Research & Vehicle Technology
"Infotainment Systems Product Development"

Feature – Bluetooth Connectivity

RACM Infotainment Subsystem Part Specific Specification (SPSS)

Version 1.0

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Revision History

Date	Version	Notes	
May 29, 2018	1.0	Initial Release	

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1 Architectural Design

1.1 BTP-CLD-REQ-031350/B-BT Phone Client (TcSE ROIN-149514-3)

Responsibility: The BT Phone Client is the interface of the BT Phone function. It acts with other system parts that control the BT Phone or need data from it.

1.1.1 Requirements

1.1.1.1 BTC-SR-REQ-247455/A-GetBTPhoneName.Rq - Device User Friendly Name

Once the status information is received that a device is connected for Phone functionality, the Phone Client shall request the device name information via the message GetBTPhoneName.Rq().

For the case that there is no response from the Phone Server, and alternative text should be shown. Please see HMI spec for more details.

1.1.1.2 BTP-SR-REQ-031351/A-InitiateBTCall.Rq - Adequate Response (TcSE ROIN-150823-1)

Adequate response to a InitiateBTCall.Rq shall be given by CES (Command Execution Status) as referenced in "MM ISO 15765-2 Message Catalogue" specification.

1.1.1.3 BTP-SR-REQ-031352/A-Caller Identification Information (TcSE ROIN-159119-2)

While two calls are connected during Call waiting or Join Calls functions, the BT Phone Client shall retain the Caller identification information for both calls. ~~It will not be re-sent by the BT Phone Server as operations in these functions are accessed by the user.~~

~~For example, for the use case of switching between connected calls, the BT Phone Client shall update the HMI with the Caller ID information of the active call as it switches from one call to another, without needing the BT Phone Server to provide the Caller ID information again.~~

1.1.1.4 BTC-SR-REQ-242069/B-Receiving BTCallerIdentification signals

The Phone Client shall do the following monitoring upon each system start up to identify the correct message:

- The Phone Client shall use the old signal BTCallerIdentification_St within the current ignition cycle until the new signal was received once.
- The Phone Client shall use the new signal BTCallerIdentification2_St within the current ignition cycle, as soon as this signal was received once.

1.1.1.5 BTP-SR-REQ-031353/A-Incoming text message from Email Address (TcSE ROIN-169279-1)

Upon receiving the BTCallerIdentification.St signal with a Validity parameter encoding of "0x5: CLID Incoming SMS Not available", the BT Phone Client shall not allow an Initiate Call use case to occur.

1.1.1.6 BTP-HMI-REQ-031354/A-Phone Mute Display Priority (TcSE ROIN-202902-1)

If PhMicrophoneMute.St = MicrophoneIsMuted ($1) and BTPhoneSts.St = Connected ($3), ConferenceCall ($D), or ConnectedOtherCallOnHold ($F), the mute shall take the display priority.

All other encodings for BTPhoneSts.St shall have display priority over the PhoneMicrophoneMute.St.

1.1.1.7 BTP-SR-REQ-099766/A-SWC Send Button Interaction

The BT Phone Client shall display the incoming call menu when the Send button is received and the BT Phone Server is indicating that a phone call is active.

Phone Call is considered active when BTPhoneSts.St equals the following:
0x02 Dialing
0x03 Connected
0x09 Phone Busy

0x0C BT Phone in Private
0x0D Conference Call
0x0F Connected, other call on hold
0x10 Connected, call on hold

The BT Phone Client shall display the Recent Calls menu when the Send button is received and the BT Phone Server is indicating that a phone is connected but not in a call.

Phone is connected and not in a call when BTPhoneSts.St equals the following:
0x01 Idle, Existing Link to BT Phone
0x0A VR session active in phone

The BT Phone Client shall request the Phone Root list once the Send button is received and then request the All Calls list from the root list. The BT Phone Client shall parse the Root list in order to detect which item is the All Calls list. Please see List Browse Protocol feature for definition on how to request the lists.

1.2 Interface Requirements

1.2.1 BTP-IIR-REQ-283782/A-BT Phone Server Status Signals

Method	Notes	Parameters
BTPhoneSts.St()	Message Type: Status The Atttribute BTPhoneSts shall reflect the current state of the Phone.	int *Status :* 0x00: Invalid 0x01: Idle, Existing link to BT Phone 0x02: Dialing 0x03: Connected 0x04: Cradle Phone not ready 0x05: Number Unobtainable 0x06: Incoming Call 0x07: No link to Phone 0x08: Initialising BT connection 0x09: Phone busy 0x0A: VR Session active in phone 0x0B: Device Not supported (only Cradle phone) 0x0C: BT phone in Private 0x0D: Conference Call 0x0E: Connected, Second Incoming Call 0x0F: Connected, other call on hold 0x10: Connected, Call on hold

2 General Requirements

2.1 BTP-HMI-REQ-283784/A-Displaying Phone Active

The BTPhone Client shall monitor the ResourceUpdate_St and BTPhoneStatus_St signals to determine when a phone call is active. Multiple functions in this SPSS describe the different types of phone call scenarios in detail. Below is a quick reference that shall be used to indicate whether a phone call is active or not.

If ResourceUpdate_St indicates that phone is not the granted source then a phone call is not active.

If ResourceUpdate_St indicates that phone is the granted source then the BTPhoneClient shall check the BTPhoneStatus_St signal and if the one of the following values is being transmitted the BTPhoneClient shall update the HMI to indicate a phone call is active.

BTPhoneStatus_St:
0x02: Dialing
0x03: Connected
0x05: Number Unobtainable
0x06: Incoming Call
0x0C: BT phone in Private
0x0D: Conference Call
0x0E: Connected, Second Incoming Call
0x0F: Connected, other call on hold
0x10: Connected, Call on hold

If ResourceUpdate_St indicates that phone is the granted source then the BTPhoneClient shall check the BTPhoneStatus_St signal and if none of the values above is being transmitted the BTPhoneClient shall not indicate phone call is active.

3 Functional Definition

3.1 BTP-FUN-REQ-041722/B-Phone VR (TcSE ROIN-294332-1)

3.1.1 Use Cases

3.1.1.1 BTP-UC-REQ-041723/A-Activating the Phone's Voice Recognition (From Phone / In-Vehicle Infotainment System) (TcSE ROIN-290987-1)

Linked Elements
BTP-FUR-REQ-191151/A-Phone Voice Service Automotive Mode
BTP-FUR-REQ-041731/A-Device Indentification (TcSE ROIN-304264-1)
BTP-FUR-REQ-041733/A-iPhone Connected via A2DP and USB (TcSE ROIN-304493-1)
BTP-UC-REQ-041724/A-The connected mobile phone fails to enable the voice recognition feature (TcSE ROIN-290988-1)
BTP-UC-REQ-041725/A-The connected mobile phone cancels the phone voice recognition feature (TcSE ROIN-290989-1)
BTP-UC-REQ-041726/B-The customer cancels the phone voice recognition feature (TcSE ROIN-290990-1)
BTP-FUR-REQ-041732/B-Configuration Requirements (TcSE ROIN-304265-1)
BTP-FUR-REQ-041730/D-Device ID Profile (TcSE ROIN-304263-1)
BTP-FUR-REQ-041728/F-Phone Voice Recognition Activation (TcSE ROIN-295112-1)
BTP-FUR-REQ-191150/B-Phone Voice Service Device handling
BTP-FUR-REQ-041729/F-Apple Siri Eyes-Free (TcSE ROIN-295113-2)
BTC-FUR-REQ-273958/A-Active Phone Voice Session

Actors	Mobile Phone Customer
Pre-conditions	The mobile phone is connected. The mobile phone has voice recognition support accessible via the in-vehicle infotainment system
Scenario Description	The customer has indicated that they want to access the voice recognition features of the connected mobile phone.
Post-conditions	The current audio source is switched to phone. The customer has the opportunity to speak commands to the connected phone via the in-vehicle microphone. The customer has the opportunity to end the voice recognition session. The customer has the opportunity to 'barge-in' via options provided by the G-HMI.
List of Exception Use Cases	E1 - The connected mobile phone fails to enable the voice recognition feature. E2 - The connected mobile phone cancels the phone voice recognition feature. E3 - The customer cancels the phone voice recognition feature.
Interfaces	G-HMI V-HMI Vehicle System Interface

3.1.1.2 BTP-UC-REQ-041724/A-The connected mobile phone fails to enable the voice recognition feature (TcSE ROIN-290988-1)

Linked Elements
BTP-FUR-REQ-191151/A-Phone Voice Service Automotive Mode
BTP-FUR-REQ-041731/A-Device Indentification (TcSE ROIN-304264-1)
BTP-FUR-REQ-041733/A-iPhone Connected via A2DP and USB (TcSE ROIN-304493-1)
BTP-FUR-REQ-041732/B-Configuration Requirements (TcSE ROIN-304265-1)
BTP-FUR-REQ-041730/D-Device ID Profile (TcSE ROIN-304263-1)
BTP-FUR-REQ-191150/B-Phone Voice Service Device handling
BTC-FUR-REQ-275839/A-Phone Voice Recognition Activation error handling
BTC-FUR-REQ-275844/A-Phone Voice Service media playback integration
BTP-FUR-REQ-041729/F-Apple Siri Eyes-Free (TcSE ROIN-295113-2)

Actors	Same as original use case.
Pre-conditions	Same as original use case.
Scenario Description	Enabling the phone voice recognition feature failed.

Post-conditions	The customer is alerted that action was not successful.
List of Exception Use Cases	N/A
Interfaces	G-HMI V-HMI Vehicle System Interface

3.1.1.3 BTP-UC-REQ-041725/A-The connected mobile phone cancels the phone voice recognition feature (TcSE ROIN-290989-1)

Linked Elements
BTP-FUR-REQ-191151/A-Phone Voice Service Automotive Mode
BTP-FUR-REQ-041731/A-Device Indentification (TcSE ROIN-304264-1)
BTP-FUR-REQ-041733/A-iPhone Connected via A2DP and USB (TcSE ROIN-304493-1)
BTP-FUR-REQ-041732/B-Configuration Requirements (TcSE ROIN-304265-1)
BTP-FUR-REQ-041730/D-Device ID Profile (TcSE ROIN-304263-1)
BTP-FUR-REQ-041728/F-Phone Voice Recognition Activation (TcSE ROIN-295112-1)
BTP-FUR-REQ-191150/B-Phone Voice Service Device handling
BTC-FUR-REQ-275843/A-Phone Voice Service De-Activation
BTP-FUR-REQ-041729/F-Apple Siri Eyes-Free (TcSE ROIN-295113-2)

Actors	Same as original use case.
Pre-conditions	Same as original use case.
Scenario Description	The mobile phone cancels the phone voice recognition feature.
Post-conditions	The customer is alerted that the phone voice recognition feature has been cancelled.
List of Exception Use Cases	N/A
Interfaces	G-HMI V-HMI Vehicle System Interface

3.1.1.4 BTP-UC-REQ-041726/B-The customer cancels the phone voice recognition feature (TcSE ROIN-290990-1)

Linked Elements
BTP-FUR-REQ-041728/F-Phone Voice Recognition Activation (TcSE ROIN-295112-1)
BTP-FUR-REQ-041729/F-Apple Siri Eyes-Free (TcSE ROIN-295113-2)
BTC-FUR-REQ-275843/A-Phone Voice Service De-Activation
BTP-FUR-REQ-191150/B-Phone Voice Service Device handling

Actors	Same as original use case.
Pre-conditions	Same as original use case.
Scenario Description	The customer cancels the phone voice recognition feature.
Post-conditions	The customer is alerted that the phone voice recognition feature has been cancelled.
List of Exception Use Cases	N/A
Interfaces	G-HMI V-HMI Vehicle System Interface

3.1.1.5 BTP-UC-REQ-041727/A-Customer Activates 'Barge-In' During Active Phone Voice Recognition (TcSE ROIN-290991-1)

Linked Elements
BTP-FUR-REQ-041728/F-Phone Voice Recognition Activation (TcSE ROIN-295112-1)
BTC-FUR-REQ-275842/A-Phone Voice Service Barge-In
BTP-FUR-REQ-041729/F-Apple Siri Eyes-Free (TcSE ROIN-295113-2)

Actors	Mobile Phone Customer
Pre-conditions	The in-vehicle infotainment system and connected mobile phone are in an active phone voice recognition session
Scenario Description	The customer has indicated that they want to 'barge-in' to speak a voice command.
Post-conditions	The in-vehicle infotainment system remains in its current state, and allows the customer to speak new voice commands.
List of Exception Use Cases	N/A
Interfaces	G-HMI V-HMI Vehicle System Interface

3.1.2 Requirements

3.1.2.1 BTP-FUR-REQ-191150/B-Phone Voice Service Device handling

The In-Vehicle Infotainment System shall allow the user to enable the phone's voice recognition feature for all phones that advertise support for the feature via BRSF (bit 2, see Handsfree Profile Specification v1.5). The In-Vehicle Infotainment System shall advertise support for the feature via AT+BRSF (bit 3).
In the effort to minimize compatibility problems and customer complaints, the In-Vehicle Infotainment System shall maintain a list of devices for which the feature shall not be used. The list shall be based on Device ID profile (see BTP-FUR-REQ-041730-Device ID Profile) or AT+CGMI (manufacturer) and AT+CGMM (model information).
When the device to be connected is in such list, the In-Vehicle Infotainment System shall not advertise support for the feature via BRSF and shall disregard support for the feature advertised from the connected device.

The supplier shall provide the possibility to easily:
• Disable the feature for all Bluetooth devices
• Disable the feature for all but some types of Bluetooth devices (see above)

• Ability to update the list of supported Bluetooth devices by an installation file via USB or IVSU

System's HMI might present the user with the option to disable the feature for a paired Bluetooth device or all paired Bluetooth devices.
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3.1.2.2 BTP-FUR-REQ-041728/F-Phone Voice Recognition Activation (TcSE ROIN-295112-1)

In-Vehicle Infotainment System shall have the ability of activating the connected phone's voice recognition activation by supporting section 4.25 of the Handsfree Profile Specification v1.5. The user shall not be able to enable phone voice recognition while in a phone call.

The phone voice session shall be established as soon as the SCO channel is opened by the connected device. Only in that case the phone voice session shall be communicated to the customer. The In-Vehicle Infotainment System should not play a tone when the phone voice recognition session is activated. The latency between the SCO channel opening and audio being completely routed to the car's loudspeaker should be at minimum possible value, but not more than 100ms.

3.1.2.3 BTC-FUR-REQ-273958/A-Active Phone Voice Session

For an active Phone Voice Session the audio source 0x6 Bluetooth Phone with priority 0x1 Telephony Service shall be used.
Additionally to the source request the correct BTPhoneSts.St 0x0A shall be sent out.

See BTP-IIR-REQ-030672-Audio Client Request Signals, BTP-IIR-REQ-030674-BT Phone Server Status Signals, and Audio Management SPSS for more details.

3.1.2.4 BTC-FUR-REQ-275839/A-Phone Voice Recognition Activation error handling

If the SCO channel is not established 5 seconds after the connected device has send +BVRA=1 or accepted AT+BVRA=1, the In-Vehicle Infotainment System shall send AT+BVRA=0, and the phone voice session is not established successfully.
If the connected device is not responding to AT+BVRA=0 or the device is responding with an error the voice session is also not established successfully.
HMI is responsible to communicate these scenarios to the customer with a meaningful error message.

3.1.2.5 BTC-FUR-REQ-275843/A-Phone Voice Service De-Activation

To end the phone voice session the In-Vehicle Infotainment System must wait for the connected device to end each voice session, unless the system is prompted to do so by user interaction. After the connected device has ended the voice session by sending BVRA=0 a defined delay shall be added before de-allocating the voice session source within the In-Vehicle Infotainment System.
This delay could be needed to eliminate or to minimize a possible gap between an ended voice session and the indication of an outgoing call or a started media stream. As soon as the connected device is indicating such - but latest after the defined delay - the voice session should be ended internally. When the system is prompted by user interaction to end the voice session no delay shall be added.
The value for the delay time for Siri devices shall be 1000ms and the time for all other devices (which are supported according BTP-FUR-REQ-191150 Phone Voice Service device handling) shall be 1000ms. Both values are subject to change following jury evaluation.

3.1.2.6 BTC-FUR-REQ-275842/A-Phone Voice Service Barge-In

In-Vehicle Infotainment System shall have the ability to 'Barge-In', in terms of HFP specifications, simply means sending, from IVIS to Phone, an AT command AT+BVRA=1 while the phone voice recognition session is already active.
In general that will cause the phone to stop current processing, play a short sound, and be ready for voice input from the user.

3.1.2.7 BTC-FUR-REQ-275844/A-Phone Voice Service media playback integration

As a result of accessing the Phone Voice Recognition via the In-Vehicle Infotainment System, the customer has the option of requesting that the connected device play a specific track, album, etc.
In that case the In-Vehicle Infotainment System shall play the media from the connected device via A2DP. The supplier shall be responsible for developing a solution to cover this scenario. The supplier shall be responsible for obtaining Ford Motor Company approval of the solution prior to implementation.
In general, such a solution shall monitor the status of the media player on the device for the 5 sec after the end of the Voice Recognition session. If the media player advertises a change of status and starts playing, the In-Vehicle Infotainment System shall assume that the user requested to play an item, and switch source to allow playback via the in-car speakers.

This requirement is only applicable when the same device is connected for Media and for Phone Voice Recognition functionality.
Identification of the connected device shall be done via the Bluetooth address.

3.1.2.8 BTP-FUR-REQ-041729/F-Apple Siri Eyes-Free (TcSE ROIN-295113-2)

This section shall only be applied to devices that are identified as an Apple iOS device and which supports SIRI (via Device ID/PNP profile and AT+XAPL custom command).

The In-Vehicle Infotainment System shall also support the Apple Siri Eye's free voice recognition activation HFP AT commands as described within section 6 of the Bluetooth Accessory Design Guidelines for Apple Products r7.

Upon each connection of a Siri Eyes Free supported device, the In-Vehicle Infotainment System shall enable the Siri Eyes-Free mode.

The In-Vehicle Infotainment System shall use the noise suppression algorithms associated with the In-Vehicle Infotainment's voice engine when Siri is active.
*Note: Echo Cancellation shall still be active.

The In-Vehicle Infotainment System shall have the ability to alert the user that Siri is supported, but not enabled by the connected device as described within section 6.2.1.1 of the Bluetooth Accessory Design Guidelines for Apple Products r7.

3.1.2.9 BTP-FUR-REQ-191151/A-Phone Voice Service Automotive Mode

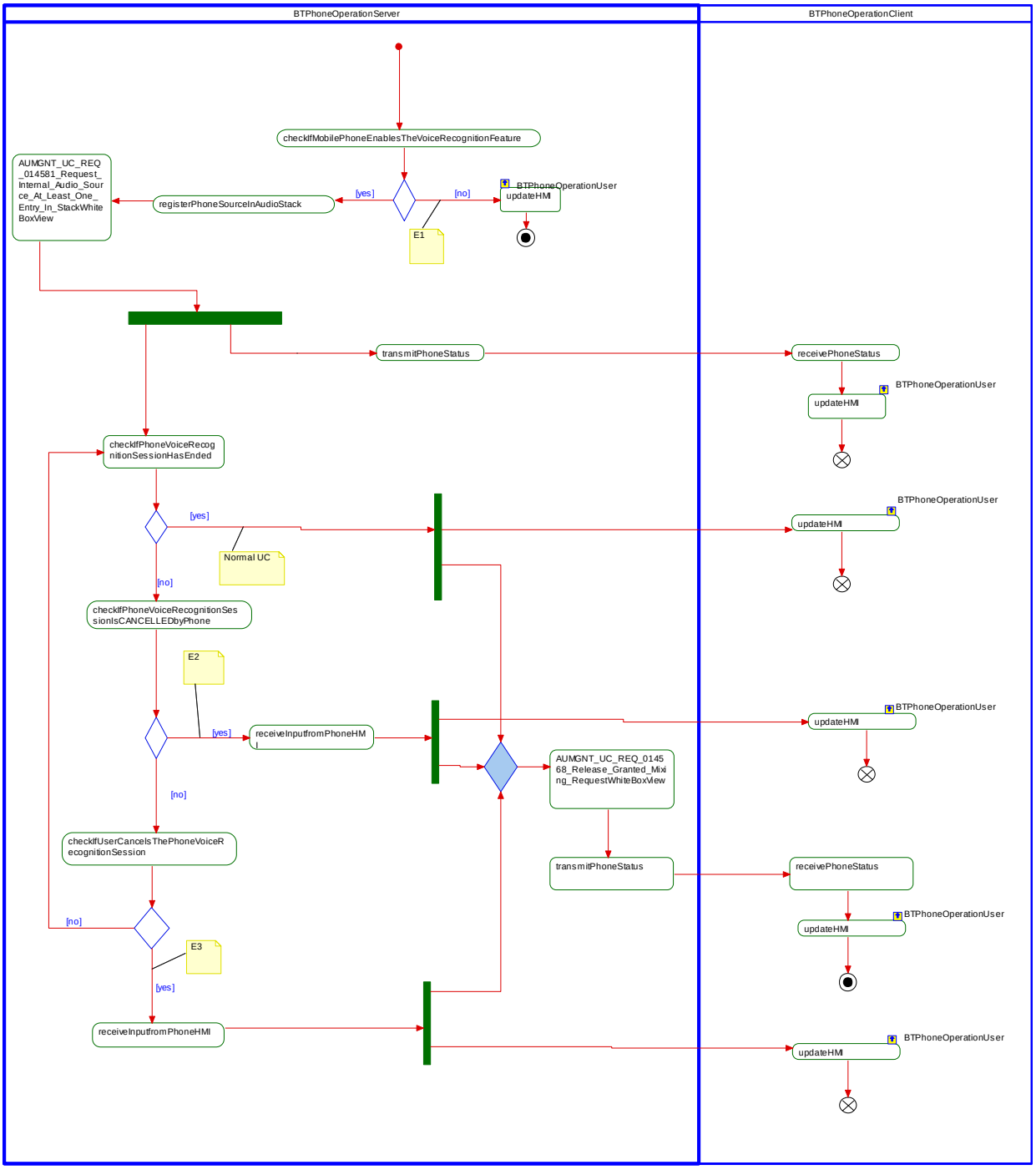
The In-Vehicle Infotainment System shall not allow the user to enable the phone's voice recognition feature unless the phone support a Voice Recognition mode designed for automotive usage that does not require to look at or touch the connected phone.

At the time of writing Apple/iOS devices (Siri Eyes-Free) and Android (Google Hands-Free Advanced) devices support such a mode.
In case the connected phone does not support an automotive specific mode, but still support voice recognition activation, then the In-Vehicle Infotainment System:

- Shall not allow the user to initiate or barge into a session from the car's commands.
- Shall allow the user to terminate the session from the car's commands.
- Shall communicate visually to the user that a session has started, and relay the audio for the session via the car speakers.

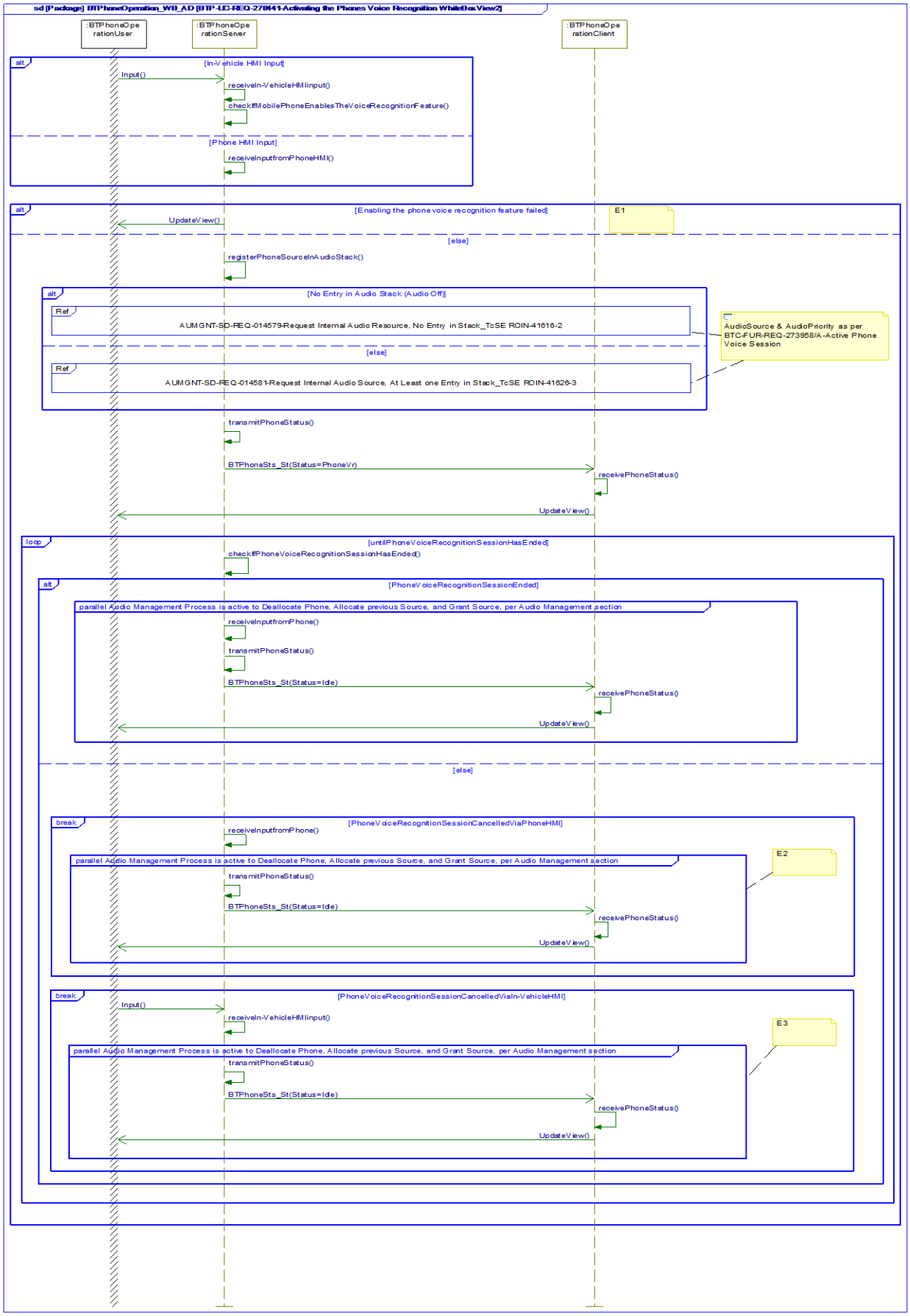
3.1.3 Activity Diagrams

3.1.3.1 ACT-REQ-278458/A-Activating the Phones Voice Recognition



3.1.4 Sequence Diagrams

3.1.4.1 SD-REQ-278441/A-Activating the Phones Voice Recognition


sd [Package] BTPhoneOperation_WD_AD [BTP-UC-REQ-270941-Activating the Phones Voice Recognition WhiteBox View2]
:BTPhoneOperationUser
:BTPhoneOperationServer
:BTPhoneOperationClient
alt
[In-Vehicle HMI Input]
Input()
receiveIn-VehicleHMIinput()
checkIfMobilePhoneEnablesTheVoiceRecognitionFeature()
[Phone HMI Input]
receiveInputfromPhoneHMI()
alt
[Enabling the phone voice recognition feature failed]
E1
UpdateView()
[else]
registerPhoneSourceInAudioStack()
alt
[No Entry in Audio Stack (Audio Off)]
Ref
AUMGNT-SD-REQ-014579-Request Internal Audio Resource, No Entry in Stack_TcSE ROIN-41616-2
AudioSource & AudioPriority as per BTC-FUR-REQ-273968/A-Active Phone Voice Session
[else]
Ref
AUMGNT-SD-REQ-014581-Request Internal Audio Source, At Least one Entry in Stack_TcSE ROIN-41626-3
transmitPhoneStatus()
BTPhoneSts_St(Status=PhoneVr)
receivePhoneStatus()
UpdateView()
loop
[untilPhoneVoiceRecognitionSessionHasEnded]
checkIfPhoneVoiceRecognitionSessionHasEnded()
alt
[PhoneVoiceRecognitionSessionEnded]
parallel Audio Management Process is active to Deallocate Phone, Allocate previous Source, and Grant Source, per Audio Management section
receiveInputfromPhone()
transmitPhoneStatus()
BTPhoneSts_St(Status=Idle)
receivePhoneStatus()
UpdateView()
[else]
break
[PhoneVoiceRecognitionSessionCancelledViaPhoneHMI]
receiveInputfromPhone()
parallel Audio Management Process is active to Deallocate Phone, Allocate previous Source, and Grant Source, per Audio Management section
E2
transmitPhoneStatus()
BTPhoneSts_St(Status=Idle)
receivePhoneStatus()
UpdateView()
break
[PhoneVoiceRecognitionSessionCancelledViaIn-VehicleHMI]
Input()
receiveIn-VehicleHMIinput()
E3
parallel Audio Management Process is active to Deallocate Phone, Allocate previous Source, and Grant Source, per Audio Management section
transmitPhoneStatus()
BTPhoneSts_St(Status=Idle)
receivePhoneStatus()
UpdateView()

