U6XXICA RearPowerSeat FS

(TBD)

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Important Note

You need to use the RE specification macros provided by the "RE_SpecificationMacroTemplate.dotm" (refer to "Utilities" on page "Specification Templates" in the RE Wiki) to allow seamless VSEM import of the specification content. ***Use only these RE specification macros to create requirements*** *in this specification. Refer to "How to use the Specification Templates" on how to enable and use the macros and the requirements templates in this specification.*

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1 INTRODUCTION

1.1 Document Purpose

The Function Specification (FS) specifies an individual function.

To get more information about the concept of feature, function and component level abstraction refer to the Ford RE Wiki.

1.2 Document Scope

The following function from the Global Feature & Function List is described in this specification:

Function ID	Function Name
	Rear Power Seat HMI Output Arbitrator
	Rear Power Seat HMI Display

1.3 Document Audience

The FS is authored by the owners of the individual functions. All Stakeholders, i.e., all people who have a valid interest in the functions and their behavior should read and, if possible, review the FS. It needs to be guaranteed, that all stakeholders have access to the currently valid version of the FS.

*#**Hint:** The FS template has the IP Classification "Proprietary" by default. IP Classification "Confidential" might be required in some cases, e.g. by Ford Functional Safety.*
*#**Macro:** Add Ins -> Edit Document Properties macro (select "Proprietary" for "Document Classification").*

1.3.1 Stakeholder List

For the latest list of the feature stakeholder and their roles & responsibilities refer to <Put VSEM Link here>.

*#**Hint:** Refer to Ford RE Wiki – Stakeholder List on how to create a stakeholder list. The stakeholder list should be stored in VSEM in the pseudo folder "General Data Artifacts" of the corresponding function.*

1.4 Document Organization

1.4.1 Document Context

Refer to the Specification Structure page in the Ford RE Wiki to understand how the FS relates to other Ford Requirements Documents and Specifications.

1.4.2 Document Structure

The structure of this document is explained below:

Section 1 – Introduction how to use this document including responsibilities and requisite documents. Explains the terminology. Gives a clarification of the definitions, concepts and abbreviations used in the document.
Section 2 – Function Specifications: Specifies the logical functions of the function group in detail
Section 3 – List of Open Concerns
Section 4 Revision history including a list of new or modified requirements. The requirements in this document are tagged, and this section contains different types of tables listing all, new, or changed requirements by their title and page no.
Section 5 – Appendix: Presenting additional data mainly in a tabular form, e.g., a data dictionary

*#**Hint:** All sections are mandatory, unless explicitly marked by the tag "#Classification" as "optional" or as applicable e.g. to certain domains like "Functional Safety".*

1.5 Document Conventions

1.5.1 Requirements Templates

Refer to "How to use the Specification Templates" on how to use the specification templates and the VBA macros to create/edit the requirements in the specifications.

The VBA macro enable the import of the specification to VSEM (refer to "How to import specifications into VSEM as separate requirements").

1.5.1.1 Identification of Requirements

The unique requirement ID given in the headline of any requirement follows the requirement throughout the development process. The requirement ID format follows a well-defined syntax.

All identifiers in a FS shall be composed of 4 parts:

- A leading prefix, which indicates the type of requirement (R=Requirement, UC=Use Case, SC=Scenario, …)
- A prefix, which indicates the abstraction level (F=Feature, FNC=Function, CMP = component).
- Followed by a name, indicating the scope, which the requirement belongs to (e.g. feature or function name)
- Ending with the actual requirement number

Example:

R_FNC_LockArbitrator_00004 This is the fourth requirement on function level for the function Lock Arbitrator.

1.5.1.2 Requirements Attributes

The templates provided by *Specification_Macros.dotm* define a list of attributes for each requirement. This helps to classify the requirement. The attributes are explained at RE Wiki - Requirements Attributes.

1.6 References

1.6.1 Ford Documents

List here all Ford internal documents, which are directly related to the feature.

Reference	Title	Doc. ID	Revision	Document Location
[aaa]				

Table 1: Ford Documents

1.6.2 External Documents and Publications

The list of external documents could include books, reports and online sources.
*#**Hint:** You may refer to IEEE Citation Reference on how to format a reference.*

Reference	Document / Publication
[bbb]	

Table 2: External Documents and Publications

1.7 Glossary

*#**Hint**: Terms, concepts and abbreviations used in the document shall be defined and illustrated here. Note that changes to terms and/or concepts described in this section tend to cause major updates to this document.*
The tables below have feature specific definitions and abbreviations. For additional, non-feature specific terms please refer to the RE Glossary

1.7.1 Definitions

*#**Hint:** The table below has definitions and abbreviations relevant for the functions in this document. For additional terms please refer to the RE Glossary*

Definition	Description

Table 3: Definitions relevant for "Logical Function A"

1.7.2 Abbreviations

Abbr.	Meaning	Description
FS	Function Requirements Specification / Function Group Specification	The document describing, collecting and developing the requirements of a function or a group of functions.

Table 4: Abbreviations relevant for "Logical Function A"

2 FUNCTION SPECIFICATION

2.1 Rear Power Seat HMI Output Arbitrator

2.1.1 Function Overview

2.1.1.1 Function Description

*#**Hint:** Some descriptive text to explain the purpose and functionality of the function.*

Rear Power Seat HMI Output Arbitrator function receive both sides of rear seat control modules (SCMK/SCML) from CAN network, arbitrate final info/warning request to Rear Power Seat HMI Display function.

2.1.2 Function Scope

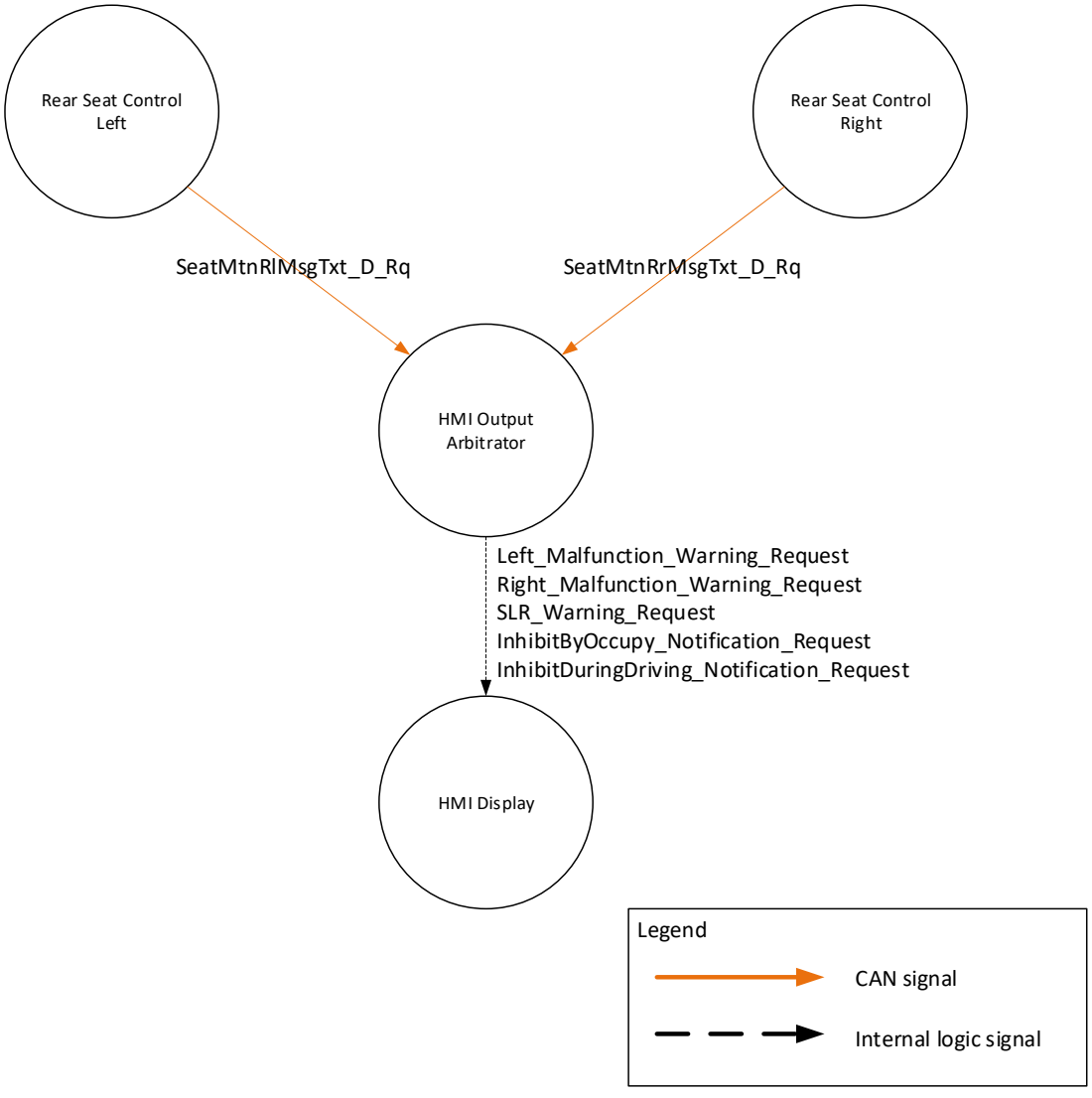


Figure 1: Context Diagram of Function HMI Output Arbitrator

2.1.3 Function Interfaces

*#**Hint:***

- *First create a Logical Signal in the "Logical Signals" section of the "Data Dictionary". Use Add Ins -> Add Requirement macro (select "Logical Signal" as type).*
- *Insert just a Word reference to the Signal ID, Name and Description (which are bookmarks in the signal/parameter definition in the section in the Data Dictionary).*

