Research & Vehicle Technology
"Infotainment Systems Product Development"

Feature – Multi-Camera Client

APIM Infotainment Subsystem Part Specific Specification (SPSS)

Version 1.11

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Version Date: October 2, 2019

FORD CONFIDENTIAL

Revision History

Date	Version	Notes	
May 31, 2013	**1.0**	**Initial Release**	
January 16, 2015	**1.1**	**SPSS Updated to add soft button view implementation**	
	RVCv2-IR-REQ-014080/B-Rear View Camera Feature ID Definition (TcSE ROIN-287010-3)	rpaquet2 - Updated encodings in table	
	MD-REQ-014070/A-Feature_St (TcSE ROIN-282399-2)	sorris1: Updated the Personalization Index parameter encoding to match the CAN database.	
	DAFVCv1-IR-REQ-014066/B-Driver Assist Front View Camera Feature ID Definition (TcSE ROIN-287061)	rpaquet2 - Updated encodings	
	MD-REQ-014070/A-Feature_St (TcSE ROIN-282399-2)	sorris1: Updated the Personalization Index parameter encoding to match the CAN database.	
	STR-052389/B-Rear View Camera (TcSE ROIN-293312-1)	rpaquet2 - Added two new variants Camera image View v3 and Rear View Camera Zoom Settings v3 to cover the new way of zooming and soft button inputs.	
	RVC-FUR-REQ-014088/B-Deactivate RVC (TcSE ROIN-293328)	rpaquet2 - Added new text to clarify Forward gear and Park no prak for Manual transmission applications.	
	CAMERA-FUR-REQ-014093/B-Camera Image Priority (TcSE ROIN-264652-1)	rpaquet2 - Updated requirement to work for all camera views. no change to requirement intent.	
	RVCv3-UC-REQ-127872/A-Activate Rear Multicamera View	rpaquet2 - New use case	
	RVCv3-UC-REQ-128191/A-Enter CHMSL Delay Mode	rpaquet2 - New use case	
	TRG-UC-REQ-102959/A-Vehicle Not in RUN/START	rpaquet2 - Added use case to multi-camera APIM SPSS	
	TRG-UC-REQ-102960/A-Loss of communication with IPMB Module	rpaquet2 - Added use case to multi-camera APIM SPSS	
	TRG-UC-REQ-102961/A-Valid Camera Video Signal not present	rpaquet2 - Added use case to multi-camera APIM SPSS	
	RVCv3-UC-REQ-128173/A-Press Zoom Button from Rear 360 View	rpaquet2 - New use case	
	RVCv3-UC-REQ-128176/A-Press Zoom Button from Rear Normal View	rpaquet2 - New use case	
	RVCv3-UC-REQ-128179/A-Press Zoom Button from CHMSL View	rpaquet2 - New use case	
	RVCv3-UC-REQ-128188/A-Press Rear 360 Unzoom	rpaquet2 - New use case	
	RVCv3-UC-REQ-128189/A-Press Rear Normal Unzoom	rpaquet2 - New use case	
	RVCv3-UC-REQ-128190/A-Press CHMSL Unzoom	rpaquet2 - New use case	
	RVCv3-ACT-REQ-127095/A-Manual Zoom	rpaquet2: New Requirement	
	RVCv3-UC-REQ-127874/A-Press Rear 360 View Button	rpaquet2 - New use case	
	RVCv3-UC-REQ-128175/A-Press RVC Normal View Button	rpaquet2 - New use case	
	RVCv3-UC-REQ-128177/A-Press RVC Split View Button	rpaquet2 - New use case	
	RVCv3-UC-REQ-128178/A-Press CHMSL Camera View Button	rpaquet2 - New use case	
	RVCv3-UC-REQ-128180/A-Press Aux Camera view Button	rpaquet2 - New use case	
	RVCv3-UC-REQ-128181/A-Press Trailer Reverse Guidance Button	rpaquet2 - New use case	
	RVCv3-UC-REQ-128396/A-Press Hard Button to Enter CHMSL View	rpaquet2 - New Use Case for CHMSL	
	RVCv3-UC-REQ-128397/A-Press Hard Button to Enter RVC View	rpaquet2 - New use case	
	RVCv3-ACT-REQ-127096/A-Change Camera View Setting	rpaquet2: Diagram updated to reflect the change in HMI to go back to soft buttons	
	STR-052463/B-Driver Assist Front View Camera (TcSE ROIN-293325)	rpaquet2 - Added New function variant 2 for Driver Assist Front Camera Image View to capture the soft button implementation.	
	DAFVCv2-UC-REQ-128182/A-Entering Front Camera - 360	rpaquet2 - New use case	
	DAFVCv2-UC-REQ-128184/A-Entering Front Camera – Non-360	rpaquet2 - New use case	
	TRG-UC-REQ-102959/A-Vehicle Not in RUN/START	rpaquet2 - Added use case to multi-camera APIM SPSS	
	TRG-UC-REQ-102960/A-Loss of communication with IPMB Module	rpaquet2 - Added use case to multi-camera APIM SPSS	

	TRG-UC-REQ-102961/A-Valid Camera Video Signal not present	rpaquet2 - Added use case to multi-camera APIM SPSS
	DAFVCv2-UC-REQ-128183/A-Press Front 360 View Button	rpaquet2 - New use case
	DAFVCv2-UC-REQ-128185/A-Press Front Normal View Button	rpaquet2 - New use case
	DAFVCv2-UC-REQ-128186/A-Press Front Split View	rpaquet2 - New use case
	DAFVCv2-UC-REQ-128187/A-Press Rear button From Front camera	rpaquet2 - New use case
	DAFVCv2-ACT-REQ-127100/A-Change Camera View Setting	rpaquet2: Diagram updated to reflect use of soft button implementation.
June 15, 2015	**1.2**	**Updates to Merge Off Road FVC into Multi-Camera and update Max Speed requirements**
	DAFVCv1-IIR-REQ-014069/B-DriverAssistFrontViewCameraClient_Rx (TcSE ROIN-282847-2)	rpaquet2 - Added Elocker_St, AwdRange_St and OffRoadMode_St in order to merge FVC Offroad Camera with MultiCamera.
	STR-052387/B-General Requirements (TcSE ROIN-293327-1)	rpaquet2 - Added Determine Off Road Mode and DAFVC Malfunction and T_cameraMalfunctionDelay. And moved RVC Malfunction to this folder.
	CAMERA-REQ-014077/B-Feature Maximum Speed (TcSE ROIN-290556)	wstephe1: Updated requirement for Max Speed per feature scenario types: camera activation (any feature), RVC active, and DAFVC active by configuration of front (off road) camera. Scenarios to continue application across camera features.
	DAFVCv1-FUR-REQ-166648/A-Determine Off Road Mode	rpaquet2 - New requirement created during merge of Offroad and multi camera specs.
	RVC-FUR-REQ-014087/B-RVC Malfunction (TcSE ROIN-146656-2)	rpaquet2 - Updated requirement per APIM team.
	DAFVCv1-FUR-REQ-166722/A-DAFVC Malfunction	rpaquet2 - Added new requirement per APIM team.
	RVC-TMR-REQ-166649/A-T_cameraMalfunctionDelay	rpaquet2 - Added new timer requirement for delay.
	STR-052390/B-Rear View Camera General Requirements (TcSE ROIN-293310-1)	rpaquet2 - Moved RVC Malfunction from Rear View Camera general requirements folder to the general requirements folder.
	RVC-FUR-REQ-014088/C-Deactivate RVC (TcSE ROIN-293328)	wstephe1: Revised to align with Max Speed requirement CAMERA-REQ-014077
	RVC-UC-REQ-014099/B-Rear Camera Delay Mode is On (TcSE ROIN-289798)	wstephe1: Revised to align with Max Speed requirement CAMERA-REQ-014077
	RVC-UC-REQ-014100/B-Active Park Assist is Active (TcSE ROIN-290554)	wstephe1: Revised to align with Max Speed requirement CAMERA-REQ-014077
	RVC-UC-REQ-014101/B-Trailer Backup Assist is Active (TcSE ROIN-290555)	wstephe1: Revised to align with Max Speed requirement CAMERA-REQ-014077
	RVC-UC-REQ-014099/B-Rear Camera Delay Mode is On (TcSE ROIN-289798)	wstephe1: Revised to align with Max Speed requirement CAMERA-REQ-014077
	RVC-UC-REQ-014100/B-Active Park Assist is Active (TcSE ROIN-290554)	wstephe1: Revised to align with Max Speed requirement CAMERA-REQ-014077
	RVC-UC-REQ-014101/B-Trailer Backup Assist is Active (TcSE ROIN-290555)	wstephe1: Revised to align with Max Speed requirement CAMERA-REQ-014077
	DAFVCv1-FUN-REQ-014045/B-Activate/Deactivate Driver Assist Front View Camera (TcSE ROIN-293385)	rpaquet2 - Added requirement folder with the off road requirement due to merging Offroad and Multicamera SPSS.
	DAFVCv1-FUR-REQ-166641/A-Deactivate FVC	rpaquet2 - New requirement number created during merge of Offroad and multi camera specs due to signal change.
	DAFVCv1-FUR-REQ-013997/B-E-Locker Deactivation Delay (TcSE ROIN-266607-1)	rpaquet2 - Changed FID to DAFVC due to merge of Offroad and Multicamera spec.
	DAFVCv1-TMR-REQ-013998/B-T_eLockerDelay (TcSE ROIN-266609-1)	rpaquet2 - Changed FID to DAFVC due to merge of Offroad and Multicamera spec.
	DAFVCv1-UC-REQ-014048/B-Activation Attempt During Overspeed Condition (TcSE ROIN-290145)	wstephe1: Revised to align with Max Speed requirement CAMERA-REQ-014077
	DAFVCv1-UC-REQ-014049/B-Deactivate Driver Assist Front View Camera (TcSE ROIN-290146)	wstephe1: Revised to align with Max Speed requirement CAMERA-REQ-014077 rpaquet2 - Updated the precondition and Scenario description to combine the Offroad use case for deactivate with that from Multi Camera.
	DAFVCv1-ACT-REQ-014043/B-Activate/Deactivate Driver Assist Front View Camera (TcSE ROIN-282606-3)	rpaquet2 - Added note to diagram to state check Feature Maximum Speed requirement for exit speed value.
	DAFVCv1-SD-REQ-014050/B-Activate_Deactivate Driver Asistance Front View Camera (TcSE ROIN-282617-2)	rpaquet2 - Update diagram to add note to check feature Maximum Speed requirement for exit speed value.
	DAFVCv2-FUN-REQ-128309/B-Activate/Deactivate Driver Assist Front View Camera v2	rpaquet2 - Added requirement folder with the off road requirement due to merging Offroad and Multicamera SPSS.
	STR-246672/A-Requirements	
	DAFVCv1-FUR-REQ-166641/A-Deactivate FVC	rpaquet2 - New requirement number created during merge of Offroad and multi camera specs due to signal change.

	DAFVCv1-FUR-REQ-013997/B-E-Locker Deactivation Delay (TcSE ROIN-266607-1)	rpaquet2 - Changed FID to DAFVC due to merge of Offroad and Multicamera spec.
	DAFVCv1-TMR-REQ-013998/B-T_eLockerDelay (TcSE ROIN-266609-1)	rpaquet2 - Changed FID to DAFVC due to merge of Offroad and Multicamera spec.
	DAFVCv2-UC-REQ-128182/B-Entering Front Camera - 360	wstephe1: Revised to align with Max Speed requirement CAMERA-REQ-014077
	DAFVCv2-UC-REQ-128184/B-Entering Front Camera – Non-360	wstephe1: Revised to align with Max Speed requirement CAMERA-REQ-014077
	DAFVCv1-UC-REQ-014049/B-Deactivate Driver Assist Front View Camera (TcSE ROIN-290146)	wstephe1: Revised to align with Max Speed requirement CAMERA-REQ-014077 rpaquet2 - Updated the precondition and Scenario description to combine the Offroad use case for deactivate with that from Multi Camera.
	DAFVCv1-ACT-REQ-014043/B-Activate/Deactivate Driver Assist Front View Camera (TcSE ROIN-282606-3)	rpaquet2 - Added note to diagram to state check Feature Maximum Speed requirement for exit speed value.
	DAFVCv1-SD-REQ-014050/B-Activate_Deactivate Driver Asistance Front View Camera (TcSE ROIN-282617-2)	rpaquet2 - Update diagram to add note to check feature Maximum Speed requirement for exit speed value.
September 16, 2015	**1.3**	**Updates for Off Road FVC Activation and Max Speed**
	CAMERA-REQ-014077/C-Feature Maximum Speed (TcSE ROIN-290556)	tmertiri-Updated requirement to account for off road changes.
	DAFVCv1-UC-REQ-014046/B-Activate Driver Assist Front View Camera (TcSE ROIN-290143)	tmertiri-Updated uses case to add Off Road Front Camera to the vehicle system indicated indications (via IPMB sending hard button press)
	DAFVCv1-SD-REQ-014050/C-Activate_Deactivate Driver Asistance Front View Camera (TcSE ROIN-282617-2)	tmertiri-removed scenario of pre and post condition from sequence diagram requirement. Already defined in the use cases.
	DAFVCv1-SD-REQ-014050/C-Activate_Deactivate Driver Asistance Front View Camera (TcSE ROIN-282617-2)	tmertiri-removed scenario of pre and post condition from sequence diagram requirement. Already defined in the use cases.
October 19, 2016	**1.4**	
	RVC-FUR-REQ-014088/D-Deactivate RVC (TcSE ROIN-293328)+	tmertiri: updated Reverse can signal name
	RVC-FUR-REQ-014090/B-Display RVC Video (TcSE ROIN-194462-2)+	tmertiri: replaces old signal name to new one. GearRvrse_D_Actl.
	STR-052391/B-Use Cases (TcSE ROIN-293353)	tmertiri: updated use case
	UC-REQ-238578/A-CHMSL Activation. Soft button press	tmertiri: updated use case
	UC-REQ-238579/A-AUX Activation. Soft button press	tmertiri: updated use case
	RVCv3-UC-REQ-128180/B-Press Aux Camera view Button	tmertiri: updated use case
	RVCv3-UC-REQ-128396/B-Press Hard Button to Enter CHMSL View	tmertiri: updated use case
January 19, 2018	**1.5**	
	RVC-REQ-292389/A-GearRvrse_D_Actl	tmertiri: Added new signal name
	RVC-REQ-292387/A-GearPos_D_Trg	tmertiri: Added new signal name
	RVC-REQ-292388/A-Veh_V_ActlEng	tmertiri: Added new signal name
	RVC-FUR-REQ-014090/D-Display RVC Video (TcSE ROIN-194462-2)	tmertiri: updated with new signal names
	RVCv2-SD-REQ-014104/B-Activate Rear View Camera (TcSE ROIN-282316-2)	Updated SD with new signals
	RVCv2-SD-REQ-014105/B-Deactivate Rear View Camera (TcSE ROIN-282323-2)	Updated SD with new signals
February 1, 2018	**1.6**	
	RVC-FUR-REQ-014090/E-Display RVC Video (TcSE ROIN-194462-2)	tmertiri: Update wording
July 27, 2018	**1.7**	
	RVC-FUR-REQ-014090/F-Display RVC Video (TcSE ROIN-194462-2)	tm: Remove DE values details.
November 7, 2018	**1.8**	
	RVCv2-IR-REQ-014080/C-Rear View Camera Feature ID Definition (TcSE ROIN-287010-3)	tmertiri: added additonal camera views
	MD-REQ-014071/B-CameraServerButton_St (TcSE ROIN-287063-1)	tmertiri: added signal name

	DAFVCv1-IR-REQ-014066/C-Driver Assist Front View Camera Feature ID Definition (TcSE ROIN-287061)	tmertiri:Update encoding table
	DAFVCv1-IIR-REQ-014067/B-DriverAsssitFrontViewCameraClient_Tx (TcSE ROIN-282846-1)	tmertiri: Added new signals
	MD-REQ-331342/A-CamraFrntBttn_D_Stat3	tmertiri: New signal added
	DAFVCv1-IIR-REQ-014069/C-DriverAssistFrontViewCameraClient_Rx (TcSE ROIN-282847-2)	tmertiri: added LIN details
	MD-REQ-331343/A-Camera Button LIN signal	tmertiri: new requirement added
	MD-REQ-331847/A-CamraFrntOffRd_B_Stat	tmertiri: New signal
	STR-052387/C-General Requirements (TcSE ROIN-293327-1)	tmertiri: Added new requirement.
	REQ-331344/A-Button Press Logic	tmertiri: new requirement
	DAFVCv1-FUR-REQ-166648/B-Determine Off Road Mode	tmertiri:Update requirement
	REQ-331863/A-Lin Button Client Operation	tmertiri: New diagram
	STR-052463/C-Driver Assist Front View Camera (TcSE ROIN-293325)	tmertiri:Modified diagrams for LIN button interface
	STR-052307/B-Sequence Diagrams (TcSE ROIN-293389)	tmertiri: added new diagram
	REQ-331856/A-Lin Button Camera Request	tmertiri: new diagram
December 18, 2018	**1.9**	
	RVCv2-IR-REQ-014080/D-Rear View Camera Feature ID Definition (TcSE ROIN-287010-3)	tmertiri: added additional camera views
	MD-REQ-014084/B-ParkBrake_St (TcSE ROIN-287064-1)	tmertiri:no content change
	MD-REQ-014085/B-ElectronicParkBrake_St (TcSE ROIN-287065-1)	tmertiri: add clarification verbiage
	DAFVCv1-IR-REQ-014066/D-Driver Assist Front View Camera Feature ID Definition (TcSE ROIN-287061)	tmertiri: Update table
	DAFVCv1-IIR-REQ-014067/C-DriverAssistFrontViewCameraClient_Tx (TcSE ROIN-282846-1)	tmertiri: fix typo in title
	STR-052388/B-Functional Definition (TcSE ROIN-293326-1)	tmertiri: added offset view
	REQ-331856/B-Lin Button Camera Request	tmertiri: verbiage correction in the boxlines
	CAMERA-FUN-REQ-331348/A-Offset View	tmertiri: new usecases
	CAMERA-UC-REQ-331349/A-Press Rear Offset View Button from Rear 360	tmertiri: new usecases Dec 14
	CAMERA-UC-REQ-331350/A-Press Rear Offset View Button from Front 360	tmertiri: new usecases
	CAMERA-UC-REQ-331351/A-Press Rear Left Corner View Button from Rear 360	tmertiri: new usecases
	CAMERA-UC-REQ-331352/A-Press Rear Left Corner View Button from Front 360	tmertiri: new usecases
	CAMERA-UC-REQ-331353/A-Press Rear Right Corner View Button from Rear 360	tmertiri: new usecases
	CAMERA-UC-REQ-331354/A-Press Rear Right Corner View Button from Front 360	tmertiri: new usecases
	CAMERA-UC-REQ-331356/A-Press Front Offset View Button from Rear 360	tmertiri: new usecases
	CAMERA-UC-REQ-331360/A-Press Front Offset View Button from Front 360	tmertiri: new usecases
	CAMERA-UC-REQ-331365/A-Press Front Left Corner View Button from Rear 360	tmertiri: new usecases
	CAMERA-UC-REQ-331369/A-Press Front Left Corner View Button from Front 360	tmertiri: new usecases
	CAMERA-UC-REQ-331373/A-Press Front Right Corner View Button from Rear 360	tmertiri: new usecases
	CAMERA-UC-REQ-331374/A-Press Front Right Corner View Button from Front 360	tmertiri: new usecases
April 26, 2019	**1.10**	
	RVCv2-IR-REQ-014080/E-Rear View Camera Feature ID Definition (TcSE ROIN-287010-3)	tmertiri: added rock crawl views
	RVC-MD-REQ-292389/B-GearRvrse_D_Actl	tmertiri: clarified what to consider as reverse
	DAFVCv1-IR-REQ-014066/E-Driver Assist Front View Camera Feature ID Definition (TcSE ROIN-287061)	tmertiri: added rock crawl views

	RVCv2-IIR-REQ-014086/C-VehicleInformation_Tx (TcSE ROIN-282400-2)	tmertiri: Structural change. Added to conent in this structure.
	MD-REQ-347573/A-PowerMode	tmertiri: added for clarification. needed only in CGEA 1.2
	RVC-FUR-REQ-014090/G-Display RVC Video (TcSE ROIN-194462-2)	tmertiri: update the GeaRvrse_D_Actl New Strategy
October 2, 2019	**1.11**	
	RVCv2-IR-REQ-014080/F-Rear View Camera Feature ID Definition (TcSE ROIN-287010-3)	tmertiri: added Views at Speed Configs
	DAFVCv1-IR-REQ-014066/F-Driver Assist Front View Camera Feature ID Definition (TcSE ROIN-287061)	tmertiri: adding Views At Speed
	MD-REQ-331342/B-CamraFrntBttn_D_Stat3	tmertiri: updating requirement. Adding Soft Press origins
	CAMERA-REQ-331344/B-Button Press Logic	tmertiri: no content changes
	CAMERA-REQ-331863/B-Lin Button Client Operation	tmertiri: no content change
	STR-052388/C-Functional Definition (TcSE ROIN-293326-1)	tmertiri:revised to allow views at speed function
	STR-669257/A-Views At Speed	tmertiri: new section
	CAMERA-FUN-REQ-354982/A-Views At Speed	tmertiri: new section
	STR-669258/A-Requirements	tmertiri: new section
	CAMERA-REQ-354992/A-Views At Speed Availability	tmertiri: new req
	CAMERA-REQ-354993/A-Views At Speed List	tmertiri: new req
	CAMERA-REQ-358450/A-Off Road Mode Views At Speed	tmertiri: new req
	STR-669259/A-Use Cases	tmertiri: new section
	CAMERA-UC-REQ-355016/A-Views At Speed Trigger	tmertiri: new usecase
	STR-669260/A-White Box Views	tmertiri: new section
	STR-673941/A-Activity Diagram	tmertiri: new diagram
	CAMERA-ACT-REQ-358468/A-Views At Speed	tmertiri: new diagram
	STR-669262/A-Sequence Diagram	tmertiri: new section
	CAMERA-SD-REQ-354994/A-Views At Speed	tmertiri: new SD

Table of Contents

1 Architectural Design

1.1 RVC-CLD-REQ-014079/A-Rear View Camera Client (TcSE ROIN-282382-1)

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

1.2 DAFVCv1-CLD-REQ-014064/A-Driver Assist Front View Camera Client (TcSE ROIN-282843-1)

Responsibility: The Driver Assist Front View Camera Client is the interface of the Driver Assist Front View Camera function. It acts with other system parts that control the Driver Assist Front View Camera or need data from it.