3.2 BTP-FUN-REQ-041845/A-Incoming Call (TcSE ROIN-294451-1)

3.2.1 Use Cases

3.2.1.1 BTP-UC-REQ-041846/A-Incoming Call Ringing (TcSE ROIN-290908-2)

Linked Elements
BTC-FUR-REQ-191908/A-Caller ID format
BTP-FUR-REQ-041856/A-Incoming Calls (TcSE ROIN-295050-1)

Actors	Connected Phone Customer
Pre-conditions	Mobile phone is connected
Scenario Description	A mobile phone is connected to the In-Vehicle Infotainment System, and while it is connected an incoming call has been indicated by ringing. The In-Vehicle Infotainment System notifies the Customer that an incoming call is present by having the ability to: Provide ring from connected phone Provide a default ring Show the information provided by the connected phone relative to the incoming call (i.e. phone number, etc.) Show the phonebook metadata if available
Post-conditions	The Customer would have the option to: Ignore (no action) Answer Reject the incoming call
List of Exception Use Cases	E1 – Connected phone does not indicate to In-Vehicle Infotainment System that an incoming call is present. E2 – Network Coverage Lost
Interfaces	G-HMI Vehicle System Interface SWC

3.2.1.2 BTP-UC-REQ-041847/A-Connected phone does not indicate to In-Vehicle Infotainment System that an incoming call is present (TcSE ROIN-292572-1)

Linked Elements
BTP-UC-REQ-041846/A-Incoming Call Ringing (TcSE ROIN-290908-2)
BTP-UC-REQ-041855/A-Incoming Call Waiting Notification (TcSE ROIN-290917-1)

Actors	Customer Mobile Phone
Pre-conditions	Same as in original use case
Scenario Description	Connected phone does not indicate to In-Vehicle Infotainment System that an incoming call is present.
Post-conditions	No Action
List of Exception Use Cases	N/A
Interfaces	N/A

3.2.1.3 BTP-UC-REQ-041848/A-Incoming Call Answer via In-Vehicle Infotainment System (TcSE ROIN-290909-2)

Linked Elements
BTC-FUR-REQ-191908/A-Caller ID format
BTP-SD-REQ-030699/A-Incoming Call - Accept Call (TcSE ROIN-118785-3)
BTP-FUR-REQ-041856/A-Incoming Calls (TcSE ROIN-295050-1)

Actors	Connected Phone Customer
Pre-conditions	Mobile phone is connected
Scenario Description	A mobile phone is connected to the In-Vehicle Infotainment System, and while it is connected an incoming call has been indicated (i.e. ringing), and the customer has opted to answer the incoming call via the In-Vehicle Infotainment System.
Post-conditions	The incoming call has been answered. The incoming ring notification is no longer present. The audio for the call is available through the In-Vehicle Infotainment System speakers. The In-Vehicle Infotainment System has the ability to display the information as provided by the connected phone relating to the name or number of the currently active call. The Customer has the active call options available to them.
List of Exception Use Cases	E1 – The incoming call is not answered. E2 – Incoming Call is answered, but Audio is not Handsfree. E3 – Network Coverage Lost
Interfaces	G-HMI Vehicle System Interface SWC

3.2.1.4 BTP-UC-REQ-041849/A-The incoming call is not answered (TcSE ROIN-290910-1)

Linked Elements
BTP-UC-REQ-041848/A-Incoming Call Answer via In-Vehicle Infotainment System (TcSE ROIN-290909-2)
BTP-FUR-REQ-041856/A-Incoming Calls (TcSE ROIN-295050-1)

Actors	Connected Phone Customer
Pre-conditions	Same as original use case
Scenario Description	The customer has opted to answer an incoming call via the means available within the In-Vehicle Infotainment System, but the call is not answered.
Post-conditions	An error message is displayed to the customer. The In-Vehicle Infotainment System is no longer alerting the user of an incoming call. The In-Vehicle Infotainment System returns to its prior state
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.2.1.5 BTP-UC-REQ-041850/A-Incoming Call is answered, but Audio is not Handsfree (TcSE ROIN-290911-1)

Linked Elements
BTP-UC-REQ-041848/A-Incoming Call Answer via In-Vehicle Infotainment System (TcSE ROIN-290909-2)
BTP-UC-REQ-041851/A-Incoming Call Answer via Mobile Phone (TcSE ROIN-290912-1)

Actors	Connected Phone Customer
Pre-conditions	Same as original use case

Scenario Description	The customer has opted to answer an incoming call via the means available within the In-Vehicle Infotainment System the call has been answered, but the call audio is not Handsfree
Post-conditions	An error message is displayed to the customer. The In-Vehicle Infotainment System routes the call audio to the connected phone (if audio was routed from the connected phone to In-Vehicle Infotainment System). The In-Vehicle Infotainment System is no longer alerting the user of an incoming call. The In-Vehicle Infotainment System indicates that there is an active call, and the audio should be on the connected phone. Display call metadata if available.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.2.1.6 BTP-UC-REQ-041851/A-Incoming Call Answer via Mobile Phone (TcSE ROIN-290912-1)

Linked Elements
BTC-FUR-REQ-191908/A-Caller ID format
BTP-SD-REQ-030699/A-Incoming Call - Accept Call (TcSE ROIN-118785-3)
BTP-FUR-REQ-041856/A-Incoming Calls (TcSE ROIN-295050-1)

Actors	Connected Phone Customer
Pre-conditions	Mobile phone is connected
Scenario Description	A mobile phone is connected to the In-Vehicle Infotainment System, and while it is connected an incoming call has been indicated (i.e. ringing), and the customer has opted to answer the incoming call from the connected mobile phone.
Post-conditions	The incoming call has been answered. The incoming ring notification is no longer present. The audio for the call is available via the means indicated from the mobile phone. The In-Vehicle Infotainment System has the ability to display the information as provided by the connected phone relating to the name or number of the currently active call. The Customer has the active call options available to them. Display phone call metadata.
List of Exception Use Cases	E1 – Incoming Call is answered, but Audio is not Handsfree.
Interfaces	G-HMI Vehicle System Interface

3.2.1.7 BTP-UC-REQ-041852/A-Incoming Call Ringing (No Answer) (TcSE ROIN-290913-1)

Linked Elements
BTP-FUR-REQ-041856/A-Incoming Calls (TcSE ROIN-295050-1)

Actors	Connected Phone Customer
Pre-conditions	Mobile phone is connected
Scenario Description	A mobile phone is connected to the In-Vehicle Infotainment System, and while it is connected an incoming call has been indicated by ringing / alerting. In this scenario, the Customer has opted not to answer the call and ignore it until the call stops alerting.
Post-conditions	The incoming call is no longer alerting A customer is indicated that a missed call is present. The In-Vehicle Infotainment System returns to prior state.

List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.2.1.8 BTP-UC-REQ-041853/A-Incoming Call Ringing (Reject from In-Vehicle Infotainment System) (TcSE ROIN-290914-1)

Linked Elements
BTP-SD-REQ-030700/A-Incoming Call - Reject Call (TcSE ROIN-149690-3)
BTP-FUR-REQ-041856/A-Incoming Calls (TcSE ROIN-295050-1)

Actors	Connected Phone Customer
Pre-conditions	Mobile phone is connected
Scenario Description	A mobile phone is connected to the In-Vehicle Infotainment System, and while it is connected an incoming call has been indicated by ringing / alerting. In this scenario, the Customer has opted to manually reject the call from the In-Vehicle Infotainment System. .
Post-conditions	The incoming call is no longer alerting via the In-Vehicle Infotainment System and connected phone. A customer is indicated that the call was rejected. The In-Vehicle Infotainment System returns to prior state.
List of Exception Use Cases	E1 – Rejecting Call via In-Vehicle Infotainment System fails.
Interfaces	G-HMI SWC Vehicle System Interface

3.2.1.9 BTP-UC-REQ-033869/B-Rejecting Call via In-Vehicle Infotainment System fails (TcSE ROIN-290915-1)

Linked Elements
BTP-UC-REQ-033868/A-Do Not Disturb Active– Incoming Call (TcSE ROIN-290918-1)
BTP-UC-REQ-041853/A-Incoming Call Ringing (Reject from In-Vehicle Infotainment System) (TcSE ROIN-290914-1)

Actors	Connected Phone Customer
Pre-conditions	Same as original use case
Scenario Description	A mobile phone is connected to the In-Vehicle Infotainment System, and while it is connected an incoming call has been indicated by ringing / alerting. In this scenario, the Customer has opted to manually reject the call from the In-Vehicle Infotainment System – or when DND is set to on – IVIS is rejecting the call automatically, but the call is not rejected.
Post-conditions	The incoming call is no longer alerting via the In-Vehicle Infotainment System. The In-Vehicle Infotainment System returns to the prior state
List of Exception Use Cases	N/A
Interfaces	G-HMI SWC Vehicle System Interface

3.2.1.10 BTP-UC-REQ-041854/A-Incoming Call Ringing (Reject from connected phone) (TcSE ROIN-290916-1)

Linked Elements
BTP-SD-REQ-030700/A-Incoming Call - Reject Call (TcSE ROIN-149690-3)
BTP-FUR-REQ-041856/A-Incoming Calls (TcSE ROIN-295050-1)

Actors	Connected Phone, Customer,
Pre-conditions	Mobile phone is connected

Scenario Description	A mobile phone is connected to the In-Vehicle Infotainment System, and while it is connected an incoming call has been indicated by ringing / alerting. In this scenario, the Customer has opted to manually reject the call from the connected phone.
Post-conditions	The incoming call is no longer alerting via the In-Vehicle Infotainment System and connected phone. Customer is alerted that there is a missed call. The In-Vehicle Infotainment System returns to the prior state.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.2.1.11 BTP-UC-REQ-041855/A-Incoming Call Waiting Notification (TcSE ROIN-290917-1)

Linked Elements
BTP-FUR-REQ-041821/B-Call Waiting Call (TcSE ROIN-295057-1)
BTP-FUR-REQ-041822/B-Call Waiting Call Accepted (TcSE ROIN-295058-1)
BTP-FUR-REQ-041823/A-Call Waiting Call Rejected (TcSE ROIN-295059-1)
BTP-FUR-REQ-041824/A-Call Waiting Call Ignored (TcSE ROIN-295060-1)
BTC-FUR-REQ-191908/A-Caller ID format
BTP-FUR-REQ-041820/B-Max Number of Calls (TcSE ROIN-295056-1)

Actors	Connected Phone Customer
Pre-conditions	Mobile phone is connected Active call is present
Scenario Description	A mobile phone is connected to the In-Vehicle Infotainment System, and while it is connected and in an active call, an incoming call waiting call has been indicated by the phone. The In-Vehicle Infotainment System notifies the Customer that an incoming call is present by having the ability to: Show the information provided by the connected phone relative to the incoming call (i.e. phone number, etc.) Show the phonebook metadata if available
Post-conditions	The Customer would have the option to: Ignore (no action) Answer Reject the incoming call
List of Exception Use Cases	E1 – Connected phone does not indicate to In-Vehicle Infotainment System that an incoming call is present.
Interfaces	G-HMI Vehicle System Interface SWC

3.2.2 Requirements

3.2.2.1 BTP-FUR-REQ-041856/A-Incoming Calls (TcSE ROIN-295050-1)

During an incoming call notification the user will have the following options:

-Rejecting the incoming call by physically rejecting the call via In-Vehicle Infotainment System

-Accepting the call by answering the call via In-Vehicle Infotainment System

-Ignore the call: No Action, In-Vehicle Infotainment System shall consider this as a missed call

-Accepting the call by answering the call via the AG

-Rejecting the call via the AG

3.2.3 Sequence Diagrams

3.2.3.1 BTP-SD-REQ-030699/A-Incoming Call - Accept Call (TcSE ROIN-118785-3)

Linked Elements
BTP-UC-REQ-041848/A-Incoming Call Answer via In-Vehicle Infotainment System (TcSE ROIN-290909-2)
BTP-UC-REQ-041851/A-Incoming Call Answer via Mobile Phone (TcSE ROIN-290912-1)

Scenarios

Normal Usage

The user receives an incoming call, and chooses to accept it. HMI displays {Caller ID, Name, Call duration}

Constraints

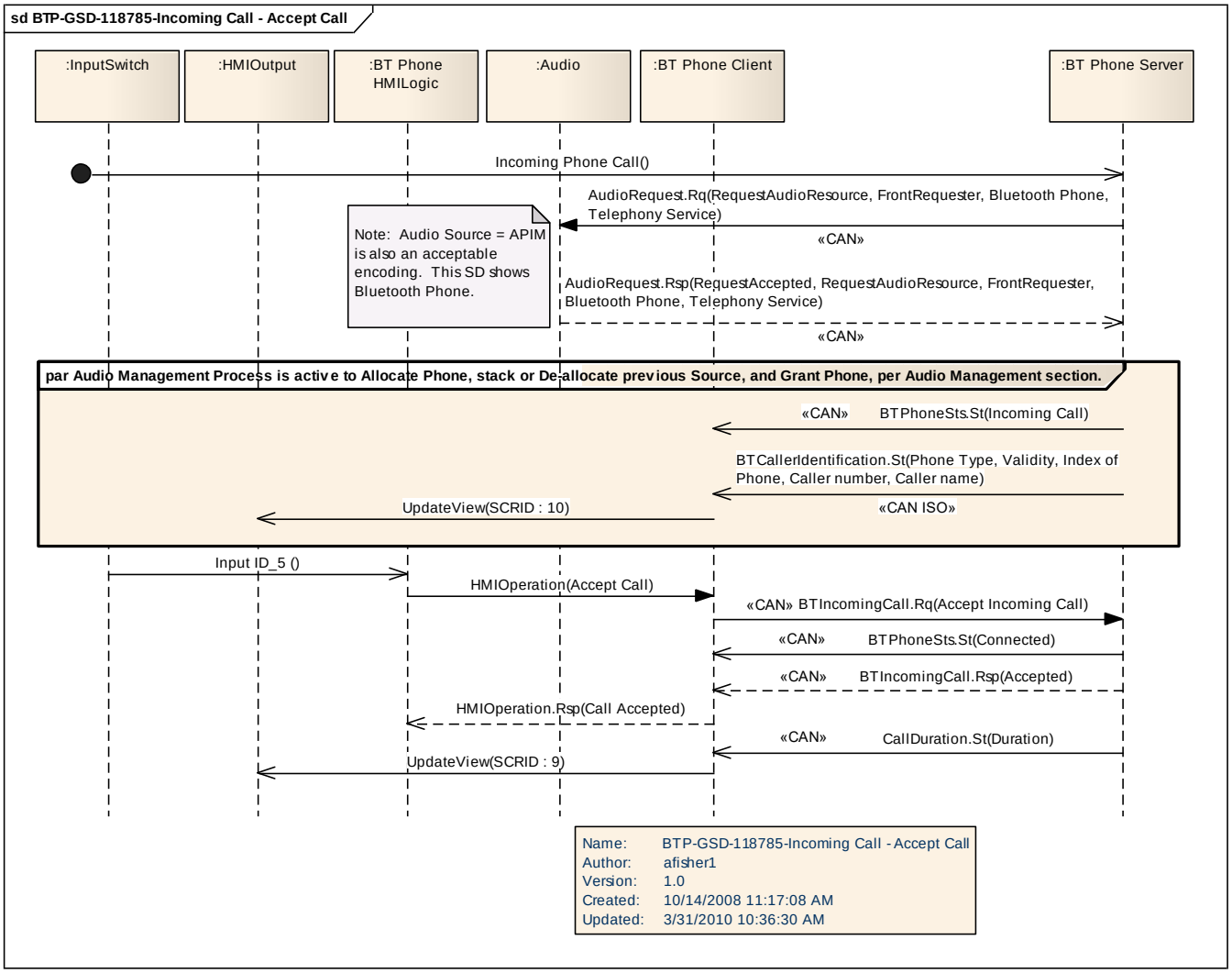
Pre-condition

A Bluetooth phone is connected to the vehicle interface. Vehicle power is On.

Post-condition

The user <accepts the incoming call> from the HMI interface.

Sequence Diagram



3.2.3.2 BTP-SD-REQ-030700/A-Incoming Call - Reject Call (TcSE ROIN-149690-3)

Linked Elements

BTP-UC-REQ-041854/A-Incoming Call Ringing (Reject from connected phone) (TcSE ROIN-290916-1)
BTP-UC-REQ-041853/A-Incoming Call Ringing (Reject from In-Vehicle Infotainment System) (TcSE ROIN-290914-1)

Scenarios

Normal Usage

The user receives an incoming call, and chooses to reject it. HMI returns to previous screen.

Constraints

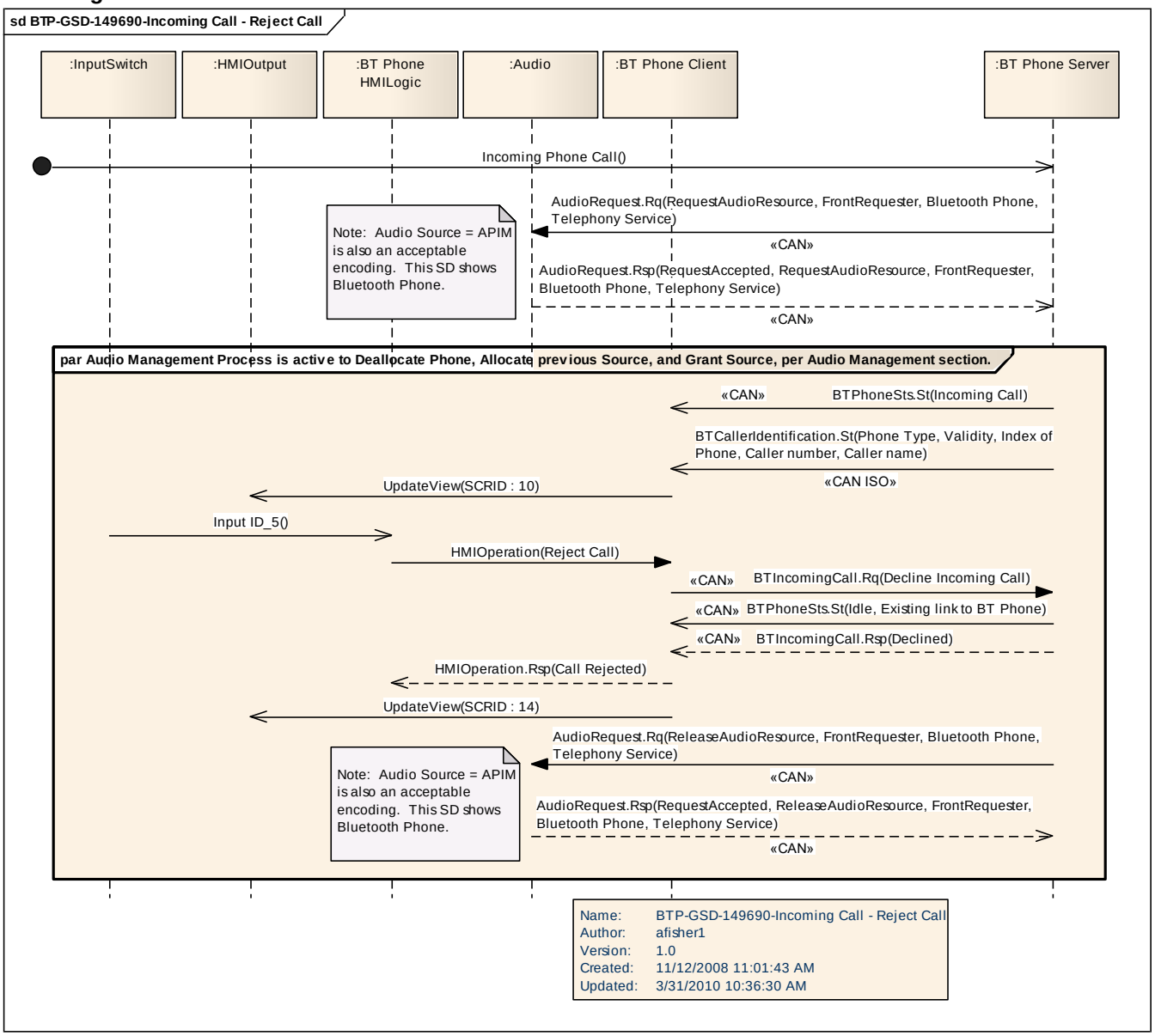
Pre-condition

A Bluetooth phone is connected to the vehicle interface. Vehicle power is On.

Post-condition

HMI indicates {previous screen prior to incoming call}

Sequence Diagram



3.3 BTP-FUN-REQ-033851/B-Outgoing Call (TcSE ROIN-294320-1)

3.3.1 Use Cases

3.3.1.1 BTP-UC-REQ-033852/C-Outgoing Call to Phonebook Contact (TcSE ROIN-290897-1)

Linked Elements

BTP-FUR-REQ-033829/C-Phonebook Download Availability (TcSE ROIN-295075-1)
BTP-FUR-REQ-033835/C-Phonebook Updating (TcSE ROIN-295081-1)
BTP-FUR-REQ-033841/H-Contact Characteristics / Data (TcSE ROIN-295087-1)
BTP-FUR-REQ-041840/B-Call Timer (TcSE ROIN-295104-1)
BTP-FUR-REQ-033839/C-PBAP Access Failure (TcSE ROIN-295085-1)
BTP-FUR-REQ-033833/G-PBAP Requirements and Characteristics (TcSE ROIN-295079-1)
BTP-FUR-REQ-033834/C-Auto Phonebook Download (TcSE ROIN-295080-1)
BTP-FUR-REQ-033864/B-Outgoing Call Methods (TcSE ROIN-295048-2)
BTP-UC-REQ-033853/A-Outgoing Call Failed (TcSE ROIN-290898-1)
BTP-UC-REQ-033854/A-No Audio Available for Call (TcSE ROIN-290899-1)
BTP-UC-REQ-033856/A-Call Failed and No network coverage (TcSE ROIN-290901-1)

BTP-FUR-REQ-033830/A-Phonebook Accessibility (TcSE ROIN-295076-1)
BTP-UC-REQ-153575/B-Phonebook is empty
BTP-FUR-REQ-033837/C-Phonebook Download Error (TcSE ROIN-295083-1)

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected. The phonebook has been downloaded AND is available
Scenario Description	The Customer has opted to initiate a phone call to a contact within his / her phonebook. This action can be completed via V-HMI, manually selecting a contact from the phonebook, or manually selecting a contact to call from the call history (if available).
Post-conditions	A call is established to the chosen contact. The In-Vehicle Infotainment System displays the name of the called contact. The In-Vehicle Infotainment System displays the photo of the contact (if available) Two way audio (i.e. SCO, eSCO, etc.) is available. A call timer is available to display the time of the active call. The Customer presented with the following options: End Call Return the audio to the handset (i.e. Privacy) Mute Call
List of Exception Use Cases	E1 – Outgoing call failed. E2 – No audio available for call. E3 – Call failed and no network coverage E4 – Phonebook is empty
Interfaces	V-HMI G-HMI

3.3.1.2 BTP-UC-REQ-033853/A-Outgoing Call Failed (TcSE ROIN-290898-1)

Linked Elements
BTP-UC-REQ-033861/A-Outgoing call initiated via Redial from the In-Vehicle Infotainment System (TcSE ROIN-290905-3)
BTP-UC-REQ-033863/A-Outgoing call initiated while Roaming (TcSE ROIN-290907-1)
BTP-UC-REQ-033852/C-Outgoing Call to Phonebook Contact (TcSE ROIN-290897-1)
BTP-UC-REQ-033857/B-Outgoing Call via Digit Dial (TcSE ROIN-290902-2)

Actors	Customer Mobile Phone
Pre-conditions	Same as in original use case
Scenario Description	When attempting to make an outgoing call, the call was unsuccessful.
Post-conditions	The customer is notified that the call is unsuccessful. The In-Vehicle Infotainment System returns to prior state.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.3.1.3 BTP-UC-REQ-033854/A-No Audio Available for Call (TcSE ROIN-290899-1)

Linked Elements
BTP-UC-REQ-033852/C-Outgoing Call to Phonebook Contact (TcSE ROIN-290897-1)
BTP-UC-REQ-033857/B-Outgoing Call via Digit Dial (TcSE ROIN-290902-2)

Actors	Customer Mobile Phone
Pre-conditions	Same as in original use case

Scenario Description	When attempting to make an outgoing call, the call audio was not routed via the speakers within the In-Vehicle Infotainment System.
Post-conditions	The In-Vehicle Infotainment System routes call audio back to connected phone. The customer is notified that the call audio is not routed through the In-Vehicle Infotainment System speakers, and that the call audio is on the handset.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.3.1.4 BTP-UC-REQ-033855/A-Number busy (TcSE ROIN-290900-1)

Linked Elements
BTP-UC-REQ-033852/C-Outgoing Call to Phonebook Contact (TcSE ROIN-290897-1)

Actors	Customer Mobile Phone
Pre-conditions	Same as in original use case
Scenario Description	When attempting to make an outgoing call, the number is busy. *Note: Based on the implementation of the connected phone, the customer is informed by a busy tone transferred via SCO.
Post-conditions	The customer is notified that the call is unsuccessful (via connected phone). The In-Vehicle Infotainment System returns to prior state. **Note: No specific action is required by the In-Vehicle Infotainment System.
List of Exception Use Cases	N/A
Interfaces	N/A

3.3.1.5 BTP-UC-REQ-033856/A-Call Failed and No network coverage (TcSE ROIN-290901-1)

Linked Elements
BTP-UC-REQ-033861/A-Outgoing call initiated via Redial from the In-Vehicle Infotainment System (TcSE ROIN-290905-3)
BTP-UC-REQ-033852/C-Outgoing Call to Phonebook Contact (TcSE ROIN-290897-1)
BTP-UC-REQ-033858/B-Outgoing call initiated from the connected phone (TcSE ROIN-290903-2)
BTP-UC-REQ-033857/B-Outgoing Call via Digit Dial (TcSE ROIN-290902-2)

Actors	Customer Mobile Phone
Pre-conditions	Same as in original use case
Scenario Description	When attempting to make an outgoing call, the call failed and the phone has no network coverage.
Post-conditions	The customer is notified that the call is unsuccessful. The In-Vehicle Infotainment System returns to prior state.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.3.1.6 BTP-UC-REQ-033857/B-Outgoing Call via Digit Dial (TcSE ROIN-290902-2)

Linked Elements
BTP-FUR-REQ-041840/B-Call Timer (TcSE ROIN-295104-1)
BTP-FUR-REQ-033864/B-Outgoing Call Methods (TcSE ROIN-295048-2)
BTP-UC-REQ-033853/A-Outgoing Call Failed (TcSE ROIN-290898-1)
BTP-UC-REQ-033854/A-No Audio Available for Call (TcSE ROIN-290899-1)
BTP-UC-REQ-033856/A-Call Failed and No network coverage (TcSE ROIN-290901-1)