*#**Link:*** RE Wiki – Adding a Logical Signal or Parameter

2.1.3.1 Logical (Physical) Inputs

Signal Name	Description
SeatMtnRlMsgTxt_D_Rq	Request to display a text message about rear left seat motion control. 0x0 = NoMessage 0x1 = Malfunction 0x2 = SeatLockReminder 0x3 = SecondRowFnInhbtByOccupy 0x4 = SecondRowFnInhbtByVehMoving 0x5~0xF = NotUsed
SeatMtnRrMsgTxt_D_Rq	Request to display a text message about rear right seat motion control. 0x0 = NoMessage 0x1 = Malfunction 0x2 = SeatLockReminder 0x3 = SecondRowFnInhbtByOccupy 0x4 = SecondRowFnInhbtByVehMoving 0x5~0xF = NotUsed

2.1.3.2 Logical Outputs

Signal Name	Description
Left_Malfunction_Warning_Request	Represent left side seat module malfunction warning request to HMI Display function to show left side rear seat malfunction warning popup window. 0x0 = Inactive 0x1 = Active
Right_Malfunction_Warning_Request	Represent right side seat module malfunction warning request to HMI Display function to show right side rear seat malfunction warning popup window. 0x0 = Inactive 0x1 = Active
SLR_Warning_Request	Represent seat lock reminder warning request to HMI Display function to show corresponded popup window. 0x0 = Inactive 0x1 = Active
InhibitByOccupy_Notification_Request	Represent rear seat function inhibit by occupied notification request to HMI Display function to show corresponded popup window. 0x0 = Inactive 0x1 = Active
InhibitDuringDriving_Notification_Request	Represent rear seat function inhibit during driving notification request to HMI Display function to show corresponded popup window. 0x0 = Inactive 0x1 = Active

2.1.3.3 Logical Parameters

*#**Hint**: Put requirements for parameters here, which are implemented as configuration parameters using Method 2 or 3 or as parameters for calibration.*

Parameter Name	Description
RearPowerSeat_Cfg	On/off the Rear Power Seat related function, include HMI Output Arbitrator, HMI Display, Return Control Menu, voice control command

2.1.4 Function Modeling

*#**Classification:** Mandatory*
*#**Hint:** Typical modeling artifacts in this section are State Machines, Activity Diagrams / Flow Charts, Decision Tables, and possibly Sequence Diagrams, which can all be used as techniques to analyze the function requirements.*

It is highly recommended to use at least one of the following modeling techniques for modeling and analyzing the Function behavior and derived requirements (refer to sample diagrams below): State Machines, Activity Diagrams / Flow Charts, or Decision Tables

*#**Links:** Analyze / Model Requirements: RE Wiki – Analyze / Model Requirements*

2.1.4.1 Decision Tables

*#**Classification:** Optional (remove section, if not used)*
*#**Hint:** Decision Tables are well suited to describe combinatorial logic*

SeatMtnRlMsgTxt_D_Rq	Left_Malfunction_Warning_Request
0x1 (Malfunction)	Active
Other	Inactive

Decision Table of Left_Malfunction_Warning_Request

SeatMtnRrMsgTxt_D_Rq	Right_Malfunction_Warning_Request
0x1 (Malfunction)	Active
Other	Inactive

Decision Table of Right_Malfunction_Warning_Request

SeatMtnRlMsgTxt_D_Rq	SeatMtnRrMsgTxt_D_Rq	SLR_Warning_Request
0x2 (SeatLockReminder)	Don't care	Active
Don't care	0x2 (SeatLockReminder)	Active
Other		Inactive

Decision Table of SLR_Warning_Request

SeatMtnRlMsgTxt_D_Rq	SeatMtnRrMsgTxt_D_Rq	InhibitByOccupy_Notification_Request
0x3 (SecondRowFnInhbtByOccupy)	Don't care	Active
Don't care	0x3 (SecondRowFnInhbtByOccupy)	Active

Other	Inactive

Decision Table of InhibitByOccupy_Notification_Request

SeatMtnRlMsgTxt_D_Rq	SeatMtnRrMsgTxt_D_Rq	InhibitDuringDriving_Notification_Request
0x4 (SecondRowFnInhbtByVehMoving)	Don't care	Active
Don't care	0x4 (SecondRowFnInhbtByVehMoving)	Active
Other		Inactive

Decision Table of InhibitDuringDriving_Notification_Request

2.1.5 Function Requirements

#Macro: Add Ins -> Add Requirement macro (select "FNC" as ID Prefix, the function name as ID Infix (Short Name) and "Requirement" as type)
#Link: RE Wiki – How to write good requirements

2.1.5.1 Functional Requirements

*#**Hint:** Please also consider specific situations like Initialization (Startup) and Deinitialization (Shutdown) apart from Normal Operation and Error Handling. E.g. a state chart or activity diagram in* section "*Function Modeling*" might *help for better understanding.*

2.1.5.1.1 Normal Operation

###R_FNC_U6XXICA RearPowerSeat - IVI_01### General Requirement of HMI Output Arbitrator

HMI Output Arbitrator shall be able to output 5 individual signals for Display function to popup 5 kinds of individual windows:

Left_Malfunction_Warning_Request
Right_Malfunction_Warning_Request
SLR_Warning_Request
InhibitByOccupy_Notification_Request
InhibitDuringDriving_Notification_Request

End of Requirement

~~**###R_FNC_U6XXICA RearPowerSeat - IVI_02### Common_Warning_Request Internal Priority**~~

~~SeatLockReminder has highest priority compared with FunctionInhibitByOccupy and FunctionInhibitDuringDriving. Any output status change within NoPopup, FunctionInhibitByOccupy and FunctionInhibitDuringDriving need to make sure neither of left nor right side input change to SeatLockReminder at same time to realize the priority requirement.~~
~~Refer to State Machine of Common_Warning_Request~~

~~End of Requirement~~

2.2 Rear Power Seat HMI Display

2.2.1 Function Overview

2.2.1.1 Function Description

*#**Hint:** Some descriptive text to explain the purpose and functionality of the function.*

Rear Power Seat HMI Display function receive HMI Output Arbitrator function's output request, to trigger corresponded popup window with corresponded alert and notification/warning information.

2.2.2 Function Scope

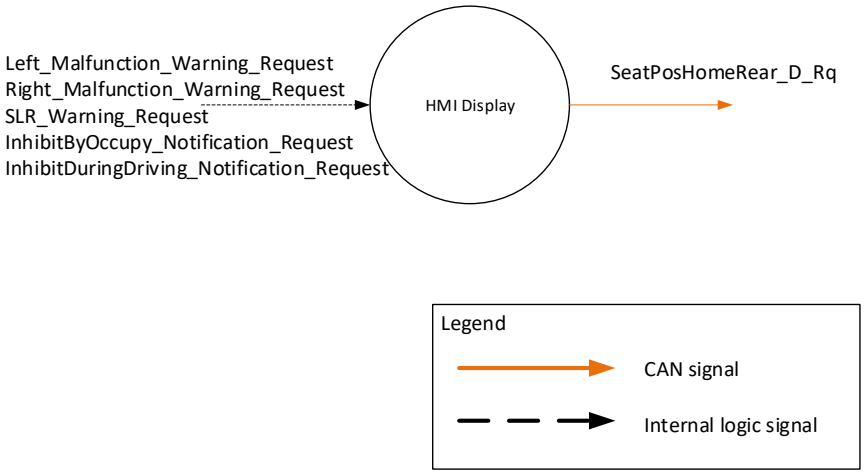


Figure 3: Context Diagram of Function HMI Display

2.2.3 Function Interfaces

*#**Hint:***
- *First create a Logical Signal in the "Logical Signals" section of the "Data Dictionary". Use Add Ins -> Add Requirement macro (select "Logical Signal" as type).*
- *Insert just a Word reference to the Signal ID, Name and Description (which are bookmarks in the signal/parameter definition in the section in the Data Dictionary).*