1.3 RearViewCameraClient Interface

1.3.1 RVCv2-IR-REQ-014080/F-Rear View Camera Feature ID Definition (TcSE ROIN-287010-3)

The below table defines the Feature ID information related to the Feature Based Message Protocol command and control method used in the Rear View Camera feature.

Feature Name	Feature ID	Config Number	Config Value
Rear Camera Visual Park Aid Overlays	0x080A	0x01	On
		0x00	Off
All Overlays	0x0812	0x01	On
		0x00	Off
Rear Camera Static Overlays	0x0818	0x01	On
		0x00	Off
Rear Camera Dynamic Overlays	0x0819	0x01	On
		0x00	Off
Manual Zoom	0x081A	0x00	Off
		0x01	Level 1
		0x02	Level2
		0x03	Level3

Feature Name	Feature ID	Config Number	Config Value
Camera Showing	0x081B	0x00	Off
		0x01	Front
		0x02	Rear
		0x03	Remote
		0x04	Rear 360
		0x05	Rear Normal
		0x06	Rear Split
		0x07	Front 360
		0x08	Front Normal
		0x09	Front Split
		0x0A	Rear Zoom
		0x0B	CHMSL

		0x0C	CHMSL Zoom
		0x0D	AUX
		0x0E	TRG
		0x0F	TRG Rear Normal
		0x10	Straight Back Up Mode
		0x11	TBA2 Rear Split
		0x12	TBA2 Rear 360
		0x13	TBA2 CHMSL
		0x14	TBA2 Aux
		0x15	TBA2 50/50
		0x16	TBA2 Rear Normal
		0x17	Auto Hitch Rear Normal
		0x18	Rear Frwd Offset
		0x19	Rear Rrwd Offset
		0x1A	Front Frwd Offset
		0x1B	Front Rrwd Offset
		0x1C	Rear FL Corner
		0x1D	Rear FR Corner
		0x1E	Rear RL Corner
		0x1F	Rear RR Corner
		0x20	Front FL Corner
		0x21	Front FR Corner
		0x22	Front RL Corner
		0x23	Front RR Corner
		0x24	Rock Crawl Front
		0x25	Rock Crawl Rear
		0x26	Hitch
		0x27	Rear Camera On Demand (360)

1.3.2 RVCv2-IIR-REQ-014081/A-RearViewCameraClient_Tx (TcSE ROIN-282395-3)

1.3.2.1 MD-REQ-014068/A-Feature_Rq (TcSE ROIN-282333-2)

Message Type: Request

Represents the request to command a feature change (select new feature, change feature setting, query features, etc.).

Included Parameters:
Operation
FeatureID
Configuration
PersIndex

Name	Literals	Value	Description
Operation	-	-	Type of operation being requested
	Null	0x0	
	Query	0x1	
	Set	0x2	

	Upload	0x3	
	Restore	0x4	
	Copy	0x5	
	NotUsed	0x6 – 0x7	
FeatureID	-	-	Feature number being requested
		0x0000 – 0xFFFF	
Configuration	-	-	Configuration value being requested
		0x0000 – 0xFFFF	
PersIndex	-	-	Indicates which personality profile is being accessed
	PERS_1	0x0	
	PERS_2	0x1	
	PERS_3	0x2	
	PERS_4	0X3	
	VEHICLE	0X4	
	Not Used	0x5	
	Not Used	0x6	
	Not Used	0x7	

1.3.3 RVCv2-IIR-REQ-014082/B-RearViewCameraClient_Rx (TcSE ROIN-282396-3)

1.3.3.1 MD-REQ-014070/A-Feature_St (TcSE ROIN-282399-2)

Message Type: Status

Represents the current status of a feature (feature selected, feature setting, etc.).

Included Parameters:
FeatureID
Configuration
PersIndex

Name	Literals	Value	Description
FeatureID	-	-	Active feature number
		0x0000 – 0xFFFF	
Configuration	-	-	Active configuration value
		0x0000 – 0xFFFF	
PersIndex	-	-	Indicates which personality profile is active
	PERS_1	0x0	
	PERS_2	0x1	
	PERS_3	0x2	
	PERS_4	0X3	
	VEHICLE	0X4	
	Not Used	0x5	
	Not Used	0x6	
	Not Used	0x7	

1.3.3.2 MD-REQ-014083/A-PJB_Bootlid_St (TcSE ROIN-282394-1)

Message Type: Status

Vehicle status message to indicate when the decklid/liftgate is ajar.

Name	Literals	Value	Description

Type	-	-	-
	TrunkClosed	0x0	
	TrunkOpen	0x1	

1.3.3.3 MD-REQ-014023/A-GearLvrPos_D_Actl (TcSE ROIN-266648-1)

Message Type: Status

Vehicle status signal for the Gear Lever Position on an automatic transmission vehicle.

Name	Literals	Value	Description
Type	-	-	-
	Park	0x0	
	Reverse	0x1	
	Neutral	0x2	
	Drive	0x3	
	Sport_DriveSport	0x4	
	Low	0x5	
	First	0x6	
	Second	0x7	
	Third	0x8	
	Fourth	0x9	
	Fifth	0xA	
	Sixth	0xB	
	Undefined_Treat_as_Fault	0xC	
	Undefined_Treat_as_Fault1	0xD	
	Unknown_Position	0xE	
	Fault	0xF	

1.3.3.4 MD-REQ-014024/A-GearRvrseActv_D_Actl (TcSE ROIN-266649-1)

Message Type: Status

Vehicle status signal for notifying that Reverse Gear is engaged on a manual transmission vehicle.

Name	Literals	Value	Description
Type	-	-	-
	Inactive	0x0	
	Active	0x1	
	Unknown	0x2	
	Fault	0x3	

1.3.3.5 MD-REQ-014025/A-VehicleSpeed_St (TcSE ROIN-223023-1)

Message Type: Status

Status used to indicate vehicle speed.

Name	Literals	Value	Description
Type	-	-	Indicates vehicle speed. Unit: kph Resolution:0.01 Offset:0
	kph	0x0 to 0xFFFF	

1.3.3.6 MD-REQ-014084/B-ParkBrake_St (TcSE ROIN-287064-1)

Message Type: Status

Signal used to indicate the Parking Brake status.

Name	Literals	Value	Description
Type	-	-	-
	Inactive	0x0	
	Active	0x1	

1.3.3.7 MD-REQ-014085/B-ElectronicParkBrake_St (TcSE ROIN-287065-1)

Message Type: Status

Signal used to indicate the Electronic Parking Brake status.

Name	Literals	Value	Description
Type	-	-	-
	NotUsed	0x0	
	Rear_Caliper_Closed	0x1	
	Rear_Caliper_Transition	0x2	
	RWU_By_EPB_Active	0x3	
	Rear_Caliper_Open	0x4	
	EPB_Limphome_Active	0x5	
	ECD_by_Brake_ECU_Active	0x6	
	GeneralFault_MaintenceMode	0x7	

Electronic Park Brake is considered active when the signal has a value of 0x1 (Rear_Caliper_Closed)

1.3.3.8 MD-REQ-014071/B-CameraServerButton_St (TcSE ROIN-287063-1)

Message Type: Status

Signal used to indicate Front Camera Hard Button status. Real Can name: CamraFrntStat_D_Stat

Name	Literals	Value	Description
ButtonState	-	-	-
	Off	0x0	
	On	0x1	
	NotUsed	0x2	
	NoDataPresent	0x3	

1.3.3.9 RVC-MD-REQ-292389/B-GearRvrse_D_Actl

GearRvrse_D_Actl

The purpose of this signal is to notify that Reverse Gear is engaged on a manual transmission vehicle.

$0: Inactive_not_confirmed
$1: Inactive_confirmed
$2: Active_not_confirmed
$3: Active_confirmed
$4: NotUsed_1
$5: NotUsed_2
$6: NotUsed_3
$7: Fault

Reverse status is indicated by both $2 (Active_not_confirmed) and $3 (Active_confirmed)

1.3.3.10 RVC-REQ-292387/A-GearPos_D_Trg

GearPos_D_Trg
This signal is used to indicate Gear direction. Used with other gear signals to determine whether or not RVC is to be turned On or Off.

Name	Literals	Value	Description
Type	-	-	-
	Neutral	0x0	
	First	0x1	
	Second	0x2	
	Third	0x3	
	Fourth	0x4	
	Fifth	0x5	
	Sixth	0x6	
	Seventh	0x7	
	Eighth	0x8	
	Ninth	0x9	
	Tenth	0xA	
	Undefined_3	0xB	
	Undefined_4	0xC	
	Undefined_5	0xD	
	Reverse	0xE	
	Unknown	0xF	

1.3.3.11 RVC-REQ-292388/A-Veh_V_ActlEng

Veh_V_ActlEng
This signal is used to indicate vehicle speed. Refer to database for proper signal values.

1.4 DriverAssistFrontViewCameraClient Interface

1.4.1 DAFVCv1-IR-REQ-014066/F-Driver Assist Front View Camera Feature ID Definition (TcSE ROIN-287061)

The below table defines the Feature ID information related to the Feature Based Message Protocol command and control method used in the Driver Assist Front View Camera feature.

The below table defines the Feature ID information related to the Feature Based Message Protocol command and control method used in the Rear View Camera feature.

Feature Name	Feature ID	Config Number	Config Value
Camera Showing	0x081B	0x00	Off
		0x01	Front
		0x02	Rear
		0x03	Remote
		0x04	Rear 360

		0x05	Rear Normal
		0x06	Rear Split
		0x07	Front 360
		0x08	Front Normal
		0x09	Front Split
		0x0A	Rear Zoom
		0x0B	CHMSL
		0x0C	CHMSL Zoom
		0x0D	AUX
		0x0E	TRG
		0x0F	TRG Rear Normal
		0x10	Straight Back Up Mode
		0x11	TBA2 Rear Split
		0x12	TBA2 Rear 360
		0x13	TBA2 CHMSL
		0x14	TBA2 Aux
		0x15	TBA2 50/50
		0x16	TBA2 Rear Normal
		0x17	Auto Hitch Rear Normal
		0x18	Rear Frwd Offset
		0x19	Rear Rrwd Offset
		0x1A	Front Frwd Offset
		0x1B	Front Rrwd Offset
		0x1C	Rear FL Corner
		0x1D	Rear FR Corner
		0x1E	Rear RL Corner
		0x1F	Rear RR Corner
		0x20	Front FL Corner
		0x21	Front FR Corner
		0x22	Front RL Corner
		0x23	Front RR Corner
		0x24	Rock Crawl Front
		0x25	Rock Crawl Rear
		0x26	Hitch
		0x27	Rear Camera on Demand (360)

1.4.2 DAFVCv1-IIR-REQ-014067/C-DriverAssistFrontViewCameraClient_Tx (TcSE ROIN-282846-1)

1.4.2.1 MD-REQ-014068/A-Feature_Rq (TcSE ROIN-282333-2)

Message Type: Request

Represents the request to command a feature change (select new feature, change feature setting, query features, etc.).

Included Parameters:
Operation
FeatureID
Configuration
PersIndex

Name	Literals	Value	Description
Operation	-	-	Type of operation being requested
	Null	0x0	
	Query	0x1	
	Set	0x2	
	Upload	0x3	
	Restore	0x4	
	Copy	0x5	
	NotUsed	0x6 – 0x7	
FeatureID	-	-	Feature number being requested
		0x0000 – 0xFFFF	
Configuration	-	-	Configuration value being requested
		0x0000 – 0xFFFF	
PersIndex	-	-	Indicates which personality profile is being accessed
	PERS_1	0x0	
	PERS_2	0x1	
	PERS_3	0x2	
	PERS_4	0X3	
	VEHICLE	0X4	
	Not Used	0x5	
	Not Used	0x6	
	Not Used	0x7	

1.4.2.2 MD-REQ-331342/B-CamraFrntBttn_D_Stat3

Message Type: Command

CamraFrntBttn_D_Stat3 : Signal is sent by client to server to request camera view activation/deactivation.

The trigger of this signal can be through a soft button press, which is internally to client or through a hard button connected to client through LIN protocol.

When the trigger of this signal is due to hard button LIN switch press, map this signal according to the details in Req 331343 and Req 331344.

Included Parameters:
Not pressed
Pressed

Name	Literals	Value	Description
Operation	-	-	
	Not pressed	0x0	Switch is not pressed
	Pressed	0x1	Switch is pressed

1.4.3 DAFVCv1-IIR-REQ-014069/C-DriverAssistFrontViewCameraClient_Rx (TcSE ROIN-282847-2)

1.4.3.1 MD-REQ-014070/A-Feature_St (TcSE ROIN-282399-2)

Message Type: Status

Represents the current status of a feature (feature selected, feature setting, etc.).

Included Parameters:
FeatureID
Configuration
PersIndex

Name	Literals	Value	Description
FeatureID	-	-	Active feature number
		0x0000 – 0xFFFF	
Configuration	-	-	Active configuration value
		0x0000 – 0xFFFF	
PersIndex	-	-	Indicates which personality profile is active
	PERS_1	0x0	
	PERS_2	0x1	
	PERS_3	0x2	
	PERS_4	0X3	
	VEHICLE	0X4	
	Not Used	0x5	
	Not Used	0x6	
	Not Used	0x7	

1.4.3.2 MD-REQ-014023/A-GearLvrPos_D_Actl (TcSE ROIN-266648-1)

Message Type: Status

Vehicle status signal for the Gear Lever Position on an automatic transmission vehicle.

Name	Literals	Value	Description
Type	-	-	-
	Park	0x0	
	Reverse	0x1	
	Neutral	0x2	
	Drive	0x3	
	Sport_DriveSport	0x4	
	Low	0x5	
	First	0x6	
	Second	0x7	
	Third	0x8	
	Fourth	0x9	
	Fifth	0xA	
	Sixth	0xB	
	Undefined_Treat_as_Fault	0xC	
	Undefined_Treat_as_Fault1	0xD	
	Unknown_Position	0xE	
	Fault	0xF	

1.4.3.3 MD-REQ-014024/A-GearRvrseActv_D_Actl (TcSE ROIN-266649-1)

Message Type: Status

Vehicle status signal for notifying that Reverse Gear is engaged on a manual transmission vehicle.

Name	Literals	Value	Description
Type	-	-	-
	Inactive	0x0	
	Active	0x1	
	Unknown	0x2	
	Fault	0x3	

1.4.3.4 MD-REQ-014025/A-VehicleSpeed_St (TcSE ROIN-223023-1)

Message Type: Status

Status used to indicate vehicle speed.

Name	Literals	Value	Description
Type	-	-	Indicates vehicle speed. Unit: kph Resolution:0.01 Offset:0
	kph	0x0 to 0xFFFF	

1.4.3.5 MD-REQ-014071/B-CameraServerButton_St (TcSE ROIN-287063-1)

Message Type: Status

Signal used to indicate Front Camera Hard Button status. Real Can name: CamraFrntStat_D_Stat

Name	Literals	Value	Description
ButtonState	-	-	-
	Off	0x0	
	On	0x1	
	NotUsed	0x2	
	NoDataPresent	0x3	

1.4.3.6 MD-REQ-014020/A-Elocker_St (TcSE ROIN-266643-1)

(CAN Name: RearDiffLckLamp_D_Rq)

Message Type: Status

Vehicle status signal for displaying the Electric Differential Locker (Elocker) engagement message to the user.

Name	Literals	Value	Description
Type	-	-	-
	OFF	0x0	
	ON	0x1	
	Flash	0x2	
	Notused	0x3	

1.4.3.7 MD-REQ-014021/A-AwdRange_St (TcSE ROIN-266644-1)

(CAN Name: AwdRnge_D_Actl)

Message Type: Status

Vehicle status signal for the state of the transfer box in terms of range and coupling locking.

"locked" means the AWD coupling / differential is locked.

"auto" means the AWD coupling / differential is under active control (could be locked, open or anywhere in between depending on system).

"2wd" means the AWD coupling is open.

Name	Literals	Value	Description
Type	-	-	-
	LowRangeLocked	0x0	
	LowRangeAuto	0x1	
	LowRange2wd	0x2	
	Neutral	0x3	
	HighRangeLocked	0x4	
	HighRangeAuto	0x5	
	HighRange2wd	0x6	
	Unknown	0x7	

1.4.3.8 MD-REQ-014022/A-OffRoadMode_St (TcSE ROIN-266645-1)

(CAN Name: AwdOffRoadMode_D_Stats)

Message Type: Status

Vehicle status signal for the state of Off Road Mode.

Name	Literals	Value	Description
Type	-	-	-
	NormalMode	0x0	
	OffRoad	0x1	
	ExtemeOffRoad	0x2	
	Invalid	0x3	

1.4.3.9 MD-REQ-014024/A-GearRvrseActv_D_Actl (TcSE ROIN-266649-1)

Message Type: Status

Vehicle status signal for notifying that Reverse Gear is engaged on a manual transmission vehicle.

Name	Literals	Value	Description
Type	-	-	-
	Inactive	0x0	
	Active	0x1	
	Unknown	0x2	
	Fault	0x3	

1.4.3.10 MD-REQ-331343/A-Camera Button LIN signal

Message Type: Command

Represents the state of the physical front camera switch. This signal is the instantaneous status of the LIN switch which is wired to an external ECU. LIN signal name used is ICPBtnID_Camera.

Included Parameters:
Inactive
Active
Short Event
Short Elapsed
Long Event
Stuck
Idle

Name	Literals	Value	Description
Operation	-	-	
	Inactive	0	Switch is not pressed
	Active	1	Switch is pressed
	Short Event	2	Switch is pressed
	Short Elapsed	3	Switch is pressed
	Long Event	4	Switch is pressed
	Stuck	5	Switch is not pressed
	Not used	6-14	Switch is not pressed
	Idle	15	Switch is not pressed

1.4.3.11 MD-REQ-331847/A-CamraFrntOffRd_B_Stat

Message Type: Status

Vehicle status signal as determined by the IPMB for the state of Off Road Mode.

Name	Literals	Value	Description
Type	-	-	-
	Inactive	0x0	
	Active	0x1	

1.5 VehicleInformation Interface

1.5.1 RVCv2-IIR-REQ-014086/C-VehicleInformation_Tx (TcSE ROIN-282400-2)

1.5.1.1 MD-REQ-014083/A-PJB_Bootlid_St (TcSE ROIN-282394-1)

Message Type: Status

Vehicle status message to indicate when the decklid/liftgate is ajar.

Name	Literals	Value	Description
Type	-	-	-
	TrunkClosed	0x0	
	TrunkOpen	0x1	

1.5.1.2 MD-REQ-014023/A-GearLvrPos_D_Actl (TcSE ROIN-266648-1)

Message Type: Status

Vehicle status signal for the Gear Lever Position on an automatic transmission vehicle.

Name	Literals	Value	Description
Type	-	-	-
	Park	0x0	
	Reverse	0x1	
	Neutral	0x2	
	Drive	0x3	
	Sport_DriveSport	0x4	
	Low	0x5	
	First	0x6	
	Second	0x7	
	Third	0x8	
	Fourth	0x9	
	Fifth	0xA	
	Sixth	0xB	
	Undefined_Treat_as_Fault	0xC	
	Undefined_Treat_as_Fault1	0xD	
	Unknown_Position	0xE	
	Fault	0xF	

1.5.1.3 MD-REQ-014024/A-GearRvrseActv_D_Actl (TcSE ROIN-266649-1)

Message Type: Status

Vehicle status signal for notifying that Reverse Gear is engaged on a manual transmission vehicle.

Name	Literals	Value	Description
Type	-	-	-
	Inactive	0x0	
	Active	0x1	
	Unknown	0x2	
	Fault	0x3	

1.5.1.4 MD-REQ-014025/A-VehicleSpeed_St (TcSE ROIN-223023-1)

Message Type: Status

Status used to indicate vehicle speed.

Name	Literals	Value	Description
Type	-	-	Indicates vehicle speed. Unit: kph Resolution:0.01 Offset:0
	kph	0x0 to 0xFFFF	

1.5.1.5 MD-REQ-014084/B-ParkBrake_St (TcSE ROIN-287064-1)

Message Type: Status

Signal used to indicate the Parking Brake status.

