Research & Vehicle Technology
"Infotainment Systems Product Development"

Feature – Rear Seat Occupant Alert

APIM Infotainment Subsystem Part Specific Specification (SPSS)

Version 1.1

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FORD CONFIDENTIAL

Revision History

Date	Version	Notes	
April 29, 2020	1.0	Initial Release	
June 11, 2020	1.1		
	RSOA-IIR-REQ-386879/B-RearSeatOccupantAlertInterfaceClient_Rx	ndecia: revised structure to use common method descriptions	
	MD-REQ-386825/B-DisplayAlert_Rq	ndecia: updated method description to reflect CAN signal instead of SOA interface	
	RSOA-IIR-REQ-386887/B-RearSeatOccupantAlertInterfaceClient_Tx	ndecia: revised structure to use common method descriptions	
	MD-REQ-366821/A-AllowAlertsSetting_St	ndecia: new CAN signal to report HMI feature setting	
	MD-REQ-366822/A-CarSeatUseSetting_St	ndecia: new CAN signal to report HMI feature setting	
	MD-REQ-366824/A-HornChirpSetting_St	ndecia: new CAN signal to report HMI feature setting	
	MD-REQ-366825/A-CancelChime_Rq	ndecia: new CAN signal to report alert canceled by User HMI interaction	
	RSOA-REQ-386893/B-Feature Menu Selections	ndecia: updated to modify signal types and include default states	
	RSOA-REQ-386894/B-Feature Menu Setting Reactivation Prompt	ndecIA: updated to state default states	
	STR-757156/B-Requirements	ndecia: revised structure to include new timing requirement	
	RSOA-REQ-386906/B-Triggering the Alert	ndecia: updated to clarify how notification is triggered and managed	
	RSOA-REQ-386907/B-Acknowledging Alert	ndecia: updated to modify signal type	
	RSOA-TMR-REQ-392735/A-T_NotificationDuration	ndecia: New timer requirement for duration of displaying pop-up	
	RSOA-UC-REQ-386914/B-Alert Dismissed by User	ndecia: updated to clarify module responsibility	
	RSOA-SD-REQ-386916/B-Alert Armed, Triggered, and Disarmed After Ignition Off	ndecia: update to ECG logic, no change to APIM logic	
	STR-757161/B-Appendix: Reference Documents	ndecia: included reference to L31a spec	

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1 Overview

The purpose of Rear Seat Occupant Alert (RSOA) feature is to:

- Monitor vehicle conditions for the presence of rear seat occupant (children) and alert the customer if a child is left unattended in the vehicle, while the vehicle is shut-OFF.

1.1 Feature Operation

The user can select to enable the feature from the in-vehicle HMI. Once monitoring is enabled, the user will receive alerts whenever certain vehicle state conditions are detected. In one use case, the user is required confirm if a child car seat is being used in the rear seat of the vehicle. This will create a subset of the conditions required to trigger the alert since the seatbelt status is no longer monitored by the feature as it may not be in use when a child car seat is present.

1.2 Feature Assumptions

This feature assumes that the ECG module is present and that the vehicle has connectivity in order for the feature to properly trigger an alert on the mobile device through the FordPass application

1.3 Terminology and Abbreviations

The following table lists terminologies that are used in this document along with a brief description.

Term	Description
RSOA	Rear Seat Occupant Alert
ECG	Enhanced Central Gateway
HMI	Human Machine Interface
RCM	Restraint Control Module
TCU	Telematics Control Unit
FNV2	Fully Networked Vehicle Architecture
RBM	Rear Belt Monitor
VSDN	Vehicle Service Delivery Network

2 Architectural Design

2.1 RSOA-CLD-REQ-353274/B-Rear Seat Occupant Alert Client

The Rear Seat Occupant Alert Client is responsible for containing the logic to determine the presence of a rear seat occupant of a vehicle, and arming or disarming the system. It is also responsible for triggering an alert when certain conditions are met.

2.2 RSOA-CLD-REQ-386786/A-Rear Seat Occupant Alert Interface Client

The Rear Seat Occupant Alert Interface Client is responsible for displaying the visual alert as well as containing the feature setting HMI.

