28
		0x4D	-1.5	29
		0x4E	-1.0	30
		0x4F	-0.5	31
		0x50	0.0	32
		0x51	0.5	33
		0x52	1.0	34
		0x53	1.5	35
		0x54	2.0	36
		0x55	2.5	37
		0x56	3.0	37
		0x57	3.5	38
		0x58	4.0	39
		0x59	4.5	40
		0x5A	5.0	41
		0x5B	5.5	42
		0x5C	6.0	43
		0x5D	6.5	44
		0x5E	7.0	45
		0x5F	7.5	46
		0x60	8.0	46
		0x61	8.5	47
		0x62	9.0	48
		0x63	9.5	49
		0x64	10.0	50
		0x65	10.5	51
		0x66	11.0	52
		0x67	11.5	53
		0x68	12.0	54
		0x69	12.5	55
		0x6A	13.0	55
		0x6B	13.5	56
		0x6C	14.0	57
		0x6D	14.5	58
		0x6E	15.0	59
		0x6F	15.5	60
		0x70	16.0	61
		0x71	16.5	62
		0x72	17.0	63
		0x73	17.5	64
		0x74	18.0	64
		0x75	18.5	65
		0x76	19.0	66
		0x77	19.5	67
		0x78	20.0	68
		0x79	20.5	69
		0x7A	21.0	70
		0x7B	21.5	71
		0x7C	22.0	72
		0x7D	22.5	73

		0x7E	23.0	73
		0x7F	23.5	74
		0x80	24.0	75
		0x81	24.5	76
		0x82	25.0	77
		0x83	25.5	78
		0x84	26.0	79
		0x85	26.5	80
		0x86	27.0	81
		0x87	27.5	82
		0x88	28.0	82
		0x89	28.5	83
		0x8A	29.0	84
		0x8B	29.5	85
		0x8C	30.0	86
		0x8D	30.5	87
		0x8E	31.0	88
		0x8F	31.5	89
		0x90	32.0	90
		0x91	32.5	91
		0x92	33.0	91
		0x93	33.5	92
		0x94	34.0	93
		0x95	34.5	94
		0x96	35.0	95
		0x97	35.5	96
		0x98	36.0	97
		0x99	36.5	98
		0x9A	37.0	99
		0x9B	37.5	100
		0x9C	38.0	100
		0x9D	38.5	101
		0x9E	39.0	102
		0x9F	39.5	103
		0xA0	40.0	104
		0xA1	40.5	105
		0xA2	41.0	106
		0xA3	41.5	107
		0xA4	42.0	108
		0xA5	42.5	109
		0xA6	43.0	109
		0xA7	43.5	110
		0xA8	44.0	111
		0xA9	44.5	112
		0xAA	45.0	113
		0xAB	45.5	114
		0xAC	46.0	115
		0xAD	46.5	116
		0xAE	47.0	117
		0xAF	47.5	118
		0xB0	48.0	118
		0xB1	48.5	119
		0xB2	49.0	120
		0xB3	49.5	121
		0xB4	50.0	122
		0xB5	50.5	123
		0xB6	51.0	124
		0xB7	51.5	125
		0xB8	52.0	126
		0xB9	52.5	127
		0xBA	53.0	127
		0xBB	53.5	128

		0xBC	54.0	129
		0xBD	54.5	130
		0xBE	55.0	131
		0xBF	55.5	132
		0xC0	56.0	133
		0xC1	56.5	134
		0xC2	57.0	135
		0xC3	57.5	136
		0xC4	58.0	136
		0xC5	58.5	137
		0xC6	59.0	138
		0xC7	59.5	139
		0xC8	60.0	140
		0xC9	60.5	141
		0xCA	61.0	142
		0xCB	61.5	143
		0xCC	62.0	144
		0xCD	62.5	145
		0xCE	63.0	145
		0xCF	63.5	146
		0xD0	64.0	147
		0xD1	64.5	148
		0xD2	65.0	149
		0xD3	65.5	150
		0xD4	66.0	151
		0xD5	66.5	152
		0xD6	67.0	153
		0xD7	67.5	154
		0xD8	68.0	154
		0xD9	68.5	155
		0xDA	69.0	156
		0xDB	69.5	157
		0xDC	70.0	158
		0xDD	70.5	159
		0xDE	71.0	160
		0xDF	71.5	161
		0xE0	72.0	162
		0xE1	72.5	163
		0xE2	73.0	163
		0xE3	73.5	164
		0xE4	74.0	165
		0xE5	74.5	166
		0xE6	75.0	167
		0xE7	75.5	168
		0xE8	76.0	169
		0xE9	76.5	170
		0xEA	77.0	171
		0xEB	77.5	172
		0xEC	78.0	172
		0xED	78.5	173
		0xEE	79.0	174
		0xEF	79.5	175
		0xF0	80.0	176
		0xF1	80.5	177
		0xF2	81.0	178
		0xF3	81.5	179
		0xF4	82.0	180
		0xF5	82.5	181
		0xF6	83.0	181
		0xF7	83.5	182
		0xF8	84.0	183
		0xF9	84.5	184

		0xFA	85.0	185
		0xFB	85.5	186
		0xFC	86.0	187
		0xFD	86.5	188
		0xFE*	87.0	189
		0xFF*	87.5	190

* These Signal states may correspond with specific CAN encodings for 'Unknown' and/or 'Invalid' states. In the event a conflict exists the CAN encodings shall take precedence.