Name	Literals	Value	Description
Type	-	-	-
	Inactive	0x0	
	Active	0x1	

1.5.1.6 MD-REQ-014085/B-ElectronicParkBrake_St (TcSE ROIN-287065-1)

Message Type: Status

Signal used to indicate the Electronic Parking Brake status.

Name	Literals	Value	Description
Type	-	-	-
	NotUsed	0x0	
	Rear_Caliper_Closed	0x1	
	Rear_Caliper_Transition	0x2	
	RWU_By_EPB_Active	0x3	
	Rear_Caliper_Open	0x4	
	EPB_Limphome_Active	0x5	
	ECD_by_Brake_ECU_Active	0x6	
	GeneralFault_MaintenceMode	0x7	

Electronic Park Brake is considered active when the signal has a value of 0x1 (Rear_Caliper_Closed)

1.5.1.7 RVC-REQ-292387/A-GearPos_D_Trg

GearPos_D_Trg
This signal is used to indicate Gear direction. Used with other gear signals to determine whether or not RVC is to be turned On or Off.

Name	Literals	Value	Description
Type	-	-	-
	Neutral	0x0	
	First	0x1	
	Second	0x2	
	Third	0x3	
	Fourth	0x4	
	Fifth	0x5	
	Sixth	0x6	
	Seventh	0x7	
	Eighth	0x8	
	Ninth	0x9	
	Tenth	0xA	
	Undefined_3	0xB	
	Undefined_4	0xC	
	Undefined_5	0xD	
	Reverse	0xE	
	Unknown	0xF	

1.5.1.8 MD-REQ-014024/A-GearRvrseActv_D_Actl (TcSE ROIN-266649-1)

Message Type: Status

Vehicle status signal for notifying that Reverse Gear is engaged on a manual transmission vehicle.

Name	Literals	Value	Description
Type	-	-	-
	Inactive	0x0	
	Active	0x1	
	Unknown	0x2	
	Fault	0x3	

1.5.1.9 RVC-MD-REQ-292389/B-GearRvrse_D_Actl

GearRvrse_D_Actl

The purpose of this signal is to notify that Reverse Gear is engaged on a manual transmission vehicle.

$0: Inactive_not_confirmed
$1: Inactive_confirmed
$2: Active_not_confirmed
$3: Active_confirmed
$4: NotUsed_1
$5: NotUsed_2
$6: NotUsed_3
$7: Fault

Reverse status is indicated by both $2 (Active_not_confirmed) and $3 (Active_confirmed)

1.5.1.10 MD-REQ-347573/A-PowerMode

PowerMode
This signal is used in CGEA 1.2 only, not for later architectures.

$0: KeyOut
$1: KeyRecentlyOut
$2: KeyApproved_0
$3: PostAccessory_0
$4: Accessory_1
$5: PostIgnition_1
$6: IgnitionOn_2
$7: Running_2
$8: Not_Used
$9: Crank_3
$A: Not_Used1

2 General Requirements

2.1 REQ-331344/A-Button Press Logic+

When configured for LIN-based camera button logic, the CAN output shall be populated as follows:

Switch Configuration (Method 2)	LIN Input	CamraFrntBttn_D_Stat3
LIN Camera Switch Not Supported	**X**	0x0 (Not pressed)
LIN Camera Switch Supported	0x0 (Inactive)	0x0 (Not pressed)
LIN Camera Switch Supported	0x1 (Active)	0x1 (Pressed)
LIN Camera Switch Supported	0x2 (Short Event)	0x1 (Pressed)
LIN Camera Switch Supported	0x3 (Short Elapsed)	0x1 (Pressed)
LIN Camera Switch Supported	0x4 (Long Event)	0x1 (Pressed)
LIN Camera Switch Supported	0x5 (Stuck)	0x0 (Not pressed)
LIN Camera Switch Supported	0x6-0xE (Not used)	0x0 (Not pressed)
LIN Camera Switch Supported	0xF (Idle)	0x0 (Not pressed)

2.2 CAMERA-REQ-014077/C-Feature Maximum Speed (TcSE ROIN-290556)

The feature maximum speed when displaying a camera image in forward gear shall be as described for each operational scenario below:

Scenario 1: Any camera feature activation attempted by User

a. *Rear Camera*

Feature maximum speed = 10 kph

b. Off Road Front Camera configured: *Not Available*

Feature maximum speed = 10 kph

c. Off Road Front Camera configured: *Available and does NOT meet conditions for Off Road Mode per Determine Off Road Mode requirement*

Feature maximum speed = 10 kph

d. Off Road Front Camera configured: *Available and meets conditions for Off Road Mode per Determine Off Road Mode requirement*

Feature maximum speed = 20 kph

Scenario 2: Rear Camera Active

Feature maximum speed = 10 kph

Scenario 3: Front Camera Active

a. Off Road Front Camera configured: *Not Available*

Feature maximum speed = 10 kph

b. Off Road Front Camera configured: *Available and does NOT meet conditions for Off Road Mode per Determine Off Road Mode requirement*

Feature maximum speed = 10 kph

c. Off Road Front Camera configured: *Available and meets conditions for Off Road Mode per Determine Off Road Mode requirement*

Feature maximum speed = 24 kph

2.3 DAFVCv1-FUR-REQ-166648/B-Determine Off Road Mode

Off Road Mode is considered active when the vehicle is configured for (Off Road Front Camera and hard camera button strategy) and one of the following conditions are true:

1) 4x4 transfer case is locked in 4L (AwdRange_St = 0x0:LowRangeLocked)

or

2) Off-Road Mode is on (OffRoadMode_St = 0x1:OffRoad or 0x2:ExtremeOffRoad)
and
E-Locker is locked (Elocker_St = 0x1:ON)

Off Road Mode is considered active when the vehicle is configured for (Off Road Front Camera and soft camera button strategy) and the following condition is true:

CamraFrntOffRd_B_Stat = Active

When transitioning out of Off Road Mode the Driver Assist Front View Camera Client shall check vehicle speed to determine if condition exists that results in Front View Camera turning off.

Example: Driver Assist Front View Camera Client determines Off Road Mode is no longer active and vehicle speed is 20 kph. The max speed to exit is now 10 kph so the Client shall exit Front View Camera based on Feature Maximum Speed requirement 014077.

2.4 RVC-FUR-REQ-014087/B-RVC Malfunction (TcSE ROIN-146656-2)

When the RVC Client (RearViewCameraClient) does not detect video present in the signal from the camera it shall set a DTC and the RVC Client shall display camera overlays for T_cameraMalfunctionDelay before displaying an error message allowing the user to acknowledge the video error and revert to the previous screen. At any time the video signal is detected RVC client should check for Gear position and show the camera.

2.5 DAFVCv1-FUR-REQ-166722/A-DAFVC Malfunction

When the DAFVC Client (DriverAssistFrontViewCameraClient) does not detect video present in the signal from the camera it shall set a DTC and the DAFVC Client shall display camera overlays for T_cameraMalfunctionDelay before displaying an error message allowing the user to acknowledge the video error and revert to the previous screen. At any time the video signal is detected DAFVC client should check for Gear position and show the camera.

2.6 RVC-TMR-REQ-166649/A-T_cameraMalfunctionDelay

Name	Description	Units	Range	Resolution	Default
T_cameraMalfunctionDelay	Time DAFVC or RVC Client should wait before displaying an error message to the user according to RVC-REQ-	sec	0-30	1	10

	014087-RVC Malfunction or DAFVC-REQ-166649 DAFVC Malfunction.				

2.7 REQ-331863/A-Lin Button Client Operation+

When Client receives signal ICPBtnID_Camera as pressed, it shall send the signal CamraFrntBttn_D_Stat3 with the value Pressed.

3 Functional Definition

3.1 Rear View Camera

3.1.1 Rear View Camera General Requirements

3.1.1.1 RVC-FUR-REQ-014088/E-Deactivate RVC (TcSE ROIN-293328)

The RVC Client (RearViewCameraClient) shall stop displaying RVC video when one of the following conditions is met:

1. Vehicle is shifted out of reverse (Camera Delay = OFF)
2. Vehicle is shifted out of reverse (GearLvrPos_D_Actl does not equal Reverse in automatic Transmission vehicle or GearRvrse_D_Actl or GearRvrseActv_D_Actl does not equal active in Manual Transmission vehicle) and vehicle speed > limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum~~ (Camera Delay = ON)
3. CGEA 1.2:
   Power Mode does not equal IgnitionOn_2 or Running_2 or Crank_3
   CGEA 1.3:
   Ignition_Status does not equal Run
4. Vehicle is shifted into Park
   a) Automatic Transmission vehicle GearLvrPos_D_Actl == 0x0
   b) Manual Transmission Vehicle with Mechanical Park Brake
      GearRvrse_D_Actl == Inactive or GearRvrseActv_D_Actl == Inactive AND PrkBrkActv_B_Actl == Active
   c) Manual Transmission Vehicle with Electronic Park Brake
      GearRvrse_D_Actl == Inactive or GearRvrseActv_D_Actl == Inactive AND PrkBrkStatus == Active

3.1.1.2 RVC-FUR-REQ-014089/A-Decklid/Liftgate Ajar (TcSE ROIN-146658-2)

When the RVC Client (RearViewCameraClient) detects the decklid or liftgate is ajar, the RVC Client shall display a warning message that explains why no guidelines are available in the camera image.

3.1.1.3 RVC-FUR-REQ-014090/G-Display RVC Video (TcSE ROIN-194462-2)

There are two ways for Reverse Detection. What way to use is decided on configuration values.

Reverse Detection NEW:

Reverse_Gear is determined as mentioned in below table. Once GearLvrPos_D_Actl is reverse, System need to loop through signal GearPos_D_Trg to determine reverse gear until either GearLvrPos_D_Actl is not reverse OR Camera turn ON.

GearLvrPos_D_Actl = 0x1 (Reverse) (automatic transmission)	GearPos_D_Trg	Gear position and Camera Status
Reverse	0xE (Reverse)	Gear is Reverse, Turn Camera On

Upon detecting the conditions for RVC to be ON, the RVC Client (RearViewCameraClient) shall start a timer (T_minImageDisp) and shall not display the RVC image until the expiration of this timer. Upon expiration of the timer, the RVC Client shall start another timer (T_maxImageDisp). The RVC Client must display the RVC image prior to the expiration of T_maxImageDisp.

Once the conditions for displaying RVC are no longer applicable the RVC client shall:

1. Cancel the timer
2. Not display the RVC image

Reverse Detection LEGACY:

Reverse Detection is determined as mentioned in below table.

GearLvrPos_D_Actl = 0x1 (Reverse) (automatic transmission) or GearRvrseActv_D_Actl = 0x1 (Active)(manual transmission vehicle and Legacy Message Set) or GearRvrse_D_Actl = 0x3 or 0x2 (Active Confirmed or Active_not_confirmed) (manual transmission vehicle and New Message Set)	Gear position and Camera Status
Reverse	Gear is Reverse, Turn Camera On

Upon detecting the conditions for RVC to be ON, the RVC Client (RearViewCameraClient) shall start a timer (T_minImageDisp) and shall not display the RVC image until the expiration of this timer. Upon expiration of the timer, the RVC Client shall start another timer (T_maxImageDisp). The RVC Client must display the RVC image prior to the expiration of T_maxImageDisp.

Once the conditions for displaying RVC are no longer applicable the RVC client shall:
1. Cancel the timer
2. Not display the RVC image

3.1.1.4 RVC-TMR-REQ-014091/A-T_minImageDisp (TcSE ROIN-264661-1)

Name	Description	Units	Range	Resolution	Default
T_minImageDisp	Minimum time RVC Client should wait before displaying the RVC video image to the user according to RVC-GREQ-194462-2-Display RVC Video.	msec	225-275	5	250

3.1.1.5 RVC-TMR-REQ-014092/A-T_maxImageDisp (TcSE ROIN-264662-1)

Name	Description	Units	Range	Resolution	Default
T_maxImageDisp	Maximum time RVC Client should wait before displaying the RVC video image to the user according to RVC-GREQ-194462-2-Display RVC Video.	msec	450-550	5	500

3.1.1.6 CAMERA-FUR-REQ-014093/B-Camera Image Priority (TcSE ROIN-264652-1)

Once the camera image has been displayed to user, the image shall be maintained as long as the conditions required to be in the particular camera view are present and shall have highest priority:

- No pop-up screens shall interrupt the video image.
- Media functions (source change, volume control, etc.) shall be available, but shall not interrupt the image view to the user.

3.1.2 RVCv2-FUN-REQ-014094/A-Activate/Deactivate Rear View Camera (TcSE ROIN-293352)

3.1.2.1 Use Cases

3.1.2.1.1 RVC-UC-REQ-014095/A-Activate Rear View Camera (TcSE ROIN-289794)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start.
Scenario Description	The driver activates the Rear View Camera (RVC) by placing the vehicle in Reverse Gear.
Post-conditions	The vehicle display shows the RVC image.
List of Exception Use Cases	E1 – Rear View Camera Malfunction E2 – Decklid/Liftgate is Ajar while Rear View Camera is ON
Interfaces	G-HMI Vehicle System Interface

3.1.2.1.2 UC-REQ-238578/A-CHMSL Activation. Soft button press

Actors	Vehicle Occupant
Pre-conditions	• APIM is configured (CHMSL) • Vehicle in Run/Start • Rear view (Aux, Rear Normal, Rear Split-View, Rear 360) is showing and not in CHSML view OR Front view (Front Normal, Front Split-View, Front 360) is showing and not in CHSML view
Scenario Description	User presses CHMSL view button Display sends “Camera Showing(81B): 0x0B”
Post-conditions	The CHMSL view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with IPMB module E3 – Valid camera video signal not present
Interfaces	

3.1.2.1.3 UC-REQ-238579/A-AUX Activation. Soft button press

Actors	Vehicle Occupant
Pre-conditions	• APIM is configured (Aux) • Vehicle in Run/Start • Rear view (CHMSL, Rear Normal, Rear Split-View, Rear 360) is showing and not in Aux view OR Front view (Front Normal, Front Split-View, Front 360) is showing and not in Aux view
Scenario Description	User presses Aux view button Display sends “Camera Showing(81B): 0x0D”
Post-conditions	The Aux view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with IPMB module E3 – Valid camera video signal not present
Interfaces	

3.1.2.1.4 RVC-UC-REQ-014096/A-Rear View Camera Malfunction (TcSE ROIN-289795)

Linked Elements
RVC-UC-REQ-014095/A-Activate Rear View Camera (TcSE ROIN-289794)

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case.
Scenario Description	The HMI interface indicates that the Rear View Camera (RVC) image cannot be shown because of a malfunction.
Post-conditions	The vehicle display is NOT showing RVC image.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

3.1.2.1.5 RVC-UC-REQ-014097/A-Decklid/Liftgate is Ajar while Rear View Camera is ON (TcSE ROIN-289796)

Linked Elements
RVC-UC-REQ-014095/A-Activate Rear View Camera (TcSE ROIN-289794)
RVC-UC-REQ-128278/A-Activate Rear View Camera

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case.
Scenario Description	The HMI interface indicates that the Decklid/Liftgate is Ajar.
Post-conditions	The vehicle display shows the Rear View Camera image. The video feed from the Rear View Camera contains an image without guideline overlays.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

3.1.2.1.6 RVC-UC-REQ-014098/A-Deactivate Rear View Camera (TcSE ROIN-289797)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start.
Scenario Description	The driver deactivates the Rear View Camera (RVC) by shifting the vehicle out of Reverse Gear.
Post-conditions	The vehicle display is NOT showing RVC image.
List of Exception Use Cases	E1 – Rear Camera Delay Mode is On E2 – Active Park Assist is Active E3 – Trailer Backup Assist is Active (N/A for stand-alone RVC)
Interfaces	G-HMI Vehicle System Interface

3.1.2.1.7 RVC-UC-REQ-014099/B-Rear Camera Delay Mode is On (TcSE ROIN-289798)

Linked Elements
RVC-UC-REQ-014098/A-Deactivate Rear View Camera (TcSE ROIN-289797)
RVC-UC-REQ-128280/A-Deactivate Rear View Camera

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case.
Scenario Description	The driver shifts out of Reverse Gear and into any gear other than Park. The RVC image remains displayed to the driver until the vehicle reaches limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum speed~~.

Post-conditions	The vehicle display stops showing Rear View Camera image when vehicle speed reaches limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum speed~~.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

3.1.2.1.8 RVC-UC-REQ-014100/B-Active Park Assist is Active (TcSE ROIN-290554)

Linked Elements
RVC-UC-REQ-014098/A-Deactivate Rear View Camera (TcSE ROIN-289797)
RVC-UC-REQ-128280/A-Deactivate Rear View Camera
DAFVCv1-UC-REQ-128313/A-Deactivate Driver Assist Front View Camera
DAFVCv1-UC-REQ-014049/B-Deactivate Driver Assist Front View Camera (TcSE ROIN-290146)

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case.
Scenario Description	The driver shifts out of Reverse Gear and into any other gear while Active Park Assist (APA) is active. The camera image feed remains displayed to the driver as long as APA is active and vehicle speed does not exceed limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum~~.
Post-conditions	The vehicle display stops showing Rear View Camera image when APA is no longer active or vehicle speed exceeds limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum~~.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

3.1.2.1.9 RVC-UC-REQ-014101/B-Trailer Backup Assist is Active (TcSE ROIN-290555)

Linked Elements
RVC-UC-REQ-014098/A-Deactivate Rear View Camera (TcSE ROIN-289797)
RVC-UC-REQ-128280/A-Deactivate Rear View Camera
DAFVCv1-UC-REQ-128313/A-Deactivate Driver Assist Front View Camera
DAFVCv1-UC-REQ-014049/B-Deactivate Driver Assist Front View Camera (TcSE ROIN-290146)

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case.
Scenario Description	The driver shifts out of Reverse Gear and into any other gear while Trailer Backup Assist (TBA) is active. The camera image feed remains displayed to the driver as long as TBA is active and vehicle speed does not exceed limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum~~.
Post-conditions	The vehicle display stops showing Rear View Camera image when TBA is no longer active or vehicle speed exceeds limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum~~.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

3.1.2.2 White Box View

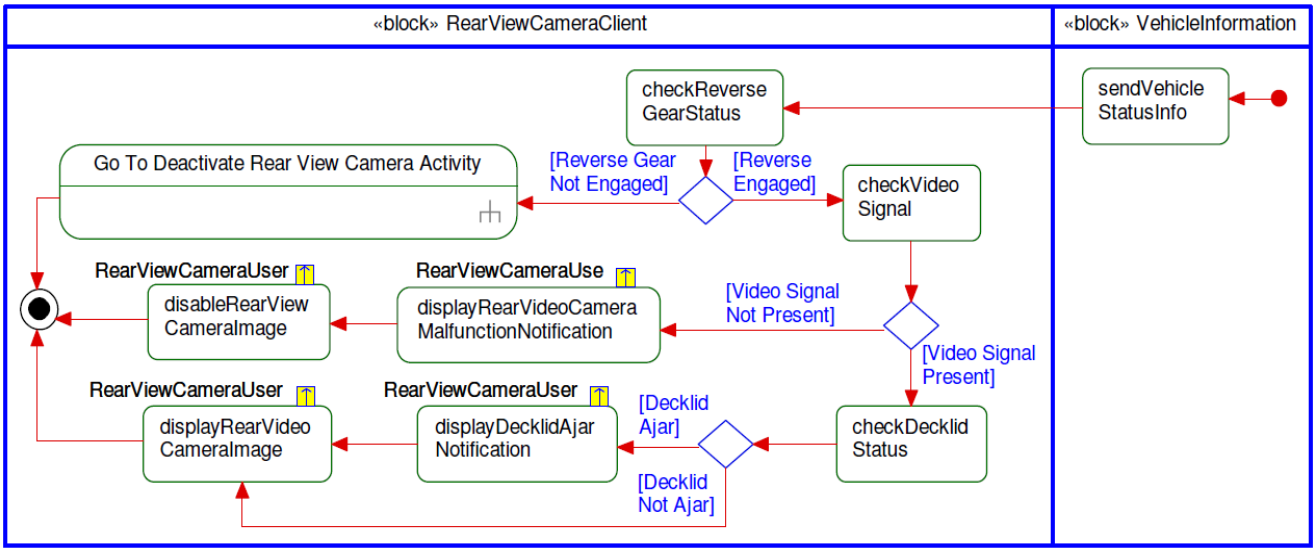
3.1.2.2.1 Activity Diagrams

3.1.2.2.1.1 RVCv2-ACT-REQ-014102/A-Activate Rear View Camera (TcSE ROIN-282388-2)

Linked Elements

RVCv2-SD-REQ-014104/B-Activate Rear View Camera (TcSE ROIN-282316-2)

Activity Diagram

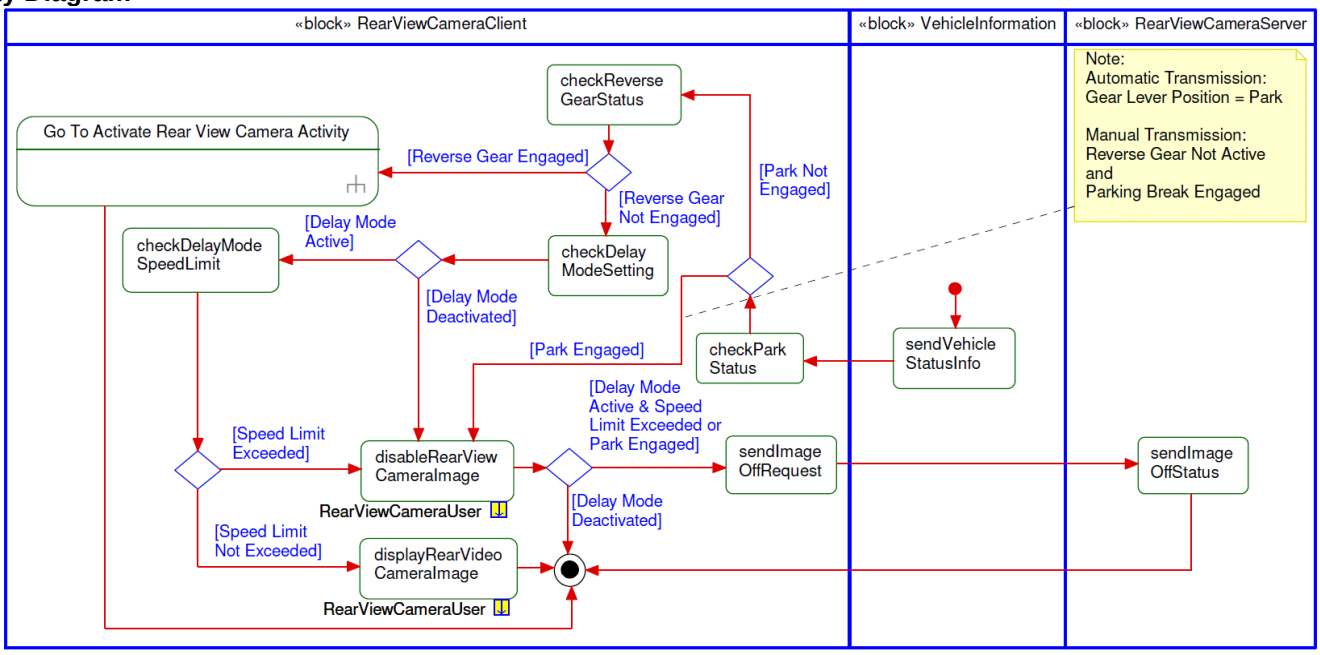


3.1.2.2.1.2 RVCv2-ACT-REQ-014103/A-Deactivate Rear View Camera (TcSE ROIN-286992-1)

Linked Elements

RVCv2-SD-REQ-014105/B-Deactivate Rear View Camera (TcSE ROIN-282323-2)

Activity Diagram



3.1.2.2.2 Sequence Diagrams

3.1.2.2.2.1 RVCv2-SD-REQ-014104/B-Activate Rear View Camera (TcSE ROIN-282316-2)

Scenario

Normal Usage

The user activates the Rear View Camera (RVC) by placing the vehicle in Reverse Gear.