2.3 RSOA-CLD-REQ-353954/B-Vehicle Data Server

The Vehicle Data Server is responsible for communicating various vehicle data and states to the Rear Seat Occupant Alert Client.

2.4 Physical Mapping of Classes

The table below shows an example of how the logical classes that make up the Rear Seat Occupant Alert feature may be mapped into physical modules. This mapping example is specific to the FNV2 architecture and does not necessarily carryover to other carlines or vehicle architectures.

Logical Class	Physical Module (ECU)
Rear Seat Occupant Alert Client	ECG
Rear Seat Occupant Alert Interface Client	APIM

2.5 RSOA-IIR-REQ-386879/B-RearSeatOccupantAlertInterfaceClient_Rx

2.5.1 MD-REQ-386825/B-DisplayAlert_Rq

Message Type: Request

The signal is used to request the Rear Seat Occupant Alert pop-up to be display

Name	Literals	Value	Description
DisplayAlert_Rq	-	-	Set to Active when the In-Vehicle Alert is Triggered
	Null	0x0	
	Active	0x1	

2.6 RSOA-IIR-REQ-386887/B-RearSeatOccupantAlertInterfaceClient_Tx

2.6.1 MD-REQ-366821/A-AllowAlertsSetting_St

Message Type: Status

This signal is used to report the status of the Allow Alerts Setting

Name	Literals	Value	Description
AllowAlertsSetting_St	-	-	When set to Off, no RSOA alerts will be triggered
	Null	0x0	
	Off	0x1	
	On	0x2	
	NotUsed	0x3	

2.6.2 MD-REQ-366822/A-CarSeatUseSetting_St

Message Type: Status

The signal is used to report the status of the Car Seat Use Setting

Name	Literals	Value	Description
CarSeatUseSetting_St	-	-	When set to In Use, only Rear Door Ajar events are needed to arm the system
	Null	0x0	
	NotInUse	0x1	
	InUse	0x2	
	NotUsed	0x3	

2.6.3 MD-REQ-366824/A-HornChirpSetting_St

Message Type: Status

This signal is used to indicate the status of the Horn Chirp Setting

Name	Literals	Value	Description
HornChirpSetting_St	-	-	When set to Off, no horn chirps will be triggered as part of RSOA escalation
	Null	0x0	
	Off	0x1	
	On	0x2	
	NotUsed	0x3	

2.6.4 MD-REQ-366825/A-CancelChime_Rq

Message Type: Request

The signal is used to request the In-Vehicle Chime Alert to be cancelled

Name	Literals	Value	Description
CancelChime_Rq	-	-	Set to Cancel when the User has chosen to dismiss the In-Vehicle Alert via the HMI
	Null	0x0	
	Cancel	0x1	

3 General Requirements

3.1 RSOA-REQ-386919/B-Feature Support Configurable Parameter

The Rear Seat Occupant Alert Interface Client shall have a configurable parameter that determines whether the Rear Seat Occupant Alert feature and associated HMI shall be supported or not supported. Please refer to the Infotainment Diagnostic Specification for further details on this parameter.

4 Functional Definition

4.1 RSOA-FUN-REQ-386892/A-Feature Menu Settings

4.1.1 Requirements

4.1.1.1 RSOA-REQ-386893/B-Feature Menu Selections

The Rear Seat Occupant Alert Interface Client shall support feature HMI to allow for the User to make the following menu setting selections:

When selected/deselected by the user, the AllowAlertsSetting_St signal shall be set to the values as described below in accordance with the HMI specification and sent to the Rear Seat Occupant Alert Client. The initial default setting of this signal shall be set to On.

OFF: AllowAlertsSetting_St set to Off
Alert Only: AllowAlertsSetting_St set to On
Alert With Horn: AllowAlertsSetting_St set to On

When selected/deselected by the user, the CarSeatUseSetting_St signal shall be set to InUse/NotInUse in accordance with the HMI specification and sent to the Rear Seat Occupant Alert Client. The initial default value of this signal shall be set to InUse.