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected. The phonebook has been downloaded AND available
Scenario Description	The Customer has opted to initiate a phone call to a contact within his / her phonebook, but manually dialing (via V-HMI or In-Vehicle Infotainment System G-HMI options) a phone number that is matched to a contact name within the In-Vehicle Infotainment System.
Post-conditions	A call is established to the chosen contact. The In-Vehicle Infotainment System displays the metadata of the called contact (if available); if the metadata is not available the number is displayed. Two way audio (i.e. SCO, eSCO, etc.) is available. A call timer is available to display the time of the active call. The Customer presented with the following options: End Call Return the audio to the handset (i.e. Privacy) Mute Call
List of Exception Use Cases	E1 – Outgoing call failed. E2 – No audio available for call. E3 – Call Failed and no network coverage.
Interfaces	V-HMI G-HMI Vehicle System Interface

3.3.1.7 BTP-UC-REQ-033858/B-Outgoing call initiated from the connected phone (TcSE ROIN-290903-2)

Linked Elements
BTP-FUR-REQ-041840/B-Call Timer (TcSE ROIN-295104-1)
BTP-FUR-REQ-033864/B-Outgoing Call Methods (TcSE ROIN-295048-2)

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected. Infotainment system must be on. Bluetooth must be on in In-Vehicle Infotainment System and mobile device(s).
Scenario Description	During an active phone connection (i.e. HFP), the Customer has opted to initiate an outgoing call from the connected phone opposed to the In-Vehicle Infotainment System.
Post-conditions	A call is established to the specified number is established The In-Vehicle Infotainment System displays the phone number of the active call or the phonebook contact metadata if the phone number of the active call is stored within the phonebook. Two way audio (i.e. SCO, eSCO, etc.) is available. A call timer is available to display the time of the active call. The Customer presented with the following options: End Call Return the audio to the handset (i.e. Privacy) Mute Call
List of Exception Use Cases	E1 – The mobile phone does not provide the In-Vehicle Infotainment System with the appropriate call set up information to indicate that a new call is being established. E2 – Connected Phone Failed to Provide the In-Vehicle Infotainment System with the Phone number of the Active Call. E3- Call failed and no network coverage.
Interfaces	G-HMI Vehicle System Interface

3.3.1.8 BTP-UC-REQ-033859/B-The mobile phone does not provide the In-Vehicle Infotainment System with the appropriate call set up information (TcSE ROIN-292571-1)

Linked Elements
BTP-UC-REQ-033858/B-Outgoing call initiated from the connected phone (TcSE ROIN-290903-2)

Actors	Customer Mobile Phone
Pre-conditions	Same as in original use case
Scenario Description	The mobile phone does not provide the In-Vehicle Infotainment System with the appropriate call set up information to indicate that a new call is being established.
Post-conditions	No Action
List of Exception Use Cases	N/A
Interfaces	N/A

3.3.1.9 BTP-UC-REQ-033860/A-Connected Phone Failed to Provide the In-Vehicle Infotainment System with the Phone number of the Active Call (TcSE ROIN-290904-1)

Linked Elements
BTP-UC-REQ-033861/A-Outgoing call initiated via Redial from the In-Vehicle Infotainment System (TcSE ROIN-290905-3)
BTP-UC-REQ-033863/A-Outgoing call initiated while Roaming (TcSE ROIN-290907-1)
BTP-UC-REQ-033858/B-Outgoing call initiated from the connected phone (TcSE ROIN-290903-2)

Actors	Customer Mobile Phone
Pre-conditions	Same as in original use case
Scenario Description	The phone has indicated that an active call is present, but it has not provided the phone number of the active call.
Post-conditions	In-Vehicle Infotainment System displays specified default text.
List of Exception Use Cases	N/A
Interfaces	G-HMI

3.3.1.10 BTP-UC-REQ-033861/A-Outgoing call initiated via Redial from the In-Vehicle Infotainment System (TcSE ROIN-290905-3)

Linked Elements
BTP-FUR-REQ-041840/B-Call Timer (TcSE ROIN-295104-1)
BTP-SD-REQ-030719/A-Redial (TcSE ROIN-149530-3)
BTP-FUR-REQ-033864/B-Outgoing Call Methods (TcSE ROIN-295048-2)

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected. Infotainment system must be on. Bluetooth must be on in In-Vehicle Infotainment System and mobile device(s). In-Vehicle Infotainment System supports this feature within HMI and/or VUI.
Scenario Description	During an active phone connection (i.e. HFP), the Customer has opted to initiate a redial via the In-Vehicle Infotainment System.
Post-conditions	A call is established to the specified number is established The In-Vehicle Infotainment System displays the phone number of the active call or the phonebook contact metadata if the phone number of the active call is stored within the phonebook. Two way audio (i.e. SCO, eSCO, etc.) is available. A call timer is available to display the time of the active call. The Customer presented with the following options: End Call

	Return the audio to the handset (i.e. Privacy) Mute Call
List of Exception Use Cases	E1 – Outgoing call failed. E2 – Connected Phone Failed to Provide the In-Vehicle Infotainment System with the Phone number of the Active Call. E3 – The mobile phone dials an call other than the last outgoing call (i.e. incoming call or missed call) E4 – Number busy E5 – Call failed and no network coverage
Interfaces	G-HMI Vehicle System Interface

3.3.1.11 BTP-UC-REQ-033862/A-The mobile phone dials an call other than the last outgoing call (i.e. incoming call or missed call) (TcSE ROIN-290906-1)

Linked Elements
BTP-UC-REQ-033861/A-Outgoing call initiated via Redial from the In-Vehicle Infotainment System (TcSE ROIN-290905-3)

Actors	Customer Mobile Phone
Pre-conditions	Same as in original use case
Scenario Description	The customer indicated a redial action, but the phone dialed another phone number other than the last outgoing call.
Post-conditions	In-Vehicle Infotainment System displays the dialed number or the phonebook contact that was dialed (if available within the phonebook)
List of Exception Use Cases	N/A
Interfaces	G-HMI

3.3.1.12 BTP-UC-REQ-033863/A-Outgoing call initiated while Roaming (TcSE ROIN-290907-1)

Linked Elements
BTP-FUR-REQ-047506/A-Roaming Report (TcSE ROIN-295106-1)

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected, and roaming notification is set to ON.
Scenario Description	During an active phone connection (i.e. HFP), the Customer has opted to initiate an outgoing call via the In-Vehicle Infotainment System while the mobile phone is reporting that it is roaming. In-Vehicle Infotainment System
Post-conditions	The In-Vehicle Infotainment System will have the ability to notify the Customer that they are roaming, and request a confirmation that they still want to place the call. If the Customer opts not to place the call because the connected mobile phone is roaming, the outgoing call is not established. If the Customer opts to place the call: A call is established to the specified number is established The In-Vehicle Infotainment System displays the phone number of the active call or the phonebook contact metadata if the phone number of the active call is stored within the phonebook. Two way audio (i.e. SCO, eSCO, etc.) is available. A call timer is available to display the time of the active call. The Customer presented with the following options: End Call Return the audio to the handset (i.e. Privacy) Mute Call

List of Exception Use Cases	E1 – Outgoing call failed. E2 – Connected Phone Failed to Provide the In-Vehicle Infotainment System with the Phone number of the Active Call.
Interfaces	G-HMI

3.3.1.13 BTC-UC-REQ-193015/A-Voice Recognition - Outgoing Call to Phonebook Contact

Linked Elements
BTP-FUR-REQ-033829/C-Phonebook Download Availability (TcSE ROIN-295075-1)
BTP-UC-REQ-033853/A-Outgoing Call Failed (TcSE ROIN-290898-1)
BTP-UC-REQ-033854/A-No Audio Available for Call (TcSE ROIN-290899-1)
BTP-UC-REQ-033855/A-Number busy (TcSE ROIN-290900-1)
BTP-UC-REQ-033856/A-Call Failed and No network coverage (TcSE ROIN-290901-1)
BTC-UC-REQ-192662/A-Voice Recognition - No HFP device connected
BTC-UC-REQ-192663/A-Voice Recognition - Phonebook is empty
BTC-UC-REQ-192664/A-Voice Recognition - Phonebook is not present yet
BTC-UC-REQ-192665/A-Voice Recognition - Phonebook download is not supported
BTC-UC-REQ-192666/A-Voice Recognition - Phonebook is not available due to missing access
BTC-UC-REQ-192667/A-Voice Recognition - Phonebook download is not activated
BTC-UC-REQ-192668/A-Voice Recognition - Phonebook contact contains no number but only an address
BTC-UC-REQ-193014/A-Voice Recognition - Phonebook is available, but will be updated in the background

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected. The phonebook has been downloaded AND is available
Scenario Description	The Customer has opted to initiate a phone call via voice control to a contact within his / her phonebook.
Post-conditions	A call is established to the chosen contact. The In-Vehicle Infotainment System displays the name of the called contact. The In-Vehicle Infotainment System displays the photo of the contact (if available) Two way audio (i.e. SCO, eSCO, etc.) is available. A call timer is available to display the time of the active call. The Customer presented with the following options via G-HMI End Call Return the audio to the handset (i.e. Privacy) Mute Call
List of Exception Use Cases	E1 – Voice Recognition - No HFP device connected E2 – Voice Recognition - Phonebook is empty E3 – Voice Recognition - Phonebook is not present yet E4 – Voice Recognition - Phonebook download is not supported E5 – Voice Recognition - Phonebook is not available due to missing access E6 – Voice Recognition - Phonebook download is not activated. E7 – Voice Recognition - Call failed and no network coverage. E8 – Voice Recognition - Phonebook contact contains no number but only an address E9 – Voice Recognition - Phonebook is available, but will be updated in the background E10 – Outgoing call failed. E11 – No audio available for call. E12 – Number busy. E13 – Call failed and no network coverage
Interfaces	Customer, Connected Phone, In-Vehicle Infotainment System

3.3.1.14 BTC-UC-REQ-193016/A-Voice Recognition - Dial a number

Linked Elements
BTP-UC-REQ-033853/A-Outgoing Call Failed (TcSE ROIN-290898-1)
BTP-UC-REQ-033854/A-No Audio Available for Call (TcSE ROIN-290899-1)
BTP-UC-REQ-033856/A-Call Failed and No network coverage (TcSE ROIN-290901-1)
BTC-UC-REQ-192662/A-Voice Recognition - No HFP device connected

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected.
Scenario Description	The Customer has opted to initiate a phone call by manually dialing a phone number via Voice Control.
Post-conditions	A call is established to the chosen phone number. The In-Vehicle Infotainment System displays the metadata of the called contact (if available); if the metadata is not available the number is displayed. Two way audio (i.e. SCO, eSCO, etc.) is available. A call timer is available to display the time of the active call. The Customer presented with the following options: End Call Return the audio to the handset (i.e. Privacy) Mute Call
List of Exception Use Cases	E1 – Outgoing call failed. E2 – No audio available for call. E3 – Call Failed and no network coverage. E4 – Voice Recognition - No HFP device connected
Interfaces	V-HMI G-HMI Vehicle System Interface

3.3.1.15 BTC-UC-REQ-192662/A-Voice Recognition - No HFP device connected

Linked Elements
BTP-FUR-REQ-033830/A-Phonebook Accessibility (TcSE ROIN-295076-1)

Actors	Customer, In-Vehicle Infotainment System
Pre-conditions	There is no connected phone, hence no phonebook is available
Scenario Description	The Customer has opted to initiate a phone call via voice control to a contact
Post-conditions	The In-Vehicle Infotainment System shall notify the user that there is no phone connected / no phonebook available and it is not possible to use voice controls to dial a number of a contact.
List of Exception Use Cases	n/a
Interfaces	V-HMI

3.3.1.16 BTC-UC-REQ-192663/A-Voice Recognition - Phonebook is empty

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected. The phonebook has been downloaded successfully (see PHB2a) but it is empty.

Scenario Description	The Customer has opted to initiate a phone call via voice control to a contact within his / her phonebook.
Post-conditions	The In-Vehicle Infotainment System shall notify the user that the phonebook is empty. Optionally, it might prompt the user to retry phonebook download.
List of Exception Use Cases	E1 – Phonebook is not present yet E2 - Phonebook download is not supported E3 - Phonebook is not available due to missing access E4 – Phonebook download is not activated.
Interfaces	V-HMI G-HMI

3.3.1.17 BTC-UC-REQ-192664/A-Voice Recognition - Phonebook is not present yet

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected. The phonebook is being downloaded for the first time or has not been downloaded yet.
Scenario Description	The Customer has opted to initiate a phone call via voice control to a contact within his / her phonebook.
Post-conditions	The In-Vehicle Infotainment System shall notify the user that the phonebook is not available yet, and to try after it becomes available. The GUI shall alert that the phonebook has become available via a status message or a popup.
List of Exception Use Cases	E1 - Phonebook download is not supported E2 - Phonebook is not available due to missing access E3 – Phonebook download is not activated. E4 – Phonebook available but will be updated in the background
Interfaces	V-HMI G-HMI

3.3.1.18 BTC-UC-REQ-192665/A-Voice Recognition - Phonebook download is not supported

Linked Elements
BTP-FUR-REQ-033829/C-Phonebook Download Availability (TcSE ROIN-295075-1)

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected. The phonebook feature is not available in the connected phone
Scenario Description	The Customer has opted to initiate a phone call via voice control to a contact within his / her phonebook.
Post-conditions	The In-Vehicle Infotainment System shall notify the user that the phonebook feature is not present in the connected phone.
List of Exception Use Cases	E1 – Phonebook is not present yet E2 - Phonebook is not available due to missing access E3 – Phonebook available but will be updated in the background E4 – Phonebook download is not activated.
Interfaces	V-HMI G-HMI

3.3.1.19 BTC-UC-REQ-192666/A-Voice Recognition - Phonebook is not available due to missing access

Linked Elements
BTP-FUR-REQ-033839/C-PBAP Access Failure (TcSE ROIN-295085-1)

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected. The phonebook download has failed because the phone has not granted permission to download the contacts from the phonebook
Scenario Description	The Customer has opted to initiate a phone call via voice control to a contact within his / her phonebook.
Post-conditions	The In-Vehicle Infotainment System shall notify the user that the phonebook feature is not available because of a permission issue. The In-Vehicle Infotainment System might prompt the user to retry the download and approve access from the phone.
List of Exception Use Cases	E1 – Phonebook is not present yet E2 - Phonebook download is not supported E3 – Phonebook available but will be updated in the background E4 – Phonebook download is not activated.
Interfaces	V-HMI

3.3.1.20 BTC-UC-REQ-192667/A-Voice Recognition - Phonebook download is not activated

Linked Elements
BTP-FUR-REQ-033829/C-Phonebook Download Availability (TcSE ROIN-295075-1)

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected. The phonebook download feature is turned off and there is no available phonebook for the connected device.
Scenario Description	The Customer has opted to initiate a phone call via voice control to a contact within his / her phonebook.
Post-conditions	The In-Vehicle Infotainment System shall notify the user that the phonebook feature is turned off and there is no available phonebook for the connected device. The In-Vehicle Infotainment System might prompt the user to turn the feature back on to be able to make calls via VUI.
List of Exception Use Cases	E1 – Phonebook is not present yet E2 - Phonebook download is not supported E3 – Phonebook available but will be updated in the background E4 - Phonebook is not available due to missing access
Interfaces	V-HMI

3.3.1.21 BTC-UC-REQ-192668/A-Voice Recognition - Phonebook contact contains no number but only an address

Linked Elements
BTP-FUR-REQ-033829/C-Phonebook Download Availability (TcSE ROIN-295075-1)
BTP-FUR-REQ-033841/H-Contact Characteristics / Data (TcSE ROIN-295087-1)
BTP-FUR-REQ-033833/G-PBAP Requirements and Characteristics (TcSE ROIN-295079-1)
BTP-FUR-REQ-033830/A-Phonebook Accessibility (TcSE ROIN-295076-1)

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected. The phonebook is available, VUI is ready to accept commands to make calls to a contact.

Scenario Description	The Customer has opted to initiate a phone call via voice control to a contact within his / her phonebook. The contact contains an address (email address or street address) but no phone numbers
Post-conditions	The In-Vehicle Infotainment System shall notify the user that the chosen contact does not have any phone numbers associated with it and hence the call cannot be completed.
List of Exception Use Cases	E1 – Phonebook is not present yet E2 - Phonebook download is not supported E3 – Phonebook available but will be updated in the background E4 - Phonebook is not available due to missing access E5 – Phonebook download is not activated.
Interfaces	V-HMI

3.3.1.22 BTC-UC-REQ-193014/A-Voice Recognition - Phonebook is available, but will be updated in the background

Linked Elements
BTP-FUR-REQ-033835/C-Phonebook Updating (TcSE ROIN-295081-1)

Actors	Customer, Connected Phone, In-Vehicle Infotainment System
Pre-conditions	A phone has been paired and is connected. The phonebook is being re-downloaded or has been downloaded but voice grammar is not ready yet
Scenario Description	The Customer has opted to initiate a phone call via voice control to a contact within his / her phonebook.
Post-conditions	The In-Vehicle Infotainment System shall notify the user that the phonebook grammar is being prepared. During this time, the phonebook GUI shall allow the user to make a call via GUI.
List of Exception Use Cases	E1 – Phonebook is not present yet E2 - Phonebook download is not supported E3 - Phonebook is not available due to missing access E4 – Phonebook download is not activated.
Interfaces	V-HMI G-HMI

3.3.2 Requirements

3.3.2.1 BTP-FUR-REQ-033864/B-Outgoing Call Methods (TcSE ROIN-295048-2)

Voice Digit Entry with a maximum of 22 digits
Voice Phonebook Name Selection
Digit Entry (i.e. Touch screen) with a maximum of 22 digits (including #, * and +).
Phonebook Entry Selection (i.e. user selects an entry from their downloaded phonebook)
From the handset
From Call History Selection
Redial –

If there is valid call history present for outgoing calls, the last outgoing number shall be used as smart dial (redial) number.
When there is outgoing call from handset or SYNC while the device is connected, then the number is stored as new smart dial (redial) number.
If there is no call history present and there is no call made from handset or SYNC after connecting, executing REDIAL shall use AT+BLDN.

3.3.2.2 BTP-FUR-REQ-033865/A-Network Compatibility (TcSE ROIN-295049-1)

In-Vehicle Infotainment System shall manage the cases of invalid numbers, loss of network, and busy lines in the same manner as commercial available AG's currently manage them.

If the user enters an invalid number, the call will fail. Some mobile phones allow the user to send (ATD) a number even there is no signal available. This behavior shall be replicated on In-Vehicle Infotainment System.

3.3.2.3 BTP-FUR-REQ-033866/C-Outgoing Call Failures (TcSE ROIN-304248-1)

When the In-Vehicle Infotainment System attempts to place a call by sending an ATD or BLDN, it expects to receive an 'OK' and corresponding CIEV notifications. The In-Vehicle Infotainment System shall assume that an outgoing call failure has occurred under the following scenarios (when the In-Vehicle Infotainment System initiated the outgoing call):

1. If an 'OK' is not received within 15 seconds of the In-Vehicle Infotainment System sending the ATD or BLDN.
2. If a callsetup value of 2 or 3 is not received within 15 seconds of receiving an 'OK'

If either of the above scenarios occurs, the In-Vehicle Infotainment System shall request the +CLCC information to verify the call setup status. IVIS should attempt to place the outgoing call again. If second attempt fails, the In-Vehicle Infotainment System shall determine that the call was not connected successfully. The In-Vehicle Infotainment System shall provide an alert that the connected AG has not responded accordingly to the In-Vehicle Infotainment System per the HMI requirements.

The In-Vehicle Infotainment System shall monitor the service availability (as reported via unsolicited CIEV responses) of the connected AG at the time of a placed call. In the event that the callsetup value 2 or 3 was not received - or value 0 was received again without receiving value 3 before - and the service status of the connected phone is reported as 0, then the In-Vehicle Infotainment System shall assume that the call failed due to network availability.
The In-Vehicle Infotainment System shall provide an alert that the call failed due to no signal per the HMI requirements.

3.3.3 Sequence Diagrams

3.3.3.1 BTP-SD-REQ-030719/A-Redial (TcSE ROIN-149530-3)

Linked Elements
BTP-UC-REQ-033861/A-Outgoing call initiated via Redial from the In-Vehicle Infotainment System (TcSE ROIN-290905-3)

Scenarios

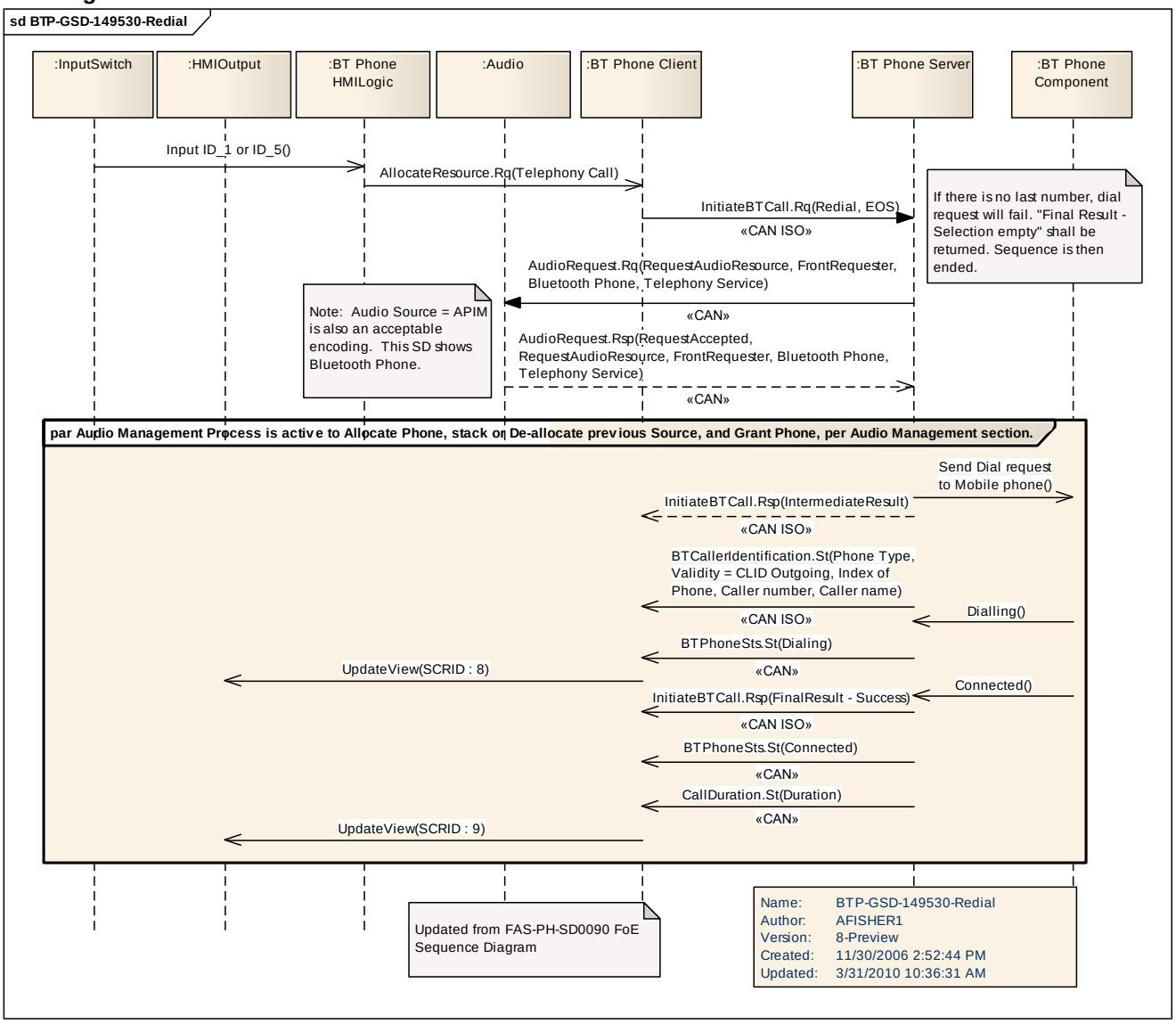
Normal Usage
The user selects <redial> via the HMI.

Constraints

Pre-condition
The vehicle power is On. A BT phone is connected.

Post-condition
The user is in an active call. HMI indicates {Caller ID / Phone Number / Call duration}.

Sequence Diagram



3.3.3.2 BTP-SD-REQ-030722/B-Initiate a Phone Call from Browse (TcSE ROIN-159083-2)

Scenarios

Normal Usage

If an additional interface is able to show the phonebook/call history, then it also shall be possible to initiate an outgoing call.

Constraints

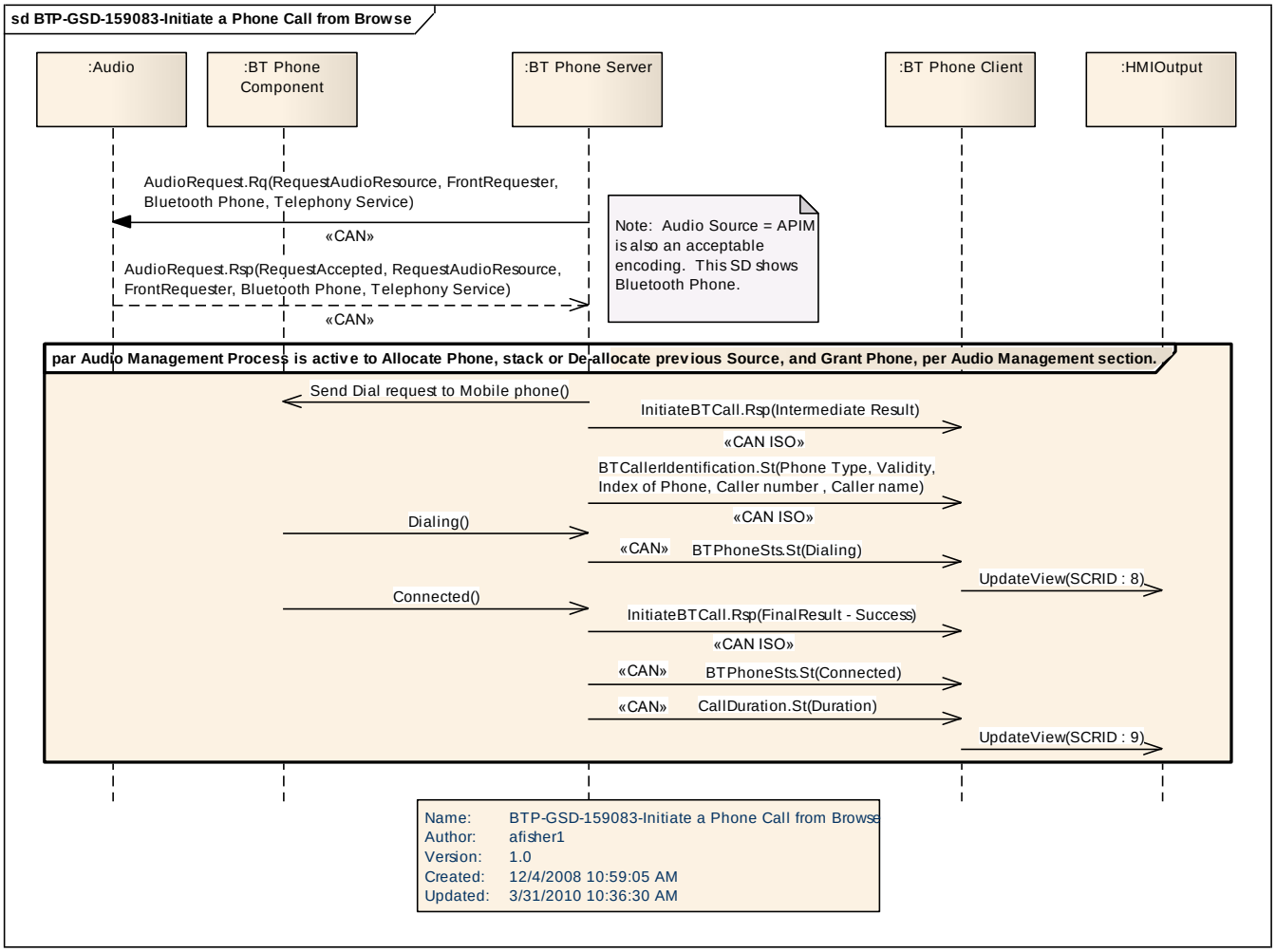
Pre-condition

The user is in phone browse mode.