*#**Link:*** RE Wiki – Adding a Logical Signal or Parameter

2.2.3.1 Logical Inputs

Signal Name	Description
Left_Malfunction_Warning_Request	Represent left side seat module malfunction warning request to HMI Display function to show left side rear seat malfunction warning popup window. 0x0 = Inactive 0x1 = Active
Right_Malfunction_Warning_Request	Represent right side seat module malfunction warning request to HMI Display function to show right side rear seat malfunction warning popup window. 0x0 = Inactive 0x1 = Active
SLR_Warning_Request	Represent seat lock reminder warning request to HMI Display function to show corresponded popup window. 0x0 = Inactive 0x1 = Active
InhibitByOccupy_Notification_Request	Represent rear seat function inhibit by occupied notification request to HMI Display function to show corresponded popup window. 0x0 = Inactive

	0x1 = Active
InhibitDuringDriving_Notification_Request	Represent rear seat function inhibit during driving notification request to HMI Display function to show corresponded popup window. 0x0 = Inactive 0x1 = Active

2.2.3.2 Logical (Physical) Outputs

Signal Name	Description
SeatPosHomeRear_D_Rq	Request for the rear seat to return to default position. 0x0 = NoRequest 0x1 = LeftSecondRowSeatReturn 0x2 = RightSecondRowSeatReturn 0x3 = BothSecondRowSeatReturn ~~0x4 = LeftThirdRowSeatReturn~~ ~~0x5 = RightThirdRowSeatReturn~~ ~~0x6 = BothThirdRowSeatReturn~~ 0x7~0xF = NotUsed

2.2.3.3 Logical Parameters

*#**Hint**: Put requirements for parameters here, which are implemented as configuration parameters using Method 2 or 3 or as parameters for calibration.*

Parameter Name	Description
RearPowerSeat_Cfg	On/off the Rear Power Seat related function, include HMI Output Arbitrator, HMI Display, Return Control Menu, voice control command

2.2.4 Function Modeling

*#**Classification:** Mandatory*
*#**Hint:** Typical modeling artifacts in this section are State Machines, Activity Diagrams / Flow Charts, Decision Tables, and possibly Sequence Diagrams, which can all be used as techniques to analyze the function requirements.*

It is highly recommended to use at least one of the following modeling techniques for modeling and analyzing the Function behavior and derived requirements (refer to sample diagrams below): State Machines, Activity Diagrams / Flow Charts, or Decision Tables

*#**Links:** Analyze / Model Requirements: RE Wiki – Analyze / Model Requirements*

2.2.4.1 State Charts

*#**Classification:** Optional (remove section, if not used)*
*#**Hint:** State Charts are widely used to describe reactive, event-driven behavior.*
*#**Links:** State Charts RE Wiki – State Charts*