When selected/deselected by the user, the HornChirpSetting_St signal shall be set to the values as described below in accordance with the HMI specification and sent to the Rear Seat Occupant Alert Client. The initial default setting of this signal shall be set to On.

OFF: HornChirpSetting_St set to Off
Alert Only: HornChirpSetting_St set to Off
Alert With Horn: HornChirpSetting_St set to On

All of the above settings shall be able to be stored for use with personal profiles. For further detail, please refer to the Enhanced Memory SPSS.

4.1.1.2 RSOA-REQ-386894/B-Feature Menu Setting Reactivation Prompt

The feature setting has a default position of ON (Allow Alert with Horn). If the setting has been switched to the OFF position, the Rear Seat Occupant Alert Interface Client shall prompt the user to switch the feature back to the ON setting (Alert Only or Alert With Horn), on the following UTC dates every year:

- April 1st
- October 1st

4.1.1.3 RSOA-REQ-386895/A-Feature Menu Setting Usage Analytics

The Rear Seat Occupant Alert Interface Client shall track the status of the feature setting usage and report usage statistics in accordance with the existing feature data and analytics functionality.

4.2 RSOA-FUN-REQ-386905/A-Displaying Rear Seat Occupant Alert

4.2.1 Requirements

4.2.1.1 RSOA-REQ-386906/B-Triggering the Alert

The Rear Seat Occupant Alert Interface Client shall support feature HMI to display a visible notification alert to the User upon reception of the DisplayAlert_Rq signal set to Active from the Rear Seat Occupant Alert Client. The DisplayAlert_Rq signal will be set back to Null by the Rear Seat Occupant Alert Client after a period of 1 second, but the minimum display timer shall be managed by the Rear Seat Occupant Alert Interface Client (along with notification arbitration). This visible notification shall

be displayed for a period of T_NotificationDuration. This request to display a visible notification is sent by the Rear Seat Occupant Alert Client to the Rear Seat Occupant Alert Interface Client after the Ignition state has transitioned from Run to Off.

4.2.1.2 RSOA-REQ-386907/B-Acknowledging Alert

The Rear Seat Occupant Alert Interface Client shall also support a soft button to acknowledge and dismiss the alert, and upon selection, shall close the notification, and shall set the CancelChime_Rq signal to Cancel and send it to the Rear Seat Occupant Alert Client.

4.2.1.3 RSOA-TMR-REQ-392735/A-T_NotificationDuration

Name	Description	Units	Range	Resolution	Default
T_NotificationDuration	The amount of time for the notification to be displayed. Note: Set by configurable parameter, refer to IDS	sec	See IDS		

4.2.2 Use Cases

4.2.2.1 RSOA-UC-REQ-386911/A-Notification and Alert Triggered

Actors	Rear Seat Occupant Alert Client, Rear Seat Occupant Alert Interface Client, Rear Seat Occupant Alert Chime Server
Pre-conditions	Ignition is ON, Rear Seat Occupant System is Armed
Scenario Description	The Ignition Status transitions to OFF
Post-conditions	The Rear Seat Occupant Alert Client has requested a chime to be played and a notification to be displayed
List of Exception Use Cases	
Interfaces	HMI