Post-condition

The user is connected to the requested Caller Id and an active phone call is in progress.

Sequence Diagram



3.4 BTP-FUN-REQ-041788/A-Active Call Management (TcSE ROIN-294448-1)

3.4.1 Use Cases

3.4.1.1 BTP-UC-REQ-041789/A-Ending a Single or Joined Active Call via In-Vehicle Infotainment System (TcSE ROIN-290920-1)

Linked Elements
BTP-FUR-REQ-041819/A-Ability to End a Single Call (TcSE ROIN-295051-1)
BTP-SD-REQ-030705/A-End Call (TcSE ROIN-149457-3)

Actors	Mobile Phone Customer
Pre-conditions	A mobile phone is connected to the In-Vehicle Infotainment System, and a call is active
Scenario Description	The customer is in an active phone call, and has opted to end the phone call via the In-Vehicle Infotainment System. In-Vehicle Infotainment System
Post-conditions	The phone call is ended. The In-Vehicle Infotainment System has the ability to indicate that a call has ended. Phone audio (i.e. SCO, eSCO, etc.) is not present via the In-Vehicle Infotainment System. The In-Vehicle Infotainment System returns to its prior state as specified.

List of Exception Use Cases	E1 – Ending a Call via In-Vehicle Infotainment System Failed.
Interfaces	G-HMI SWC Vehicle System Interface

3.4.1.2 BTP-UC-REQ-041790/A-Ending a Call via In-Vehicle Infotainment System Failed (TcSE ROIN-290921-1)

Linked Elements
BTP-UC-REQ-041789/A-Ending a Single or Joined Active Call via In-Vehicle Infotainment System (TcSE ROIN-290920-1)
BTP-UC-REQ-041791/A-Ending a Single Active Call w/ Call on Hold via In-Vehicle Infotainment System (TcSE ROIN-290922-1)

Actors	Mobile Phone Customer
Pre-conditions	Same as original use case
Scenario Description	The customer is in an active phone call, and has opted to end the phone call via the In-Vehicle Infotainment System. The connected phone has indicated that the call is not ended.
Post-conditions	An error is provided to the customer The phone call audio is no longer present via the In-Vehicle Infotainment System. The In-Vehicle Infotainment System returns to the prior state (as specified) as if the call has ended.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.4.1.3 BTP-UC-REQ-041791/A-Ending a Single Active Call w/ Call on Hold via In-Vehicle Infotainment System (TcSE ROIN-290922-1)

Actors	Mobile Phone Customer
Pre-conditions	A mobile phone is connected, and one call is active and another call is on hold.
Scenario Description	The customer has one active call, and one call on hold. The customer wants to end the active call and return to the held call. As a result, the customer uses the G-HMI available via the In-Vehicle Infotainment System to end the active call.
Post-conditions	The active call is ended. The held call becomes the active call. The In-Vehicle Infotainment System has the ability to indicate that a call has ended. The In-Vehicle Infotainment System has the ability to indicate the current active call. The In-Vehicle Infotainment System provides the customer with the option to end the active call.
List of Exception Use Cases	E1 – Ending a Call via In-Vehicle Infotainment System Failed.
Interfaces	G-HMI Vehicle System Interface

3.4.1.4 BTP-UC-REQ-041792/A-Ending a Single or Joined Active Call via Mobile Phone (TcSE ROIN-290923-1)

Actors	Mobile Phone, Customer
Pre-conditions	A mobile phone is connected to the In-Vehicle Infotainment System, and a call is active
Scenario Description	The customer is in an active phone call, and the connected mobile phone has indicated that the active call is no longer active.
Post-conditions	The phone call is ended.

	The In-Vehicle Infotainment System has the ability to indicate that the call has ended. Phone audio (i.e. SCO, eSCO, etc.) is not present via the In-Vehicle Infotainment System. In-Vehicle Infotainment System returns to prior state.
List of Exception Use Cases	E1 – Phone does not notify In-Vehicle Infotainment System that a call(s) has ended.
Interfaces	G-HMI Vehicle System Interface

3.4.1.5 BTP-UC-REQ-041794/A-Ending a Single Call while in a Joined Call or in an Active Call with a Call on Hold via Mobile Phone (TcSE ROIN-290924-1)

Actors	Mobile Phone Customer
Pre-conditions	A mobile phone is connected to the In-Vehicle Infotainment System, and a joined call is active or a single call is active, with a call on hold (i.e. multi-party call).
Scenario Description	The customer is in an active multi-party call (joined call or single call w/ call on hold) and the connected mobile phone has indicated that one of the calls is no longer present.
Post-conditions	The phone call is ended. The In-Vehicle Infotainment System has the ability to indicate that the call has ended. The In-Vehicle Infotainment System has the ability to indicate the current active call. Phone audio (i.e. SCO, eSCO, etc.) is present via the In-Vehicle Infotainment System for the remaining call. The In-Vehicle Infotainment System provides the customer with the option to end the active call. The call timer is still present
List of Exception Use Cases	E1 – Mobile phone does not indicate that a call has ended in a multi-party call.
Interfaces	G-HMI Vehicle System Interface

3.4.1.6 BTP-UC-REQ-041793/A-Phone does not notify In-Vehicle Infotainment System that a call(s) has ended (TcSE ROIN-292573-1)

Linked Elements
BTP-UC-REQ-041792/A-Ending a Single or Joined Active Call via Mobile Phone (TcSE ROIN-290923-1)

Actors	Customer Mobile Phone
Pre-conditions	Same as in original use case
Scenario Description	Phone does not notify In-Vehicle Infotainment System that a call(s) has ended
Post-conditions	No Action
List of Exception Use Cases	N/A
Interfaces	N/A

3.4.1.7 BTP-UC-REQ-041795/A-Mobile phone does not indicate that a call has ended in a multi-party call (TcSE ROIN-290925-1)

Linked Elements
BTP-UC-REQ-041794/A-Ending a Single Call while in a Joined Call or in an Active Call with a Call on Hold via Mobile Phone (TcSE ROIN-290924-1)

Actors	Mobile Phone Customer
Pre-conditions	Same as original use case
Scenario Description	The customer is in an active multi-party call (joined call or single call w/ call on hold) and that one of the calls is no longer present, but the phone has not indicated that call was no longer present.
Post-conditions	The In-Vehicle Infotainment System will still indicate that a multi-party call is active.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.4.1.8 BTP-UC-REQ-041796/A-Muting the In-Vehicle Infotainment System Microphone while in an Active Call (TcSE ROIN-290926-1)

Linked Elements
BTP-FUR-REQ-041831/A-Muting an Active Call(s) (TcSE ROIN-295067-1)
BTP-SD-REQ-030709/A-Mute Phone (TcSE ROIN-149429-1)

Actors	Customer, Connected Mobile Phone, Microphone
Pre-conditions	A mobile is connected. A call is active The active call audio is Handsfree and available via the In-Vehicle Infotainment System.
Scenario Description	In this scenario, there is an active call present and the audio is available through the speakers of the In-Vehicle Infotainment System. The customer has opted to mute the in-vehicle microphone by using the options available via the In-Vehicle Infotainment System G-HMI.
Post-conditions	The In-Vehicle Infotainment System indicates that the in-vehicle microphone is muted. The in-vehicle microphone is muted, and no audio from the vehicle cabin can be heard on the far end of the phone call. The far end audio is available via the In-Vehicle Infotainment System speakers. The In-Vehicle Infotainment System provides the Customer with option of un-muting the microphone.
List of Exception Use Cases	E1 – Fault Recognized with the microphone or muting effort failed. E2 – The call is placed into privacy while the call is muted.
Interfaces	G-HMI Vehicle System Interface SWC

3.4.1.9 BTP-UC-REQ-041797/A-Fault Recognized with the microphone or muting effort failed (TcSE ROIN-290927-2)

Linked Elements
BTP-UC-REQ-041796/A-Muting the In-Vehicle Infotainment System Microphone while in an Active Call (TcSE ROIN-290926-1)
BTP-UC-REQ-041799/A-Un-muting the In-Vehicle Infotainment System Microphone while in an Active Call (TcSE ROIN-290929-1)

Actors	Customer Connected Mobile Phone Microphone
Pre-conditions	Same as original use case
Scenario Description	In this scenario, there is an active call present and the audio is available through the speakers of the In-Vehicle Infotainment System. The customer has opted to mute the in-vehicle microphone by using the options available via the In-Vehicle Infotainment System G-HMI, but In-Vehicle Infotainment System has been alerted to a fault with the microphone and/or the muting effort failed.
Post-conditions	~~Error message displayed to customer~~ The In-Vehicle Infotainment System does not indicate that the call is muted.

List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.4.1.10 BTP-UC-REQ-041798/A-The call is placed into Privacy while the Call is muted (TcSE ROIN-290928-1)

Linked Elements
BTP-UC-REQ-041796/A-Muting the In-Vehicle Infotainment System Microphone while in an Active Call (TcSE ROIN-290926-1)

Actors	Customer Connected Mobile Phone Microphone
Pre-conditions	Same as original use case
Scenario Description	In this scenario, there is an active call present and the audio is available through the speakers of the In-Vehicle Infotainment System. The customer has opted to mute the in-vehicle microphone by using the options available via the In-Vehicle Infotainment System G-HMI, but In-Vehicle Infotainment System has been alerted that the call has been placed into privacy (i.e. call audio is routed to the handset.)
Post-conditions	Customer is alerted that the microphone is no longer muted. The In-Vehicle Infotainment System indicates that the call is in privacy, as described in the privacy use cases.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.4.1.11 BTP-UC-REQ-041799/A-Un-muting the In-Vehicle Infotainment System Microphone while in an Active Call (TcSE ROIN-290929-1)

Linked Elements
BTP-FUR-REQ-041831/A-Muting an Active Call(s) (TcSE ROIN-295067-1)
BTP-SD-REQ-030709/A-Mute Phone (TcSE ROIN-149429-1)

Actors	Customer Connected Mobile Phone Microphone
Pre-conditions	A mobile is connected. A call is active The active call audio is Handsfree and the in-vehicle microphone is muted.
Scenario Description	In this scenario, there is an active call present and the in-vehicle microphone is muted. The customer has opted to un-mute the in-vehicle microphone by using the options available via the G-HMI.
Post-conditions	The In-Vehicle Infotainment System indicates that the in-vehicle microphone is un-muted. The in-vehicle microphone is un-muted, and audio from the vehicle cabin can be heard on the far end of the phone call. The In-Vehicle Infotainment System provides the Customer with the option of muting the microphone
List of Exception Use Cases	E1 – Fault Recognized with the microphone or muting effort failed.
Interfaces	G-HMI Vehicle System Interface

3.4.1.12 BTP-UC-REQ-041800/A-Customer opts to Mute / Unmute call via connected phone (TcSE ROIN-290930-1)

Actors	Customer

	Connected Mobile Phone
Pre-conditions	A mobile is connected. A call is active
Scenario Description	In this scenario, there is an active call present, and the customer opts to mute / unmute the call via the connected phone.
Post-conditions	The In-Vehicle Infotainment System does not take any action, as the In-Vehicle Infotainment System is not alerted to the mute / unmute status of the connected phone.
List of Exception Use Cases	N/A
Interfaces	N/A

3.4.1.13 BTP-UC-REQ-041801/C-Answering an Incoming Call Waiting Call via In-Vehicle Infotainment System (TcSE ROIN-290931-1)

Linked Elements
BTP-FUR-REQ-041820/B-Max Number of Calls (TcSE ROIN-295056-1)
BTP-FUR-REQ-041840/B-Call Timer (TcSE ROIN-295104-1)
BTP-FUR-REQ-041822/B-Call Waiting Call Accepted (TcSE ROIN-295058-1)
BTP-FUR-REQ-041821/B-Call Waiting Call (TcSE ROIN-295057-1)
BTP-SD-REQ-030715/A-Call Waiting Call (TcSE ROIN-149471-2)

Actors	Customer Connected Mobile Phone
Pre-conditions	A mobile is connected. A call is active
Scenario Description	In this scenario, there is an active call present and the connected mobile phone indicates that an incoming call waiting call is present. As a result of this notification the In-Vehicle Infotainment System notifies the Customer of the incoming call by displaying the phone number of the incoming call or the phonebook contact name if the contact name is available. The Customer opts to answer the incoming call via the In-Vehicle Infotainment System G-HMI options available – see linked requirements.
Post-conditions	The incoming call waiting call becomes the active call. The call that was the active call when the incoming call waiting call was indicated becomes the held call or is hanged up, depending on the option chosen by the user. The In-Vehicle Infotainment System has the ability to indicate to the Customer that there is an active call (and a call on hold, if that is the case) If there is an active call and a call on hold, the In-Vehicle Infotainment System provides the Customer with the opportunity to toggle between the two. The appropriate call timer information are shown.
List of Exception Use Cases	E1 – Answering an Incoming Call Waiting Call via In-Vehicle Infotainment System Failed.
Interfaces	G-HMI

3.4.1.14 BTP-UC-REQ-041802/A-Answering an Incoming Call Waiting Call via In-Vehicle Infotainment System Failed (TcSE ROIN-290932-1)

Linked Elements
BTP-FUR-REQ-041821/B-Call Waiting Call (TcSE ROIN-295057-1)
BTP-FUR-REQ-041840/B-Call Timer (TcSE ROIN-295104-1)
BTP-UC-REQ-041801/C-Answering an Incoming Call Waiting Call via In-Vehicle Infotainment System (TcSE ROIN-290931-1)

Actors	Customer Connected Mobile Phone
Pre-conditions	Same as original use case
Scenario Description	In this scenario, there is an active call present and the connected mobile phone indicates that an incoming call waiting call is present. As a result of this notification

	the In-Vehicle Infotainment System notifies the Customer of the incoming call by displaying the phone number of the incoming call or the phonebook contact name if the contact name is available. The Customer opts to answer the incoming call via the In-Vehicle Infotainment System G-HMI options available, but the call is not answered.
Post-conditions	Error message is provided to the customer. In-Vehicle Infotainment System indicates that the active call is the call that was present when the incoming call was received.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.4.1.15 BTP-UC-REQ-041803/C-Answering an Incoming Call Waiting Call via Mobile Phone (TcSE ROIN-290933-1)

Linked Elements
BTP-SD-REQ-030715/A-Call Waiting Call (TcSE ROIN-149471-2)
BTP-FUR-REQ-041840/B-Call Timer (TcSE ROIN-295104-1)
BTP-FUR-REQ-041821/B-Call Waiting Call (TcSE ROIN-295057-1)
BTP-FUR-REQ-041822/B-Call Waiting Call Accepted (TcSE ROIN-295058-1)

Actors	Customer, Connected Mobile Phone
Pre-conditions	A mobile is connected. A call is active
Scenario Description	In this scenario, there is an active call present and the connected mobile phone indicates that an incoming call waiting call is present. As a result of this notification the In-Vehicle Infotainment System notifies the Customer of the incoming call by displaying the phone number of the incoming call or the phonebook contact name if the contact name is available. The mobile phone indicates that the incoming call awaiting call has been answered.
Post-conditions	The incoming call waiting call becomes the active call. The In-Vehicle Infotainment System correctly indicates whether the call that was the active call is now held or not present any more. If there is an active and a held call, the In-Vehicle Infotainment System provides the Customer with the opportunity to toggle between the two. The appropriate call timer information are shown.
List of Exception Use Cases	E1 – Mobile phone does not indicate that a call has been answered during an active call.
Interfaces	G-HMI Vehicle System Interface

3.4.1.16 BTC-UC-REQ-247276/B-Switching calls via In-Vehicle Infotainment System or Connected Mobile Phone

Linked Elements
BTP-FUR-REQ-041826/B-Toggle Calls (TcSE ROIN-295062-1)

Actors	Customer Connected Mobile Phone In-Vehicle Infotainment System
Pre-conditions	Mobile Phone is connected. There are two calls. One is active, one is held.
Scenario Description	In this scenario, there are two calls present, one is active and one is held. Both Mobile Phone and In-Vehicle Infotainment System indicate that there are two calls and that one is active, one is held The Customer opts to swap the calls (hold the active call, make the held call active) via the In-Vehicle Infotainment System, or via the connected Mobile Phone.

Post-conditions	Both - Mobile Phone and In-Vehicle Infotainment System - indicate that there are two calls and that one is active, one is held, and correctly display which call is held, which one is active. The appropriate call timer information shall be displayed for each call.
List of Exception Use Cases	
Interfaces	G-HMI Vehicle System Interface

3.4.1.17 BTC-UC-REQ-247275/A-Joining calls via In-Vehicle Infotainment System or Connected Mobile Phone

Linked Elements
BTP-FUR-REQ-041828/B-Join Calls (TcSE ROIN-295064-1)
BTP-SD-REQ-030717/B-Join Calls (TcSE ROIN-149478-3)

Actors	Customer Connected Mobile Phone In-Vehicle Infotainment System
Pre-conditions	Mobile Phone is connected There are two calls. One is active, one is held
Scenario Description	In this scenario, there are two calls present, one is active and one is held. Both Mobile Phone and In-Vehicle Infotainment System indicate that there are two calls and that one is active, one is held The Customer opts to join the calls together into a conference call via the In-Vehicle Infotainment System G-HMI, or via a cluster interface, or via the connected Mobile Phone.
Post-conditions	Both Mobile Phone and In-Vehicle Infotainment System (G-HMI and cluster interface) indicate that there are two calls joined into a conference call.
List of Exception Use Cases	
Interfaces	G-HMI, Cluster interface, Mobile Phone

3.4.1.18 BTC-UC-REQ-235611/A-Setting single held call to active

Linked Elements
BTP-FUR-REQ-041826/B-Toggle Calls (TcSE ROIN-295062-1)

Actors	Mobile Phone Customer
Pre-conditions	A mobile phone is connected, and one call is on hold.
Scenario Description	The customer has one call on hold. The In-Vehicle Infotainment System provides the customer with the option to end the held call. The In-Vehicle Infotainment System provides the customer with the option to unhold the held call. The customer wants to set the held call to active. As a result, the customer uses the G-HMI available via the In-Vehicle Infotainment System to unhold the call.
Post-conditions	The held call becomes the active call. The In-Vehicle Infotainment System has the ability to indicate the current active call. The In-Vehicle Infotainment System provides the customer with the option to end the active call.
List of Exception Use Cases	

Interfaces	G-HMI Vehicle System Interface

3.4.1.19 BTP-UC-REQ-041804/B-Mobile phone does not indicate that a call has been answered during an active call (TcSE ROIN-290934-1)

Linked Elements
BTP-UC-REQ-041803/C-Answering an Incoming Call Waiting Call via Mobile Phone (TcSE ROIN-290933-1)

Actors	Mobile Phone Customer
Pre-conditions	Same as original use case
Scenario Description	During an incoming call waiting call, the incoming call is answered by the connected mobile phone, but the mobile phone does not update the In-Vehicle Infotainment System.
Post-conditions	The In-Vehicle Infotainment System indicates that the current call is the active call. (No In-Vehicle Infotainment System action required)
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.4.1.20 BTP-UC-REQ-041805/A-Rejecting an Incoming Call Waiting Call via In-Vehicle Infotainment System (TcSE ROIN-290935-1)

Linked Elements
BTP-FUR-REQ-041821/B-Call Waiting Call (TcSE ROIN-295057-1)
BTP-FUR-REQ-041823/A-Call Waiting Call Rejected (TcSE ROIN-295059-1)

Actors	Customer, Connected Mobile Phone
Pre-conditions	A mobile is connected. A call is active
Scenario Description	In this scenario, there is an active call present and the connected mobile phone indicates that an incoming call waiting call is present. As a result of this notification the In-Vehicle Infotainment System notifies the Customer of the incoming call by displaying the phone number of the incoming call or the phonebook contact name if the contact name is available. The Customer opts to reject the incoming call via the In-Vehicle Infotainment System G-HMI options available.
Post-conditions	The incoming call waiting call is no longer presented to the Customer via the In-Vehicle Infotainment System. The call that was the active call when the incoming call waiting call was indicated remains the active call.
List of Exception Use Cases	E1 – The incoming call waiting call is not rejected when Customer initiates rejection from In-Vehicle Infotainment System.
Interfaces	G-HMI Vehicle System Interface SWC

3.4.1.21 BTP-UC-REQ-041806/A-The incoming call waiting call is not rejected when Customer initiates rejection from In-Vehicle Infotainment System (TcSE ROIN-290936-1)

Linked Elements
BTP-FUR-REQ-041821/B-Call Waiting Call (TcSE ROIN-295057-1)
BTP-UC-REQ-041805/A-Rejecting an Incoming Call Waiting Call via In-Vehicle Infotainment System (TcSE ROIN-290935-1)

Actors	Mobile Phone Customer

Pre-conditions	Same as original use case
Scenario Description	During an incoming call waiting call, the incoming call is rejected by the In-Vehicle Infotainment System, but the connected mobile phone does not indicate that the call is rejected.
Post-conditions	The In-Vehicle Infotainment System no longer displays the incoming call waiting call. The In-Vehicle Infotainment System indicates that the call that was active upon receipt of the incoming call waiting call is the active call.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.4.1.22 BTP-UC-REQ-041807/A-Rejecting an Incoming Call Waiting Call via Connected Mobile Phone (TcSE ROIN-290937-1)

Linked Elements
BTP-FUR-REQ-041821/B-Call Waiting Call (TcSE ROIN-295057-1)
BTP-FUR-REQ-041823/A-Call Waiting Call Rejected (TcSE ROIN-295059-1)

Actors	Customer Connected Mobile Phone
Pre-conditions	A mobile is connected. A call is active
Scenario Description	In this scenario, there is an active call present and the connected mobile phone indicates that an incoming call waiting call is present. As a result of this notification the In-Vehicle Infotainment System notifies the Customer of the incoming call by displaying the phone number of the incoming call or the phonebook contact name if the contact name is available. The connected mobile phone indicates that the incoming call waiting call is no longer present.
Post-conditions	The incoming call waiting call is no longer presented to the Customer via the In-Vehicle Infotainment System. The call that was the active call when the incoming call waiting call was indicated remains the active call.
List of Exception Use Cases	E1 – Mobile Phone did not indicate that the incoming call waiting call was rejected.
Interfaces	G-HMI Vehicle System Interface

3.4.1.23 BTP-UC-REQ-041808/A-Mobile Phone did not indicate that the incoming call waiting call was rejected (TcSE ROIN-290938-1)

Linked Elements
BTP-UC-REQ-041807/A-Rejecting an Incoming Call Waiting Call via Connected Mobile Phone (TcSE ROIN-290937-1)

Actors	Customer Connected Mobile Phone
Pre-conditions	Same as original use case
Scenario Description	In this scenario, there is an active call present and the connected mobile phone indicates that an incoming call waiting call is present. As a result of this notification the In-Vehicle Infotainment System notifies the Customer of the incoming call by displaying the phone number of the incoming call or the phonebook contact name if the contact name is available. The connected mobile phone indicates that the incoming call waiting call is no longer present, but that indication was not provided to the In-Vehicle Infotainment System.

Post-conditions	The In-Vehicle Infotainment System continues to display the incoming call waiting call as long as the connected phone provides a notification of the incoming call waiting call.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.4.1.24 BTP-UC-REQ-041809/A-Transferring the Handsfree Audio to the Connected Mobile Phone via the In-Vehicle Infotainment System (i.e. Transfer to Privacy) (TcSE ROIN-290939-1)

Linked Elements
BTP-FUR-REQ-041834/D-Enabling Privacy (TcSE ROIN-295070-1)
BTP-SD-REQ-030711/A-Go to Privacy Mode (TcSE ROIN-149464-1)

Actors	Customer Connected Mobile Phone
Pre-conditions	A mobile is connected. A call is active The audio is Handsfree and available via the In-Vehicle Infotainment System speakers.
Scenario Description	An active Handsfree call is present and the customer has opted to have a private conversation by requesting that the call audio be transferred from the In-Vehicle Infotainment System speakers to the connected mobile phone. The customer opted to do this via the In-Vehicle Infotainment System G-HMI options available.
Post-conditions	The active call is still active. The active call audio can no longer be heard via the In-Vehicle Infotainment System speakers. The active call audio is on the connected mobile phone. The In-Vehicle Infotainment System indicates that the audio is now present on the connected mobile phone. The In-Vehicle Infotainment System provides the Customer with the option to place the audio back to the In-Vehicle Infotainment System speakers.
List of Exception Use Cases	E1 – Transferring the audio (via In-Vehicle Infotainment System) to handset failed.
Interfaces	G-HMI Vehicle System Interface

3.4.1.25 BTP-UC-REQ-041810/A-Transferring the audio (via In-Vehicle Infotainment System) to handset failed (TcSE ROIN-290940-1)

Linked Elements
BTP-UC-REQ-041809/A-Transferring the Handsfree Audio to the Connected Mobile Phone via the In-Vehicle Infotainment System (i.e. Transfer to Privacy) (TcSE ROIN-290939-1)

Actors	Customer Connected Mobile Phone
Pre-conditions	Same as original use case
Scenario Description	An active Handsfree call is present and the customer has opted to have a private conversation by requesting that the call audio be transferred from the In-Vehicle Infotainment System speakers to the connected mobile phone. The customer opted to do this via the In-Vehicle Infotainment System G-HMI options available, but the transfer failed.
Post-conditions	An error message is displayed to the customer. The call remains Handsfree via the In-Vehicle Infotainment System.
List of Exception Use Cases	N/A
Interfaces	G-HMI

	Vehicle System Interface

3.4.1.26 BTP-UC-REQ-041811/A-Transferring the Handsfree Audio to the Connected Mobile Phone via the Connected Mobile Phone (i.e. Transfer to Privacy) (TcSE ROIN-290941-1)

Linked Elements
BTP-FUR-REQ-041834/D-Enabling Privacy (TcSE ROIN-295070-1)
BTP-SD-REQ-030711/A-Go to Privacy Mode (TcSE ROIN-149464-1)

Actors	Customer, Connected Mobile Phone
Pre-conditions	A mobile is connected. A call is active The audio is Handsfree and available via the In-Vehicle Infotainment System speakers.
Scenario Description	An active Handsfree call is present and the customer has opted to have a private conversation by requesting that the call audio be transferred from the In-Vehicle Infotainment System speakers to the connected mobile phone. The connected mobile phone has requested that the audio be transferred to the connected mobile phone.
Post-conditions	The active call is still active. The In-Vehicle Infotainment System grants the connected mobile phone's request. The active call audio can no longer be heard via the In-Vehicle Infotainment System speakers. The active call audio is on the connected mobile phone. The In-Vehicle Infotainment System indicates that the audio is now present on the connected mobile phone. The In-Vehicle Infotainment System provides the Customer with the option to place the audio back to the In-Vehicle Infotainment System speakers.
List of Exception Use Cases	E1 – Transferring the Handsfree Audio to the Connected Mobile Phone via the Connected Mobile Phone (i.e. Transfer to Privacy) (Failed).
Interfaces	G-HMI Vehicle System Interface

3.4.1.27 BTP-UC-REQ-041812/A-Transferring the Handsfree Audio to the Connected Mobile Phone via the Connected Mobile Phone (i.e. Transfer to Privacy) (Failed (TcSE ROIN-290942-1)