Constraints

Pre-condition

Ignition_Status = Run

Post-condition
HMI Display shows the RVC image

Sequence Diagram

3.1.2.2.2.2 RVCv2-SD-REQ-014105/B-Deactivate Rear View Camera (TcSE ROIN-282323-2)

Scenario

Normal Usage

The user deactivates the Rear View Camera (RVC) by taking the vehicle out of Reverse Gear.

Constraints

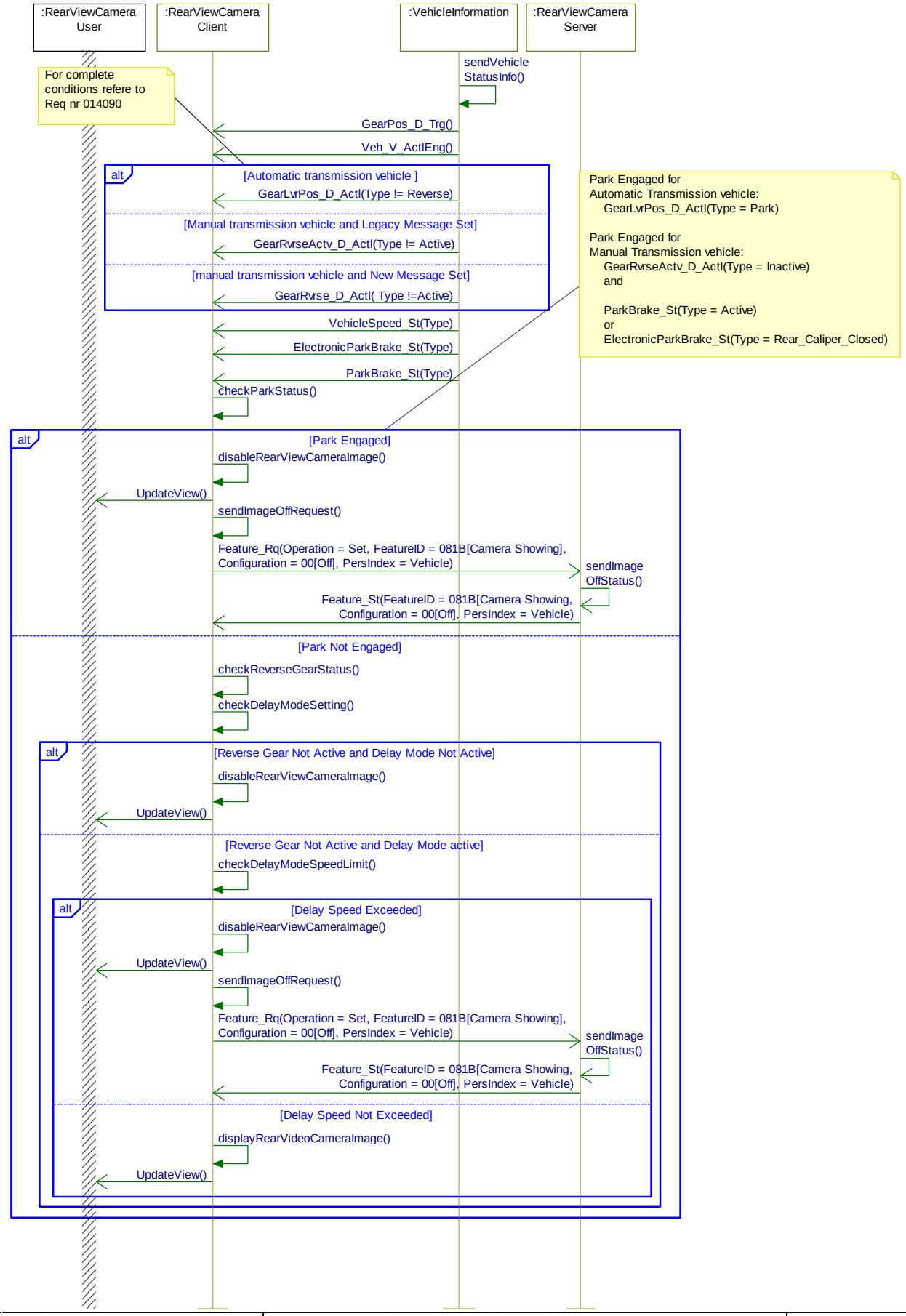
Pre-condition

Ignition_Status = Run

Post-condition

HMI Display stops showing the RVC image

Sequence Diagram


:RearViewCamera User
:RearViewCamera Client
:VehicleInformation
:RearViewCamera Server
For complete conditions refere to Req nr 014090
sendVehicle StatusInfo()
GearPos_D_Trg()
Veh_V_ActlEng()
alt
[Automatic transmission vehicle]
GearLvrPos_D_Actl(Type != Reverse)
[Manual transmission vehicle and Legacy Message Set]
GearRvrseActv_D_Actl(Type != Active)
[manual transmission vehicle and New Message Set]
GearRvrse_D_Actl(Type !=Active)
Park Engaged for
Automatic Transmission vehicle:
GearLvrPos_D_Actl(Type = Park)
Park Engaged for
Manual Transmission vehicle:
GearRvrseActv_D_Actl(Type = Inactive)
and
ParkBrake_St(Type = Active)
or
ElectronicParkBrake_St(Type = Rear_Caliper_Closed)
VehicleSpeed_St(Type)
ElectronicParkBrake_St(Type)
ParkBrake_St(Type)
checkParkStatus()
alt
[Park Engaged]
disableRearViewCameraImage()
UpdateView()
sendImageOffRequest()
Feature_Rq(Operation = Set, FeatureID = 081B[Camera Showing], Configuration = 00[Off], PersIndex = Vehicle)
sendImage OffStatus()
Feature_St(FeatureID = 081B[Camera Showing, Configuration = 00[Off], PersIndex = Vehicle)
[Park Not Engaged]
checkReverseGearStatus()
checkDelayModeSetting()
alt
[Reverse Gear Not Active and Delay Mode Not Active]
disableRearViewCameraImage()
UpdateView()
[Reverse Gear Not Active and Delay Mode active]
checkDelayModeSpeedLimit()
alt
[Delay Speed Exceeded]
disableRearViewCameraImage()
UpdateView()
sendImageOffRequest()
Feature_Rq(Operation = Set, FeatureID = 081B[Camera Showing], Configuration = 00[Off], PersIndex = Vehicle)
sendImage OffStatus()
Feature_St(FeatureID = 081B[Camera Showing, Configuration = 00[Off], PersIndex = Vehicle)
[Delay Speed Not Exceeded]
displayRearVideoCameraImage()
UpdateView()

3.1.3 RVCv3-FUN-REQ-128277/A-Activate/Deactivate Rear View Camera v3

3.1.3.1 Use Cases

3.1.3.1.1 RVCv3-UC-REQ-127872/A-Activate Rear Multicamera View

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START
Scenario Description	The driver shifts gear to reverse for 250ms
Post-conditions	The Rear Multicamera view appears with overlays and review button
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.3.1.2 RVC-UC-REQ-014097/A-Decklid/Liftgate is Ajar while Rear View Camera is ON (TcSE ROIN-289796)

Linked Elements
RVC-UC-REQ-014095/A-Activate Rear View Camera (TcSE ROIN-289794)
RVC-UC-REQ-128278/A-Activate Rear View Camera

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case.
Scenario Description	The HMI interface indicates that the Decklid/Liftgate is Ajar.
Post-conditions	The vehicle display shows the Rear View Camera image. The video feed from the Rear View Camera contains an image without guideline overlays.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

3.1.3.1.3 RVC-UC-REQ-014098/A-Deactivate Rear View Camera (TcSE ROIN-289797)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start.
Scenario Description	The driver deactivates the Rear View Camera (RVC) by shifting the vehicle out of Reverse Gear.
Post-conditions	The vehicle display is NOT showing RVC image.
List of Exception Use Cases	E1 – Rear Camera Delay Mode is On E2 – Active Park Assist is Active E3 – Trailer Backup Assist is Active (N/A for stand-alone RVC)
Interfaces	G-HMI Vehicle System Interface

3.1.3.1.4 RVC-UC-REQ-014099/B-Rear Camera Delay Mode is On (TcSE ROIN-289798)

Linked Elements
RVC-UC-REQ-014098/A-Deactivate Rear View Camera (TcSE ROIN-289797)

RVC-UC-REQ-128280/A-Deactivate Rear View Camera

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case.
Scenario Description	The driver shifts out of Reverse Gear and into any gear other than Park. The RVC image remains displayed to the driver until the vehicle reaches limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum speed~~.
Post-conditions	The vehicle display stops showing Rear View Camera image when vehicle speed reaches limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum speed~~.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

3.1.3.1.5 RVCv3-UC-REQ-128191/A-Enter CHMSL Delay Mode

Actors	Vehicle Occupant
Pre-conditions	• The vehcile is configured with CHMSL camera • The vehicle is in Run/Start • CHMSL or CHMSL Zoom shown • Camera Delay is set On
Scenario Description	The driver shifts from Reverse to Neutral or Drive
Post-conditions	The vehicle shows CHMSL without zoom button
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.3.1.6 RVC-UC-REQ-014100/B-Active Park Assist is Active (TcSE ROIN-290554)

Linked Elements
RVC-UC-REQ-014098/A-Deactivate Rear View Camera (TcSE ROIN-289797)
RVC-UC-REQ-128280/A-Deactivate Rear View Camera
DAFVCv1-UC-REQ-128313/A-Deactivate Driver Assist Front View Camera
DAFVCv1-UC-REQ-014049/B-Deactivate Driver Assist Front View Camera (TcSE ROIN-290146)

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case.
Scenario Description	The driver shifts out of Reverse Gear and into any other gear while Active Park Assist (APA) is active. The camera image feed remains displayed to the driver as long as APA is active and vehicle speed does not exceed limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum~~.
Post-conditions	The vehicle display stops showing Rear View Camera image when APA is no longer active or vehicle speed exceeds limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum~~.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

3.1.3.1.7 RVC-UC-REQ-014101/B-Trailer Backup Assist is Active (TcSE ROIN-290555)

Linked Elements
RVC-UC-REQ-014098/A-Deactivate Rear View Camera (TcSE ROIN-289797)

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case.
Scenario Description	The driver shifts out of Reverse Gear and into any other gear while Trailer Backup Assist (TBA) is active. The camera image feed remains displayed to the driver as long as TBA is active and vehicle speed does not exceed limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum~~.
Post-conditions	The vehicle display stops showing Rear View Camera image when TBA is no longer active or vehicle speed exceeds limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum~~.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

3.1.3.1.8 TRG-UC-REQ-102959/A-Vehicle Not in RUN/START

Actors	Vehicle Occupant
Pre-conditions	Same as normal usage use case
Scenario Description	Driver moves the ignition out of Run/Start
Post-conditions	The vehicle returns to non-TRG behavior
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.1.3.1.9 TRG-UC-REQ-102960/A-Loss of communication with IPMB Module

Actors	Vehicle Occupant
Pre-conditions	Same as normal usage use case
Scenario Description	Driver attempts to do something in TRG and APIM has lost communication with IPMB
Post-conditions	The vehicle shows camera view, without any overlays
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.1.3.1.10 TRG-UC-REQ-102961/A-Valid Camera Video Signal not present

Actors	Vehicle Occupant
Pre-conditions	Same as normal usage use case
Scenario Description	Driver attempts to do something in TRG and APIM is not receiving valid video
Post-conditions	The vehicle returns to non-TRG behavior
List of Exception Use Cases	N/A
Interfaces	G-HMI

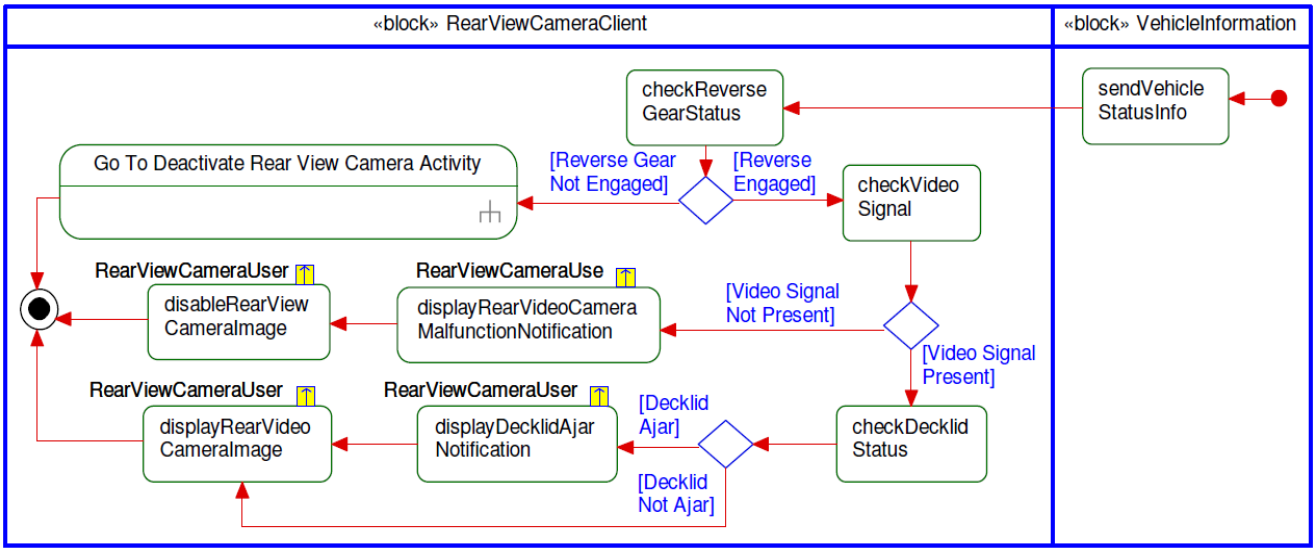
3.1.3.2 White Box View

3.1.3.2.1 Activity Diagrams

3.1.3.2.1.1 RVCv2-ACT-REQ-014102/A-Activate Rear View Camera (TcSE ROIN-282388-2)

Linked Elements
RVCv2-SD-REQ-014104/B-Activate Rear View Camera (TcSE ROIN-282316-2)

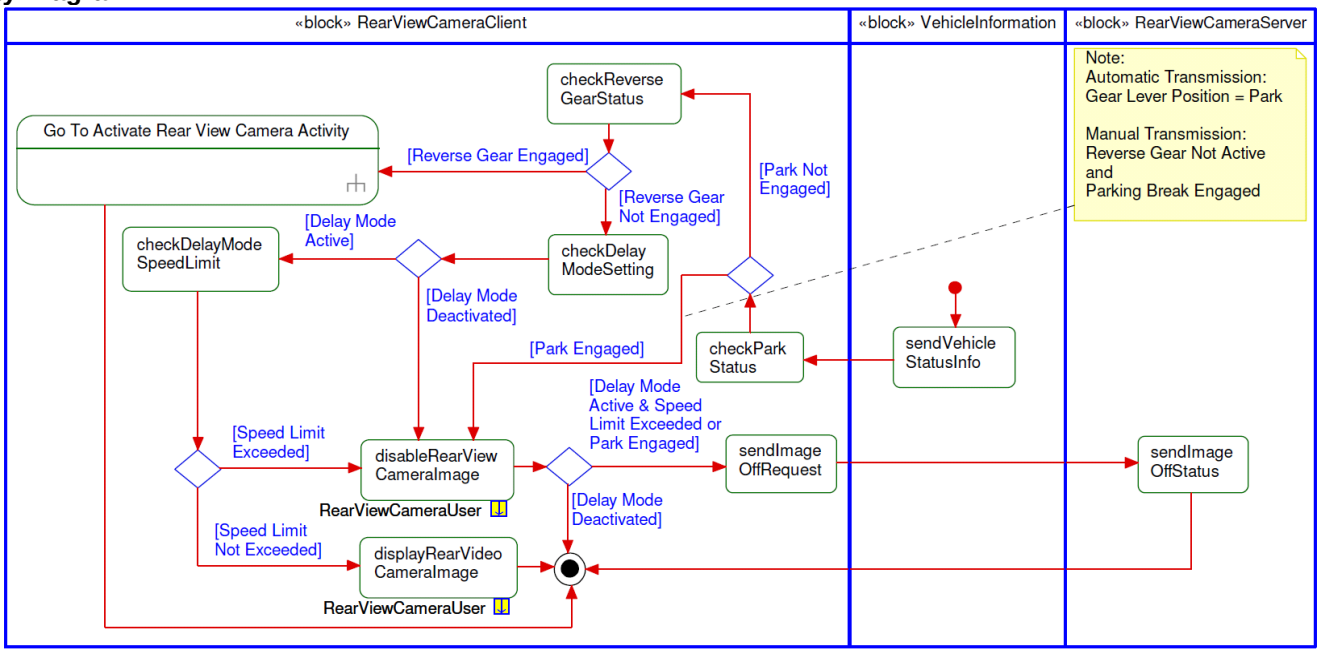
Activity Diagram



3.1.3.2.1.2 RVCv2-ACT-REQ-014103/A-Deactivate Rear View Camera (TcSE ROIN-286992-1)

Linked Elements
RVCv2-SD-REQ-014105/B-Deactivate Rear View Camera (TcSE ROIN-282323-2)

Activity Diagram



3.1.3.2.2 Sequence Diagrams

3.1.3.2.2.1 RVCv2-SD-REQ-014104/B-Activate Rear View Camera (TcSE ROIN-282316-2)

Scenario

Normal Usage

The user activates the Rear View Camera (RVC) by placing the vehicle in Reverse Gear.

Constraints

Pre-condition

Ignition_Status = Run

Post-condition

HMI Display shows the RVC image

Sequence Diagram

3.1.3.2.2.2 RVCv2-SD-REQ-014105/B-Deactivate Rear View Camera (TcSE ROIN-282323-2)

Scenario

Normal Usage

The user deactivates the Rear View Camera (RVC) by taking the vehicle out of Reverse Gear.