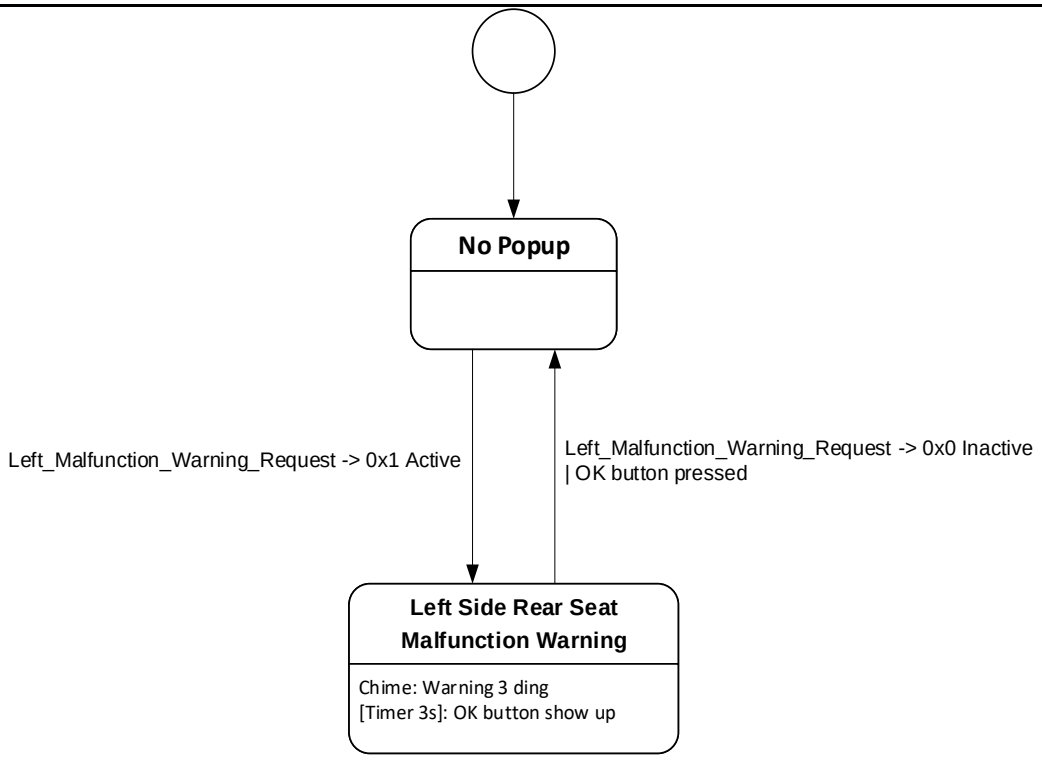


Figure 4: State Machine of Left Side Rear Seat Malfunction Warning Window

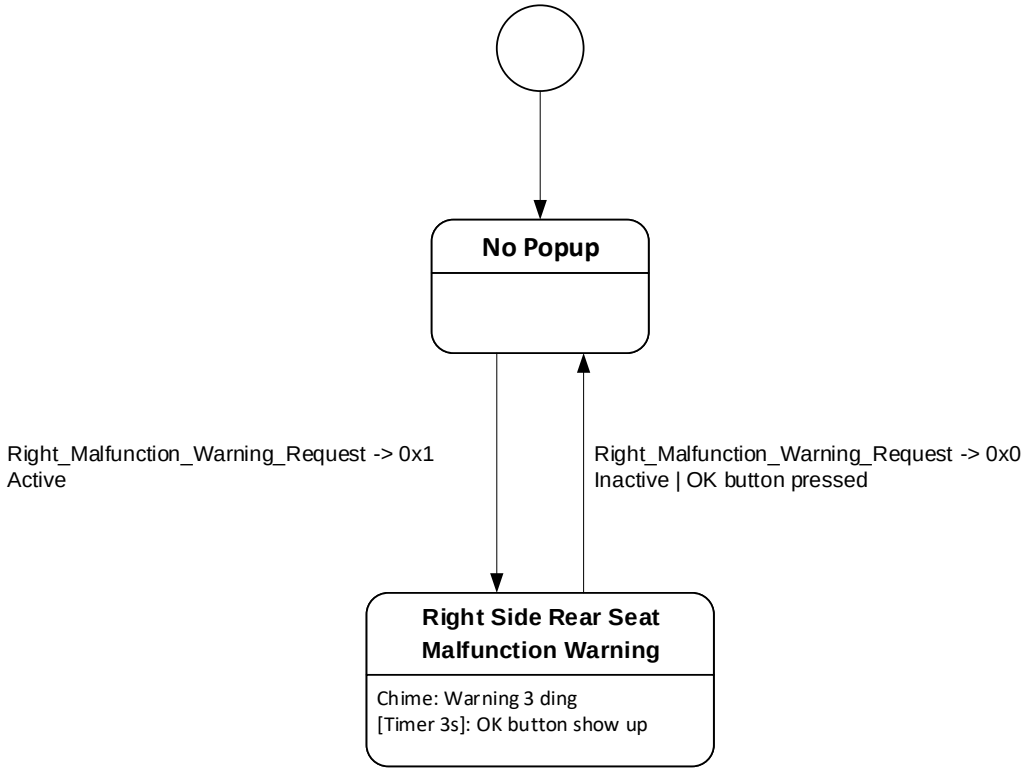
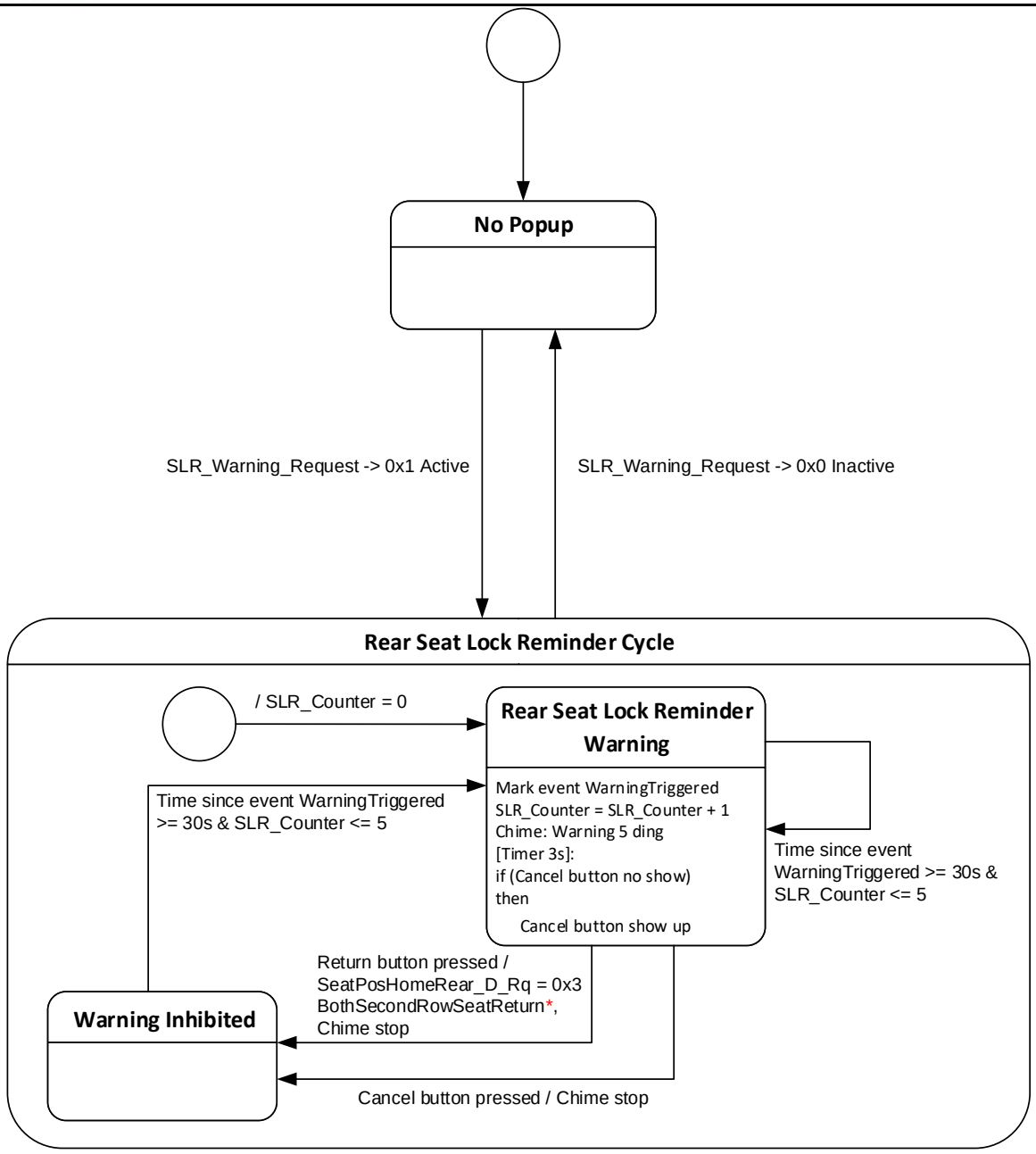


Figure 5: State Machine of Right Side Rear Seat Malfunction Warning Window



SeatPosHomeRear_D_Rq = 0x3 BothSecondRowSeatReturn*： 3 continuous frame on CAN bus then back to 0x0, cannot be interrupted by other SeatPosHomeRear_D_Rq send request.

Figure 6: State Machine of Rear Seat Lock Reminder Warning Window

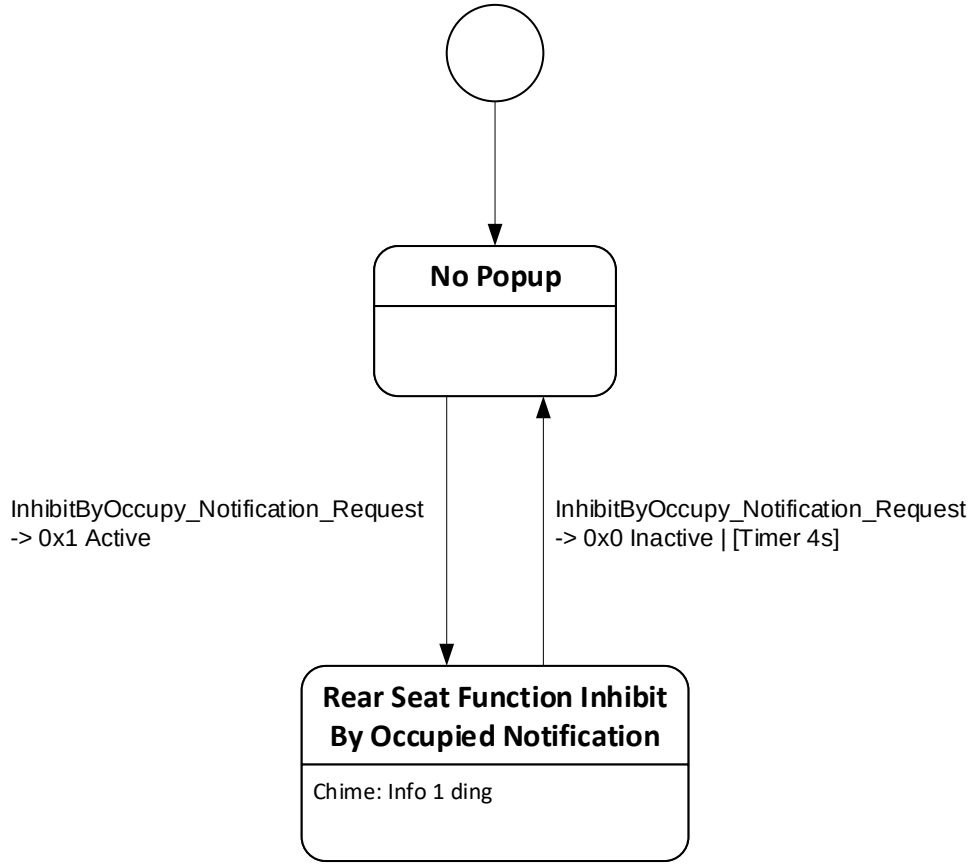


Figure 7: State Machine of Rear Seat Function Inhibit By Occupied Notification Window

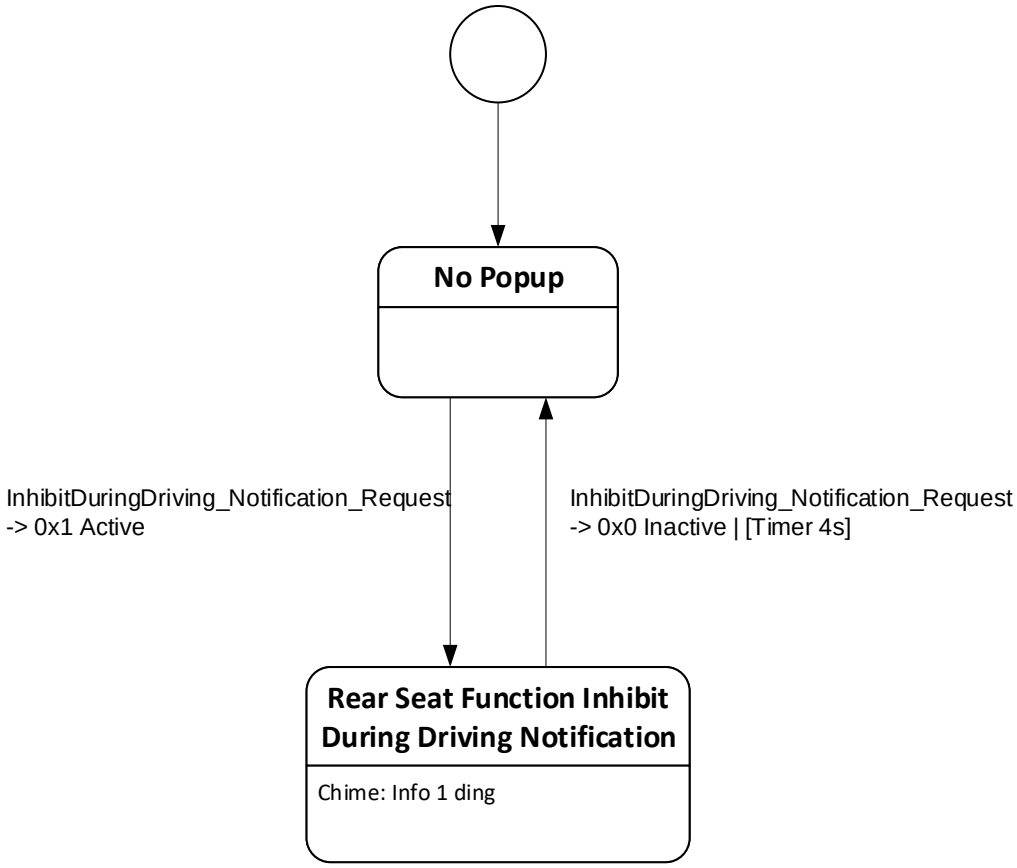


Figure 8: State Machine of Rear Seat Function Inhibit During Driving Notification Window