Linked Elements
BTP-UC-REQ-041811/A-Transferring the Handsfree Audio to the Connected Mobile Phone via the Connected Mobile Phone (i.e. Transfer to Privacy) (TcSE ROIN-290941-1)
BTP-FUR-REQ-041834/D-Enabling Privacy (TcSE ROIN-295070-1)
BTP-SD-REQ-030711/A-Go to Privacy Mode (TcSE ROIN-149464-1)

Actors	Customer Connected Mobile Phone
Pre-conditions	Same as original use case
Scenario Description	An active Handsfree call is present and the customer has opted to have a private conversation by requesting that the call audio be transferred from the In-Vehicle Infotainment System speakers to the connected mobile phone. The connected mobile phone has requested that the audio be transferred to the connected mobile phone, but failed to notify the In-Vehicle Infotainment System
Post-conditions	In-Vehicle Infotainment System continues to indicate an active Handsfree call
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.4.1.28 BTP-UC-REQ-041813/A-Transferring the Audio to the In-Vehicle Infotainment System from the Connected Phone via In-Vehicle Infotainment System (i.e. (TcSE ROIN-290943-1)

Linked Elements
BTP-FUR-REQ-041835/A-Disabling Privacy (TcSE ROIN-295071-1)
BTP-SD-REQ-030713/A-Go to Hands Free Mode (TcSE ROIN-150117-1)

Actors	Customer, Connected Mobile Phone
Pre-conditions	A mobile is connected. A call is active The audio is present on the connected phone.
Scenario Description	An active call is present and the audio is presently available via the connected mobile phone. The customer has opted to transfer the audio from the connected mobile phone to the speakers of the In-Vehicle Infotainment System.
Post-conditions	The active call is still active. The active call audio can no longer be heard via the connected mobile phone. The active call audio is now available via the In-Vehicle Infotainment System speakers. The In-Vehicle Infotainment System indicates that the audio is now present via the In-Vehicle Infotainment System speakers. The In-Vehicle Infotainment System provides the Customer with the option to place the audio back to the connected mobile phone.
List of Exception Use Cases	E1 – Transferring the Audio to the In-Vehicle Infotainment System from the Connected Phone via In-Vehicle Infotainment System (i.e. Transfer to Handsfree) (Failed).
Interfaces	G-HMI Vehicle System Interface

3.4.1.29 BTP-UC-REQ-041814/A-Transferring the Audio to the In-Vehicle Infotainment System from the Connected Phone via In-Vehicle Infotainment System (i.e. (TcSE ROIN-290944-1)

Linked Elements
BTP-UC-REQ-041813/A-Transferring the Audio to the In-Vehicle Infotainment System from the Connected Phone via In-Vehicle Infotainment System (i.e. (TcSE ROIN-290943-1)
BTP-FUR-REQ-041835/A-Disabling Privacy (TcSE ROIN-295071-1)
BTP-SD-REQ-030713/A-Go to Hands Free Mode (TcSE ROIN-150117-1)

Actors	Customer, Connected Mobile Phone
Pre-conditions	Same as original use case.
Scenario Description	An active call is present and the audio is presently available via the connected mobile phone. The customer has opted to transfer the audio from the connected mobile phone to the speakers of the In-Vehicle Infotainment System, but the transfer failed.
Post-conditions	Error message is indicated to the customer. The audio is still routed to the connected phone.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.4.1.30 BTP-UC-REQ-041815/A-Transferring the Audio to the In-Vehicle Infotainment System from the Connected Phone via the Connected Mobile Phone (i.e. Trans (TcSE ROIN-290945-1)

Linked Elements
BTP-FUR-REQ-041835/A-Disabling Privacy (TcSE ROIN-295071-1)
BTP-SD-REQ-030713/A-Go to Hands Free Mode (TcSE ROIN-150117-1)

Actors	Customer, Connected Mobile Phone
Pre-conditions	A mobile is connected. A call is active

	The audio is present on the connected phone.
Scenario Description	An active call is present and the audio is presently available via the connected mobile phone. The mobile phone has indicated that the active call audio is to be transferred from the connected mobile phone to the In-Vehicle Infotainment System speakers.
Post-conditions	The active call is still active. The In-Vehicle Infotainment System grants the connected mobile phone's request. The active call audio can no longer be heard via the connected mobile phone. The active call audio is now available via the In-Vehicle Infotainment System speakers. The In-Vehicle Infotainment System indicates that the audio is now present via the In-Vehicle Infotainment System speakers. The In-Vehicle Infotainment System provides the Customer with the option to place the audio back to the connected mobile phone.
List of Exception Use Cases	E1 – Transferring the Audio from the Connected Mobile Phone to the In-Vehicle Infotainment System via the Connected Mobile Phone (i.e. Transfer to Handsfree) (Failed).
Interfaces	G-HMI Vehicle System Interface

3.4.1.31 BTP-UC-REQ-041816/B-Transferring the Audio from the Connected Mobile Phone to the In-Vehicle Infotainment System via the Connected Mobile Phone (i.e (TcSE ROIN-290946-1)

Linked Elements
BTP-UC-REQ-041815/A-Transferring the Audio to the In-Vehicle Infotainment System from the Connected Phone via the Connected Mobile Phone (i.e. Trans (TcSE ROIN-290945-1)
BTP-FUR-REQ-041835/A-Disabling Privacy (TcSE ROIN-295071-1)

Actors	Customer Connected Mobile Phone
Pre-conditions	Same as original use case
Scenario Description	An active call is present and the audio is presently available via the connected mobile phone. The customer has opted to transfer the call audio to the In-Vehicle Infotainment System via the connected phone, but the phone has failed to indicate this to the In-Vehicle Infotainment System.
Post-conditions	In-Vehicle Infotainment System continues to indicate an active call in privacy The audio is still present on the connected phone.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.4.1.32 BTP-UC-REQ-041817/A-Entering DTMF Tones During an Active Phone Call (TcSE ROIN-290947-1)

Linked Elements
BTP-FUR-REQ-041830/B-DTMF Tones (TcSE ROIN-295066-1)

Actors	Customer, Connected Mobile Phone
Pre-conditions	A mobile phone is connected. A call is active (Handsfree or Privacy)
Scenario Description	In this case there is an active call present, and Customer wants to send DTMF tones to the far end. (As an example, the Customer may want to join a conference call, etc.) Via the In-Vehicle Infotainment System G-HMI available, the Customer indicates which DTMF tones to send to the far end.
Post-conditions	The call is still active As each DTMF tone is requested by the Customer, it is sent to the connected mobile phone.

	The In-Vehicle Infotainment System displays to the Customer which DTMF tones have been sent to the far end.
List of Exception Use Cases	E1 – DTMF tones from the In-Vehicle Infotainment System fails.
Interfaces	G-HMI

3.4.1.33 BTP-UC-REQ-041818/A-DTMF tones from the In-Vehicle Infotainment System fails (TcSE ROIN-290948-1)

Linked Elements
BTP-UC-REQ-041817/A-Entering DTMF Tones During an Active Phone Call (TcSE ROIN-290947-1)

Actors	Customer, Connected Mobile Phone
Pre-conditions	Same as original use case
Scenario Description	In this case there is an active call present, and Customer wants to send DTMF tones to the far end. (As an example, the Customer may want to join a conference call, etc.) Via the In-Vehicle Infotainment System G-HMI available, the Customer indicates which DTMF tones to send to the far end, but the connected phone has failed to respond appropriately.
Post-conditions	An error is displayed to the customer. The In-Vehicle Infotainment System remains in an active call.
List of Exception Use Cases	N/A
Interfaces	G-HMI

3.4.1.34 BTP-UC-REQ-192191/A-Turning Bluetooth off with an active call

Linked Elements
BTP-FUR-REQ-192187/E-Turning Bluetooth off/on

Actors	Mobile Phone Customer
Pre-conditions	The mobile phone is connected, a voice call is ongoing
Scenario Description	The customer has indicated that they want to turn Bluetooth off
Post-conditions	The In-Vehicle Infotainment System closes Bluetooth connections with the connected device (all connections: ACL and SCO/eSCO) and does not allow reconnections. It then turns off the Bluetooth chip so that it stops transmitting and receiving data over the air. The phone call is not explicitly ended by the In-Vehicle Infotainment System and depending on devices' implementation should continue on the handset. The process of turning Bluetooth off shall not require more than 3 sec, no matter the device behavior upon request for disconnection. A similar behavior shall be followed for the case when a phone call is not present, or it is present and in privacy, or when multiple devices are connected at the same time.
List of Exception Use Cases	

Interfaces	G-HMI Vehicle System Interface

3.4.2 Requirements

3.4.2.1 BTP-FUR-REQ-041819/A-Ability to End a Single Call (TcSE ROIN-295051-1)

The ability to end a single active call shall only be available while in a single call. This will allow the user to end the call.
The user shall be able to end a call via In-Vehicle Infotainment System or the AG
After a call has been ended, the phone application shall release Primary Audio Source.

3.4.2.2 BTP-FUR-REQ-041820/B-Max Number of Calls (TcSE ROIN-295056-1)

The In-Vehicle Infotainment System shall be able to control a maximum of two calls simultaneously.
While in a single active call, the user shall be able to accept a second call.
While in a multi-party call state, the user will not have the option via the In-Vehicle Infotainment System to answer any other incoming call waiting call.

The call which is not supported anymore shall be ignored by the In-Vehicle Infotainment System.

3.4.2.3 BTP-FUR-REQ-041821/B-Call Waiting Call (TcSE ROIN-295057-1)

When a call waiting notification is received from the connected AG, the phone application shall notify the user by displaying the calls characteristics as described in the Phonebook Matching section of this specification. The user shall be able to accept, reject, or ignore this call.

Depending on HMI design, the user might be able to choose between 2 different ways to accept the call –

1. Accept and make the previous active call into a held call
2. Accept and hang-up the previous active call

If only one option is available to the user to accept the call, it shall be option #1.
The two options correspond to different CHLD values that will be sent from the IVIS to the connected phone – see BT SIG HFP specifications for more details.

3.4.2.4 BTP-FUR-REQ-041822/B-Call Waiting Call Accepted (TcSE ROIN-295058-1)

If accepted via In-Vehicle Infotainment System or the AG, the phone application shall reflect that the incoming call waiting call is now the active call.
The phone application shall also correctly reflect the status of the previously active call.

3.4.2.5 BTP-FUR-REQ-041823/A-Call Waiting Call Rejected (TcSE ROIN-295059-1)

If rejected via the In-Vehicle Infotainment System, the phone application shall block the incoming call waiting call's caller ID, send it to voicemail (if supported by the connected AG), and shall continue with the active call.

3.4.2.6 BTP-FUR-REQ-041824/A-Call Waiting Call Ignored (TcSE ROIN-295060-1)

If the user ignores the incoming call waiting call (i.e. not pressing any buttons via In-Vehicle Infotainment System), the phone core shall continue to report an incoming call waiting call until the phone stops reporting a CCWA notification. At that time In-Vehicle Infotainment System shall inform the user they have a Missed Call, and a Missed Call shall be recorded in the Call History section within THE IN-VEHICLE INFOTAINMENT SYSTEM.

3.4.2.7 BTP-FUR-REQ-041826/B-Toggle Calls (TcSE ROIN-295062-1)

This function allows the user to switch between an active call and a held call. This function shall only be allowed in a multi-party call state where one call is on hold and one is active.
IVIS shall determine that switching the calls was successful based on the CIND and CLCC information.

3.4.2.8 BTP-FUR-REQ-041827/B-Ending Specific Call (TcSE ROIN-295063-1)

This function allows the user to end an active call, and return to a held call.

Note: For CDMA devices, the user will not be able to end the active call. In this case, the user will end both calls, and the holding call will begin to ring as a new incoming call.
No specific handling required for this case.

3.4.2.9 BTP-FUR-REQ-041828/B-Join Calls (TcSE ROIN-295064-1)

This function shall allow the user to join two calls, and create a conference call. This function shall only be allowed in a multi-party call state where one call is on hold and one is active.
IVIS shall determine that joining the calls was successful based on the CIND and CLCC information.

3.4.2.10 BTP-FUR-REQ-041829/A-Ending Joined Calls (TcSE ROIN-295065-1)

This function shall allow the user to end a joined call. This function shall only be allowed in a multi-party call state where both calls are active. After the calls have been ended, the phone application shall release Primary Audio Source.

3.4.2.11 BTP-FUR-REQ-041830/B-DTMF Tones (TcSE ROIN-295066-1)

This feature shall only be available while in an active call. It shall allow the user to send DTMF tones during active calls. All numerals, asterisks, and pound shall be supported. The user shall be allowed to enter these tones using the GUI. The connected device might send a short tone over the audio channel each time a user sends a DTMF tone. This will provide some audio feedback to assure the user that their action was registered.

3.4.2.12 BTP-FUR-REQ-041831/A-Muting an Active Call(s) (TcSE ROIN-295067-1)

This feature shall only be available while in an active call. It shall mute the In-Vehicle Infotainment System microphone, and not pass audio to the connected AG. When this feature is set to 'ON', the In-Vehicle Infotainment System microphone will be muted. SCO shall still be connected, and the user shall be able to hear the party on the far end.

3.4.2.13 BTP-FUR-REQ-041832/A-Privacy Availability (TcSE ROIN-295068-1)

The ability to place a call into privacy / Handsfree shall only be available while in an active call. It will allow a user to transfer their call from the HF to the AG and vice versa via In-Vehicle Infotainment System or the AG.

3.4.2.14 BTP-FUR-REQ-041833/A-Privacy / Handsfree Call Management (TcSE ROIN-295069-1)

The call shall still be managed by the Handsfree connection with HF, while the call audio is on the handset.

3.4.2.15 BTP-FUR-REQ-041834/D-Enabling Privacy (TcSE ROIN-295070-1)

While the setting “Mute audio in privacy” is set to 'ON', and when the active call is in privacy, the In-Vehicle Infotainment System shall not play music from any source.

While the setting “Mute audio in privacy” is set to “OFF”, and when the active call is in privacy, the In-Vehicle Infotainment System shall fall back to the previous Audio Source.

The state of “Mute audio in privacy” shall be set according to the default value of customer market requirement as specified in BTP-FUR-REQ-113745 Device Specific settings. The customer shall have the ability to change the state for mute audio in privacy via a GUI option in the device specific settings.

3.4.2.16 BTP-FUR-REQ-041835/A-Disabling Privacy (TcSE ROIN-295071-1)

While this feature is set to 'OFF' audio will be transferred to the HF, and the phone application shall take Primary Audio Source.

3.4.2.17 BTP-FUR-REQ-193063/A-Handling of call audio and privacy indicator

The In-Vehicle Infotainment System, when a phone is connected and a call is present or established, shall try to make the call handsfree (call audio via the In-Vehicle Infotainment System speakers and microphone) in the following situations (described by relative use cases):

- Whenever the In-Vehicle Infotainment System connects to a phone and a call is already present (either on resume or on connection)
- Whenever the call is outgoing (either dialed from the In-Vehicle Infotainment System or from the handset)
- When an incoming call is answered by the In-Vehicle Infotainment System

The In-Vehicle Infotainment System shall not try to make the call handsfree for incoming calls answered via the handset. Depending on handset design, however, answering the call from the handset might result in a handsfree call.

At the same time the GUI for a call shall provide the user with the option to transfer the call audio from the In-Vehicle Infotainment System to the handset (and viceversa), and communicate the current status of the call audio.

For incoming calls answered via the handset, the In-Vehicle Infotainment System GUI shall always indicate to the user the current status of the call audio. In this case the In-Vehicle Infotainment System shall not try to make the call handsfree and shall try to modify the call audio status according to user input.

For all other cases (see bullet point list above) the In-Vehicle Infotainment System, to avoid flicker of the privacy status on the call GUI at the start of the call, shall show to the user that the call is NOT in privacy even if it is still trying to make the call handsfree. After the attempt to make the call handsfree is done, the privacy indicator shall correctly reflect the privacy status. If the user presses the button to make the call private, then the In-Vehicle Infotainment System shall either stop trying to make the call handsfree, or transfer audio to the phone, following the user input. From then on the privacy indicator shall correctly reflect the privacy status.

3.4.2.18 BTP-FUR-REQ-041836/A-Privacy Exception (TcSE ROIN-295072-1)

The In-Vehicle Infotainment System shall not indicate that the active call is in privacy when the customer is ending the call. To achieve this goal, the In-Vehicle Infotainment System shall wait 500ms before indicating that a call has been transferred into privacy when a Release SCO notification is received from the connected AG. Also, if the customer has opted to end the call via the In-Vehicle Infotainment System, the In-Vehicle Infotainment System shall not indicate that the call has transferred to privacy prior to phone call disconnect.

3.4.2.19 BTP-FUR-REQ-041837/A-Automatic Transfer to Privacy (TcSE ROIN-295073-1)

In the event that In-Vehicle Infotainment System has to release the Handsfree Connection with the AG while there is an active call present, it shall transfer the audio to the AG. In this case, In-Vehicle Infotainment System shall present a 180

second timer once the power mode transitions to Wait-Suspend. This timer shall indicate that the call will be transferred to privacy. The call shall be transferred if In-Vehicle Infotainment System receives a Driver Door open signal after a transition to Wait-Suspend. In the event that there is an active call, and In-Vehicle Infotainment System recognizes that the Driver Door is open and receives an ignition off In-Vehicle Infotainment System shall transfer the call to privacy. These scenarios can be found in In-Vehicle Infotainment System Welcome Power Modes.

3.4.2.20 BTP-FUR-REQ-041838/A-Automatic Transfer to Handsfree (TcSE ROIN-295074-1)

In the event that In-Vehicle Infotainment System connects to an AG, and it is in an active call, In-Vehicle Infotainment System shall transfer the call to Handsfree within 2 seconds.

3.4.2.21 BTP-FUR-REQ-130713/A-Hold Call

In the event that the connected device is capable of indicating the hold status of a connected call, the In-Vehicle Infotainment System shall be able to display this status to the customer.

3.4.2.22 BTP-FUR-REQ-041839/A-Advanced Call Tracking (TcSE ROIN-295103-1)

If supported by the connected AG, In-Vehicle Infotainment System shall use the Advance Call Tracking (i.e. CLCC) indicators as the call status indicator.

In the event of an Emergency Call, In-Vehicle Infotainment System shall use either CIEV and/or AT+CLCC updates to determine if an Emergency Call has been established.

3.4.2.23 BTP-FUR-REQ-041840/B-Call Timer (TcSE ROIN-295104-1)

During an active call, a call timer shall be maintained for hands-free calls.
In call hold scenarios, the appropriate call timer for each call shall be maintained.
In multi-party scenarios, the timer shall continue until the final call is terminated.

*****Note: In-Vehicle Infotainment System will not be able to display an accurate call timer when the call was active at the time of connection.

3.4.2.24 BTP-FUR-REQ-041841/B-Blower Motor Reduction / Activation (TcSE ROIN-295114-2)

The In-Vehicle Infotainment System shall request that the climate module reduce the blower motor when a Handsfree call is active. The In-Vehicle Infotainment System shall enable / disable the blower motor within 50ms of a handsfree phone call or the release of eSCO/SCO.

Reference
BTP-REQ-032098-Blower Motor Reduction Activation/Deactivation
BTP-REQ-032099-Incoming Call (Setting Blower Motor Reduction Activation)
BTP-REQ-032100-Outgoing Call Initiated from HF/AG (Setting Blower Motor Reduction Activation)
BTP-REQ-032101-Active Call at Time of Connection (Setting Blower Motor Reduction Activation)
BTP-REQ-032102-End of Call (Setting Blower Motor Reduction Activation)
BTP-REQ-032103-AG Disconnect (Setting Blower Motor Reduction Activation)
BTP-REQ-032104-Unspecified (per Handsfree Profile 1.5) Conditions Handling
BTP-REQ-032105-Audio is placed into Privacy (i.e. SCO is Released)
BTP-REQ-032106-Audio is placed into Handsfree from Privacy (i.e. SCO is granted)
BTP-REQ-032107-Additional Notes.

3.4.2.25 BTP-FUR-REQ-041842/B-Active Call Audio Error Detection (TcSE ROIN-304249-1)

The In-Vehicle Infotainment System shall have the ability to detect when eSCO / SCO should be active per the requirements within Handsfree Profile Specification.

Outgoing Call:

When an outgoing call is initiated via the In-Vehicle Infotainment System, it shall determine that an external error with the AG has occurred when the following scenario takes place:

1. If the connected AG fails to establish the audio connection within 3 seconds of receiving a callsetup value of 2.

When the above scenario is detected, the In-Vehicle Infotainment System shall try to establish the audio connection.

Incoming Call:

If incoming call is answered from IVIS, and there is no call audio being established by the phone in 3 sec from when the call becomes active, then IVIS shall try to establish the audio connection.

In-Band Ringing Support:

When the in-vehicle infotainment system is alerted to an incoming phone call via a callsetup value =1, it shall determine that an external audio routing error with AG has occurred when the following scenario takes place:

1. In-band ringing is active (as reported from the device)
2. If the connected AG fails to establish the audio connection within 3 seconds of receiving a callsetup value = 1.

When the above scenario is detected, the In-Vehicle Infotainment System shall try to establish the audio connection.

Non In-Band Ringing Support:

When the in-vehicle infotainment system provides and ATA to the connected AG and has received the corresponding call value = 1 and callsetup value = 0 shall determine that an external audio routing error with the AG has occurred when the following scenario takes place:

1. The connected AG fails to establish the audio connection within 3 seconds of receiving the callsetup value = 0.

When the above scenario is detected, the In-Vehicle Infotainment System shall try to establish the audio connection.

Retrieval From Privacy:

The In-Vehicle Infotainment System determines that an external audio routing error has taken place when attempting to retrieve a call from the handset (i.e. eSCO / SCO request) when the following scenario takes place:

1. The In-Vehicle Infotainment System has requested eSCO / SCO from the connected AG, but the AG has either:
    a. Failed to respond to the request within 3 seconds
    b. Rejected the request

3.4.2.26 BTP-FUR-REQ-041843/B-Incoming Call Answer Failure (TcSE ROIN-304250-1)

The In-Vehicle Infotainment System shall have the ability to detect when the connected AG has not responded to the request to answer an incoming call correctly per the requirements within Handsfree Phone Specification.

When the In-Vehicle Infotainment System provides an ATA or CHLD = 2 to the connected AG the In-Vehicle Infotainment System shall determine that an external error has occurred when the following scenario takes place:

1. The connected AG fails to respond with an OK within 5 seconds

*Note: For CHLD = 2; the categorization of an incoming call failure is only applicable when it is used in response to answering an incoming call waiting call (i.e. CCWA notification).

When the above scenario occurs the In-Vehicle Infotainment System shall consider this as an error while accepting the call. The In-Vehicle Infotainment System shall continue to attempt to answer the call by repeating the message to the AG every 5 seconds until the AG is no longer indicating that an incoming call is present or the user has indicated that the In-Vehicle Infotainment System should stop trying.

3.4.2.27 BTP-FUR-REQ-041844/C-Incoming Call Rejection Failure (TcSE ROIN-304251-1)

The In-Vehicle Infotainment System shall have the ability to detect when the connected AG has not responded to the request to reject an incoming call correctly per the requirements within Handsfree Phone Specification.

When the In-Vehicle Infotainment system provides a CHUP to the connected AG the in-vehicle infotainment system shall determine that an external error has occurred when the following scenario takes place:

1. The connected AG fails to respond with an OK within 5 seconds

When the above scenario occurs the In-Vehicle Infotainment system shall consider this as an Error while rejecting the call. The In-Vehicle Infotainment System shall continue to reject the call by repeating the message to the AG every 5 seconds until the AG is no longer indicating that an incoming call is present or the user has indicated that the In-Vehicle Infotainment System should stop trying.
Dependent on the HMI specification an error message may be displayed to the customer.

3.4.2.28 BTP-FUR-REQ-130714/E-Phone Volume Adjustment

The In-Vehicle Infotainment System shall offer an opportunity for the costumer to adjust the phone volume level to the media volume level (e.g. USB, FM). This setting shall be stored and shall apply for each paired device separately.
This adjustment shall apply prior to the phone feature volume setting.
The offset shall cover a gain of –10 dB to + 10 dB in 15 steps.
The default value is specified in STMGNT-FUR-REQ-014654-AHU-DSP AMP Default Parameters (TcSE ROIN-119131-11).
This requirement shall consider the existing requirement AHU-HR-REQ-102963-Mode Balancing - Media Level Matching For Audio Outputs. It is furthermore an additional option to compensate different behavior of consumer electronics.

Note: This setting shall NOT apply to Emergency Assistance calls.

3.4.2.29 BTC-FUR-REQ-191908/A-Caller ID format

The caller ID shall be displayed in the static format {FirstName LastName} independently from the chosen phonebook sorting order.

Exception:
For the APA countries which are specified in “BTP-FUR-REQ Phonebook Sorting per Market“ the format shall be dynamically handled according the selected phonebook sorting order, meaning if the phonebook is sorted via LastName the caller ID shall be displayed as {LastName Firstname}.
If the phonebook is currently sorted via FirstName then the caller name shall also have the format {Firstname Lastname}.
As soon as the costumer is changing the order for the phonebook sorting the change should apply to the caller ID as well.

3.4.3 Sequence Diagrams

3.4.3.1 BTP-SD-REQ-030709/A-Mute Phone (TcSE ROIN-149429-1)

Linked Elements
BTP-UC-REQ-041799/A-Un-muting the In-Vehicle Infotainment System Microphone while in an Active Call (TcSE ROIN-290929-1)
BTP-UC-REQ-041796/A-Muting the In-Vehicle Infotainment System Microphone while in an Active Call (TcSE ROIN-290926-1)

Scenarios

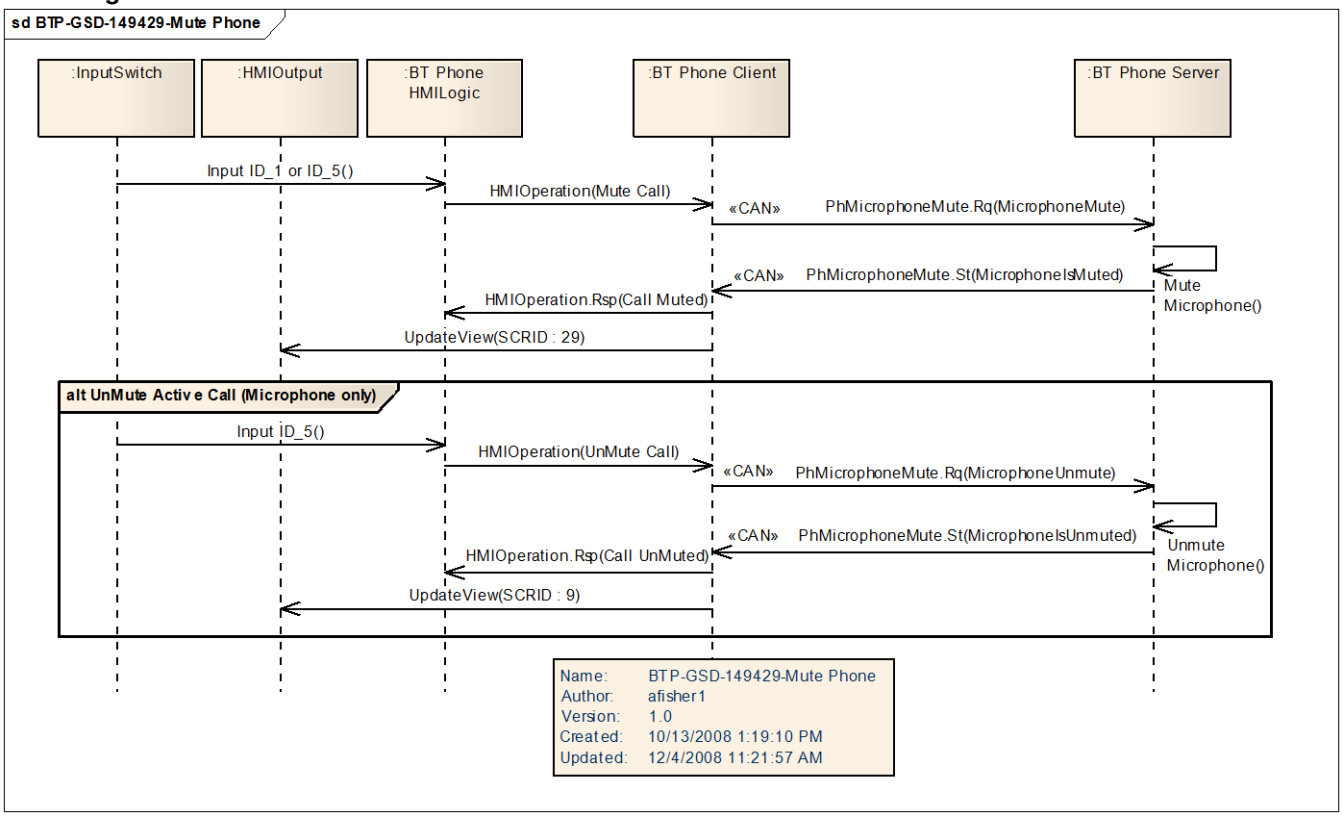
Normal Usage
The user selects <Mute / UnMute current call> via the HMI.