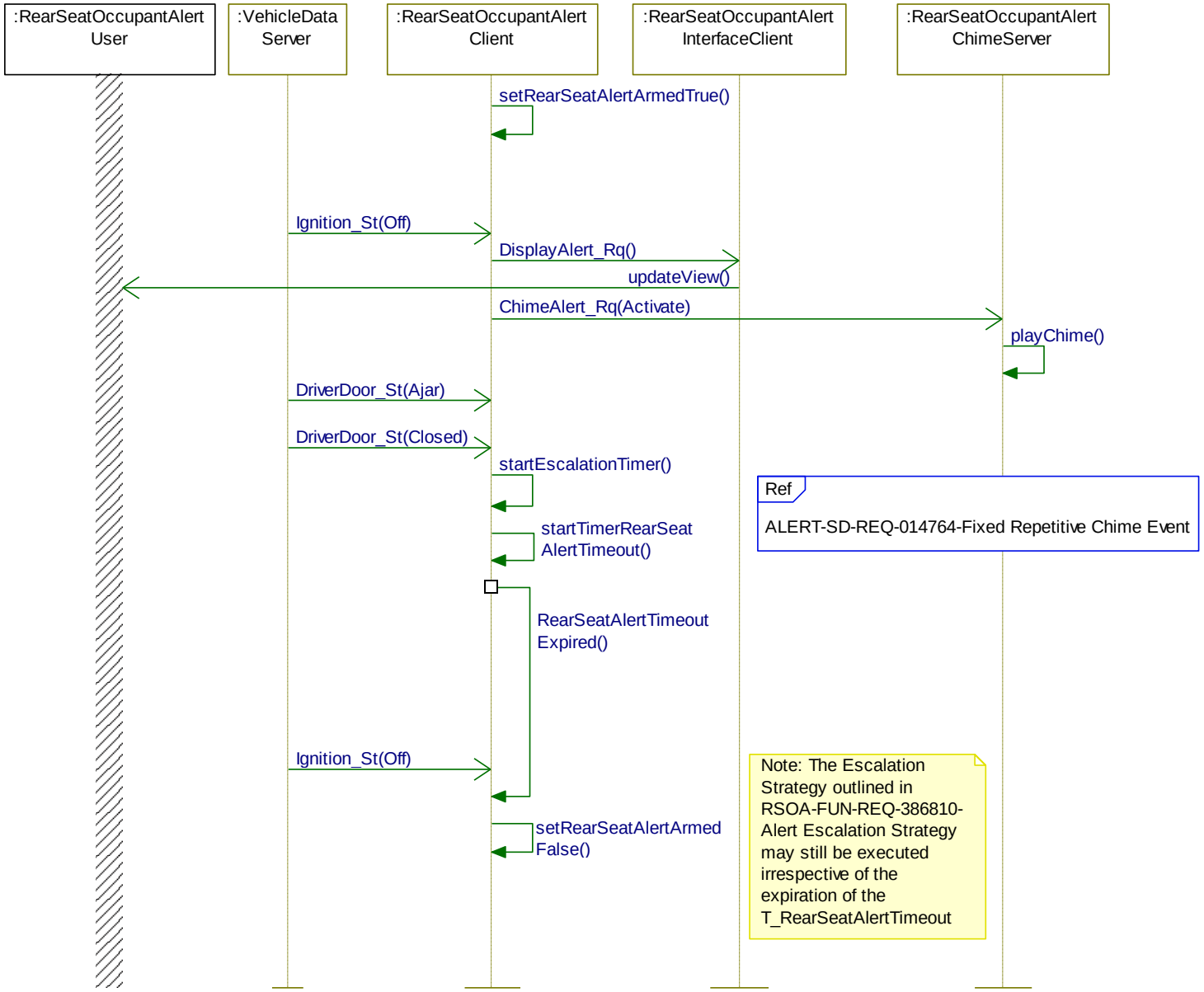
4.2.2.2 RSOA-UC-REQ-386914/B-Alert Dismissed by User

Actors	Rear Seat Occupant Alert Client, Rear Seat Occupant Alert Interface Client
Pre-conditions	The Ignition Status is OFF The Rear Seat Occupant Alert Client has requested a chime to be played and a notification to be displayed
Scenario Description	The User has acknowledged the alert on the HMI
Post-conditions	The Rear Seat Occupant Alert Interface Client has closed the visible notification and the Rear Seat Occupant Alert client has canceled the audible chime
List of Exception Use Cases	
Interfaces	HMI

4.2.3 White Box View

4.2.3.1 Sequence Diagrams

4.2.3.1.1 RSOA-SD-REQ-386916/B-Alert Armed, Triggered, and Disarmed After Ignition Off



5 Appendix: Reference Documents

Reference #	Document Title
1	RearSeatOccupantAlert L31a HMI Specification
2	
3	
4	
5	
6	
7	
8	
9	
10	