2.2.5 Function Requirements

#Macro: Add Ins -> Add Requirement macro (select "FNC" as ID Prefix, the function name as ID Infix (Short Name) and "Requirement" as type)
#Link: RE Wiki – How to write good requirements

2.2.5.1 Functional Requirements

*#**Hint:** Please also consider specific situations like Initialization (Startup) and Deinitialization (Shutdown) apart from Normal Operation and Error Handling. E.g. a state chart or activity diagram in* section "*Function Modeling*" might *help for better understanding.*

2.2.5.1.1 Normal Operation

###R_FNC_U6XXICA RearPowerSeat - IVI_03### General Requirement of HMI Display

HMI Display function shall be able to provide 5 individual popup windows with corresponded warning/notification which can be shown on IVI screen at same time in different layers (cover each other):

Left Side Rear Seat Malfunction Warning Window:
    Left Side Rear Seat Malfunction Warning
Right Side Rear Seat Malfunction Warning Window:
    Right Side Rear Seat Malfunction Warning
Rear Seat Lock Reminder Warning Window:
    Rear Seat Lock Reminder Warning
Rear Seat Function Inhibit By Occupied Notification Window:
    Rear Seat Function Inhibit By Occupied Notification
Rear Seat Function Inhibit During Driving Notification Window:
    Rear Seat Function Inhibit During Driving Notification

End of Requirement

###R_FNC_U6XXICA RearPowerSeat - IVI_04### Popup Window Priority

Popup window shall always take top layer of IVI screen.
For all warning/notification shall be divided into 3 classes,
Any new pop up window request belongs to same class as current pop up window shall overlay current pop up window;
Any new pop up window request belongs to lower class shall underlay existed higher class pop up window, e.g. Class2 should be covered by Class1 popup, and should cover Class3 popup.

Class1:
    Rear Seat Lock Reminder Warning
Class2:
    Left Side Rear Seat Malfunction Warning
    Right Side Rear Seat Malfunction Warning
Class3:
    Rear Seat Function Inhibit By Occupied Notification
    Rear Seat Function Inhibit During Driving Notification

End of Requirement

###R_FNC_U6XXICA RearPowerSeat - IVI_05### Alert Audio Channel

Alert shall take highest priority audio channel to output audio notification to customer.
Alert shall use software audio notification channel, not low layer chime channel.

End of Requirement

###R_FNC_U6XXICA RearPowerSeat - IVI_06### Alert Priority

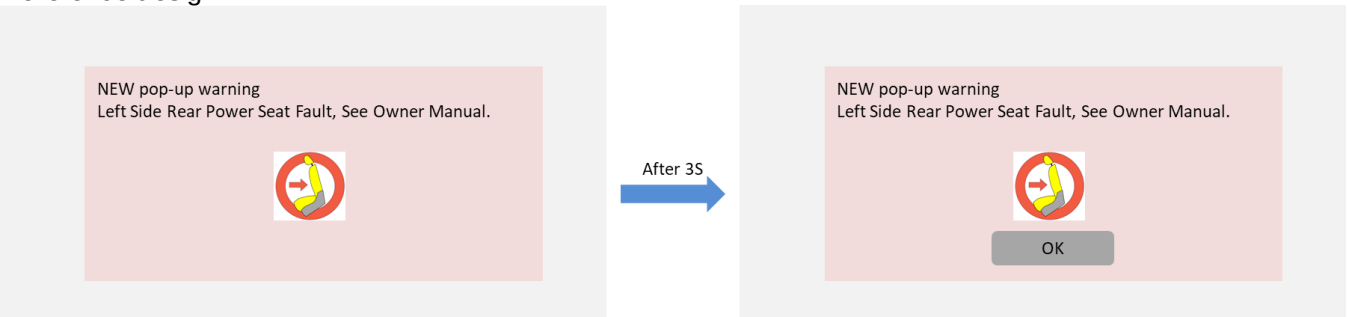
For all warning/notification shall be divided into 3 classes,
Any new alert request belongs to same class as current alert shall not interrupt current alert audio play;
Any new alert request belongs to higher class shall interrupt lower class alert audio play immediately and start play new alert audio, e.g. Class1 alert should interrupt Class2/Class3 alert.
Class1:
Rear Seat Lock Reminder Warning
Class2:
Left Side Rear Seat Malfunction Warning
Right Side Rear Seat Malfunction Warning
Class3:
Rear Seat Function Inhibit By Occupied Notification
Rear Seat Function Inhibit During Driving Notification

End of Requirement

###R_FNC_U6XXICA RearPowerSeat - IVI_07### Left Side Rear Seat Malfunction Warning

Left Side Rear Seat Malfunction Warning is shown in Left Side Rear Seat Malfunction Warning Window with warning alert.
Trigger
Left_Malfunction_Warning_Request -> 0x1 Active
Alert
Warning type: 3 * 0.5s_Alert
Warning popup, will be cleared until
3s after warning popup, OK button show up and pressed;
or Left_Malfunction_Warning_Request -> 0x0 Inactive

Reference design:



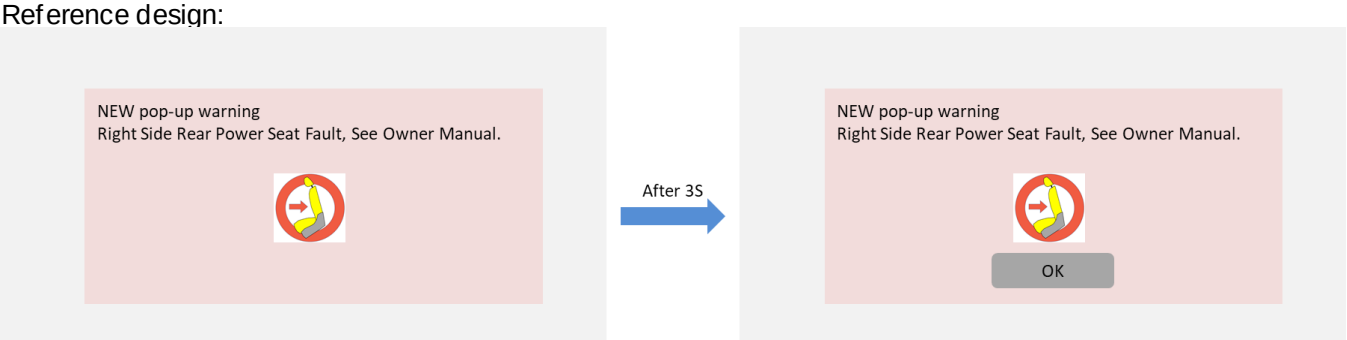
Refer to State Machine of Left Side Rear Seat Malfunction Warning Window

End of Requirement

###R_FNC_U6XXICA RearPowerSeat - IVI_08### Right Side Rear Seat Malfunction Warning

Right Side Rear Seat Malfunction Warning is shown in Right Side Rear Seat Malfunction Warning Window with warning alert.
Trigger
Right_Malfunction_Warning_Request -> 0x1 Active
Alert
Warning type: 3 * 0.5s_Alert
Warning popup, will be cleared until
3s after warning popup, OK button show up and pressed;
or Right_Malfunction_Warning_Request -> 0x0 Inactive

Reference design:



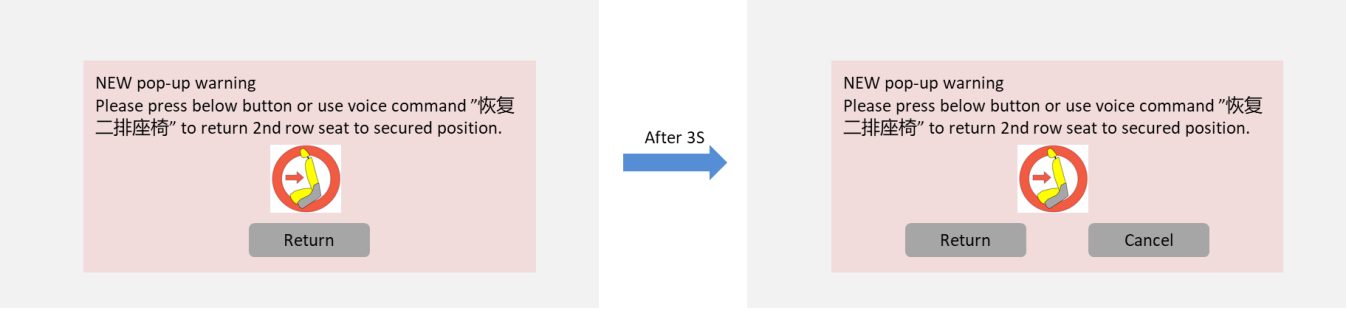
Refer to State Machine of Right Side Rear Seat Malfunction Warning Window

End of Requirement

###R_FNC_U6XXICA RearPowerSeat - IVI_09### Rear Seat Lock Reminder Warning

Rear Seat Lock Reminder Warning shall be shown in Common Rear Seat Warning Window with warning alert.
Trigger
SLR_Warning_Request -> 0x1 Active
Alert
Warning type: 5 * 0.5s_Alert
Alert will stop if pop up warning cleared within 5 ding time duration
First time warning popup, shall be cleared until
Return button pressed;
or 3s after warning popup, Cancel button show up and pressed;
or SLR_Warning_Request -> 0x0 Inactive
Second time warning shall be performed since first time warning triggered and SLR_Warning_Request keep 0x1 Active value for 30s.
If first time warning cleared, second time warning shall popup with alert;
or if first time warning not cleared, alert shall be performed only, and will be cleared until
Return button pressed;
or if first time warning not cleared before, Cancel button pressed;
or if first time warning cleared before, then 3s after second warning popup, Cancel button show up and pressed;
or SLR_Warning_Request -> 0x0 Inactive
3rd/4th/5th/6th time warning shall be performed since last time warning triggered and SLR_Warning_Request keep 0x1 Active value for 30s. 6th time is the last time warning, no further warning popup if SLR_Warning_Request still keep 0x1 Active value.

Reference design:



Refer to State Machine of Rear Seat Lock Reminder Warning Window

End of Requirement

###R_FNC_U6XXICA RearPowerSeat - IVI_10### Rear Seat Lock Reminder Return Button CAN Signal Output

If return button pressed on Rear Seat Lock Reminder Warning popup window, 3 continuous frames of SeatPosHomeRear_D_Rq = 0x3 BothSecondRowSeatReturn shall be published on CAN bus, then SeatPosHomeRear_D_Rq back to 0x0.

This CAN signal sent event shall not be interrupted by any other SeatPosHomeRear_D_Rq send request, any new send request raised during sent event shall wait for 3 continuous frames finished published.

This requirement not only apply to SeatPosHomeRear_D_Rq = 0x3 BothSecondRowSeatReturn send request, but also apply to any none zero value SeatPosHomeRear_D_Rq send request.

End of Requirement

###R_FNC_U6XXICA RearPowerSeat - IVI_11### Rear Seat Function Inhibit By Occupied Notification

Rear Seat Function Inhibit By Occupied Notification is shown in Common Rear Seat Warning Window with information alert.

Trigger

InhibitByOccupy_Notification_Request -> 0x1 Active

Alert

Information type: 1 * 1s_Alert

Notification popup, will be cleared until

OK pressed;
or 4s timer completed;
or InhibitByOccupy_Notification_Request -> 0x0 Inactive

Reference design:

Refer to State Machine of Rear Seat Function Inhibit By Occupied Notification Window

End of Requirement

###R_FNC_U6XXICA RearPowerSeat - IVI_12### Rear Seat Function Inhibit During Driving Notification

Rear Seat Function Inhibit During Driving Notification is shown in Common Rear Seat Warning Window with information alert.

Trigger

InhibitDuringDriving_Notification_Request -> 0x1 Active

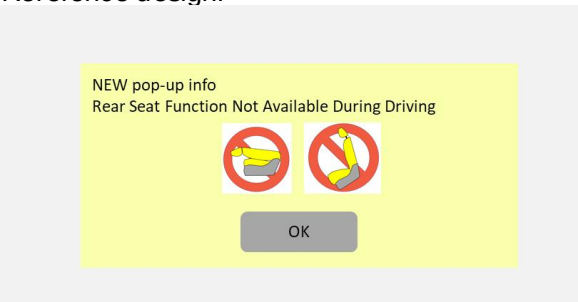
Alert

Information type: 1 * 1s_Alert

Notification popup, will be cleared until

OK pressed;
or 4s timer completed;
or InhibitDuringDriving_Notification_Request -> 0x0 Inactive

Reference design:



Refer to State Machine of Rear Seat Function Inhibit During Driving Notification Window

End of Requirement

2.3 Rear Power Seat Vehicle Setting Menu Return Control

2.3.1 Function Overview

2.3.1.1 Function Description

*#**Hint:** Some descriptive text to explain the purpose and functionality of the function.*

Rear Power Seat Vehicle Setting Menu Return Control function provide user interface in IVI screen to customer to return rear seat to default position by sending CAN signal to rear seat control modules (SCMK/SCML).

2.3.2 Function Scope

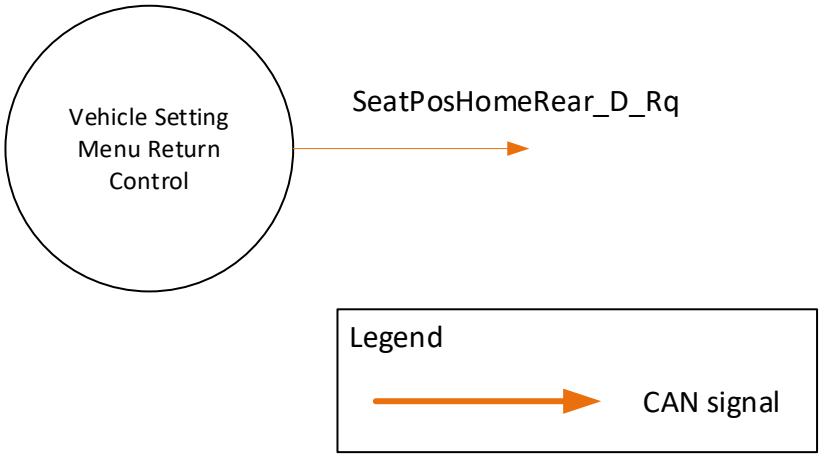


Figure 7: Context Diagram of Function Vehicle Setting Menu Return Control

2.3.3 Function Interfaces

*#**Hint:***
- *First create a Logical Signal in the "Logical Signals" section of the "Data Dictionary". Use Add Ins -> Add Requirement macro (select "Logical Signal" as type).*
- *Insert just a Word reference to the Signal ID, Name and Description (which are bookmarks in the signal/parameter definition in the section in the Data Dictionary).*

*#**Link:** RE Wiki – Adding a Logical Signal or Parameter*

2.3.3.1 Logical (Physical) Outputs

Signal Name	Description
SeatPosHomeRear_D_Rq	Request for the rear seat to return to default position. 0x0 = NoRequest 0x1 = LeftSecondRowSeatReturn 0x2 = RightSecondRowSeatReturn 0x3 = BothSecondRowSeatReturn ~~0x4 = LeftThirdRowSeatReturn~~ ~~0x5 = RightThirdRowSeatReturn~~ ~~0x6 = BothThirdRowSeatReturn~~ 0x7~0xF = NotUsed

2.3.3.2 Logical Parameters

*#**Hint**: Put requirements for parameters here, which are implemented as configuration parameters using Method 2 or 3 or as parameters for calibration.*

Parameter Name	Description
RearPowerSeat_Cfg	On/off the Rear Power Seat related function, include HMI Output Arbitrator, HMI Display, Return Control Menu, voice control command

2.3.4 Function Modeling

*#**Classification:** Mandatory*
*#**Hint:** Typical modeling artifacts in this section are State Machines, Activity Diagrams / Flow Charts, Decision Tables, and possibly Sequence Diagrams, which can all be used as techniques to analyze the function requirements.*

It is highly recommended to use at least one of the following modeling techniques for modeling and analyzing the Function behavior and derived requirements (refer to sample diagrams below): State Machines, Activity Diagrams / Flow Charts, or Decision Tables