Constraints

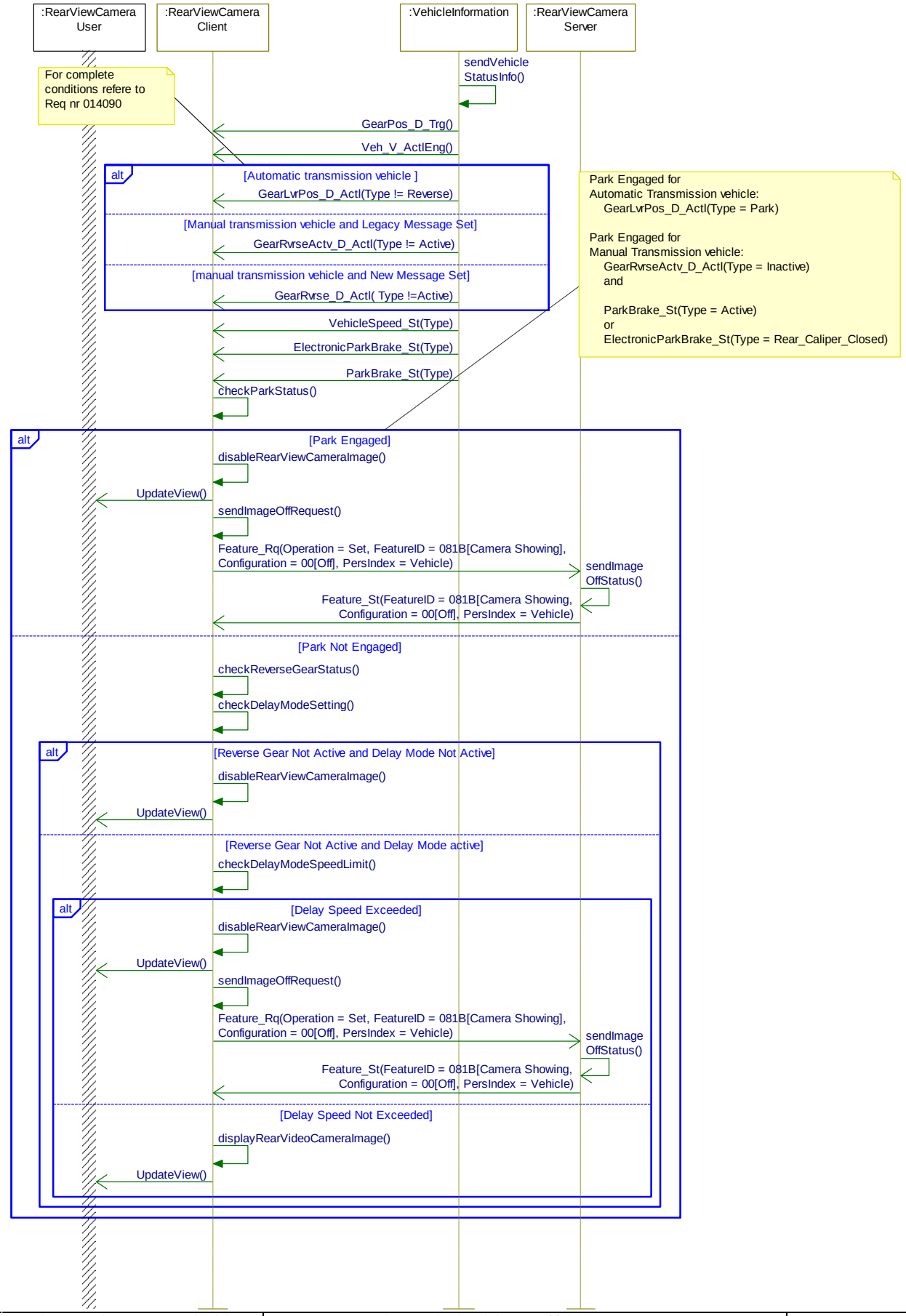
Pre-condition

Ignition_Status = Run

Post-condition

HMI Display stops showing the RVC image

Sequence Diagram


:RearViewCamera User
:RearViewCamera Client
:VehicleInformation
:RearViewCamera Server
For complete conditions refere to Req nr 014090
sendVehicle StatusInfo()
GearPos_D_Trg()
Veh_V_ActlEng()
alt
[Automatic transmission vehicle]
GearLvrPos_D_Actl(Type != Reverse)
[Manual transmission vehicle and Legacy Message Set]
GearRvrseActv_D_Actl(Type != Active)
[manual transmission vehicle and New Message Set]
GearRvrse_D_Actl(Type !=Active)
Park Engaged for
Automatic Transmission vehicle:
GearLvrPos_D_Actl(Type = Park)
Park Engaged for
Manual Transmission vehicle:
GearRvrseActv_D_Actl(Type = Inactive)
and
ParkBrake_St(Type = Active)
or
ElectronicParkBrake_St(Type = Rear_Caliper_Closed)
VehicleSpeed_St(Type)
ElectronicParkBrake_St(Type)
ParkBrake_St(Type)
checkParkStatus()
alt
[Park Engaged]
disableRearViewCameraImage()
UpdateView()
sendImageOffRequest()
Feature_Rq(Operation = Set, FeatureID = 081B[Camera Showing], Configuration = 00[Off], PersIndex = Vehicle)
sendImage OffStatus()
Feature_St(FeatureID = 081B[Camera Showing, Configuration = 00[Off], PersIndex = Vehicle)
[Park Not Engaged]
checkReverseGearStatus()
checkDelayModeSetting()
alt
[Reverse Gear Not Active and Delay Mode Not Active]
disableRearViewCameraImage()
UpdateView()
[Reverse Gear Not Active and Delay Mode active]
checkDelayModeSpeedLimit()
alt
[Delay Speed Exceeded]
disableRearViewCameraImage()
UpdateView()
sendImageOffRequest()
Feature_Rq(Operation = Set, FeatureID = 081B[Camera Showing], Configuration = 00[Off], PersIndex = Vehicle)
sendImage OffStatus()
Feature_St(FeatureID = 081B[Camera Showing, Configuration = 00[Off], PersIndex = Vehicle)
[Delay Speed Not Exceeded]
displayRearVideoCameraImage()
UpdateView()

3.1.4 RVCv2-FUN-REQ-014106/A-Rear View Camera Zoom Setting (TcSE ROIN-293363)

3.1.4.1 Use Cases

3.1.4.1.1 RVC-UC-REQ-014107/A-Select Manual Zoom Level X (TcSE ROIN-289799)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The vehicle display is showing the Rear View Camera image.
Scenario Description	The driver activates Manual Zoom Mode Level X via the HMI interface.
Post-conditions	The vehicle display continues to show the Rear View Camera image. The vehicle display indicates that a zoom level is selected. The video feed from the Rear View Camera contains a zoomed-in image.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface
Notes	*There are three defined zoom levels and "Level X" is used to generically designate that one of the three is selected as described in this use case. Refer to HMI documentation (requirements and/or screen-flow) for which level(s) of zoom will be utilized.*

3.1.4.1.2 RVC-UC-REQ-014108/A-Deactivate Manual Zoom (TcSE ROIN-289802)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The vehicle display is showing the Rear View Camera image with Zoom Level X selected.
Scenario Description	The user deactivates Manual Zoom Mode via HMI interface.
Post-conditions	The vehicle display continues to show the Rear View Camera image. The vehicle display indicates that no zoom level is selected. The video feed from the Rear View Camera contains a normal (no zoom applied) image.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface
Notes	*There are three defined zoom levels and "Level X" is used to generically designate that one of the three is selected as described in this use case. Refer to HMI documentation (requirements and/or screen-flow) for which level(s) of zoom will be utilized.*

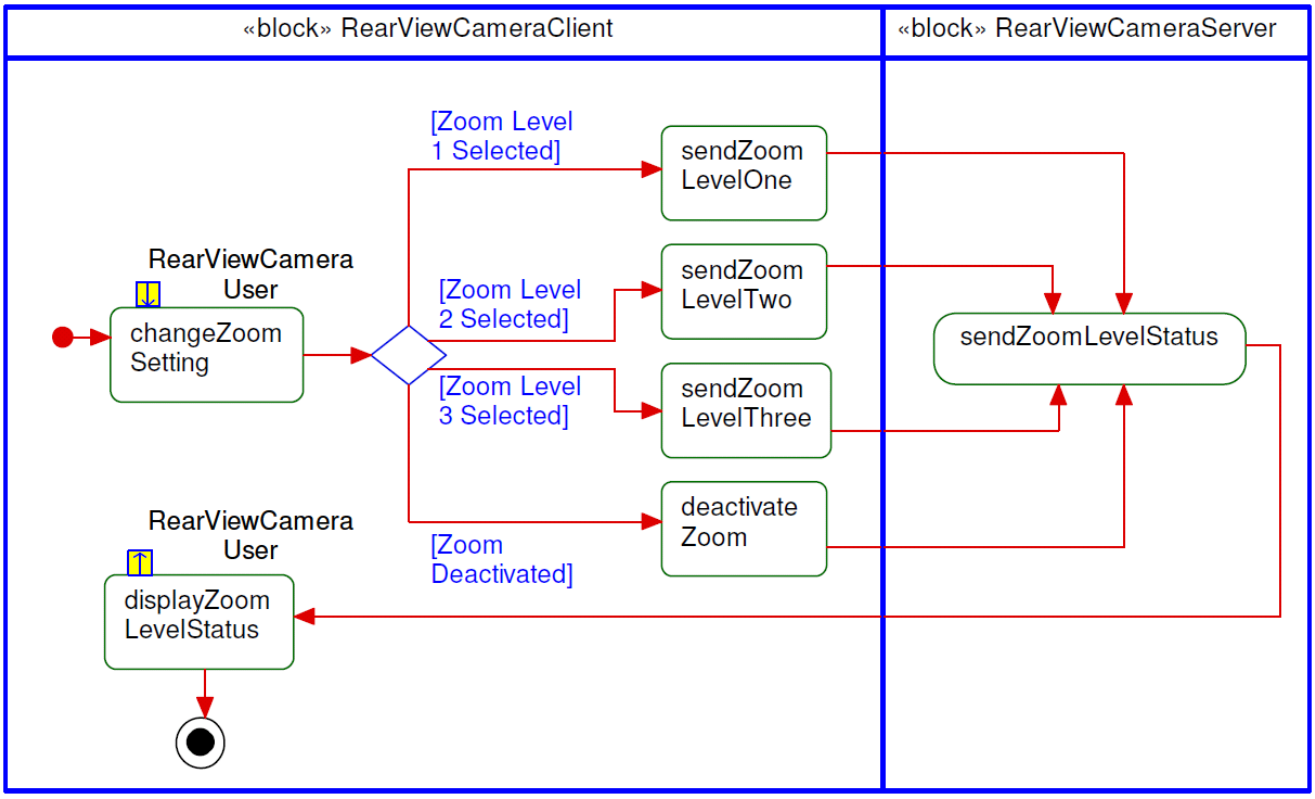
3.1.4.2 White Box View

3.1.4.2.1 Activity Diagrams

3.1.4.2.1.1 RVCv2-ACT-REQ-014109/A-Manual Zoom (TcSE ROIN-282390-1)

Linked Elements
RVCv2-SD-REQ-014110/A-Manual Zoom (TcSE ROIN-282356-1)

Activity Diagram



3.1.4.2.2 Sequence Diagrams

3.1.4.2.2.1 RVCv2-SD-REQ-014110/A-Manual Zoom (TcSE ROIN-282356-1)

Scenario

Normal Usage

The user changes the manual zoom level setting via the HMI interface.

Constraints

Pre-condition

Ignition_Status = Run

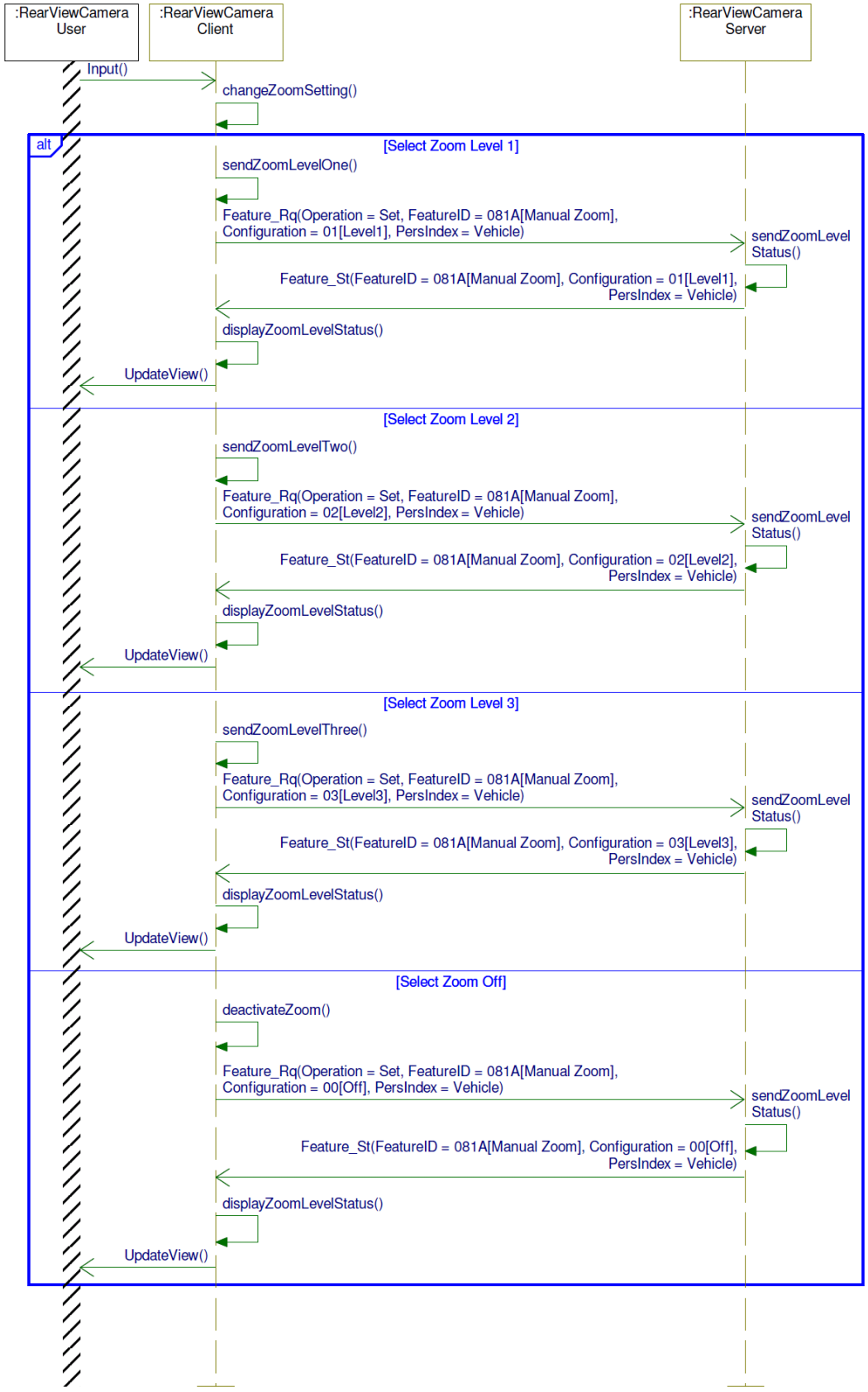
Pre-condition

HMI Display is showing RVC Image.

Post-condition

The HMI display is showing the Rear Video Camera image that reflects the updated zoom setting.

Sequence Diagram



3.1.5 RVCv3-FUN-REQ-127106/A-Rear View Camera Zoom Setting v3

3.1.5.1 Use Cases

3.1.5.1.1 RVCv3-UC-REQ-128173/A-Press Zoom Button from Rear 360 View

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START • In reverse and in Multicamera RVC view
Scenario Description	The driver presses the Zoom button
Post-conditions	The RVC zoom view appears with Multicamera view still being highlighted
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.5.1.2 RVCv3-UC-REQ-128176/A-Press Zoom Button from Rear Normal View

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with camera • The vehicle is in RUN/START • RVC view shown
Scenario Description	The Driver presses the Zoom button
Post-conditions	The RVC zoom view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.5.1.3 RVCv3-UC-REQ-128179/A-Press Zoom Button from CHMSL View

Actors	Vehicle Occupant
Pre-conditions	• The vehicke is configured with CHMSL camera • The vehicle is in Run/Start • The vehicle in Reverse • CHMSL View is shown
Scenario Description	The driver presses Zoom Button
Post-conditions	CHMSL Zoom view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.5.1.4 RVCv3-UC-REQ-128188/A-Press Rear 360 Unzoom

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in Run/Start • Rear Zoom Shown (from Rear Multicamera)
Scenario Description	The driver presses soft Button to unzoom
Post-conditions	Rear Multicamera shows
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.5.1.5 RVCv3-UC-REQ-128189/A-Press Rear Normal Unzoom

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with any camera • The vehicle is in Run/Start • Rear Zoom Shown (from Rear Normal)
Scenario Description	The driver presses soft Button to unzoom
Post-conditions	Rear Normal shows
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.5.1.6 RVCv3-UC-REQ-128190/A-Press CHMSL Unzoom

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with CHMSL camera • The vehicle is in Run/Start • CHMSL Zoom Shown
Scenario Description	The driver presses soft Button to unzoom
Post-conditions	Rear Normal shows
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

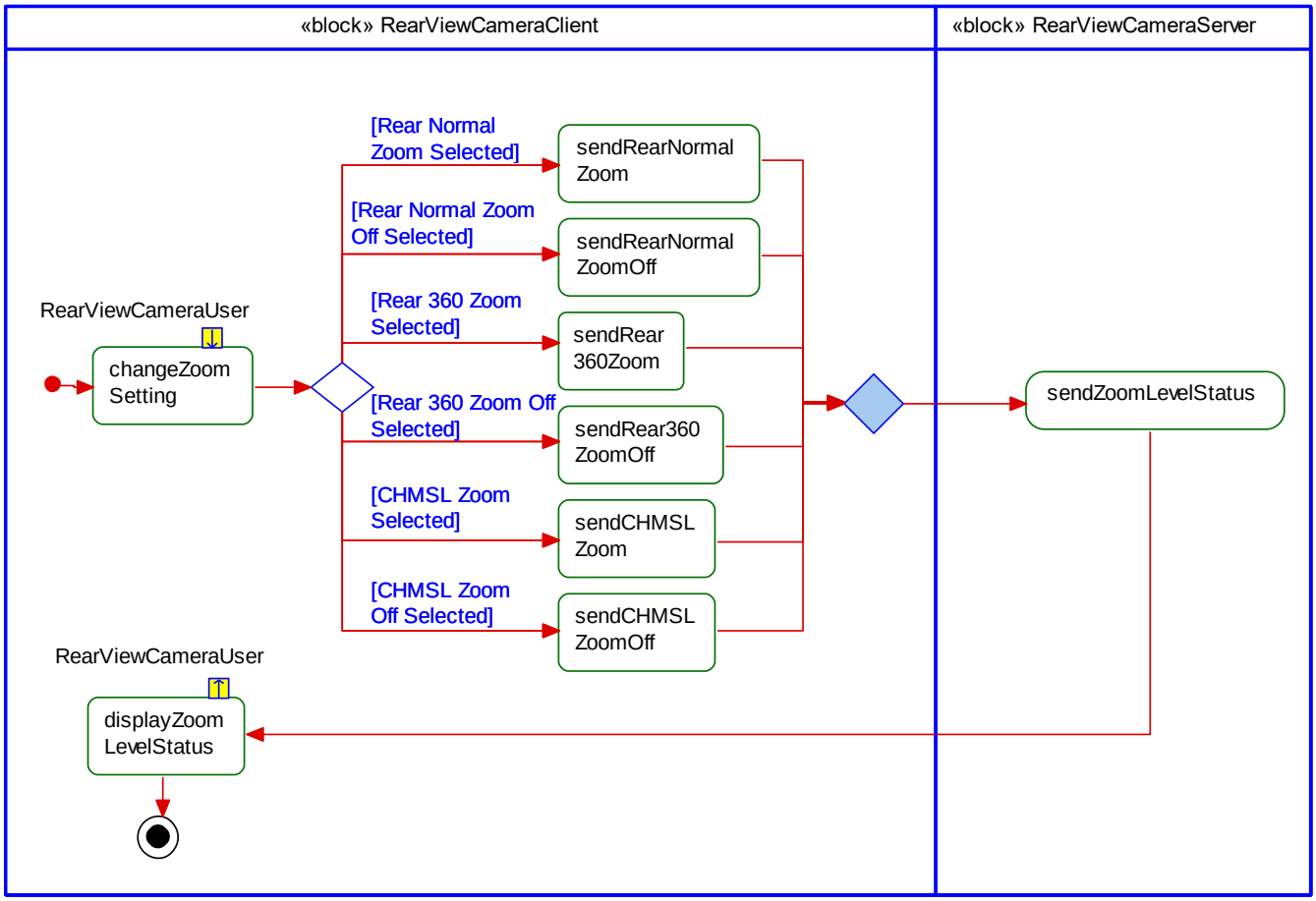
3.1.5.2 White Box View

3.1.5.2.1 Activity Diagrams

3.1.5.2.1.1 RVCv3-ACT-REQ-127095/A-Manual Zoom

Linked Elements
RVCv2-SD-REQ-014110/A-Manual Zoom (TcSE ROIN-282356-1)

Activity Diagram



3.1.5.2.2 Sequence Diagrams

3.1.5.2.2.1 RVCv3-SD-REQ-127097/A-Manual Zoom

Scenario

Normal Usage

The user changes the manual zoom setting via the HMI interface.