3.4.1.3 REQ-389577/A-OAT display location

The OAT display shall only be located within the centerstack of the vehicle visible to both driver and passenger.

3.4.1.4 REQ-389578/A-OAT display accuracy

The OAT value shall always be displayed in whole degrees only. When data is received in 0.5°C increments and the value is to be displayed in °C units, the 0.5° portion shall be ignored/dropped.

3.4.1.5 REQ-389579/A-OAT display dependence on Ignition status

The OAT shall only be displayed when ignition status = Run or Start.

3.4.1.6 REQ-389581/A-OAT display dependence on climate module status

The OAT shall be displayed regardless of whether any other climate status information is displayed in the user interface.

3.4.1.7 REQ-392613/A-OAT display units

The OAT value is calculated by the climate module and shall be displayed in either °C or °F based on user selection for temperature units.

3.5 FUN-REQ-410161/A-Climate Module to Voice Commands Interface

3.5.1 Climate Module to Voice Commands Interface

3.5.1.1 REQ-389567/A-Driver's Temperature Setpoint – Voice Commands

REQ389386 shall apply when setting the driver setpoint temperature to a specific value when a specific temperature (or maximum temperature or minimum temperature) is spoken by the user.

3.5.1.2 REQ-389568/A-Voice Blower Limiting

While in certain air distribution modes the blower speed may be limited during voice sessions and/or phone calls. Furthermore, if and when the blower is limited after being manually adjusted by the user, the blower indications may be adjusted to agree with manual blower setting(1-7) closest to actual blower speed. When blower is set for automatic operation, blower speed will not be displayed regardless of whether or not the speed is being limited. Any manual adjustments of blower speed, while limited, shall be relative to the limited speed.

3.5.1.2.1 REQ-389569/A-Voice Blower Limit Request – voice control master CAN transmission

If this signal goes missing, the climate module shall turn off blower limiting and treat as if receiving the "NoRequest" state

Message	Signal	State(s)	Description
GatewayData	Voice_Blower_Limit	NoRequest	Shall default to this state whenever a voice session (incl. phone call) is inactive
		Request	Transmitted whenever the user activates a voice session or whenever a phone call is initiated or received (including emergency calls).

3.6 FUN-REQ-410162/A-Missing Messages

3.6.1 Message Clmt_Button_Stat1 missing from Climate Module to User Interface(s)

3.6.1.1 REQ-389592/A-Missing when Vehicle State ≠ Normal Run

If this message is missing, the user interface(s) shall turn off all climate status displays and/or indications that are based on signal states within this message whenever the Vehicle state ≠ a 'Normal Run' state. All other climate status indications shall update normally per the other applicable message(s) from the climate module.

3.6.1.2 REQ-389593/A-Missing when Vehicle State = Normal Run

When this message goes missing, the user interface(s) shall maintain the current climate status indications for as long as the message is missing and the Vehicle state = a 'Normal Run' state. All other climate status indications shall update normally per the other applicable message(s) from the climate module. If this message is missing when Vehicle state changes from ≠ a 'Normal Run' state to = a 'Normal Run' state, all climate status displays and/or indications that are based on signal states within this message shall remain off.

3.6.1.3 REQ-389594/A-Recovery Response

The user interface(s) shall resume normal operation immediately upon receipt of a valid message from the climate module per valid signal states within the message.

3.6.2 Message Clmt_Button_Stat2 missing from Climate Module to User Interface(s)

3.6.2.1 REQ-389588/A-Missing when Vehicle State ≠ Normal Run

If this message is missing, the user interface(s) shall blank off the temperature setting and blower speed displays and/or indications whenever the Vehicle state ≠ a 'Normal Run' state. All other climate status indications shall update normally per the other applicable message(s) from the climate module.

3.6.2.2 REQ-389589/A-Missing when Vehicle State = Normal Run

When this message goes missing, the user interface(s) shall maintain the current temperature setting and blower speed indications for as long as the message is missing and the Vehicle state = a 'Normal Run' state. All other climate status indications shall update normally per the other applicable message(s) from the climate module. If this message is missing when Vehicle state changes from ≠ a 'Normal Run' state to = a 'Normal Run' state, the temperature setting and blower speed displays and/or indications shall remain off

3.6.2.3 REQ-389590/A-Recovery Response

The user interface(s) shall resume normal operation immediately upon receipt of a valid message from the climate module per valid signal states within the message.