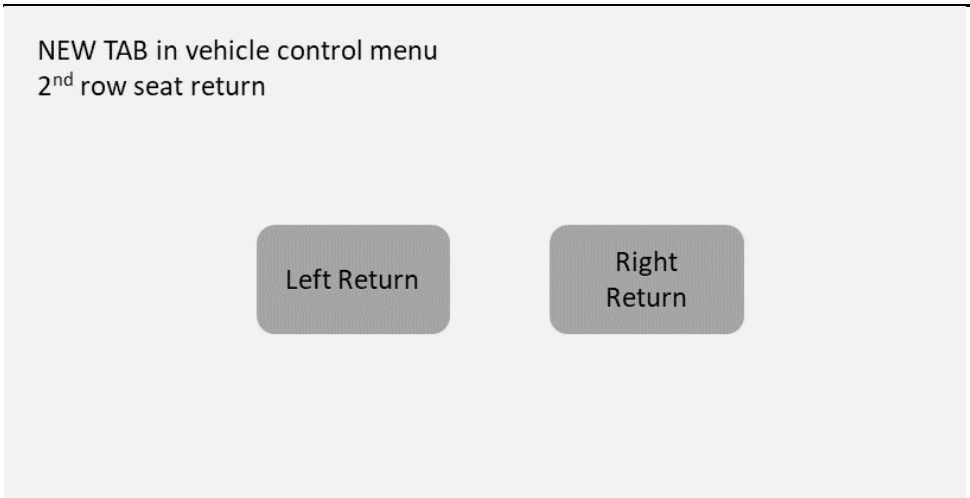
*#**Links:** Analyze / Model Requirements: RE Wiki – Analyze / Model Requirements*

2.3.4.1 Use Cases

*#**Classification:** Infotainment Only (remove section, if not used)*
*#**Hint:** Some Domains (e.g. Infotainment) use not only Customer Use Cases (in the Feature Doc), but refine Use Case descriptions down to function level. In general, the RE approach encourages the use of Use Cases on Feature Level but not on Function Level. Activity Diagrams are a more suitable way to express the same on Function Level.*
*#**Links:** Infotainment – "Harmony Systems Engineering" Approach*

Use case flow:

1. Passenger use any 2nd row power seat function and seat in any position not intent;
2. Driver press IVI soft button in setting menu to return rear left or right seat to default;
3. CAN Signal sent out with corresponded value to CAN bus.



2.3.5 Function Requirements

#Macro: Add Ins -> Add Requirement macro (select "FNC" as ID Prefix, the function name as ID Infix (Short Name) and "Requirement" as type)
#Link: RE Wiki – How to write good requirements

2.3.5.1 Functional Requirements

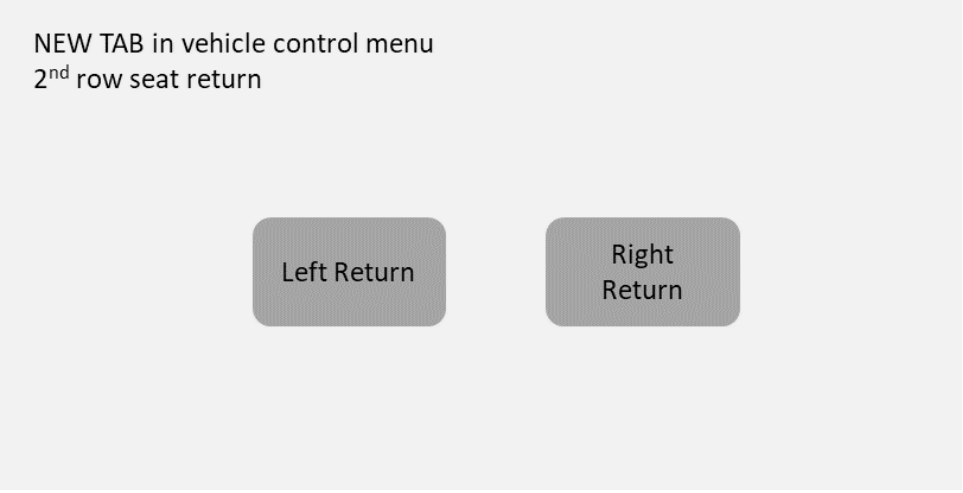
*#**Hint:** Please also consider specific situations like Initialization (Startup) and Deinitialization (Shutdown) apart from Normal Operation and Error Handling. E.g. a state chart or activity diagram in* section "*Function Modeling*" might *help for better understanding.*

2.3.5.1.1 Normal Operation

###R_FNC_U6XXICA RearPowerSeat - IVI_13### Vehicle Setting Menu Return Control General Requirement

Vehicle Setting Menu Return Control function provide a menu with 2 soft buttons for customer to return rear seat (2nd row) to default position.
Buttons:
Left Rear Seat Return
Right Rear Seat Return

Reference design:



End of Requirement

###R_FNC_U6XXICA RearPowerSeat - IVI_14### Vehicle Setting Menu Return Button CAN Signal Output

If Left Rear Seat Return or Right Rear Seat Return button pressed on Vehicle Setting Menu, 3 continuous frames of SeatPosHomeRear_D_Rq = 0x1 LeftSecondRowSeatReturn or 0x2 RightSecondRowSeatReturn shall be published on CAN bus, then SeatPosHomeRear_D_Rq back to 0x0.

This CAN signal sent event shall not be interrupted by any other SeatPosHomeRear_D_Rq send request, any new send request raised during sent event shall wait for 3 continuous frames finished published.

This requirement not only apply to above send request, but also apply to any none zero value SeatPosHomeRear_D_Rq send request.

End of Requirement

2.4 Rear Power Seat Voice Command Return Control

2.4.1 Function Overview

2.4.1.1 Function Description

*#**Hint:** Some descriptive text to explain the purpose and functionality of the function.*

Rear Power Seat Voice Command Return Control function provide voice control command in IVI to customer to return rear seat to default position by sending CAN signal to rear seat control modules (SCMK/SCML).

2.4.2 Function Scope

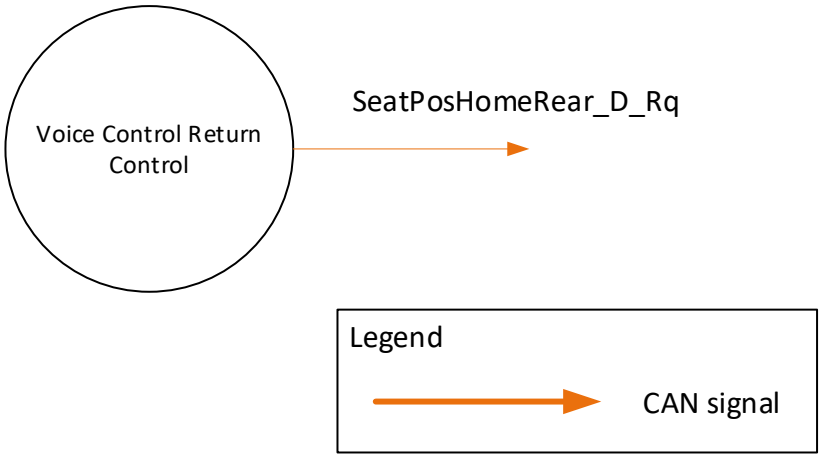


Figure 8: Context Diagram of Function Voice Command Return Control

2.4.3 Function Interfaces

*#**Hint:***
- *First create a Logical Signal in the "Logical Signals" section of the "Data Dictionary". Use Add Ins -> Add Requirement macro (select "Logical Signal" as type).*
- *Insert just a Word reference to the Signal ID, Name and Description (which are bookmarks in the signal/parameter definition in the section in the Data Dictionary).*

*#**Link:*** RE Wiki – Adding a Logical Signal or Parameter

2.4.3.1 Logical (Physical) Outputs

Signal Name	Description
SeatPosHomeRear_D_Rq	Request for the rear seat to return to default position. 0x0 = NoRequest 0x1 = LeftSecondRowSeatReturn 0x2 = RightSecondRowSeatReturn 0x3 = BothSecondRowSeatReturn ~~0x4 = LeftThirdRowSeatReturn~~ ~~0x5 = RightThirdRowSeatReturn~~ ~~0x6 = BothThirdRowSeatReturn~~ 0x7~0xF = NotUsed

2.4.3.2 Logical Parameters

*#**Hint**: Put requirements for parameters here, which are implemented as configuration parameters using Method 2 or 3 or as parameters for calibration.*

Parameter Name	Description
RearPowerSeat_Cfg	On/off the Rear Power Seat related function, include HMI Output Arbitrator, HMI Display, Return Control Menu, voice control command