Constraints

Pre-condition

Ignition_Status = Run

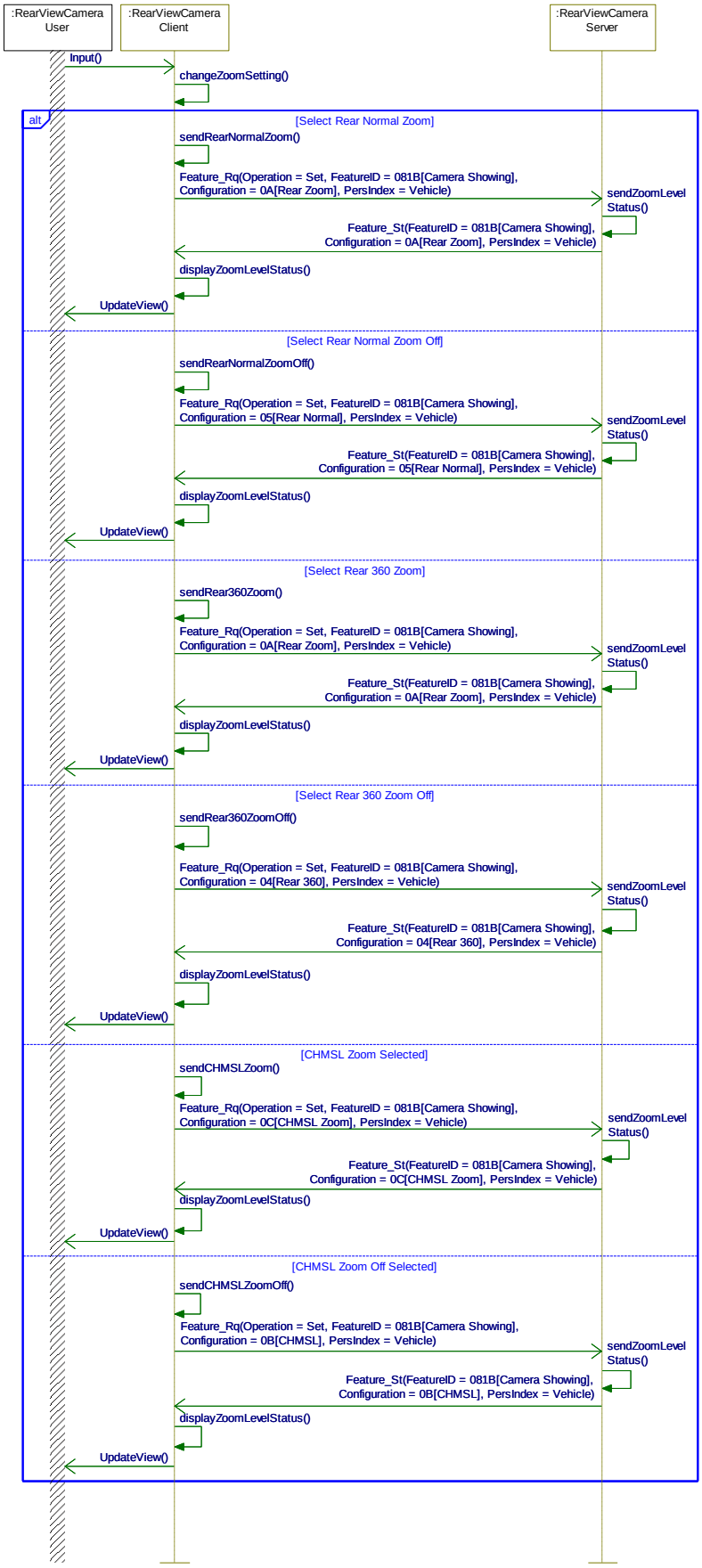
Pre-condition

HMI Display is showing RVC Image.

Post-condition

The HMI display is showing the Rear Video Camera image that reflects the updated zoom setting.

Sequence Diagram



3.1.6 RVCv2-FUN-REQ-014111/A-Rear View Camera Delay Mode Setting (TcSE ROIN-293368)

3.1.6.1 Use Cases

3.1.6.1.1 RVC-UC-REQ-014112/A-Activate/Deactivate Rear Camera Delay (TcSE ROIN-289803)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start.
Scenario Description	The driver activates/deactivates the Rear View Camera (RVC) Delay Mode via the HMI interface.
Post-conditions	The RVC Delay Mode is activated/deactivated.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

3.1.7 RVCv2-FUN-REQ-014113/A-Camera Image View (TcSE ROIN-293370)

3.1.7.1 Use Cases

3.1.7.1.1 RVCv2-UC-REQ-014114/A-Select Rear Camera Split-View (TcSE ROIN-289805)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The vehicle display is showing the Rear View Camera image.
Scenario Description	The driver selects split-view image via hard switch interface.
Post-conditions	The vehicle display continues to show the Rear View Camera image. The video feed from the Rear View Camera contains a split-view image.
List of Exception Use Cases	NA
Interfaces	G-HMI Dedicated Hard Button Vehicle System Interface

3.1.7.1.2 RVCv2-UC-REQ-014115/A-Select Rear Camera 360-View (TcSE ROIN-289806)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The vehicle display is showing the Rear View Camera image.
Scenario Description	The driver selects 360-view image via hard switch interface.
Post-conditions	The vehicle display continues to show the Rear View Camera image. The video feed from the Rear View Camera contains a 360-view image.
List of Exception Use Cases	NA
Interfaces	G-HMI Dedicated Hard Button Vehicle System Interface

3.1.7.1.3 RVCv2-UC-REQ-014116/A-Select Rear Camera Normal View (TcSE ROIN-289807)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The vehicle display is showing the Rear View Camera image.
Scenario Description	The driver selects normal view image via hard switch interface.
Post-conditions	The vehicle display continues to show the Rear View Camera image. The video feed from the Rear View Camera contains a normal view image.
List of Exception Use Cases	NA
Interfaces	G-HMI Dedicated Hard Button Vehicle System Interface

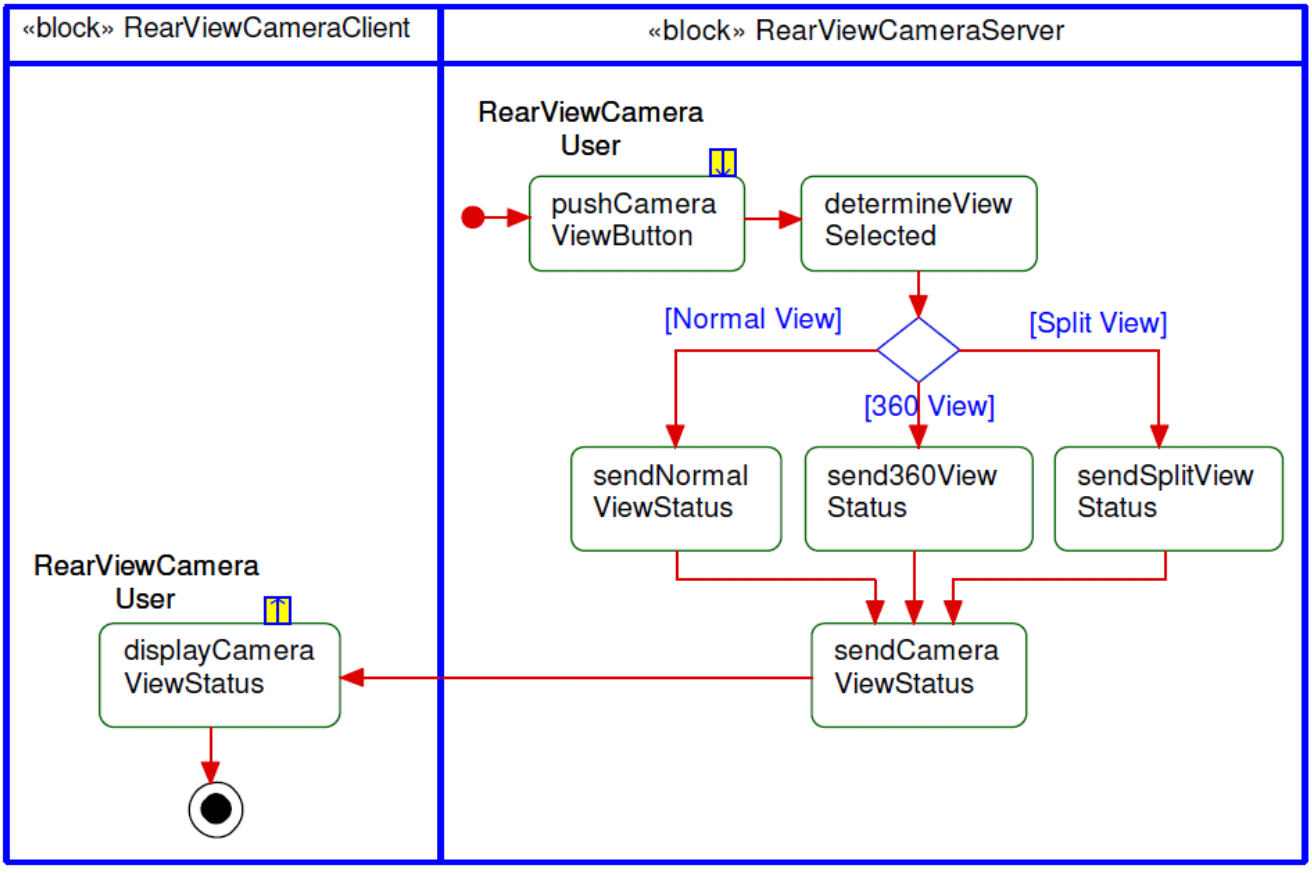
3.1.7.2 White Box View

3.1.7.2.1 Activity Diagrams

3.1.7.2.1.1 RVCv2-ACT-REQ-014117/A-Change Camera View Setting (TcSE ROIN-282392-2)

Linked Elements
RVCv2-SD-REQ-014118/A-Change Camera View Setting (TcSE ROIN-282363-3)

Activity Diagram



3.1.7.2.2 Sequence Diagrams

3.1.7.2.2.1 RVCv2-SD-REQ-014118/A-Change Camera View Setting (TcSE ROIN-282363-3)

Scenario

Normal Usage

The user selects alternate view image setting via the HMI interface.

Constraints

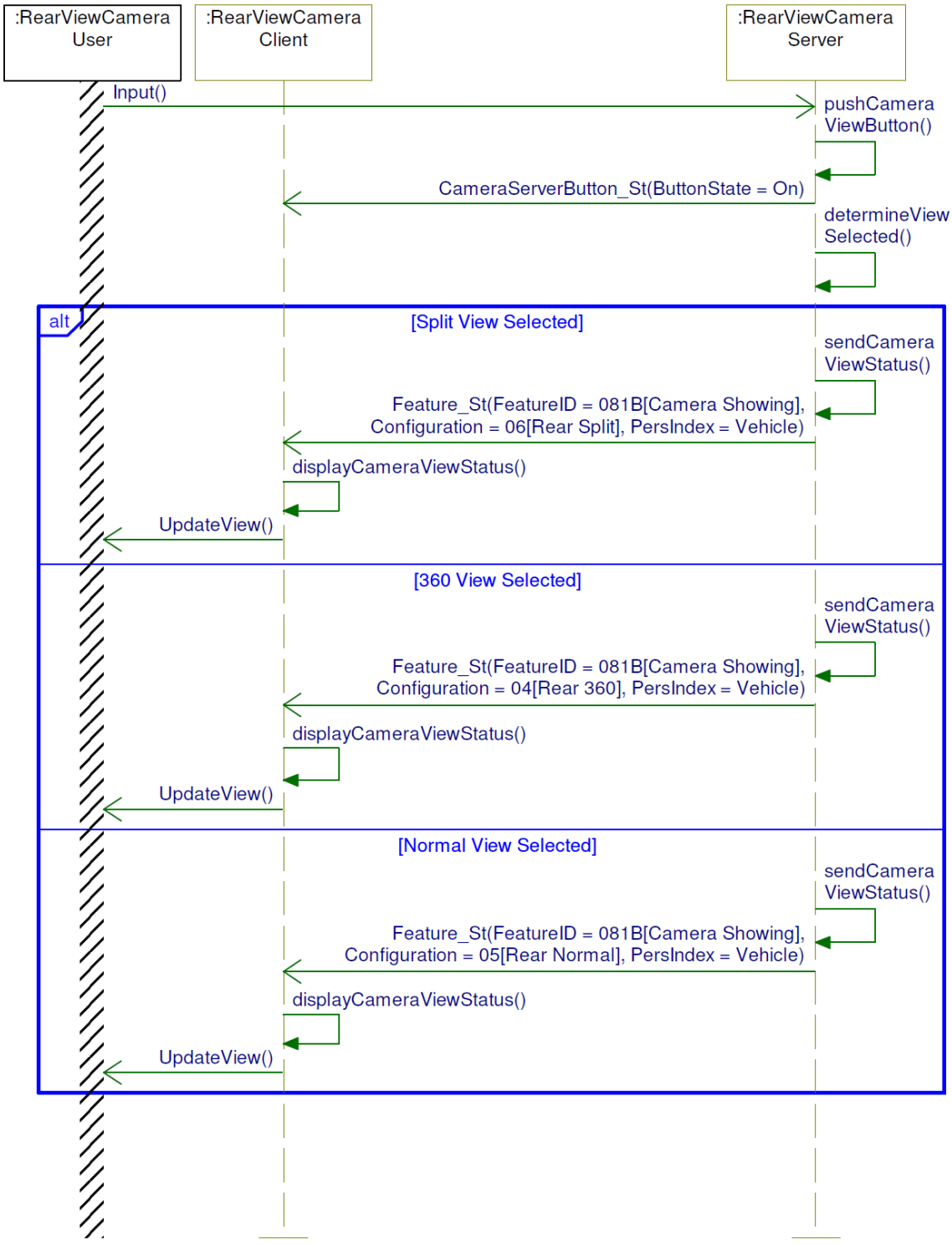
Pre-condition

Ignition_Status = Run

Post-condition

The HMI display is showing the Rear Video Camera image that reflects the updated alternate view setting.

Sequence Diagram



3.1.8 RVCv3-FUN-REQ-127111/A-Camera Image View v3

3.1.8.1 Use Cases

3.1.8.1.1 RVCv3-UC-REQ-127874/A-Press Rear 360 View Button

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START • Reverse camera shown and not in Rear Multicamera view.
Scenario Description	The driver presses Multicamera rear button
Post-conditions	Multicamera RVC view appears with overlays
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.8.1.2 RVCv3-UC-REQ-128175/A-Press RVC Normal View Button

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with non- Multicamera • The vehicle is in RUN/START • In reverse and not in RVC view
Scenario Description	The Driver presses the RVC button
Post-conditions	RVC view appears with overlays
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.8.1.3 RVCv3-UC-REQ-128177/A-Press RVC Split View Button

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured as Multicamera with Rear Split View • The Vehicle is in Run/Start • RVC View being shown, and not in RVC Split view
Scenario Description	The Driver presses RVC Split view button
Post-conditions	RVC Split view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.8.1.4 RVCv3-UC-REQ-128178/A-Press CHMSL Camera View Button

Actors	Vehicle Occupant
Pre-conditions	• The vehicke is configured with CHMSL camera • Vehicle is in Run/Start • Rear Camera shown and Not in CHMSL
Scenario Description	The driver presses CHMSL view button
Post-conditions	CHMSL view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.8.1.5 RVCv3-UC-REQ-128180/B-Press Aux Camera view Button

Actors	Vehicle Occupant
Pre-conditions	• Vehicle in Run/Start • Vehicle is in Reverse, Park, Netural, or Drive • The CHMSL view is not showing • Vehicle below 10kph
Scenario Description	• User presses camera hard button IPMB sends “Camera Showing (81B): 0x0D”
Post-conditions	The Aux view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.8.1.6 RVCv3-UC-REQ-128181/A-Press Trailer Reverse Guidance Button

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with TRG • The vehicle is in Run/Start • The vehicle is in Reverse • TRG is not activated

Scenario Description	The driver presses TRG view button
Post-conditions	TRG scenarios enter; see TRG Use cases for more details
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.8.1.7 RVCv3-UC-REQ-128396/B-Press Hard Button to Enter CHMSL View

Actors	Vehicle Occupant
Pre-conditions	• Vehicle in Run/Start • Vehicle is in Reverse, Park, Neutral, or Drive. • The CHMSL view is not showing. • Vehicle below 10kph.
Scenario Description	• User presses camera hard button • IPMB sends “Camera Showing (81B): 0x0D”
Post-conditions	CHMSL view is shown
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.1.8.1.8 RVCv3-UC-REQ-128397/A-Press Hard Button to Enter RVC View

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with CHMSL, Rear Camera and Soft button strategy • The vehicle is in Run/Start • CHMSL or CHMSL Zoom is shown
Scenario Description	The driver presses Hard Camera Button to enter Rear Normal View
Post-conditions	Rear Normal shows
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

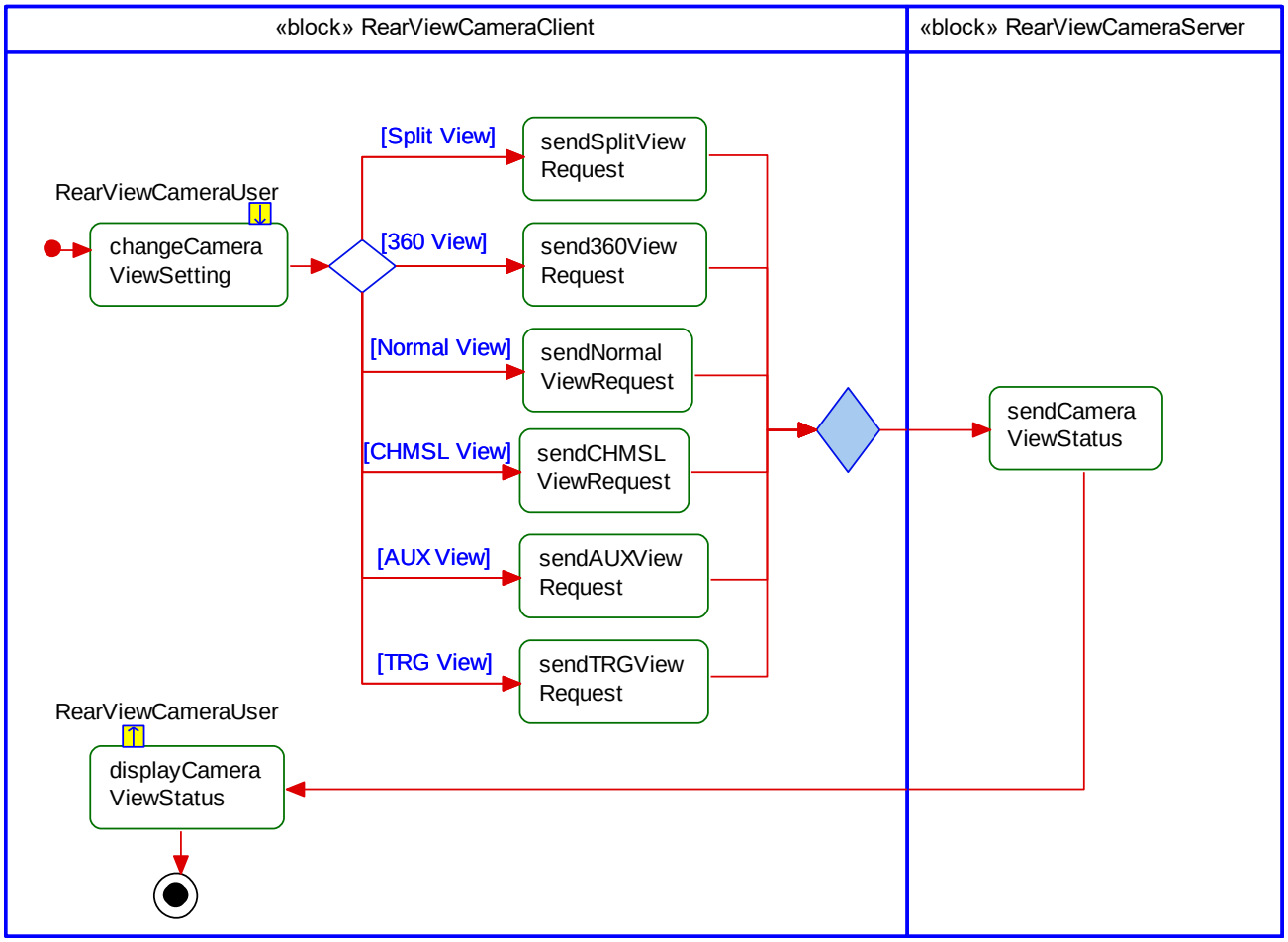
3.1.8.2 White Box View

3.1.8.2.1 Activity Diagrams

3.1.8.2.1.1 RVCv3-ACT-REQ-127096/A-Change Camera View Setting

Linked Elements
RVCv2-SD-REQ-014118/A-Change Camera View Setting (TcSE ROIN-282363-3)

Activity Diagram



3.1.8.2.2 Sequence Diagrams

3.1.8.2.2.1 RVCv3-SD-REQ-127098/A-Change Camera View Setting

Scenario

Normal Usage

The user selects alternate view image setting via the HMI interface.