3.6.3 Message Clmt_Button_Stat3 missing from Climate Module to User Interface(s)

3.6.3.1 REQ-401720/A-Missing when Vehicle State ≠ Normal Run

If this message is missing, the user interface(s) shall blank off the temperature setting and blower speed displays and/or indications whenever the Vehicle state ≠ a 'Normal Run' state. All other climate status indications shall update normally per the other applicable message(s) from the climate module.

3.6.3.2 REQ-401721/A-Missing when Vehicle State = Normal Run

When this message goes missing, the user interface(s) shall maintain the current temperature setting and blower speed indications for as long as the message is missing and the Vehicle state = a 'Normal Run' state. All other climate status indications shall update normally per the other applicable message(s) from the climate module. If this message is missing when Vehicle state changes from ≠ a 'Normal Run' state to = a 'Normal Run' state, the temperature setting and blower speed displays and/or indications shall remain off

3.6.3.3 REQ-401722/A-Recovery Response

The user interface(s) shall resume normal operation immediately upon receipt of a valid message from the climate module per valid signal states within the message.

3.6.4 Message ParticulateMatterData2 missing from Climate Module to User Interface(s)

3.6.4.1 REQ-389600/A-Temporary response while qualifying missing

The last valid signal data from the climate module shall be used for any applicable displays until the message is missing continuously for 60 seconds (this shall be calibratable from 5 to 60 seconds in 5 second increments).

If the message is missing and no valid message has been received (i.e. right after an ignition cycle etc), the user interface(s) shall blank out the areas where any associated data would normally be displayed

3.6.4.2 REQ-389601/A-Default response after confirming missing

When the message has been missing continuously for 60 or more seconds, the receiving module(s) shall stop displaying the data that it receives in the missing message(s) and blank out the areas where this data would normally be displayed.

3.6.4.3 REQ-389602/A-Recovery response

Modules acting on receipt of this signal shall resume normal operation immediately upon receipt of this message from the climate module per the signal states within the message.

3.6.5 Message ParticulateMatterData1 missing from Climate Module to User Interface(s)

3.6.5.1 REQ-389596/A-Temporary response while qualifying missing

The last valid signal data from the climate module shall be used for any applicable displays until the message is missing continuously for 60 seconds (this shall be calibratable from 5 to 60 seconds in 5 second increments).

If the message is missing and no valid message has been received (i.e. right after an ignition cycle etc), the user interface(s) shall blank out the areas where any associated data would normally be displayed

3.6.5.2 REQ-389598/A-Recovery response

Modules acting on receipt of this signal shall resume normal operation immediately upon receipt of a valid message from the climate module per the signal states within this message.

3.6.5.3 REQ-389597/A-Default response after confirming missing

When the message has been missing continuously for 60 or more seconds, the receiving module(s) shall stop displaying the data that it receives in the missing message(s) and blank out the areas where this data would normally be displayed.

3.7 FUN-REQ-410175/A-Faulted Messages/Signals

3.7.1 Signal Outside_Air_Temp_Stat = “Invalid” from Climate Module to User Interface(s)

3.7.1.1 REQ-389618/A-Default response after confirming fault

When an invalid signal state has been received continuously for 60 or more seconds, the receiving module(s) shall stop displaying an outside temperature and replace with 'dashes' in place of the temperature value. Units of measure shall continue to be displayed per the user selection.

3.7.1.2 REQ-389617/A-Temporary response while qualifying fault

Receiving module(s) utilize this message to determine what outside temperature to display. The last valid signal state from the climate module shall be used for any display until this signal is invalid continuously for 60 seconds (this shall be calibratable from 5 to 60 seconds in 5 second increments).

If this signal state is Invalid and no valid signal state has been received (i.e. right after an ignition cycle etc), the user interface(s) shall display 'dashes' in place of the temperature value. Units of measure shall continue to be displayed per the user selection

3.7.1.3 REQ-389619/A-Recovery response

Modules acting on receipt of this signal shall resume normal operation immediately upon receipt of a valid signal state from the climate module.

3.7.2 Signal Outside_Air_Temp_Stat = "Unknown" from Climate module to User Interface(s)

3.7.3 Placeholder

3.7.4 Placeholder

4 Appendix: Reference Documents

4.1 REQ-389624/A-Appendix B – Temperature Setpoint conversion

°C Setpoint	°F Setpoint
LO	LO
15.5	60
16.0	61
16.5	62
17.0	63
17.5	64
18.0	64
18.5	65
19.0	66
19.5	67
20.0	68
20.5	69
21.0	70
21.5	71
22.0	72

°C Setpoint	°F Setpoint
22.5	73
23.0	73
23.5	74
24.0	75
24.5	76
25.0	77
25.5	78
26.0	79
26.5	80
27.0	81
27.5	82
28.0	82
28.5	83
29.0	84
29.5	85
HI	HI