2.4.4 Function Modeling

*#**Classification:** Mandatory*
*#**Hint:** Typical modeling artifacts in this section are State Machines, Activity Diagrams / Flow Charts, Decision Tables, and possibly Sequence Diagrams, which can all be used as techniques to analyze the function requirements.*

It is highly recommended to use at least one of the following modeling techniques for modeling and analyzing the Function behavior and derived requirements (refer to sample diagrams below): State Machines, Activity Diagrams / Flow Charts, or Decision Tables

*#**Links:** Analyze / Model Requirements: RE Wiki – Analyze / Model Requirements*

2.4.4.1 Use Cases

*#**Classification:** Infotainment Only (remove section, if not used)*
*#**Hint:** Some Domains (e.g. Infotainment) use not only Customer Use Cases (in the Feature Doc), but refine Use Case descriptions down to function level. In general, the RE approach encourages the use of Use Cases on Feature Level but not on Function Level. Activity Diagrams are a more suitable way to express the same on Function Level.*
*#**Links:** Infotainment – "Harmony Systems Engineering" Approach*

Use case flow:

1. Customer use voice control command to return rear seat;
2. CAN Signal sent out with corresponded value to CAN bus.
3. IVI provide customer feedback regardless of operating result

Voice Command	"恢复二排座椅"	Return 2nd row both side seat to default position
	"恢复二排左侧座椅"	Return 2nd row left side seat to default position
	"恢复二排右侧座椅"	Return 2nd row right side seat to default position
Feedback	"好的"	

2.4.5 Function Requirements

#Macro: Add Ins -> Add Requirement macro (select "FNC" as ID Prefix, the function name as ID Infix (Short Name) and "Requirement" as type)

#Link: RE Wiki – How to write good requirements

2.4.5.1 Functional Requirements

#**Hint:** *Please also consider specific situations like Initialization (Startup) and Deinitialization (Shutdown) apart from Normal Operation and Error Handling. E.g. a state chart or activity diagram in* section "*Function Modeling*" might *help for better understanding.*

2.4.5.1.1 Normal Operation

###R_FNC_U6XXICA RearPowerSeat - IVI_15### Voice Command Return Control General Requirement

Voice Command Return Control function provide 3 voice command for customer to return rear seat (2nd row) to default position, and provide customer feedback if CAN signal sent out regard less of module operation result.
Voice command:

"恢复二排座椅"	Return 2nd row both side seat to default position
"恢复二排左侧座椅"	Return 2nd row left side seat to default position
"恢复二排右侧座椅"	Return 2nd row right side seat to default position

Feedback:

"好的"	OK

End of Requirement

###R_FNC_U6XXICA RearPowerSeat - IVI_16### Voice Command Return Control CAN Signal Output

If any voice command recognized by IVI, 3 continuous frames of SeatPosHomeRear_D_Rq shall be published on CAN bus, then SeatPosHomeRear_D_Rq back to 0x0.

Voice Command	Description	SeatPosHomeRear_D_Rq
"恢复二排座椅"	Return 2nd row both side seat to default position	0x3 = BothSecondRowSeatReturn
"恢复二排左侧座椅"	Return 2nd row left side seat to default position	0x1 = LeftSecondRowSeatReturn
"恢复二排右侧座椅"	Return 2nd row right side seat to default position	0x2 = RightSecondRowSeatReturn

This CAN signal sent event shall not be interrupted by any other SeatPosHomeRear_D_Rq send request, any new send request raised during sent event shall wait for 3 continuous frames finished published.

This requirement not only apply to above send request, but also apply to any none zero value SeatPosHomeRear_D_Rq send request.

End of Requirement

3 OPEN CONCERNS

*#**Hint:** The following list presents open concerns, which have to be discussed or clarified over the course of the on-going requirements engineering.*

ID	Concern Description	e-Tracker / Reference	Responsible	Status	Solution
1					
2					
3					
4					
5					
6					
7					
8					
9					

Table 5: Open Concerns

4 REVISION HISTORY

Revision	Date	Description	Approved by	Responsible
A		Initial version		
V1.1		1. Update Figure 2: State Machine of Common_Warning_Request a. Refine jump condition 2. Update Figure 6: State Machine of Common Rear Seat Warning Window a. Modify SLR cycle number from 2 -> 6 to be consistent with SBR 3. Corresponded update R_FNC_U6XXICA RearPowerSeat - IVI_09### Rear Seat Lock Reminder Warning		
V1.2		1. Update Function Rear Power Seat HMI Output Arbitrator a. Replace Common_Warning_Request with 3 separate siganl: i. SLR_Warning_Request ii. InhibitByOccupy_Notification_Request iii. InhibitDuringDriving_Notification_Request b. Update accordingly i. Figure 1: Context Diagram of Function HMI Output Arbitrator ii. Logic output iii. Delete state machine for Common_Warning_Request iv. Add decision table for 1. SLR_Warning_Request 2. InhibitByOccupy_Notification_Request 3. InhibitDuringDriving_Notification_Request v. R_FNC_U6XXICA RearPowerSeat - IVI_01 vi. Delete R_FNC_U6XXICA RearPowerSeat - IVI_02 2. Update Function Rear Power Seat HMI Display a. Replace Common Warning Window with 3 individual window: i. Rear Seat Lock Reminder Warning Window ii. Rear Seat Function Inhibit By Occupied Notification Window iii. Rear Seat Function Inhibit During Driving Notification Window b. Update accordingly i. Delete state machine for Common Warning Window ii. Add state machine for		

		1. Rear Seat Lock Reminder Warning Window 2. Rear Seat Function Inhibit By Occupied Notification Window 3. Rear Seat Function Inhibit During Driving Notification Window iii. R_FNC_U6XXICA RearPowerSeat - IVI_04### Popup Window Priority iv. R_FNC_U6XXICA RearPowerSeat - IVI_09/10/11		
V1.3		1. Replace "Chime" with "Alert" to avoid misunderstand 2. Modify warning 3 ding -> 3 * 0.5s_Alert 3. Modify warning 5 ding -> 5 * 0.5s_Alert 4. Modify information 1ding -> 1 * 1s_Alert 5. Modify REQ Alert Audio Channel, add "Alert shall use software audio notification channel, not low layer chime channel" to define software solution of alert		
V1.4		1. Correct timer logic in State Machine of Rear Seat Lock Reminder Warning Window to comply with requirement 2. Update popup window priority and alert priority, totally 3 classes to put SLR in highest priority		

6	0b	2019-07-02	• "Important" box added on cover sheet which points to the macros • Chapters “References” and “Glossary” moved back up to section “Introduction • Chapter “Inputs Requirements”” reworked	
6	0b	2019-09-09	• Function Spec derived from Function Group Spec, version 6.b by removing those sections, which make no sense when specifying a single function (driven by AV team request). • Chapter 2.4 has now one section per modeling technique again. This is to allow more intuitive tailoring of the section (driven by AV team request).	
			•	

5 APPENDIX

5.1 Data Dictionary

5.1.1 Logical Signals

*#**Macro:** Add Ins -> Add Requirement macro (select "Logical Signal" as type)*

###LSG_SeatMtnRlMsgTxt_D_Rq_01### LSG_SeatMtnRlMsgTxt_D_Rq

<Signal Description>

ASIL		Choose an item.
Encoding Type Name		<If you reuse an existing encoding type, fill in the Encoding Type Name in this field and delete fields below. Otherwise leave the Encoding Type Name field blank and fill in relevant fields below>
Note: An encoding is either discrete or continuous. Delete fields below which are not needed		
Value (Continuous Encoding)	Min Value	
	Max Value	
	Resolution	
	Offset	
Value (Discrete Encoding)	Value 1	Interpretation of value 1
	Value 2	…
	…	…
Unit		

###LSG_SeatMtnRrMsgTxt_D_Rq_02### LSG_SeatMtnRrMsgTxt_D_Rq

<Signal Description>

ASIL		Choose an item.
Encoding Type Name		<If you reuse an existing encoding type, fill in the Encoding Type Name in this field and delete fields below. Otherwise leave the Encoding Type Name field blank and fill in relevant fields below>
Note: An encoding is either discrete or continuous. Delete fields below which are not needed		
Value (Continuous Encoding)	Min Value	
	Max Value	
	Resolution	
	Offset	
Value (Discrete Encoding)	Value 1	Interpretation of value 1
	Value 2	…
	…	…
Unit		

5.1.2 Logical Parameters

*#**Macro:** Add Ins -> Add Requirement macro (select "Logical Parameter" as type)*

5.1.3 Encoding Types

*#**Macro:** Add Ins -> Add Requirement macro (select "Encoding Type" as type)*

Document ends here.