Constraints

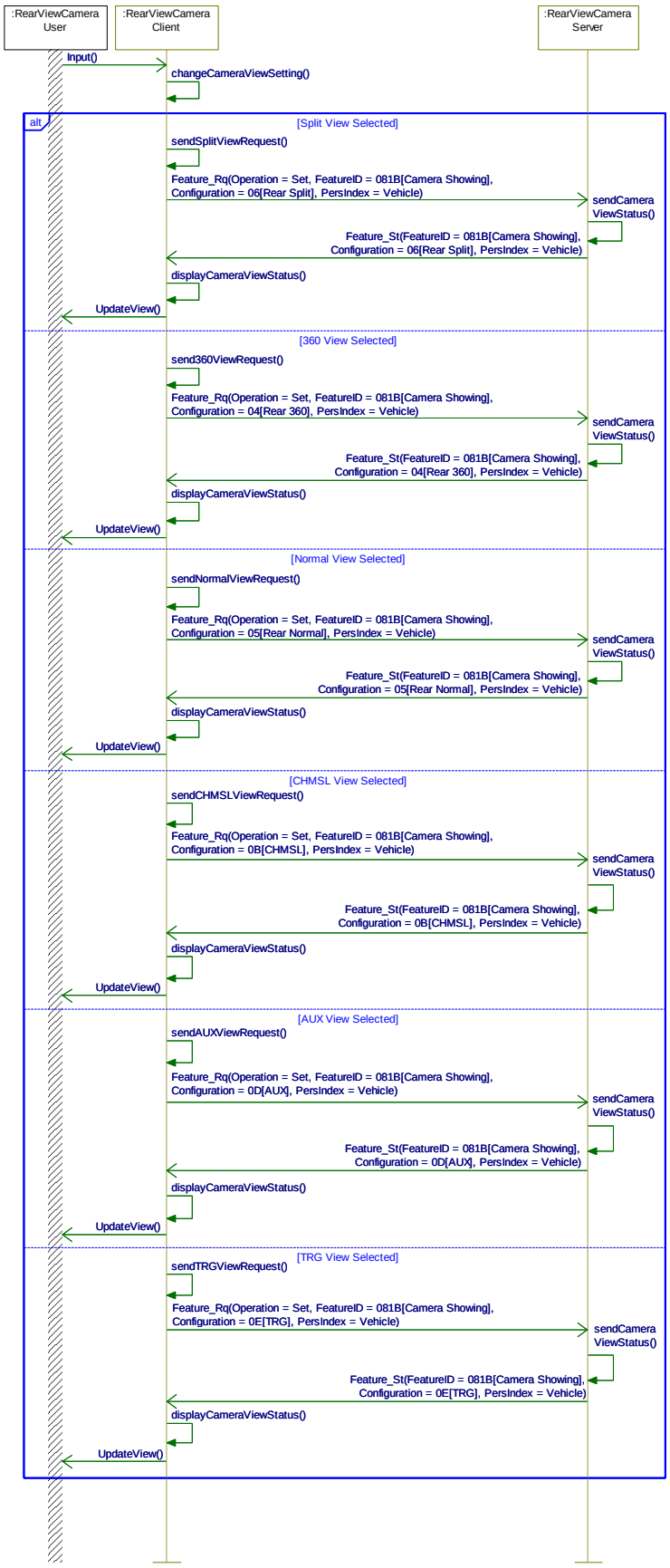
Pre-condition

Ignition_Status = Run

Post-condition

The HMI display is showing the Rear Video Camera image that reflects the updated alternate view setting.

Sequence Diagram



3.1.9 RVCv2-FUN-REQ-014119/A-Activate/Deactivate Enhanced Park Aids (TcSE ROIN-293375)

3.1.9.1 Requirements

3.1.9.1.1 RVCv2-REQ-014120/A-Visual Park Aid Alert Availability (TcSE ROIN-281600-2)

The Rear Video Camera and the HMI Display must both be configured with Park Aid Module present in order to enable the Visual Park Aid Alert setting options (HMI refers to this as Enhanced Park Aids and this refers to Visual Park Aid Alert or Visual Park Assist depending on vehicle configuration. See HMI specification for implementation details).

3.1.9.2 Use Cases

3.1.9.2.1 RVC-UC-REQ-014121/A-Activate/Deactivate Enhanced Park Aids (TcSE ROIN-289804)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start.
Scenario Description	The driver activates/deactivates the Enhanced Park Aids via the HMI interface.
Post-conditions	The Enhance Park Aids are activated/deactivated. The HMI indicates the setting change determined by vehicle system interface signal.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

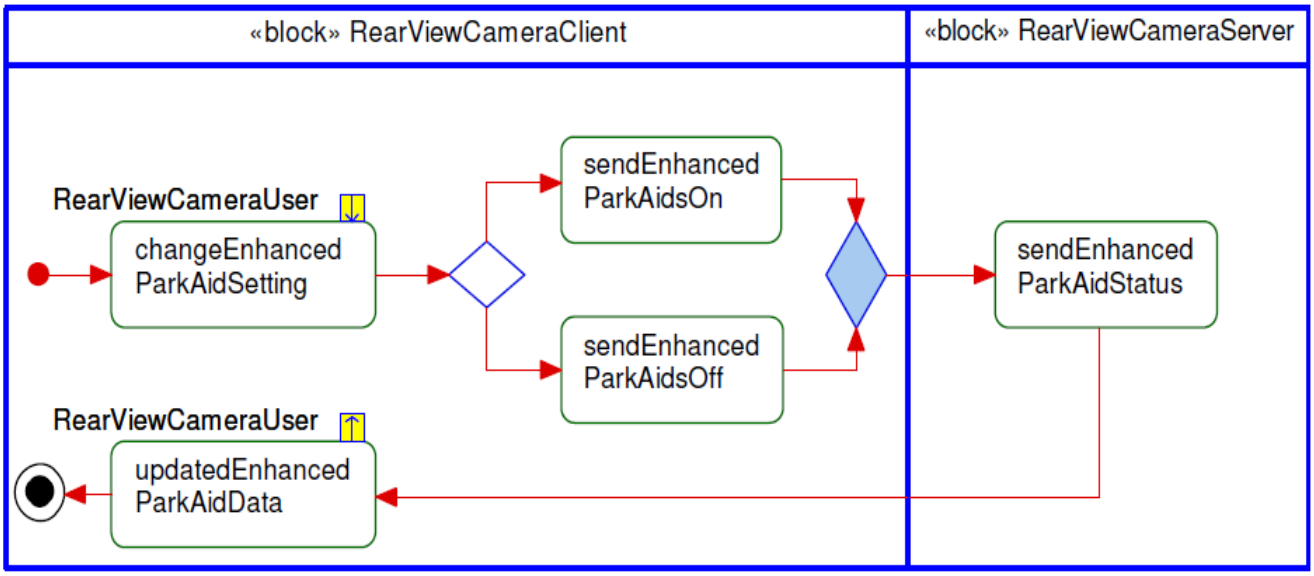
3.1.9.3 White Box View

3.1.9.3.1 Activity Diagrams

3.1.9.3.1.1 RVCv2-ACT-REQ-014122/A-Activate/Deactivate Enhanced Park Aids (TcSE ROIN-286990-1)

Linked Elements
RVCv2-SD-REQ-014123/A-Activate/Deactivate Enhanced Park Aids (TcSE ROIN-286982-2)

Activity Diagram



3.1.9.3.2 Sequence Diagrams

3.1.9.3.2.1 RVCv2-SD-REQ-014123/A-Activate/Deactivate Enhanced Park Aids (TcSE ROIN-286982-2)

Scenario

Normal Usage

The user activates/deactivates Enhanced Park Aids via the HMI interface.

Constraints

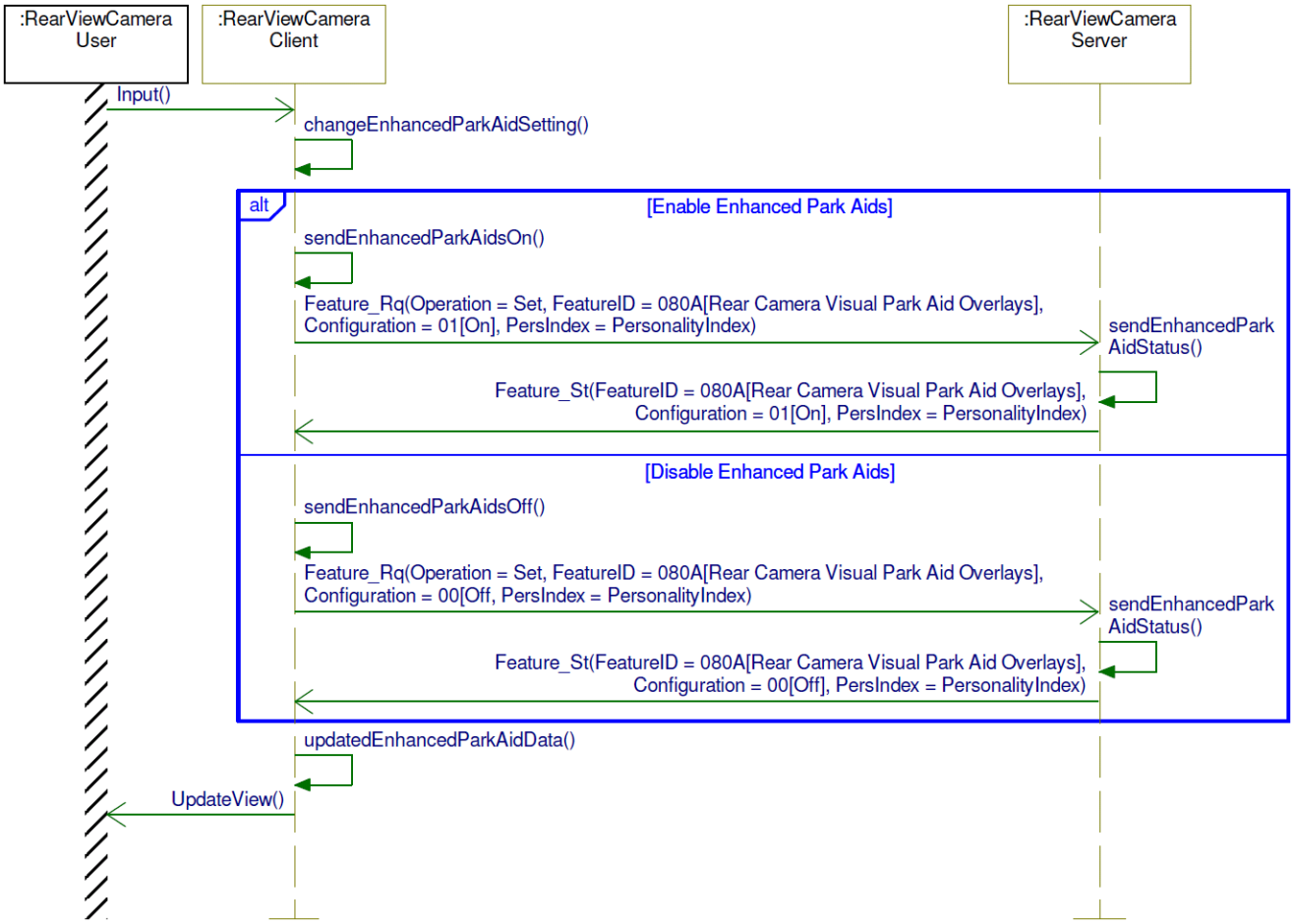
Pre-condition

Ignition_Status = Run

Post-condition

Enhanced Park Aids are enabled/disabled.

Sequence Diagram



3.1.10 RVCv2-FUN-REQ-014124/A-Camera Overlay Setting (TcSE ROIN-293357)

3.1.10.1 Requirements

3.1.10.1.1 RVC-FUR-REQ-014125/A-Guideline Availability (TcSE ROIN-264660-2)

- In order for Active (Dynamic) Guidelines to be available, the vehicle must be equipped with an Absolute Steering Angle Sensor and both the Rear Video Camera and the HMI Display must be configured with Absolute Steering Angle Sensor present.
- When Active (Dynamic) Guidelines are active, Fixed (Static) Guidelines must also be active.
- When Fixed (Static) Guidelines are inactive, Active (Dynamic) Guidelines must also be inactive.

3.1.10.2 Use Cases

3.1.10.2.1 RVCv2-UC-REQ-014126/A-Select Global Overlay Setting (All Guidelines) (TcSE ROIN-289808)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start.
Scenario Description	The driver activates/deactivates all Rear View Camera overlays (guidelines) via the HMI interface.
Post-conditions	The vehicle display indicates the selected overlay setting. The video feed from the Rear View Camera contains an image with or without all guideline overlays as indicated by the selected setting.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface
Notes	*Use Case is optional.* *Current direction is to not apply guideline related use cases.*

3.1.10.2.2 RVCv2-UC-REQ-014127/A-Select Active Guideline Setting (TcSE ROIN-289809)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start.
Scenario Description	The driver activates/deactivates the Active (Dynamic) Guidelines Setting via the HMI interface.
Post-conditions	The vehicle display indicates the selected Active Guideline setting. The video feed from the Rear View Camera contains an image with or without Active guideline overlays as indicated by the selected setting.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface
Notes	*Use Case is optional.* *Current direction is to not apply guideline related use cases.*

3.1.10.2.3 RVCv2-UC-REQ-014128/A-Select Fixed Guideline Setting (TcSE ROIN-289810)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start.
Scenario Description	The driver activates/deactivates the Fixed (Static) Guidelines Setting via the HMI interface.
Post-conditions	The vehicle display indicates the selected Fixed Guideline setting. The video feed from the Rear View Camera contains an image with or without Fixed guideline overlays as indicated by the selected setting.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface
Notes	*Use Case is optional.* *Current direction is to not apply guideline related use cases.*

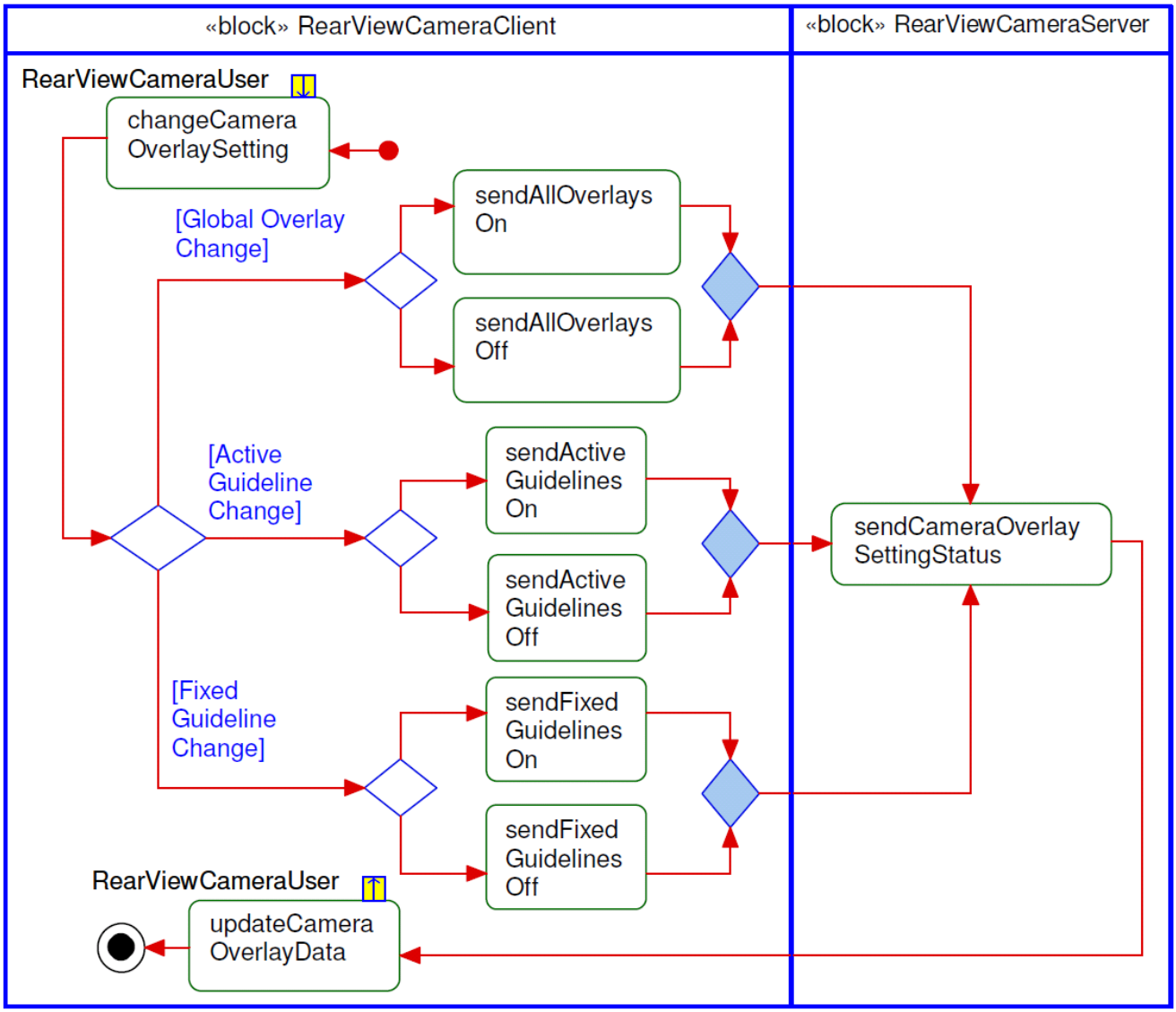
3.1.10.3 White Box View

3.1.10.3.1 Activity Diagrams

3.1.10.3.1.1 RVCv2-ACT-REQ-014129/A-Change Camera Overlay Setting (TcSE ROIN-282386-2)

Linked Elements
RVCv2-SD-REQ-014130/A-Activate Overlays (TcSE ROIN-282334-2)
RVCv2-SD-REQ-014131/A-Deactivate Overlays (TcSE ROIN-282341-2)

Activity Diagram



3.1.10.3.2 Sequence Diagrams

3.1.10.3.2.1 RVCv2-SD-REQ-014130/A-Activate Overlays (TcSE ROIN-282334-2)

Scenario

Normal Usage

The user activates Rear View Camera overlays via the HMI interface.

Constraints

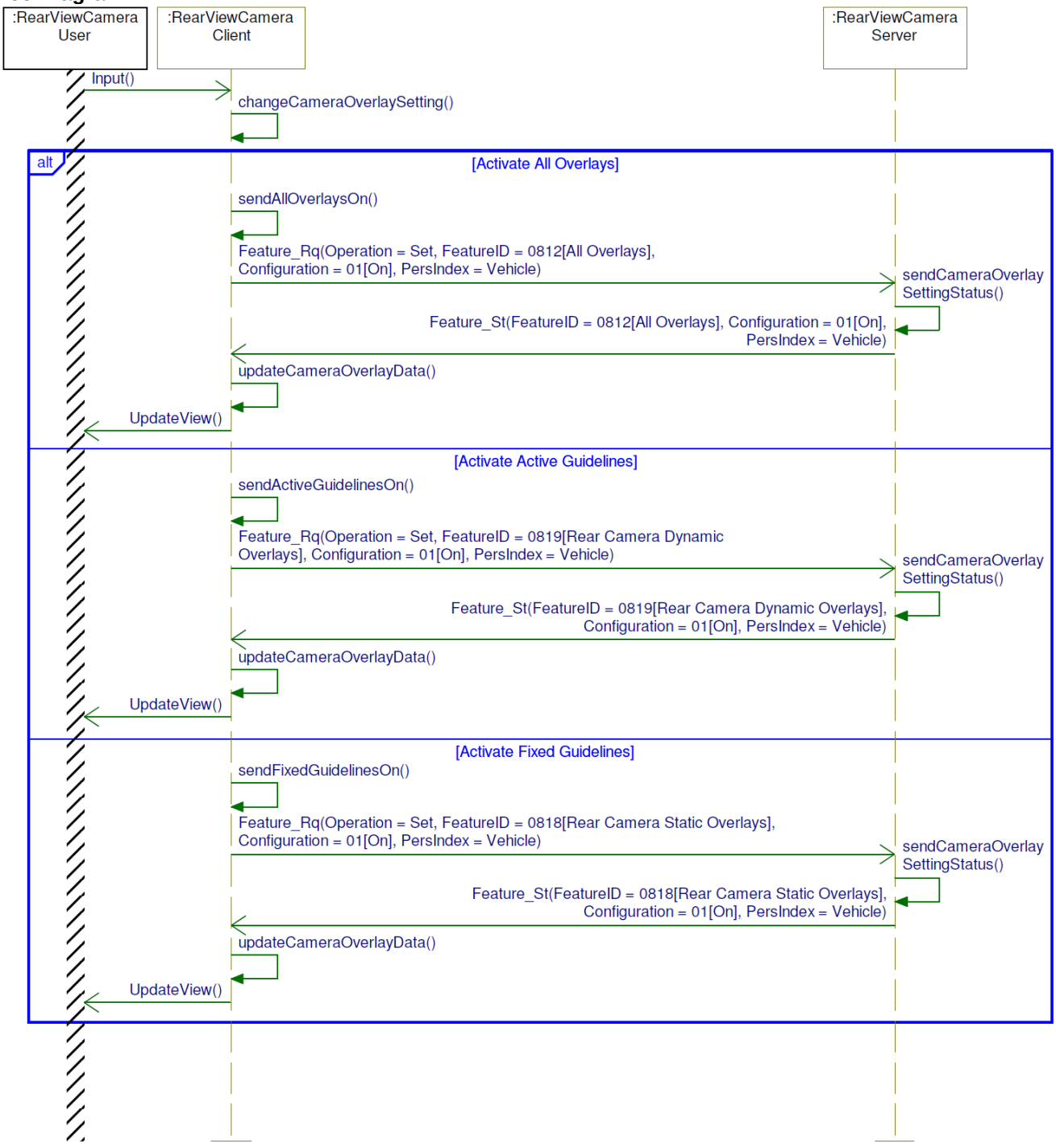
Pre-condition

Ignition_Status = Run

Post-condition

Rear View Camera overlays are enabled.