Constraints

Pre-condition
A Bluetooth phone is connected to the vehicle interface. Vehicle power is On. User is in an active phone call.

Post-condition
The user is in an active phone call, and the phone is muted or unmuted depending upon user action.

Sequence Diagram



3.4.3.2 BTP-SD-REQ-030705/A-End Call (TcSE ROIN-149457-3)

Linked Elements
BTP-UC-REQ-041789/A-Ending a Single or Joined Active Call via In-Vehicle Infotainment System (TcSE ROIN-290920-1)

Scenarios

Normal Usage
The user selects <End Call> via the HMI.

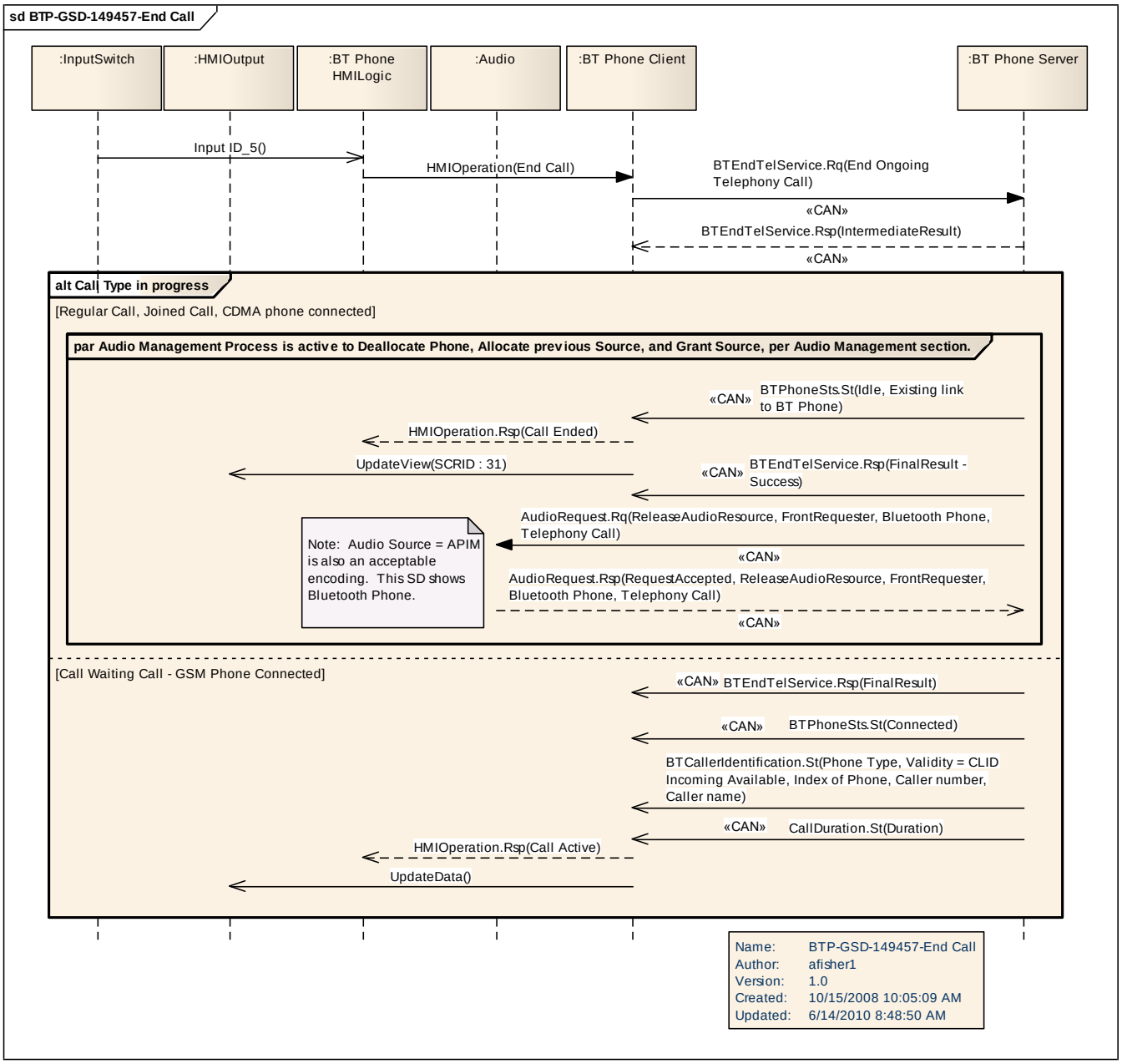
Constraints

Pre-condition
A Bluetooth phone is connected to the vehicle interface. Vehicle power is On. User is in an active phone call.

Post-condition
If active call is a regular one party call, a joined call, or a CDMA call waiting call, the active call is ended.

If active call is a call waiting call with a GSM phone connected, the current active call is ended, and the second call currently on hold is made the active call.

Sequence Diagram



3.4.3.3 BTP-SD-REQ-030711/A-Go to Privacy Mode (TcSE ROIN-149464-1)

Linked Elements

BTP-UC-REQ-041811/A-Transferring the Handsfree Audio to the Connected Mobile Phone via the Connected Mobile Phone (i.e. Transfer to Privacy) (TcSE ROIN-290941-1)

BTP-UC-REQ-041812/A-Transferring the Handsfree Audio to the Connected Mobile Phone via the Connected Mobile Phone (i.e. Transfer to Privacy) (Failed (TcSE ROIN-290942-1)

BTP-UC-REQ-041809/A-Transferring the Handsfree Audio to the Connected Mobile Phone via the In-Vehicle Infotainment System (i.e. Transfer to Privacy) (TcSE ROIN-290939-1)

Scenarios

Normal Usage

The user selects <Enter Privacy mode> via the HMI.

Constraints

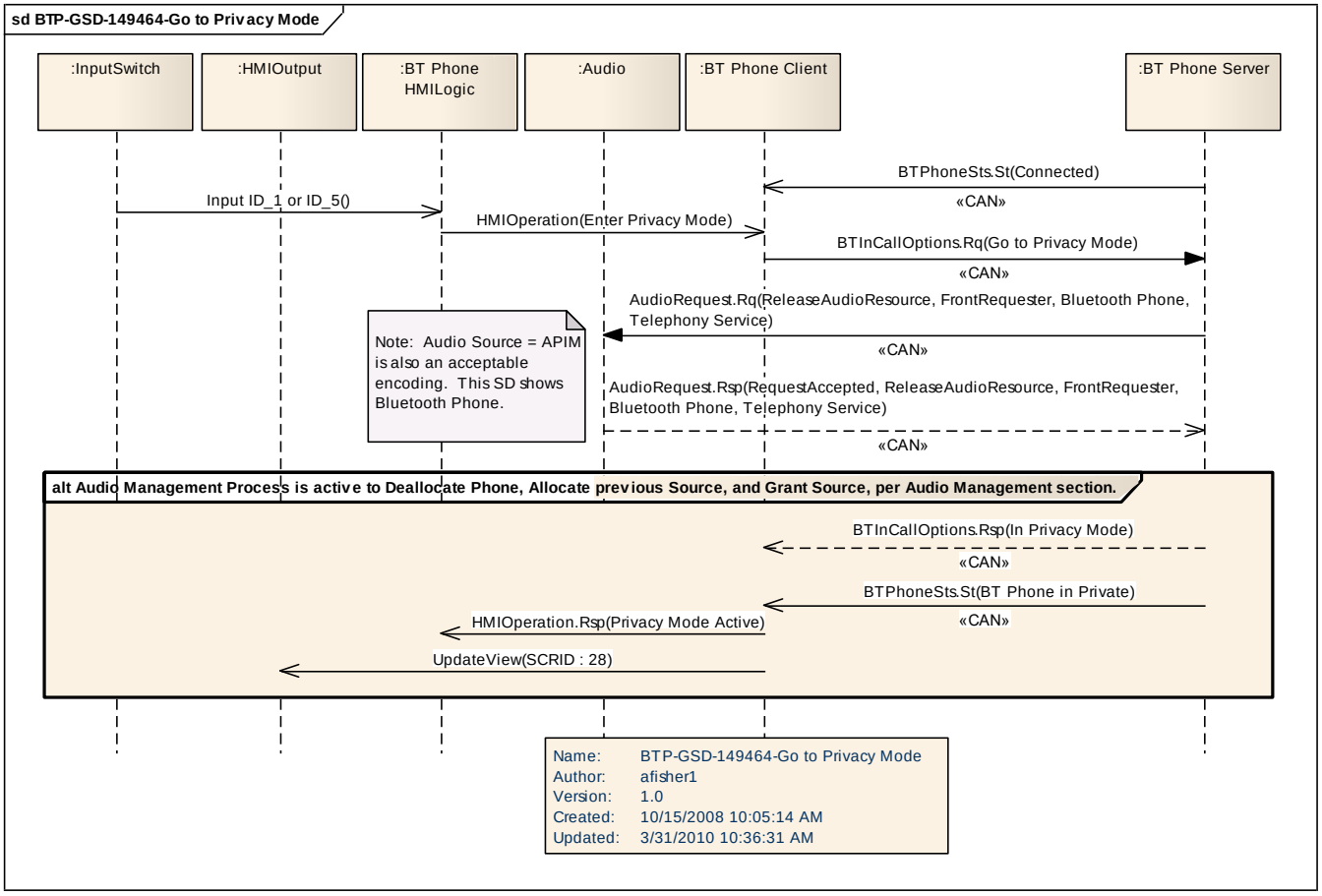
Pre-condition

A Bluetooth phone is connected to the vehicle interface. Vehicle power is On. User is in an active phone call, and is in hands free mode.

Post-condition

The user is in an active phone call, and the phone is placed in privacy mode The previous audio source is made active on the vehicle audio system.

Sequence Diagram



3.4.3.4 BTP-SD-REQ-030713/A-Go to Hands Free Mode (TcSE ROIN-150117-1)

Linked Elements

BTP-UC-REQ-041813/A-Transferring the Audio to the In-Vehicle Infotainment System from the Connected Phone via In-Vehicle Infotainment System (i.e. (TcSE ROIN-290943-1)

BTP-UC-REQ-041814/A-Transferring the Audio to the In-Vehicle Infotainment System from the Connected Phone via In-Vehicle Infotainment System (i.e. (TcSE ROIN-290944-1)

BTP-UC-REQ-041815/A-Transferring the Audio to the In-Vehicle Infotainment System from the Connected Phone via the Connected Mobile Phone (i.e. Trans (TcSE ROIN-290945-1)

Scenarios

Normal Usage

The user selects <Enter Hands free mode> via the HMI.

Constraints

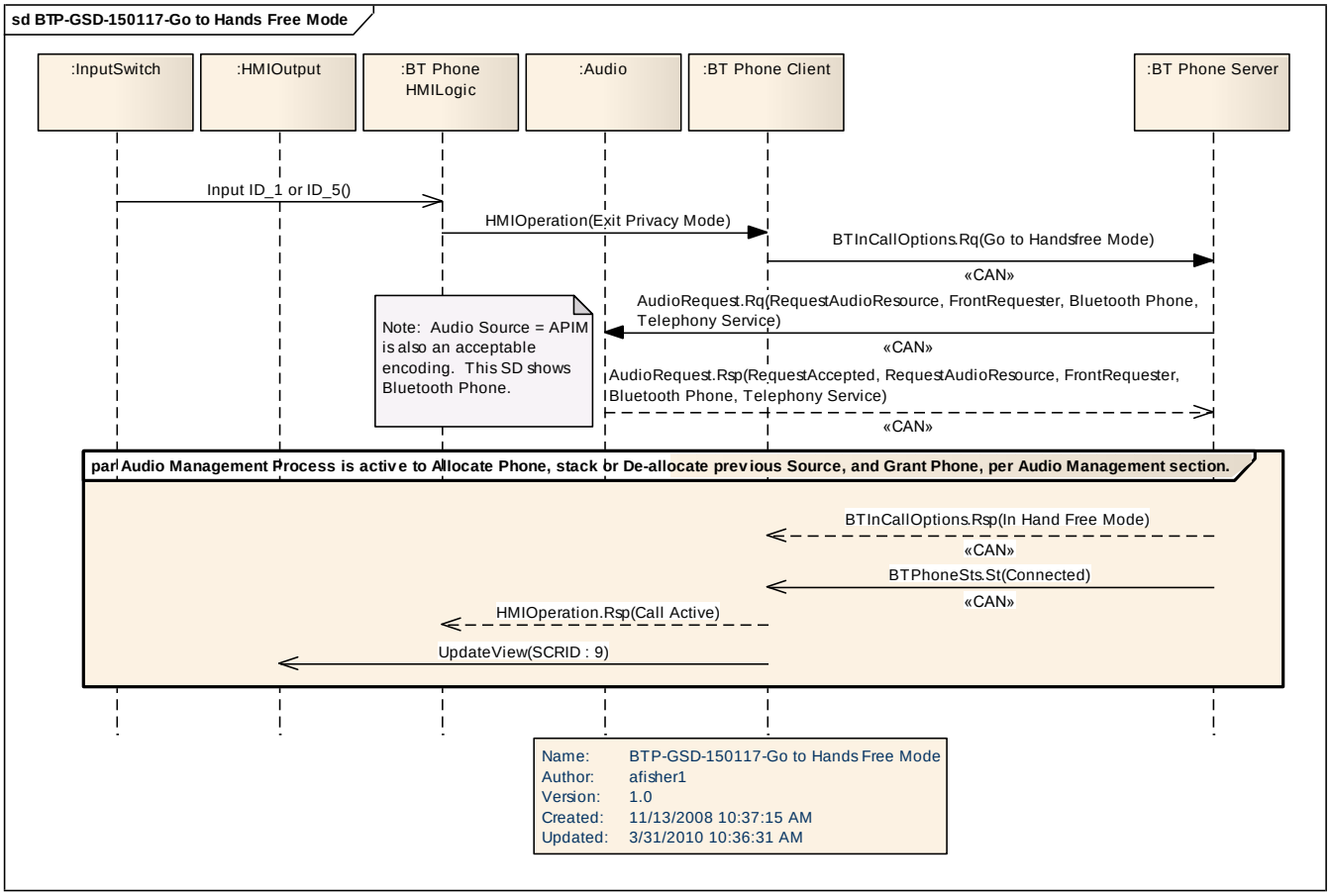
Pre-condition

A Bluetooth phone is connected to the vehicle interface. Vehicle power is On. User is in an active phone call, and is in privacy mode.

Post-condition

The user is in an active phone call, and the phone is placed in hands free mode Phone is made active on the vehicle audio system.

Sequence Diagram



3.4.3.5 BTP-SD-REQ-030715/A-Call Waiting Call (TcSE ROIN-149471-2)

Linked Elements

BTP-UC-REQ-041801/C-Answering an Incoming Call Waiting Call via In-Vehicle Infotainment System (TcSE ROIN-290931-1)
BTP-UC-REQ-041803/C-Answering an Incoming Call Waiting Call via Mobile Phone (TcSE ROIN-290933-1)

Scenarios

Normal Usage

The user is currently in an active call. HMI indicates {Calling waiting call, caller id, and accept/reject}. User selects <Accept / Reject> via HMI.

Constraints

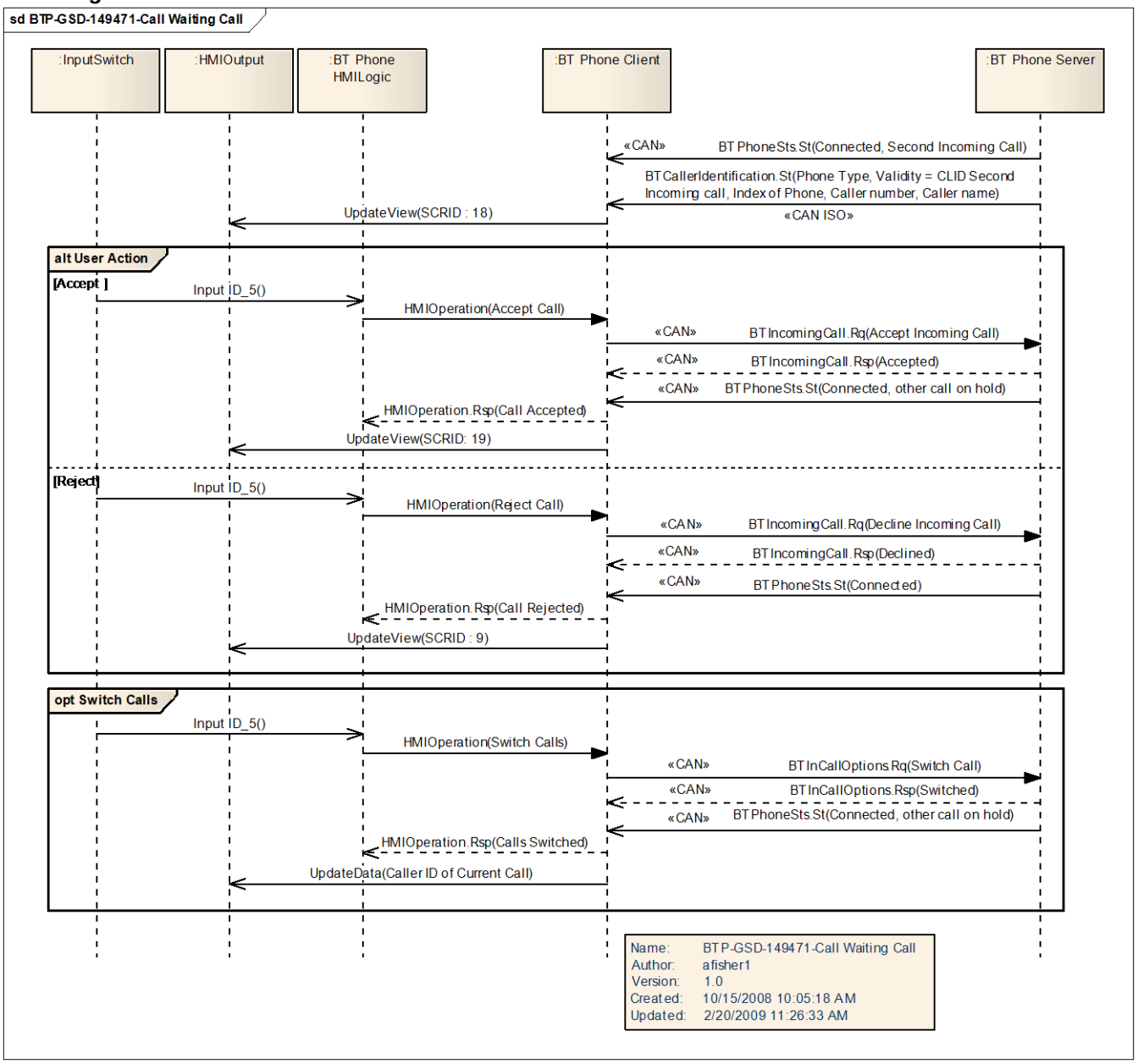
Pre-condition

A Bluetooth phone is connected to the vehicle interface. Vehicle power is On. User is in an active phone call. Another incoming call is received.

Post-condition

The user accepts or rejects second call, and continues in phone call. If second call is accepted, the first call is placed on hold.

Sequence Diagram



3.4.3.6 BTP-SD-REQ-030717/B-Join Calls (TcSE ROIN-149478-3)

Linked Elements

BTC-UC-REQ-247275/A-Joining calls via In-Vehicle Infotainment System or Connected Mobile Phone

Scenarios

Normal Usage

The user selects <join calls> via the HMI. Both active calls are joined into one active call.

Constraints

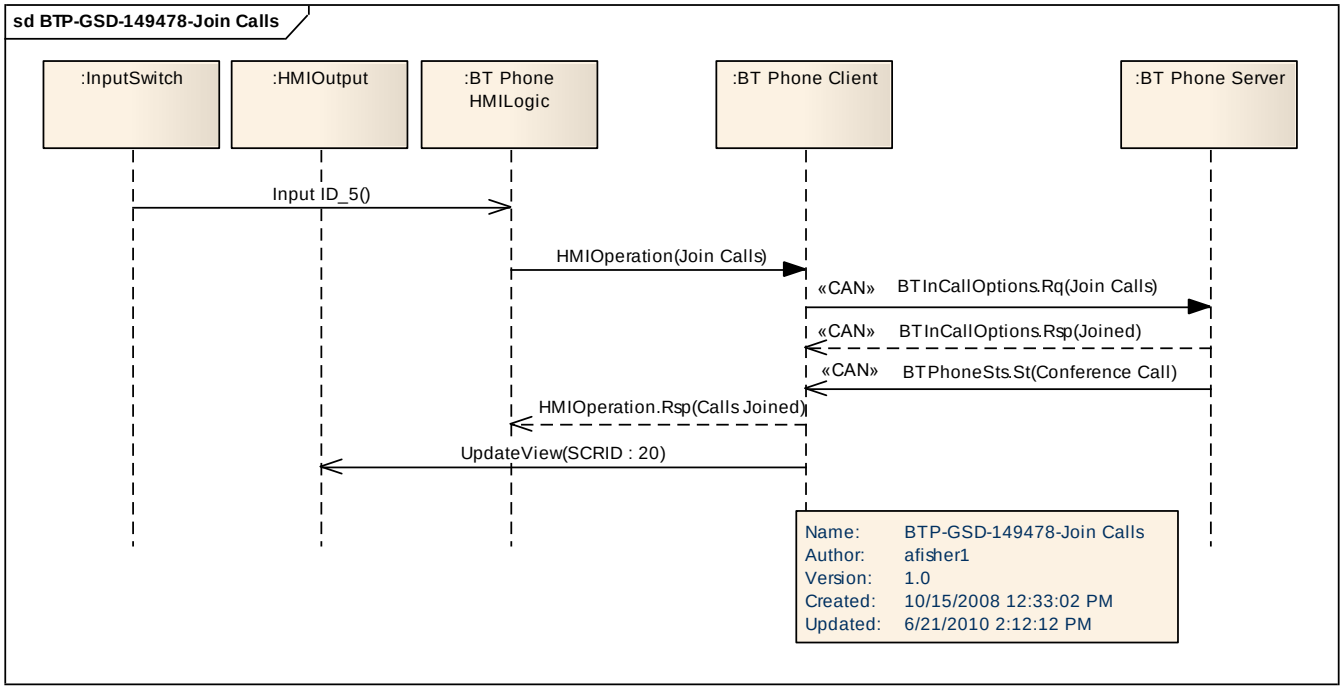
Pre-condition

A Bluetooth phone is connected to the vehicle interface. Vehicle power is On. User is in an active ~~handsfree~~ phone call with another call on hold.

Post-condition

The active and held call are joined into one active call

Sequence Diagram



3.5 BTP-FUN-REQ-041734/D-Messaging - SMS and eMail (TcSE ROIN-294445-2)

The messaging feature relies on the Bluetooth MAP profile. This section refers to both SMS and eMail.

Nomenclature:

Message:	Any SMS message or eMail message
SMS/ text message:	SMS only
eMail message:	eMails only

3.5.1 Use Cases

3.5.1.1 BTP-UC-REQ-041735/A-Messaging Synchronization (TcSE ROIN-290968-1)

Linked Elements

BTP-FUR-REQ-041753/B-Message Listing Display Requirements (TcSE ROIN-295118-2)
BTP-FUR-REQ-041750/D-Retrieving the Message Listing (Upon Connection) (TcSE ROIN-295115-2)
BTP-FUR-REQ-133777/C-Text Messaging Availability
BTP-FUR-REQ-041752/A-Message Listing Parameters (TcSE ROIN-295117-1)
BTP-FUR-REQ-041751/A-Retrieving the Message Listing (Upon Entry Into Text Messaging Application) (TcSE ROIN-295116-2)
BTP-FUR-REQ-041754/A-Message Listing Retention (TcSE ROIN-295119-1)

Actors	Mobile Phone
Pre-conditions	Mobile phone supports ability to transfer text messages Mobile phone is paired and connected
Scenario Description	The mobile phone is connected to the In-Vehicle Infotainment System, and has the ability to transfer the text messages stored within internal memory. The In-Vehicle Infotainment System recognizes this capability and requests to synchronize specific text messages so that the customer can access them via the In-Vehicle Infotainment System G-HMI.
Post-conditions	The mobile phone and the In-Vehicle Infotainment System remain connected for phone features.

	The In-Vehicle Infotainment System “downloads” the specified text messages (i.e. Unread, Read, Sent, etc.). The customer has the option to access the text messages via the G-HMI available within the In-Vehicle Infotainment System.
List of Exception Use Cases	E1- Messages cannot be synchronized and customer cannot be notified of new messages. E2 – First Time Notification
Interfaces	G-HMI V-HMI Vehicle System Interface

3.5.1.2 BTP-UC-REQ-033743/A-Messages Cannot be Synchronized and Customer Cannot be Notified of New Messages (TcSE ROIN-290839-1)

Linked Elements
BTP-UC-REQ-041735/A-Messaging Synchronization (TcSE ROIN-290968-1)
BTP-UC-REQ-033760/B-Pairing a phone via non-SSP – Discovery Mode (TcSE ROIN-290852-1)
BTP-UC-REQ-033752/A-Pairing a phone with other phone(s) paired via SSP – Discoverable Mode (TcSE ROIN-290845-1)
BTP-UC-REQ-033754/A-Pairing a phone with phone paired via SSP – Discovery Mode (TcSE ROIN-290847-2)
BTP-UC-REQ-033755/B-Pairing a phone via non-SSP – Discoverable Mode (TcSE ROIN-290848-1)
BTP-UC-REQ-033762/B-Pairing a phone with other device(s) connected (TcSE ROIN-290854-1)
BTP-UC-REQ-033753/C-Pairing a phone via SSP – Discovery Mode (TcSE ROIN-290846-2)
BTP-UC-REQ-033759/B-Pairing a phone with other phone(s) paired via non SSP – Discoverable Mode (TcSE ROIN-290851-2)
BTP-UC-REQ-033735/C-Pairing a phone via SSP – Discoverable Mode (TcSE ROIN-290831-2)
BTP-UC-REQ-033761/B-Pairing a phone with phone paired via non SSP – Discovery Mode (TcSE ROIN-290853-1)

Actors	Customer Mobile Phone
Pre-conditions	Same as normal use case
Scenario Description	In-Vehicle Infotainment System In-Vehicle Infotainment System Messages can’t be synced or new messages can’t be indicated (i.e. MAP)
Post-conditions	Text Messaging feature is not accessible to the customer
List of Exception Use Cases	N/A
Interfaces	G-HMI

3.5.1.3 BTP-UC-REQ-041736/A-First Time Notification (TcSE ROIN-290969-1)

Linked Elements
BTP-UC-REQ-041735/A-Messaging Synchronization (TcSE ROIN-290968-1)

Actors	In-Vehicle Infotainment System and Connected Phone
Pre-conditions	Same as original
Scenario Description	The In-Vehicle Infotainment System has opted to download synchronize the messages for the first time.
Post-conditions	The In-Vehicle Infotainment System alerts the customer that they may need to provide the In-Vehicle Infotainment System with access to the messages via the connected mobile phone.
List of Exception Use Cases	N/A
Interfaces	G-HMI V-HMI

3.5.1.4 BTP-UC-REQ-041737/A-Messaging New Message Notification (TcSE ROIN-290970-1)

Linked Elements
BTP-FUR-REQ-041758/A-Receipt of a New Message Event (TcSE ROIN-295123-2)
BTP-FUR-REQ-041759/B-Message Notification (End User) (TcSE ROIN-295124-2)

Actors	Mobile Phone
Pre-conditions	Mobile phone supports ability to transfer text messages Mobile phone is paired and connected
Scenario Description	The mobile phone is connected to the In-Vehicle Infotainment System, and has the ability to transfer the text messages stored within it. The connected mobile phone receives a new message, and notifies the In-Vehicle Infotainment System that a new message is received.
Post-conditions	The In-Vehicle Infotainment System has the ability to display to the Customer key characteristics of the newly received message. For example, Sender, Date / Time, type of message, etc. The In-Vehicle Infotainment System provides the Customer with the option of retrieving the newly received message via the In-Vehicle Infotainment System
List of Exception Use Cases	E1- Customer cannot be notified of new message.
Interfaces	G-HMI V-HMI Vehicle System Interface

3.5.1.5 BTP-UC-REQ-033744/A-Customer Cannot be Notified of New Messages (TcSE ROIN-290840-1)

Linked Elements

BTP-UC-REQ-041737/A-Messaging New Message Notification (TcSE ROIN-290970-1)
BTP-UC-REQ-033760/B-Pairing a phone via non-SSP – Discovery Mode (TcSE ROIN-290852-1)
BTP-UC-REQ-033752/A-Pairing a phone with other phone(s) paired via SSP – Discoverable Mode (TcSE ROIN-290845-1)
BTP-UC-REQ-033754/A-Pairing a phone with phone paired via SSP – Discovery Mode (TcSE ROIN-290847-2)
BTP-UC-REQ-033755/B-Pairing a phone via non-SSP – Discoverable Mode (TcSE ROIN-290848-1)
BTP-UC-REQ-033762/B-Pairing a phone with other device(s) connected (TcSE ROIN-290854-1)
BTP-UC-REQ-033753/C-Pairing a phone via SSP – Discovery Mode (TcSE ROIN-290846-2)
BTP-UC-REQ-033759/B-Pairing a phone with other phone(s) paired via non SSP – Discoverable Mode (TcSE ROIN-290851-2)
BTP-UC-REQ-033735/C-Pairing a phone via SSP – Discoverable Mode (TcSE ROIN-290831-2)
BTP-UC-REQ-033761/B-Pairing a phone with phone paired via non SSP – Discovery Mode (TcSE ROIN-290853-1)

Actors	Customer Mobile Phone
Pre-conditions	Same as normal use case
Scenario Description	In-Vehicle Infotainment System In-Vehicle Infotainment System New messages can't be indicated (i.e. MNS)
Post-conditions	Potentially, User is notified that an error has occurred.
List of Exception Use Cases	N/A
Interfaces	G-HMI

3.5.1.6 BTP-UC-REQ-041738/A-Messaging New Message 'Download' (TcSE ROIN-290971-1)

Linked Elements

BTP-FUR-REQ-041760/C-UI Notification (TcSE ROIN-295125-2)
BTP-FUR-REQ-041764/B-Downloading Messages Received as a result of a New Message Event (TcSE ROIN-295129-1)
BTP-FUR-REQ-041759/B-Message Notification (End User) (TcSE ROIN-295124-2)
BTP-FUR-REQ-041758/A-Receipt of a New Message Event (TcSE ROIN-295123-2)
BTP-FUR-REQ-041761/B-Audible Notification (TcSE ROIN-295126-2)

Actors	Mobile Phone
Pre-conditions	Mobile phone supports ability to transfer text messages Mobile phone is paired and connected The mobile phone has indicated that a new message has been received
Scenario Description	The customer has indicated that they want to download the unread message to access it via the G-HMI available via the In-Vehicle Infotainment System
Post-conditions	The In-Vehicle Infotainment System accessed the newly received text message. The In-Vehicle Infotainment System provides the newly received message per the G-HMI and V-HMI they chose via the In-Vehicle Infotainment System.

	The message is marked as read on the In-Vehicle Infotainment System and connected mobile phone.
List of Exception Use Cases	E1- The In-Vehicle Infotainment System was not able to download the messages.
Interfaces	G-HMI V-HMI Vehicle System Interface

3.5.1.7 BTP-UC-REQ-041739/A-The In-Vehicle Infotainment System was not able to download the messages (TcSE ROIN-290972-1)

Linked Elements
BTP-UC-REQ-041738/A-Messaging New Message 'Download' (TcSE ROIN-290971-1)

Actors	Mobile Phone
Pre-conditions	Same as original use case
Scenario Description	The customer has indicated that they want to download the unread message to access it via the G-HMI available via the In-Vehicle Infotainment System, but the action has failed.
Post-conditions	The In-Vehicle Infotainment System alerts the customer that there was an error with downloading the messages.
List of Exception Use Cases	N/A
Interfaces	G-HMI V-HMI Vehicle System Interface

3.5.1.8 BTP-UC-REQ-041740/A-Messaging Message Status Updated (TcSE ROIN-290973-1)

Linked Elements
BTP-FUR-REQ-041762/A-Unread to Read Notification (TcSE ROIN-295127-1)

Actors	Mobile Phone
Pre-conditions	Mobile phone supports ability to transfer text messages Mobile phone is paired and connected
Scenario Description	While the In-Vehicle Infotainment System is connected to the mobile phone, a message status has changed. These changes can range from unread to read, read to deleted, etc. As a result, the customer expects for that status to be consistent across the connected devices.
Post-conditions	The In-Vehicle Infotainment System and/or mobile is updated to reflect the new status of the selected message(s). *For those items that have been deleted or removed, the In-Vehicle Infotainment System will not display them.
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.5.1.9 BTP-UC-REQ-041741/A-Messaging Call Sender (TcSE ROIN-290974-1)

Linked Elements
BTP-FUR-REQ-041771/C-Call (TcSE ROIN-295136-2)

Actors	Mobile Phone
Pre-conditions	Mobile phone supports ability to transfer text messages Mobile phone has the ability to provide the sender information. Mobile phone is paired and connected

Scenario Description	While the In-Vehicle Infotainment System is connected to the mobile phone, and the Customer indicates that they intend to place a call to the sender of a specific message
Post-conditions	See Outgoing Call Section
List of Exception Use Cases	E1 – Sender of message is not a phone number. See Outgoing Call Section
Interfaces	See Outgoing Call Section

3.5.1.10 BTP-UC-REQ-041742/B-Sender of Message is not a Phone number (TcSE ROIN-290975-1)

Linked Elements
BTP-UC-REQ-041741/A-Messaging Call Sender (TcSE ROIN-290974-1)
BTP-FUR-REQ-041771/C-Call (TcSE ROIN-295136-2)

Actors	Mobile Phone
Pre-conditions	Same as original use case
Scenario Description	The In-Vehicle Infotainment System has received a message from an email address or a name.
Post-conditions	The option to call the sender via the In-Vehicle Infotainment System is not available, unless the email or the name is stored in the phonebook and relative to a contact that also has a phone number, in which case the user might be allowed to call one or any of the numbers stored in the phonebook for that contact (G-HMI / V-HMI).
List of Exception Use Cases	N/A
Interfaces	G-HMI V-HMI Vehicle System Interface

3.5.1.11 BTP-UC-REQ-041743/C-Messaging Reply to Sender (TcSE ROIN-290976-1)

Linked Elements
BTP-FUR-REQ-041770/D-Reply (TcSE ROIN-295135-3)

Actors	Mobile Phone
Pre-conditions	Mobile phone supports text messaging and supports ability to send messages. Mobile phone has the ability to provide the sender information. Mobile phone is paired and connected. Message inbox is not empty.
Scenario Description	While the In-Vehicle Infotainment System is connected to the mobile phone, the Customer indicates that they intend to reply to the sender of a specific message.
Post-conditions	The desired message is delivered to the connected mobile phone with the intent of delivery to the intended recipient.
List of Exception Use Cases	E1 – Sending a message failed.
Interfaces	G-HMI V-HMI

3.5.1.12 BTP-UC-REQ-041744/C-Sending a Message Failed (TcSE ROIN-290977-1)

Linked Elements
BTP-UC-REQ-041743/C-Messaging Reply to Sender (TcSE ROIN-290976-1)
BTP-UC-REQ-041745/A-Messaging Sending (TcSE ROIN-290978-1)

Actors	Mobile Phone
Pre-conditions	Same as original
Scenario Description	The customer has opted to reply to a message and the action has failed.

Post-conditions	The In-Vehicle Infotainment System displays an error message to the customer
List of Exception Use Cases	N/A
Interfaces	G-HMI V-HMI

3.5.1.13 BTP-UC-REQ-041745/A-Messaging Sending (TcSE ROIN-290978-1)

Actors	Mobile Phone
Pre-conditions	Mobile phone supports ability to transfer text messages Mobile phone is paired and connected
Scenario Description	While the In-Vehicle Infotainment System is connected to the mobile phone, and the Customer indicates that they intend to send a message to someone.
Post-conditions	The desired message is delivered to the connected mobile phone with the intent of delivery to the intended recipient.
List of Exception Use Cases	E1 – Sending a message failed.
Interfaces	G-HMI V-HMI

3.5.1.14 BTP-UC-REQ-041748/A-Accessing Messages (via G-HMI) (TcSE ROIN-290981-1)

Actors	Mobile Phone
Pre-conditions	Mobile phone supports ability to transfer text messages Mobile phone is paired and connected Text messages are available from the connected phone within the In-Vehicle Infotainment System
Scenario Description	The customer has indicated that they want to access a text message via In-Vehicle Infotainment System
Post-conditions	The In-Vehicle Infotainment System displays the requested message
List of Exception Use Cases	N/A
Interfaces	G-HMI

3.5.1.15 BTP-UC-REQ-041749/B-Accessing Messages (TTS) (TcSE ROIN-290982-1)

Actors	Mobile Phone
Pre-conditions	Mobile phone supports ability to transfer text messages Mobile phone is paired and connected Text messages are available from the connected phone within the In-Vehicle Infotainment System
Scenario Description	The customer has indicated that they want to access a text message via the TTS option within In-Vehicle Infotainment System
Post-conditions	The In-Vehicle Infotainment System reads out the content of the message.
List of Exception Use Cases	N/A
Interfaces	G-HMI V-HMI Vehicle System Interface

3.5.1.16 BTC-UC-REQ-193017/A-Voice Recognition - Listen to a message

Linked Elements
BTP-FUR-REQ-133777/C-Text Messaging Availability

BTC-UC-REQ-193020/A-Voice Recognition - Access messaging via VUI when messaging connection is not yet finalized
BTC-UC-REQ-193021/A-Voice recognition - Access messaging via VUI when connected device does not support messaging
BTC-UC-REQ-193022/A-Voice recognition - Access messaging via VUI when inbox is empty
BTC-UC-REQ-193023/A-Voice recognition - Access messaging via VUI when access to messaging features is denied by connected phone
BTC-UC-REQ-193024/A-Voice recognition - Access messaging via VUI when messaging is disabled in the In-Vehicle Infotainment System
BTP-SD-REQ-030702/A-Incoming Text Message- Listen (TcSE ROIN-149436-3)

Actors	Customer, In-Vehicle Infotainment System
Pre-conditions	There is a connected phone that supports the messaging feature, there are new messages from new message notifications or messages in the message inbox
Scenario Description	The Customer has opted to listen to a message from the list of available messages in the inbox or from a message notifications
Post-conditions	The In-Vehicle Infotainment System shall read the message to the user
List of Exception Use Cases	E1: Voice recognition - Messaging connection not finalized yet E2: Voice recognition - Connected device does not support messaging E3: Voice recognition - Inbox is empty E4: Voice recognition - Access to messaging feature not granted from connected device E5: Voice recognition - Messaging is disabled
Interfaces	V-HMI

3.5.1.17 BTC-UC-REQ-193018/A-Voice Recognition - Reply to a message

Linked Elements
BTP-FUR-REQ-133777/C-Text Messaging Availability
BTP-FUR-REQ-041770/D-Reply (TcSE ROIN-295135-3)
BTC-UC-REQ-193022/A-Voice recognition - Access messaging via VUI when inbox is empty
BTC-UC-REQ-193020/A-Voice Recognition - Access messaging via VUI when messaging connection is not yet finalized
BTC-UC-REQ-193021/A-Voice recognition - Access messaging via VUI when connected device does not support messaging
BTC-UC-REQ-193023/A-Voice recognition - Access messaging via VUI when access to messaging features is denied by connected phone
BTC-UC-REQ-193024/A-Voice recognition - Access messaging via VUI when messaging is disabled in the In-Vehicle Infotainment System
BTC-UC-REQ-193026/A-Voice recognition - Reply to a message that does not have a sender number
BTC-UC-REQ-193027/A-Voice recognition - Reply to a message when connected iOS device does not support replying to messages

Actors	Customer, In-Vehicle Infotainment System
Pre-conditions	There is a connected phone that supports the messaging feature, there are new messages from new message notifications or messages in the message inbox
Scenario Description	The Customer has opted to reply to a message from the list of available messages in the inbox or from a message notifications via the VUI
Post-conditions	The In-Vehicle Infotainment System shall guide the user via VUI and GUI to reply to the message with some stock messages
List of Exception Use Cases	E1: Voice Recognition - Messaging connection not finalized yet E2: Voice Recognition - Connected device does not support messaging E3: Voice Recognition - Replying to messages not available for connected device E4: Voice Recognition - Access to messaging feature not granted from connected device E5: Voice Recognition - Messaging is disabled
Interfaces	V-HMI

3.5.1.18 BTC-UC-REQ-193019/A-Voice recognition - Access messaging via voice when there is no phone connected

Actors	Customer, In-Vehicle Infotainment System
Pre-conditions	There is no connected phone
Scenario Description	The Customer tries to access the messaging feature via VUI when there is no phone connected
Post-conditions	The In-Vehicle Infotainment System shall notify the user via VUI that the messaging feature is not available because there is no phone connected

List of Exception Use Cases	N/A
Interfaces	V-HMI

3.5.1.19 BTC-UC-REQ-193020/A-Voice Recognition - Access messaging via VUI when messaging connection is not yet finalized

Actors	Customer, In-Vehicle Infotainment System
Pre-conditions	There is a connected phone but the messaging connection is not yet finalized: the connection is still being setup, messages are still being downloaded or messaging notifications channel is still being opened
Scenario Description	The Customer tries to access the messaging feature via VUI when the messaging connection is not yet finalized
Post-conditions	The In-Vehicle Infotainment System shall notify the user via VUI that the messaging feature is not available yet because the messaging connection is still being set up
List of Exception Use Cases	E1: Voice Recognition - Connected device does not support messaging E2: Voice Recognition - Access to messaging feature not granted from connected device E3: Voice Recognition - Messaging is disabled
Interfaces	V-HMI

3.5.1.20 BTC-UC-REQ-193021/A-Voice recognition - Access messaging via VUI when connected device does not support messaging

Actors	Customer, In-Vehicle Infotainment System
Pre-conditions	There is a connected phone but the connected phone does not support the messaging feature
Scenario Description	The Customer tries to access the messaging feature via VUI
Post-conditions	The In-Vehicle Infotainment System shall notify the user via VUI that the messaging feature is not available for the connected phone
List of Exception Use Cases	E1: No phone is connected E2: Access to messaging feature not granted from connected device E3: Messaging is disabled E4: Message inbox is empty
Interfaces	V-HMI

3.5.1.21 BTC-UC-REQ-193022/A-Voice recognition - Access messaging via VUI when inbox is empty

Actors	Customer, In-Vehicle Infotainment System
Pre-conditions	There is a connected phone that supports the messaging feature. The message inbox is empty
Scenario Description	The Customer tries to access the messaging feature via VUI
Post-conditions	The In-Vehicle Infotainment System shall notify the user via VUI that the inbox is empty and there are no messages to view or listen to or reply

List of Exception Use Cases	E1: No phone is connected E2: Access to messaging feature not granted from connected device E3: Messaging is disabled E4: Connected device does not support messaging
Interfaces	V-HMI

3.5.1.22 BTC-UC-REQ-193023/A-Voice recognition - Access messaging via VUI when access to messaging features is denied by connected phone

Actors	Customer, In-Vehicle Infotainment System
Pre-conditions	There is a connected phone that supports the messaging feature. The phone has denied the In-Vehicle Infotainment System request to access the messaging features
Scenario Description	The Customer tries to access the messaging feature via VUI
Post-conditions	The In-Vehicle Infotainment System shall notify the user via VUI that the phone did not grant access to the messaging feature. Also, the VUI might instruct the user on how to try to fix the issue and retry to access the messaging feature. Also, the VUI prompt might be different depending on the way the messaging feature is enabled on the connected phone (for example, iPhones and Android, where access must be granted before or after the connection request is performed by the In-Vehicle Infotainment System)
List of Exception Use Cases	E1: No phone is connected E2: Messaging is disabled E3: Access to messaging feature not granted from connected device
Interfaces	V-HMI

3.5.1.23 BTC-UC-REQ-193024/A-Voice recognition - Access messaging via VUI when messaging is disabled in the In-Vehicle Infotainment System

Actors	Customer, In-Vehicle Infotainment System
Pre-conditions	There is a connected phone that supports the messaging feature. The messaging feature has been disabled on the In-Vehicle Infotainment System
Scenario Description	The Customer tries to access the messaging feature via VUI
Post-conditions	The In-Vehicle Infotainment System shall notify the user via VUI that the messaging feature has been disabled. The VUI might also guide the user to re-enable the feature and try to setup a messaging connection with the connected phone
List of Exception Use Cases	E1: No phone is connected E2: Messaging connection denied by connected phone E3: Connected device does not support messaging E4: Message inbox is empty
Interfaces	V-HMI

3.5.1.24 BTC-UC-REQ-193025/A-Voice Recognition - Listen to a message that has no readable content

Actors	Customer, In-Vehicle Infotainment System
Pre-conditions	There is a connected phone that supports the messaging feature. The messaging feature is enabled, the phone allowed access to messages, the inbox is not empty
Scenario Description	The Customer tries to listen via VUI to a message that has no readable content
Post-conditions	The In-Vehicle Infotainment System shall notify the user via VUI that the selected message has no readable content
List of Exception Use Cases	E1: No phone is connected E2: Messaging connection denied by connected phone E3: Connected device does not support messaging E4: Message inbox is empty E5: Messaging is disabled on the The In-Vehicle Infotainment System E6: Message has more than 2000 characters
Interfaces	V-HMI

3.5.1.25 BTC-UC-REQ-193026/A-Voice recognition - Reply to a message that does not have a sender number

Linked Elements
BTP-FUR-REQ-041770/D-Reply (TcSE ROIN-295135-3)

Actors	Customer, In-Vehicle Infotainment System
Pre-conditions	There is a connected phone that supports the messaging feature. The messaging feature is enabled, the phone allowed access to messages, the inbox is not empty
Scenario Description	The Customer tries to reply to a message that does not have a sender number associated with it
Post-conditions	The In-Vehicle Infotainment System shall notify the user via VUI that the selected message cannot be replied to because there is no sender number available
List of Exception Use Cases	E1: No phone is connected E2: Messaging connection denied by connected phone E3: Connected device does not support messaging E4: Message inbox is empty E5: Messaging is disabled on the The In-Vehicle Infotainment System
Interfaces	V-HMI

3.5.1.26 BTC-UC-REQ-193027/A-Voice recognition - Reply to a message when connected iOS device does not support replying to messages

Linked Elements
BTP-FUR-REQ-041770/D-Reply (TcSE ROIN-295135-3)

Actors	Customer, In-Vehicle Infotainment System
Pre-conditions	There is a connected phone that supports the messaging feature. The connected iOS device does not allow to reply to messages
Scenario Description	The Customer tries to reply to a message
Post-conditions	The In-Vehicle Infotainment System shall notify the user via VUI that the selected message cannot be replied to because the connected phone does not allow to reply to messages from the In-Vehicle Infotainment System. The use case applies whether the message access was granted or not.

List of Exception Use Cases	E1: No phone is connected E2: Connected device does not support messaging E3: Message inbox is empty E4: Messaging is disabled on the In-Vehicle Infotainment System
Interfaces	V-HMI

3.5.2 Requirements

3.5.2.1 BTC-FUR-REQ-203864/A-SMS via MAP support

If the IVIS is required, via Implementation Guide, to support this present requirement, then all requirements and use cases and parts below that mention SMS messages shall be implemented.

3.5.2.2 BTC-FUR-REQ-203865/A-eMail via MAP support

If the IVIS is required, via Implementation Guide, to support this present requirement, then all requirements and use cases and parts below that mention email messages shall be implemented.

3.5.2.3 BTP-FUR-REQ-041750/D-Retrieving the Message Listing (Upon Connection) (TcSE ROIN-295115-2)

Upon connecting to an AG that supports messaging via Bluetooth, the In-Vehicle Infotainment System shall

- Connect to the SMS MAS instance, register for notifications and wait for notification channel to be opened (see also BTP-FUR-REQ-041784-Message Notification Not Established).
- Request the message listing of the last 25 SMS messages received by the connected MSE
- Connect to all other MAS instances available in the MSE, up to 4 (SMS and 3 email inboxes), and register for notifications for each of these instances.
- For each MAS instance successfully connected, if the SDP record advertises support for the GetMASInstanceInformation function, the In-Vehicle Infotainment System shall query the GetMASInstanceInformation and use the information retrieved to distinguish the various instances in the HMI. If this is not supported, the instances will be named by default “SMS”, “e-mail”, “e-mail 2”, etc.
- Request the message listing of the last 25 email messages received by the connected MSE, for each inbox.

Upon the customer successfully accessing the message menu via the GUI/ VUI the In-Vehicle Infotainment System shall provide the details of the message listing as described in BTP-FUR-REQ-041753/A-Message Listing Display Requirements in this document and in the format defined within the HMI spec, within 2 seconds of the customer entering the messaging menu. While the In-Vehicle Infotainment System is waiting to display the message listing, the In-Vehicle Infotainment System shall display a graphic / message as defined within HMI spec.

3.5.2.4 BTP-FUR-REQ-041752/A-Message Listing Parameters (TcSE ROIN-295117-1)

Within the message listing request, the In-Vehicle Infotainment System shall request the following parameters:

- Subject (future use)
- DateTime
- Sender_name
- Sender_Addressing
- Replyto_addressing (future use)
- Recipient_name (future use)
- Recipient_addressing (future_use)
- Type
- Reception_Status
- Size

- Text
- Read
- Sent
- Protected (future use)
- Priority (future use)

3.5.2.5 BTP-FUR-REQ-041753/B-Message Listing Display Requirements (TcSE ROIN-295118-2)

The In-Vehicle Infotainment System shall use the information provided by the MSE via the message listing to present the following information within a message list via the UI as defined within the HMI specification:

- Sender of the message
- Date / Time of the message
- Read / Unread status

When presenting the message listing via the UI, the In-Vehicle Infotainment System shall present a reference number for each message beginning with number 1 as defined within HMI specification. This will assist the customer in identifying the order in which messages were received. The messages shall be presented in chronological order, with the most recent messages presented first, thus having a reference number of 1.

The numbering shall be implemented for each of the inboxes/MAS instances to which the In-Vehicle Infotainment System is connected to.

The user will have the option of selecting any of the messages displayed, and they shall be directed the viewing pane of that individual message (as described within the View (Specific Message) section of this specification).

The IVIS shall always display the most recent 25 messages per MAS instance. In the event that a new message is received and the IVIS already has received a message listing with 25 messages, the new message will be displayed and the oldest message shall no longer be available.
If the IVIS has been alerted that a specific message(s) has been deleted within the MSE, the IVIS shall no longer display the deleted message(s) within the message listing and update the reference number(s) accordingly.

3.5.2.6 BTP-FUR-REQ-041754/A-Message Listing Retention (TcSE ROIN-295119-1)

The message listing shall be retained throughout the current Message Access Service connection.

Once the connection is terminated, the IVIS shall not persist the message listing.

*Note: See deleted message requirements within the Message Listing Display Requirements of this document.

3.5.2.7 BTP-FUR-REQ-041755/B-Message Listing Request Failed (TcSE ROIN-295120-2)

In the event the MSE fails to respond (including error or abort) to the request to provide the message listing after 30 seconds, the In-Vehicle Infotainment System shall attempt to retrieve the message listing again.

If the second attempt fails, for SMS instance, upon entry into the messaging option via any provided user interface, the In-Vehicle Infotainment System shall alert the customer it was not able to retrieve messages from the connected MSE as described within HMI Specification.

If the second attempt fails for a MAS instance that supports email, the instance shall be considered as unavailable and not presented to the user.

3.5.2.8 BTP-FUR-REQ-041756/B-Setting Message Notification to ON (TcSE ROIN-295121-1)

Upon connecting to a MSE that indicates support for Message Notification, the In-Vehicle Infotainment System shall set message notification to ‘ON’, for every MAS instance that is present on the MSE and to which the In-Vehicle Infotainment System connected successfully to.

3.5.2.9 BTP-FUR-REQ-041757/B-Setting Message Notification 'On' Failure (TcSE ROIN-295122-1)

If the IVIS has attempted to set message notification to 'ON', but the MAS Server of the MSE did not respond within 30 seconds or the MNS Client of the MSE does not request to connect the Message Notification Service within 30 seconds of receipt of the MAS Server response, the IVIS shall attempt to set message notification to 'ON' again. If the second attempt fails, based on the criteria within this section the IVIS shall provide a notice to the customer that it will not be able to provide the customer with new messages received while connected to the current MSE.

If this error happens on a MAS instance that supports email, this instance shall be considered as unavailable and not presented to the user.

3.5.2.10 BTP-FUR-REQ-041758/A-Receipt of a New Message Event (TcSE ROIN-295123-2)

During a connection, the MNS Client of the MSE may alert the in-vehicle infotainment system that it has received a new message(s). Upon notification of a new message event from the connected MSE, the in-vehicle infotainment system shall request a message listing for the unread messages only. The message listing request shall include the same parameters and guidelines within the GREQ-295117 ~~"Retrieving~~ Message Listing Parameters (Functional)~~"~~ section of this document.

3.5.2.11 BTP-FUR-REQ-041759/B-Message Notification (End User) (TcSE ROIN-295124-2)

Notifications of new incoming messages shall be consistent with the settings contained within the phone application. Regardless of the setting within the phone application, the new message Envelope Icon shall be displayed in the event of a new message notification.

The Envelope Icon shall not be shown for unread messages received upon connection.

The new message icon shall be removed in the following scenarios:

a) Once the user has chosen to read or listen to all of their new messages.
b) Once the user has chosen to enter the inbox of the newly received message

More information regarding these notifications are included within the Incoming Message Alerts section of this document.

3.5.2.12 BTP-FUR-REQ-041760/C-UI Notification (TcSE ROIN-295125-2)

When a new message is received, the user shall be notified within 2 seconds that they have received a new unread message. This notification shall include the following sender's information:

Name (if available from contact list); if not the phone number or e-mail address shall be displayed.

*Note: If the sender is an e-mail address and that e-mail address is stored within the phonebook, then In-Vehicle Infotainment System shall display the name of that contact.

The notification shall also include the following options via the GUI and Voice:

-Listen (TTS)
-Ignore
-View (if driver restrictions are not enabled)

For a more detailed description of the behavior of these options, follow the requirements included within HMI specification.

The HMI specification might include the possibility of disabling notifications on a per – instance basis, allowing the user to receive, for example, email notification from one email inbox, but no notifications for SMSs or from another email inbox.

The HMI specification might include the possibility of disabling notifications for all messaging instances in the device settings menu. When this setting is changed to disable notifications, all eventual per instance notification settings shall be changed to

disabled. When this setting is changed to enable notifications, all eventual per instance notification settings shall be changed to what they were before changing the device setting to disabled.

By default both the device setting for messaging notifications and the per-instance notification settings shall be set to enabled.

Both these settings, when present, shall be maintained across connection cycles.

Note: Please also consider BTP-FUR-REQ-033871- Do Not Disturb.

3.5.2.13 BTP-FUR-REQ-041761/B-Audible Notification (TcSE ROIN-295126-2)

When a new message is received, the user shall be notified by the alert defined within BTP-FUR-REQ-041775-Audible Alerts and within the HMI Text Messaging Specification.

Note: Please also consider BTP-FUR-REQ-033871- Do Not Disturb.

3.5.2.14 BTP-FUR-REQ-041762/A-Unread to Read Notification (TcSE ROIN-295127-1)

The receipt of a new message shall not prompt the In-Vehicle Infotainment System to update the status of that message as read on the MSE. The In-Vehicle Infotainment System shall only update the status of an unread message to read if the user has opted to perform any of the following actions:

- View the message
- Listen to the message

The In-Vehicle Infotainment System shall provide the MSE this notification within 2 seconds of performing either of the actions listed above.

3.5.2.15 BTP-FUR-REQ-041764/B-Downloading Messages Received as a result of a New Message Event (TcSE ROIN-295129-1)

The IVIS shall automatically download a message received as a result of a new message event, as defined in the “Receipt of a New Message Event” section of this document. This will insure that the message is available to the customer when and/or if they choose to access it. The message download shall take place within 2 seconds of a new message event, for all MAS instances to which the IVIS is connected to.

3.5.2.16 BTP-FUR-REQ-041765/A-Downloaded Message Retention (TcSE ROIN-295130-1)

Downloaded messages shall be retained until one of the following conditions are met:

- a disconnect of the current Message Access Service connection
- MSE has indicated that the message has been deleted.

Once the connection is terminated, the IVIS shall not persist the downloaded messages.

3.5.2.17 BTP-FUR-REQ-041766/A-Unsolicited Message Notification of a Message Status Change (TcSE ROIN-295131-1)

During a connection, the MSE may alert The In-Vehicle Infotainment System that the status of a message has changed. Upon receipt of this notification, The In-Vehicle Infotainment System shall update the status of the referenced message if it was one of the messages previously downloaded. In event that the message notification is related to a deleted message, The In-Vehicle Infotainment System shall remove the message from the text messaging list within 2 seconds.

3.5.2.18 BTP-FUR-REQ-041767/C-Listen HMI (TcSE ROIN-295132-1)

If the user chooses to 'Listen' to a text message, then In-Vehicle Infotainment System shall TTS the message. The In-Vehicle Infotainment System shall TTS a maximum of 2000 characters. If the contents of a message exceed this limit, the IVIS shall notify the customer that they will have to review the remainder of the message on their handset when it is safe to do so.

In-Vehicle Infotainment System shall reference a language based Text-To-Speech library to interpret common words, emoticons, names, etc. For example, LOL is "Laughing out Loud", etc.
At the conclusion of the Text-To-Speech session, the user might have the following options:

- Reply
- Next Message
- Previous Message
- Call the sender of the message (see BTP-FUR-REQ 041771/ Call)

3.5.2.19 BTP-FUR-REQ-041768/A-Ignore (TcSE ROIN-295133-1)

If the user chooses to 'Ignore' an incoming message notification, then In-Vehicle Infotainment System shall return to the previous function / source. The downloaded messages shall remain 'Unread' and the envelope icon shall still be present.

3.5.2.20 BTP-FUR-REQ-041769/C-View (TcSE ROIN-295134-2)

If the user chooses 'View', In-Vehicle Infotainment System shall display the specific message so that the user can read the message. This feature is subject to driver distraction rules. This display shall also include the following items:

- Name (if available from phonebook); if not the phone number or e-mail address shall be displayed.

- The date and time associated with the message.
  The date and time shall be displayed based on the format set within the Global Clock Specification.

While viewing a message the user shall have the following options with text content displayed or a message stating there is no text content when text data is not available:

-Listen (TTS) (to message content or getting the information that there is no text data)
-Reply
-Call (see BTP-FUR-REQ-041771/B-Call)

The In-Vehicle Infotainment Systems shall display the 2000 characters of a received message. If the contents of a message exceed this limit, the IVIS shall notify the customer that they will have to review the remainder of the message on their handset when it is safe to do so.

If supported by the HMI/GUI specifications, the IVIS shall display eventual
- phone numbers
- street addresses
- email addresses

inside the body of the message in a special way to allow a richer interaction with the user (call the phone number, navigate to street address, etc.)

3.5.2.21 BTP-FUR-REQ-041770/D-Reply (TcSE ROIN-295135-3)

The option to reply to a message shall be present or enabled only when the connected device is supporting this feature.

See the following logic to determine when the option to reply shall be present or enabled:

SMS:
- If only one number is present: Reply to the number
- Else, if an email is present: Reply to the email
- Else, do not allow reply

EMAIL:
- If an email is present: Reply to this email address
- Else, do not allow reply

For display purposes only the IVIS might show the sender's name from the message, if available.
If that is not available then the IVIS might try to match the sender number or email to an entry in the phonebook information.

If the user chooses 'Reply' via GUI or VUI In-Vehicle Infotainment System shall provide the user with the canned message options described in requirement GREQ-295135 of this specification and the HMI specification.

*Note: The reply function shall not be available when connecting to an iOS device.

3.5.2.22 BTP-FUR-REQ-041771/C-Call (TcSE ROIN-295136-2)

This option to Call shall be present or enabled following the logic below:

- If a number is present: Call this number
- Else, if a contact name is present: try to match the contact name to a contact in the phonebook.
  - if a match is found, and the contact has one number only: call this number
  - Else, if a match is found and the contact has more than one number, allow calling, allow user to select which number to dial.
- Else, if an email is present: try to match the email to a contact in the phonebook.
  - if a match is found, and the contact has one number only: call this number
  - Else, if a match is found and the contact has more than one number, allow calling, allow user to select which number to dial.

3.5.2.23 BTP-FUR-REQ-041774/B-Insert Message Alert Options (TcSE ROIN-295139-2)

The user shall have the option of selecting one of two incoming message notifications.
They are:

- An Audible Alert (as defined within the HMI specification.
- Envelope Icon Alert (i.e. no pop-up notification of a newly received message)

Regardless of Incoming Message Alert settings, In-Vehicle Infotainment System shall always display the new message Envelope Icon once a new message(s) are received.

3.5.2.24 BTP-FUR-REQ-041775/A-Audible Alerts (TcSE ROIN-295140-1)

The user shall have a total of 1 audible alert to choose from for an incoming message notification. This audible alert shall be pre-recorded and stored on In-Vehicle Infotainment System.

3.5.2.25 BTP-FUR-REQ-041776/A-Envelope Icon Only (TcSE ROIN-295141-2)

When this setting is enabled, In-Vehicle Infotainment System shall not display a pop-up notification once a new message(e) has been received, nor shall it play an audible alert. In-Vehicle Infotainment System shall only display the Envelope Icon to alert the user that they have received a new message(s). This is the messaging alert to be used when the user has set Do Not Disturb on as described within ~~Handsfree Phone Requirements~~ the phone section of the SPSS.

3.5.2.26 BTP-FUR-REQ-041777/B-Canned Messages Requirements (TcSE ROIN-295142-1)

There shall be a maximum of 15 canned messages available to the user for sending and/or replying to a text message.

3.5.2.27 BTP-FUR-REQ-041778/A-Canned Message Selection Options (TcSE ROIN-295143-1)

The user shall be able to choose one of the canned messages via GUI or Voice. The user shall be able to:

Choose a canned message via numerical list selection (i.e. text message number 1, etc.).

If the user selects a canned message via Voice, they shall be required to confirm or cancel the message selection prior to In-Vehicle Infotainment System actually sending the message.

3.5.2.28 BTP-FUR-REQ-041779/C-Canned Message List (TcSE ROIN-295145-1)

The canned messages shall be defined in the HMI specification to cover regional aspects. The following messages are only for reference, and not mandatory.

I'll call you back in a few minutes.
I just left. I'll be there soon.
I am driving. Can you give me a call?
I'm on my way.
I'm running a few minutes late.
I'm ahead of schedule, so I'll be there early.
I'm outside.
I'll call you when I get there.
OK
Yes
No
Thanks
Stuck in traffic.
Call me later.
LOL

3.5.2.29 BTP-FUR-REQ-041780/B-Sending Messages (TcSE ROIN-295146-2)

The In-Vehicle Infotainment System shall use the following application parameters when sending any message:

Parameter	Setting
Transparent	Off
Retry	On
Charset	UTF-8 or Native (based on device and suppliers experience with devices within the industry) Supplier shall provide Ford Motor Company with details regarding the use of both of these options.

3.5.2.30 BTP-FUR-REQ-041782/A-Message Access Error States (TcSE ROIN-304253-1)

The in-vehicle infotainment system shall be able to determine if the connected server has denied the in-vehicle infotainment system access to the Message Access Profile, if the server has not responded per the requirements within the message access profile, or the server has failed to establish a message notification service with it.

3.5.2.31 BTP-FUR-REQ-041783/A-Message Access Not Granted (TcSE ROIN-304254-1)

When the in-vehicle infotainment system requests to connect to the Message Access Profile of the connected AG / MSE the in-vehicle infotainment system shall determine that the AG / MSE has not granted access to Message Access Profile when either of the following scenarios takes place:

1. The connected AG / MSE does not respond to the connect request within 15 seconds.
2. The connected AG / MSE responds with a response code other than Success

3.5.2.32 BTP-FUR-REQ-041784/B-Message Notification Not Established (TcSE ROIN-304255-1)

When the In-Vehicle Infotainment System establishes a Message Access Server connection it shall determine that the MSE has experienced an internal message notification error under the following scenario(s):

1. The MSE supports Message Notification as reported via SDP and does not establish a Message Notification Service (MNS) within 30 seconds of the In-Vehicle Infotainment System establishing a connection to the Message Access Server for the SMS MAS instance and registering for notifications

When the above occurs, the In-Vehicle Infotainment System shall attempt to force the MSE to establish a MNS connection by disabling notifications, disconnecting MAS instance for SMS, reconnecting MAS instance for SMS, re-enabling notifications. In the event of a MAS reconnect the In-Vehicle Infotainment System shall retrieve the SMS message listing of the last 25 received messages.

*Note: In this case, the In-Vehicle Infotainment System shall not wait for the MSE to establish a MNS connection, and shall not connect to any other MAS instance available on the phone

If the MSE fails to establish MNS within 30 seconds again, the In-Vehicle Infotainment system shall consider that the connected MSE has experienced a “Text Message Notification Failure”

The In-Vehicle Infotainment System shall connect to all other MAS instances presented by the phone only after the MNS connection has been setup successfully.

If the MNS connection has not been setup successfully, then the In-Vehicle Infotainment System shall not connect to any non-SMS MAS instances.

If the MNS connection is unexpectedly disconnected, the In-Vehicle Infotainment System shall unregister for notifications and close the MAS connection for all non-SMS instances.

3.5.2.33 BTP-FUR-REQ-041785/B-Message Download Failed (TcSE ROIN-304256-1)

When the In-Vehicle Infotainment System establishes a Message Access Server connection it shall determine that the MSE has experienced an internal message download error under one of the following scenario(s):

1. The In-Vehicle Infotainment System is not able to get the message listing
2. The In-Vehicle Infotainment System is not able to download any of the listed messages.
3. The In-Vehicle Infotainment System is not able to parse any of the requested messages within the inbox.

In that error case the customer shall be notified with a meaningful error message according HMI specification.

3.5.2.34 BTP-FUR-REQ-041786/B-Sending Message Failed (TcSE ROIN-304257-1)

When the In-Vehicle Infotainment System establishes a Message Access Server connection it shall determine that the MSE has experienced an internal send message error under one of the following scenario(s):

1. Failure of the MSE to respond within 10 seconds to any of the set path requests.
2. The MSE responds with error to any of the outbox set path requests.
3. The MSE responds with a result code of error to the in-vehicle infotainment system’s request to send the message
4. The MSE fails to respond to the in-vehicle infotainment system’s request to send the message within 10 seconds.

The In-Vehicle Infotainment System shall alert the customer of the failure within 2 seconds of a failed indication.

3.5.2.35 BTP-FUR-REQ-041787/B-Message Exceptions (TcSE ROIN-304258-1)

When the In-Vehicle Infotainment Systems receives a vCARD without an entry within the TEL field it shall use the FN and/or N or email field of the vCard to determine the sender of a text message.

If the MSE reports an error in sending a message due to the service unavailable, the in-vehicle infotainment system shall alert the user that the MSE does not have a network signal, and that the MSE will continue to try to send the message.

3.5.2.36 BTP-FUR-REQ-133777/C-Text Messaging Availability

The messaging feature(s) shall only be announced to the customer via VUI or GUI when a device is paired and the connected device is supporting that feature(s), separately for text messaging and for email.

In that case the In-Vehicle Infotainment System shall provide the user with the option to enable or disable the messaging feature(s) manually.
If disabled the In-Vehicle Infotainment System shall not establish a connection to the corresponding MAS instance - which were disabled - of the connected HFP device.
If this setting gets set to disabled for email and text messages, the In-Vehicle Infotainment System shall close the Bluetooth messaging connections via unregistering for notifications and closing the connection(s) to the connected device's MAS instances.
If this setting gets set to enabled, the In-Vehicle Infotainment System shall immediately try to establish a map connection to register for messaging notifications and download of messages as described in BTP-FUR-REQ-041758/A-Receipt of a New Message Event and BTP-FUR-REQ-041750/A-Retrieving the Message Listing (Upon Connection).
The alert option which was set before disabling the feature shall be valid again.

3.5.2.37 BTP-FUR-REQ-146186/C-Requirements for Handling of Messaging Feature in VUI/GUI

Any VUI/GUI that intends to support the messaging functionality shall clearly define its behavior for the following error conditions and special cases.

Short	Condition	Notes	See also…
MSG1	Connected device supports all messaging features, connection is successful and initialization of feature has completed	All features are available to the user.	Messaging requirements under BTP-FUN-REQ-041734-Messaging
MSG2	Messaging connection not finalized yet	When trying to use this feature, the user shall be informed that the feature is not ready yet.	BTP-FUR-REQ-041784-Message Notification Not Established
MSG3	Connected device does not support messaging	When trying to use this feature, the user shall be informed when trying to use the feature that the messaging feature is not available with this device. The help prompts and the HMI should not show this feature.	BTP-FUR-REQ-133777-Text Messaging Availability
MSG4	Replying to messages not available for connected device (iOS devices OR empty inbox)	User shall not be led to believe that replies are available.	BTP-FUR-REQ-041770-Reply
MSG5	Access to messaging feature not granted from connected device	When trying to use this feature, the user shall be informed when trying to use the feature that the messaging feature is not available because access was not granted from the connected device. Optionally the user might be guided on how to try to fix this problem.	BTP-FUR-REQ-041783-Message Access Not Granted BTP-FUR-REQ-041784-Message Notification Not Established
MSG6	Messaging disabled	When trying to use this feature, the user shall be informed when trying to use the feature that the messaging feature has been disabled.	BTP-FUR-REQ-133777-Text Messaging Availability

		Optionally the user might be guided on how to re-enable the feature.	
MSG7	Message has no readable content	When trying to listen to a message which has no readable content (e.g. only a picture attached), the user shall be informed that there is no readable content.	BTP-UC-REQ-193025-VR - Listen to a message that has no readable content, BTP-FUR-REQ-041769/B-View
MSG8	Sender of a message is not a phone number	When trying to call the sender of a message and the sender is not a phone number or no phone number can be associated with the sender of the message, the feature should not be available.	BTP-FUR-REQ-041771/B-Call

3.5.3 Sequence Diagrams

3.5.3.1 BTP-SD-REQ-030702/A-Incoming Text Message- Listen (TcSE ROIN-149436-3)

Linked Elements
BTC-UC-REQ-193017/A-Voice Recognition - Listen to a message

Scenarios

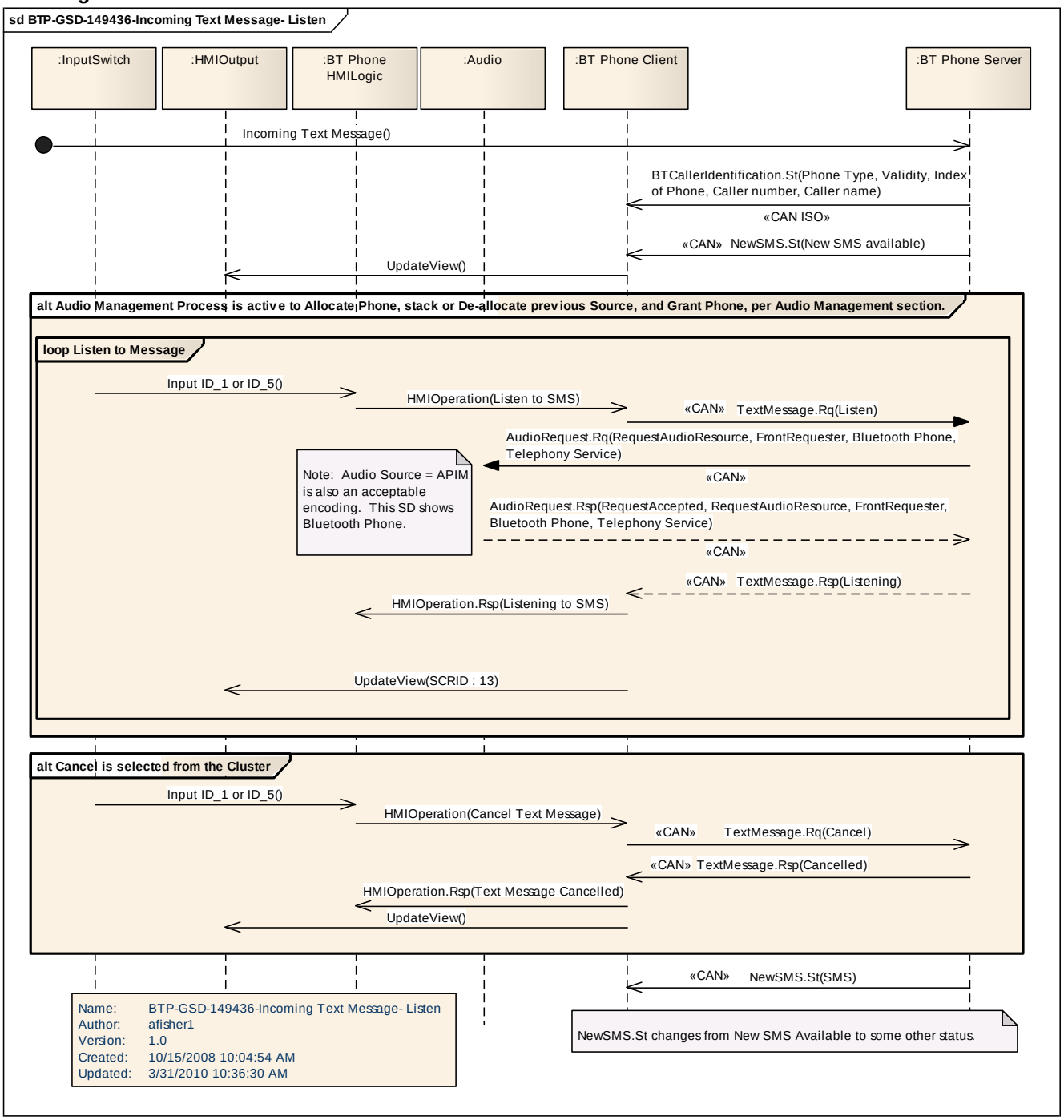
Normal Usage
The user receives an incoming text message, and selects <listen> via the HMI.

Constraints

Pre-condition
A Bluetooth phone is connected to the vehicle interface. Vehicle power is On.

Post-condition
The text message {is read} via the HMI, and the user is presented with the option <to repeat the message> via the HMI.

Sequence Diagram



3.5.3.2 BTP-SD-REQ-030703/A-Incoming Text Message- Ignore (TcSE ROIN-149443-3)

Scenarios

Normal Usage

The user receives an incoming email message, selects <ignore the message> via the HMI.

Constraints

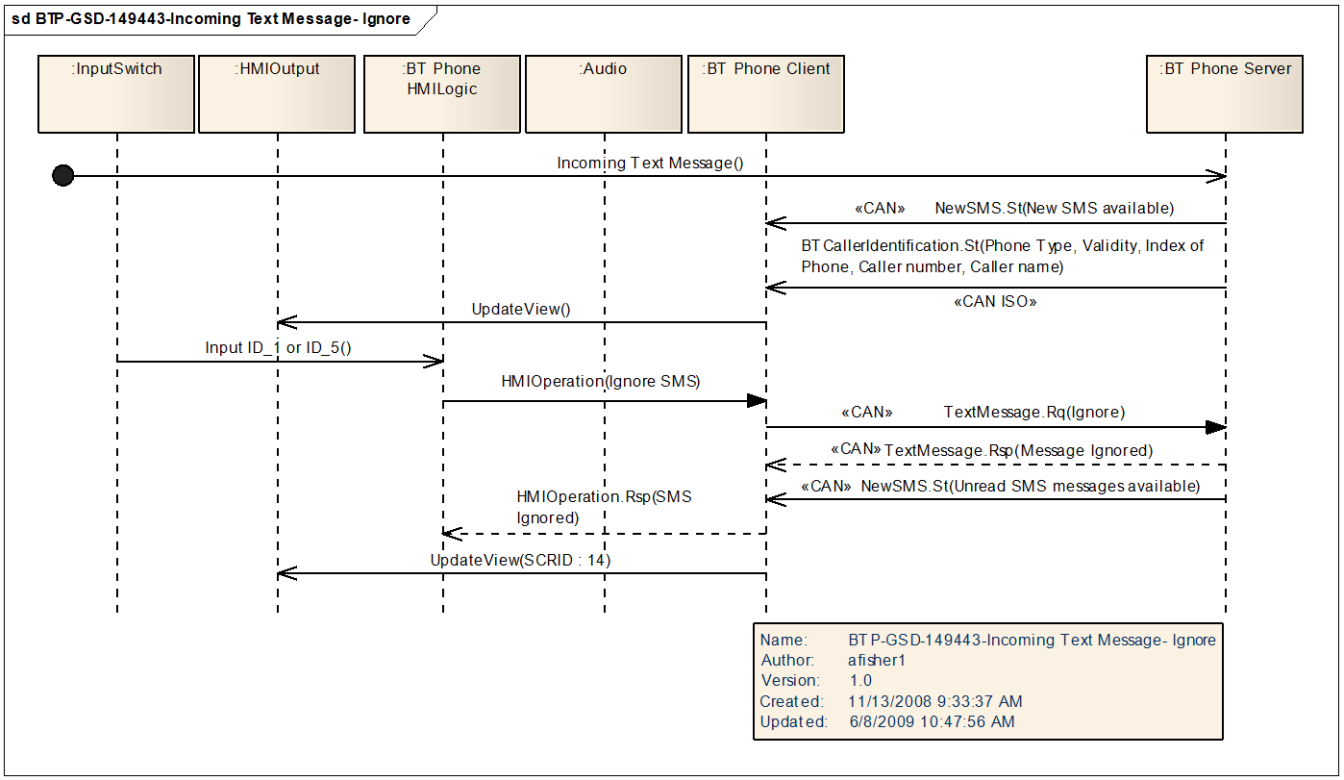
Pre-condition

A Bluetooth phone is connected to the vehicle interface. Vehicle power is On.

Post-condition

The text message is ignored, and HMI indicates {previous screen that user was on prior to the incoming text message}.

Sequence Diagram



3.5.3.3 BTP-SD-REQ-030697/A-Initiate a Phone Call from Text Message (TcSE ROIN-149517-2)

Scenarios

Normal Usage

User <initiates a BT Phone call via the Cluster display> via the HMI.

Constraints

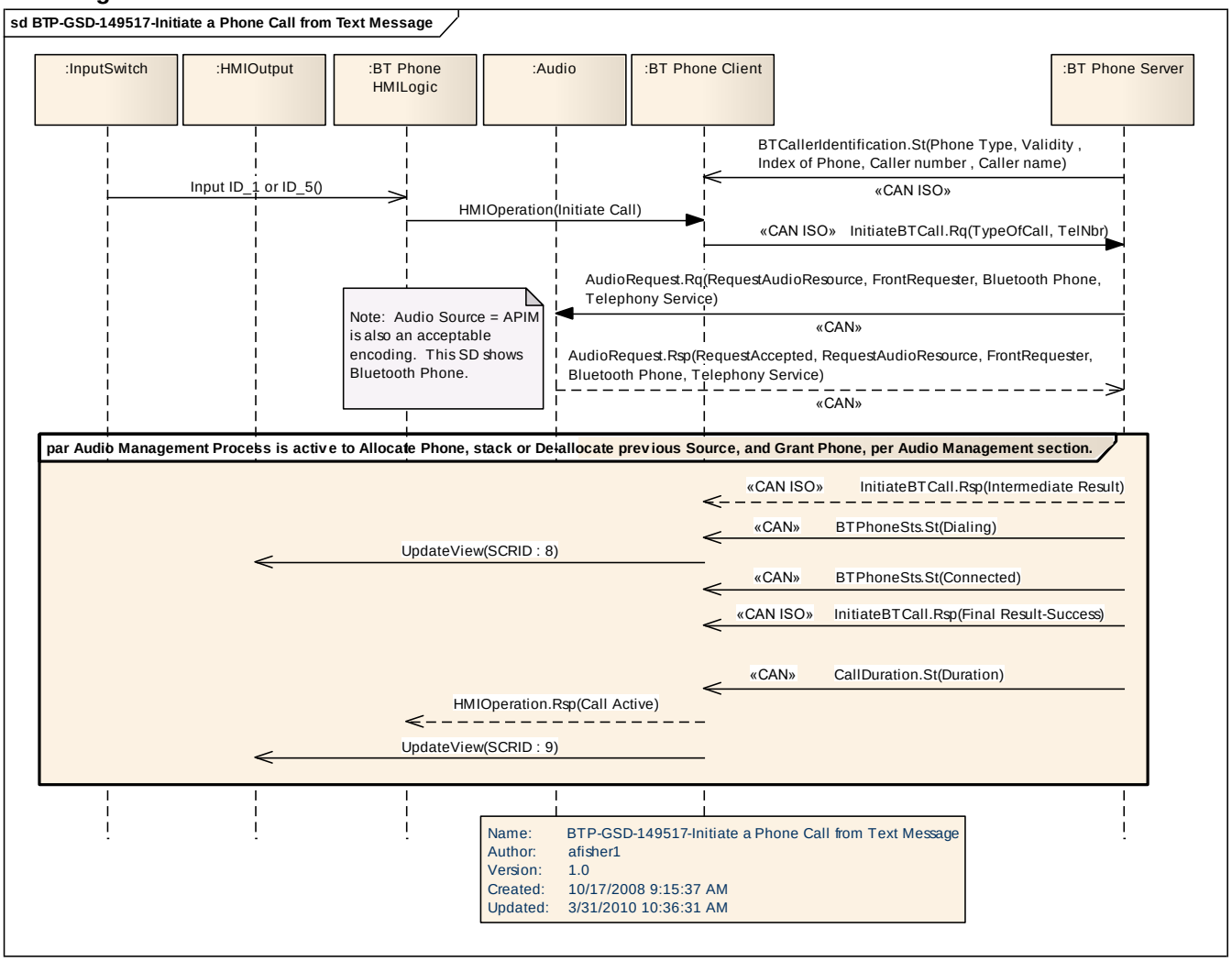
Pre-condition

The user is currently accessing a new email message via the cluster, or is in phone browse mode.

Post-condition

The user is connected to the requested Caller Id and an active phone call is in progress.

Sequence Diagram



4 Appendix: Reference Documents

Reference #	Document Title
1	Audio Management SPSS RACM