Sequence Diagram



3.1.10.3.2.2 RVCv2-SD-REQ-014131/A-Deactivate Overlays (TcSE ROIN-282341-2)

Scenario

Normal Usage

The user deactivates Rear View Camera overlays via the HMI interface.

Constraints

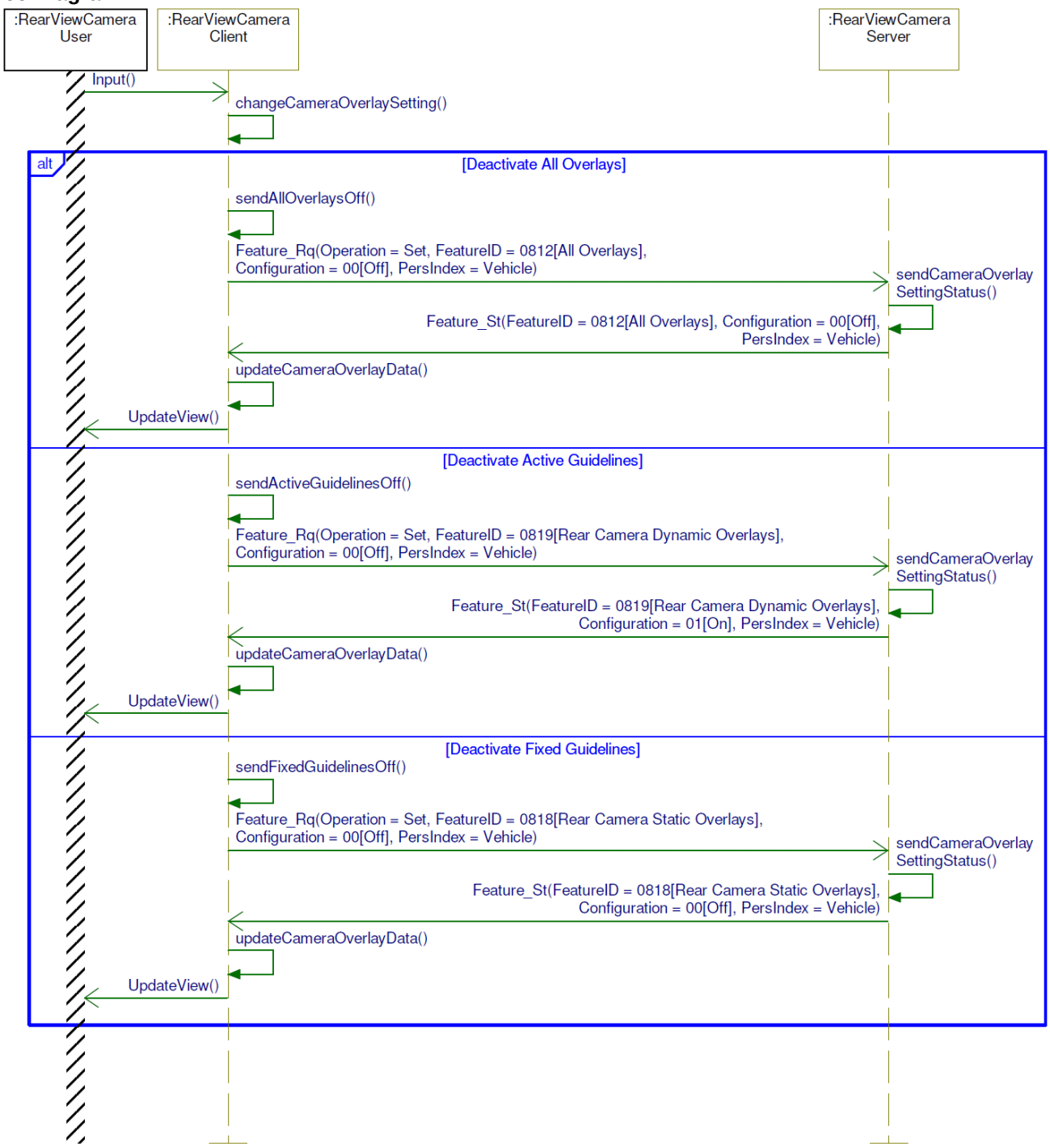
Pre-condition

Ignition_Status = Run

Post-condition

Rear View Camera overlays are disabled.

Sequence Diagram



3.2 Driver Assist Front View Camera

3.2.1 DAFVCv1-FUN-REQ-014045/B-Activate/Deactivate Driver Assist Front View Camera (TcSE ROIN-293385)

3.2.1.1 Requirements

3.2.1.1.1 DAFVCv1-FUR-REQ-166641/A-Deactivate FVC

The DriverAssistFrontViewCameraClient shall stop displaying Front View Camera (FVC) image when one of the following conditions is met:

- Vehicle is shifted into 'Reverse' (Rear View Camera image will be shown)
- Vehicle is shifted into 'Park' (No Image shown in 'Park')
- Power Mode does not equal IgnitionOn_2 or Running_2 or Crank_3
- FVC is disabled (Feature_St equals 0x81B Camera Showing and 0x00 Off)
- Vehicle speed exceeds Feature Maximum Speed requirement 014077

3.2.1.1.2 DAFVCv1-FUR-REQ-013997/B-E-Locker Deactivation Delay (TcSE ROIN-266607-1)

If the FrontViewCameraClient is displaying the Front View Camera (FVC) image (all conditions for front camera image display are true) and the E-Locker transistions from 'Locked' (Elocker_St = 0x1:ON) to 'Unlocked' (Elocker_St = 0x0:OFF), the FrontViewCameraClient shall start a timer (T_eLockerDelay) and shall continue to display the FVC image until the expiration of this timer.

If the FrontViewCameraClient detects that the E-Locker transistions back to 'Locked' prior to the expiration of T_eLockerDelay, and all other conditions for front camera image remain true, the FrontViewCameraClient shall cancel the timer and continue to display the FVC image.

3.2.1.1.3 DAFVCv1-TMR-REQ-013998/B-T_eLockerDelay (TcSE ROIN-266609-1)

Name	Description	Units	Range	Resolution	Default
T_eLockerDelay	Maximum time FrontViewCameraClient should wait before stopping the display of the FVC video image to the user according to FAS-FVC-GREQ-266607-E-Locker Deactivation Delay.	msec	4975-5025	5	5000

3.2.1.2 Use Cases

3.2.1.2.1 DAFVCv1-UC-REQ-014046/B-Activate Driver Assist Front View Camera (TcSE ROIN-290143)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The gear position status is NOT Reverse.
Scenario Description	The driver activates the Driver Assist Front View Camera (DAFVC) via hard button interface, or vehicle system indicates DAFVC activation for Trailer Backup Assist, ~~or~~ Active Park Assist or Off Road Front Camera. ~~.~~
Post-conditions	The vehicle display shows the DAFVC image.
List of Exception Use Cases	E1 – Driver Assist Front View Camera Malfunction E2 – Activation Attempt During Overspeed Condition
Interfaces	G-HMI Dedicated Hard Button Vehicle System Interface

3.2.1.2.2 DAFVCv1-UC-REQ-014047/A-Driver Assist Front View Camera Malfunction (TcSE ROIN-290144)

Linked Elements
DAFVCv1-UC-REQ-014046/B-Activate Driver Assist Front View Camera (TcSE ROIN-290143)

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case
Scenario Description	The driver attempts to activate the Driver Assist Front View Camera (DAFVC) via hard button interface. The HMI interface indicates that the DAFVC image cannot be shown because of a malfunction.
Post-conditions	The vehicle display does NOT show the DAFVC image.
List of Exception Use Cases	NA
Interfaces	G-HMI Dedicated Hard Button Vehicle System Interface

3.2.1.2.3 DAFVCv1-UC-REQ-014048/B-Activation Attempt During Overspeed Condition (TcSE ROIN-290145)

Linked Elements
DAFVCv1-UC-REQ-014046/B-Activate Driver Assist Front View Camera (TcSE ROIN-290143)

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case
Scenario Description	The driver attempts to activate the Driver Assist Front View Camera (DAFVC) via hard button interface while traveling at a speed greater than the limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum~~.
Post-conditions	The vehicle display does NOT show the DAFVC image.
List of Exception Use Cases	NA
Interfaces	G-HMI Dedicated Hard Button Vehicle System Interface

3.2.1.2.4 DAFVCv1-UC-REQ-014049/B-Deactivate Driver Assist Front View Camera (TcSE ROIN-290146)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The vehicle system display is showing front view camera image
Scenario Description	The user deactivates the Driver Assist Front View Camera (DAFVC) by one of the following: • Disabling DAFVC via hard button interface • Exceeding the speed limit per CAMERA-REQ-014077-Feature Maximum Speed • Shifting the vehicle into Reverse (RVC image will be shown if conditions for RVC allow it) • Shifting the vehicle into Park (No image shown in 'Park')
Post-conditions	The vehicle display does NOT show the DAFVC image.
List of Exception Use Cases	NA
Interfaces	G-HMI Dedicated Hard Button Vehicle System Interface

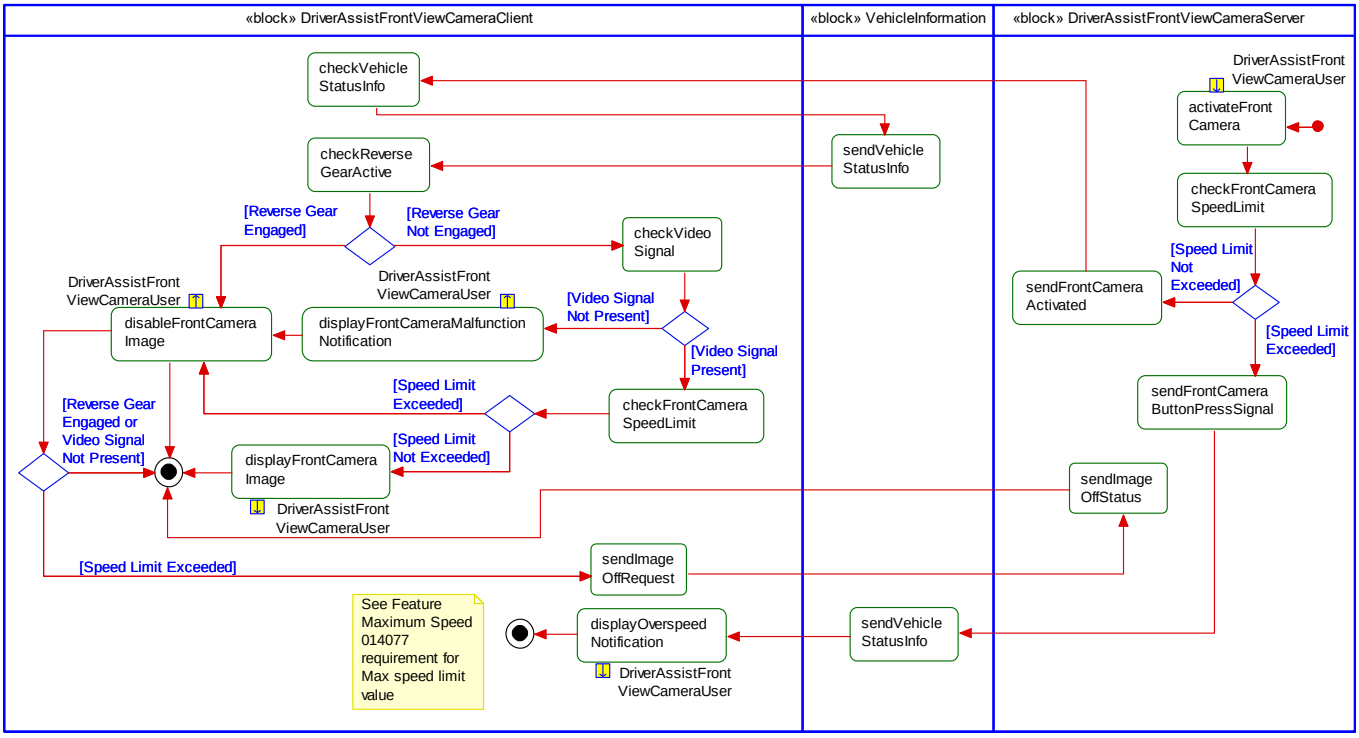
3.2.1.3 White Box View

3.2.1.3.1 Activity Diagrams

3.2.1.3.1.1 DAFVCv1-ACT-REQ-014043/B-Activate/Deactivate Driver Assist Front View Camera (TcSE ROIN-282606-3)

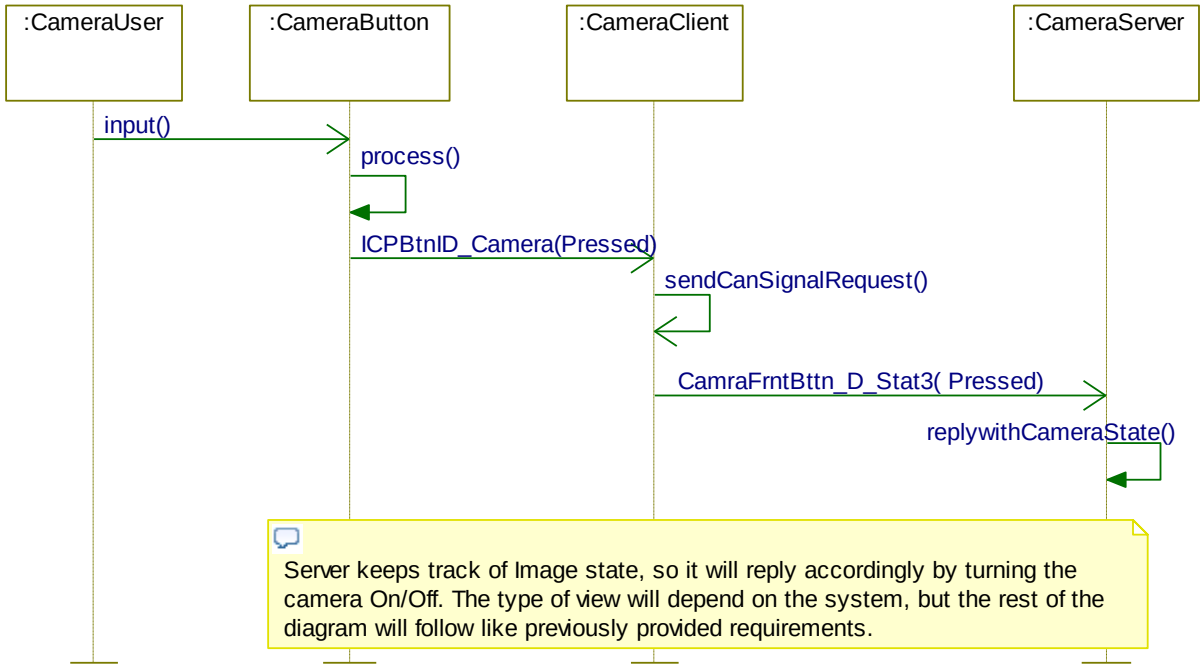
Linked Elements
DAFVCv1-SD-REQ-014051/A-Activation Attempt During Overspeed (TcSE ROIN-287030-1)
DAFVCv1-SD-REQ-014050/C-Activate_Deactivate Driver Asistance Front View Camera (TcSE ROIN-282617-2)

Activity Diagram



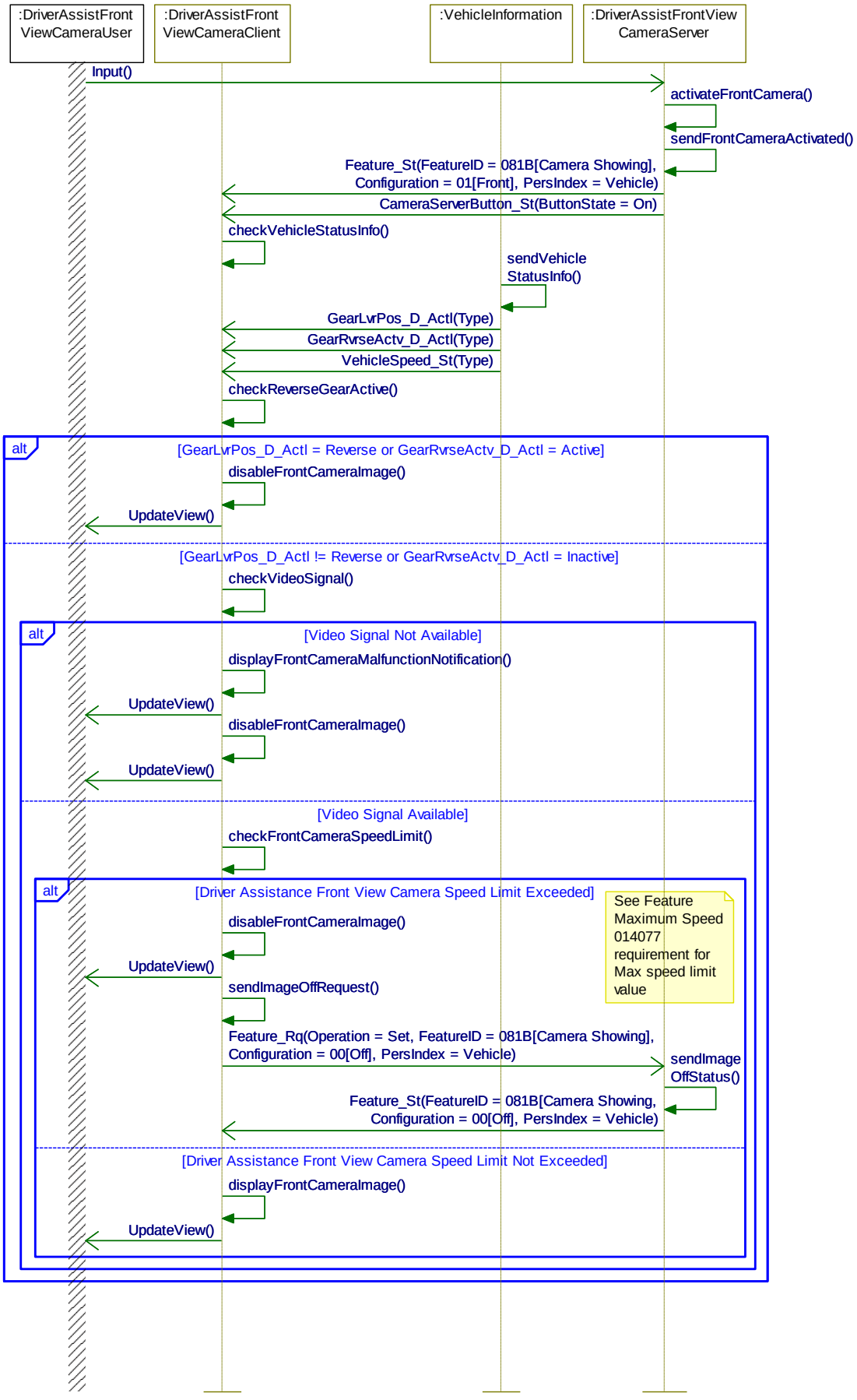
3.2.1.3.2 Sequence Diagrams

3.2.1.3.2.1 REQ-331856/B-Lin Button Camera Request



3.2.1.3.2.2 DAFVCv1-SD-REQ-014050/C-Activate_Deactivate Driver Asistance Front View Camera (TcSE ROIN-282617-2)

Sequence Diagram


:DriverAssistFront ViewCameraUser
:DriverAssistFront ViewCameraClient
:VehicleInformation
:DriverAssistFrontView CameraServer
Input()
activateFrontCamera()
sendFrontCameraActivated()
Feature_St(FeatureID = 081B[Camera Showing], Configuration = 01[Front], PersIndex = Vehicle)
CameraServerButton_St(ButtonState = On)
checkVehicleStatusInfo()
sendVehicle StatusInfo()
GearLvrPos_D_Actl(Type)
GearRvrseActv_D_Actl(Type)
VehicleSpeed_St(Type)
checkReverseGearActive()
alt
[GearLvrPos_D_Actl = Reverse or GearRvrseActv_D_Actl = Active]
disableFrontCameraImage()
UpdateView()
[GearLvrPos_D_Actl != Reverse or GearRvrseActv_D_Actl = Inactive]
checkVideoSignal()
alt
[Video Signal Not Available]
displayFrontCameraMalfunctionNotification()
UpdateView()
disableFrontCameraImage()
UpdateView()
[Video Signal Available]
checkFrontCameraSpeedLimit()
alt
[Driver Assistance Front View Camera Speed Limit Exceeded]
See Feature Maximum Speed 014077 requirement for Max speed limit value
disableFrontCameraImage()
UpdateView()
sendImageOffRequest()
Feature_Rq(Operation = Set, FeatureID = 081B[Camera Showing], Configuration = 00[Off], PersIndex = Vehicle)
sendImage OffStatus()
Feature_St(FeatureID = 081B[Camera Showing, Configuration = 00[Off], PersIndex = Vehicle)
[Driver Assistance Front View Camera Speed Limit Not Exceeded]
displayFrontCameraImage()
UpdateView()

3.2.1.3.2.3 DAFVCv1-SD-REQ-014051/A-Activation Attempt During Overspeed (TcSE ROIN-287030-1)

Scenario

Normal Usage

The user attempts to activate the Driver Assist Front View Camera (DAFVC) by pressing the hard switch while exceeding the ~~DAFVC vehicle~~ speed limit per CAMERA-REQ-014077-Feature Maximum Speed.

Constraints

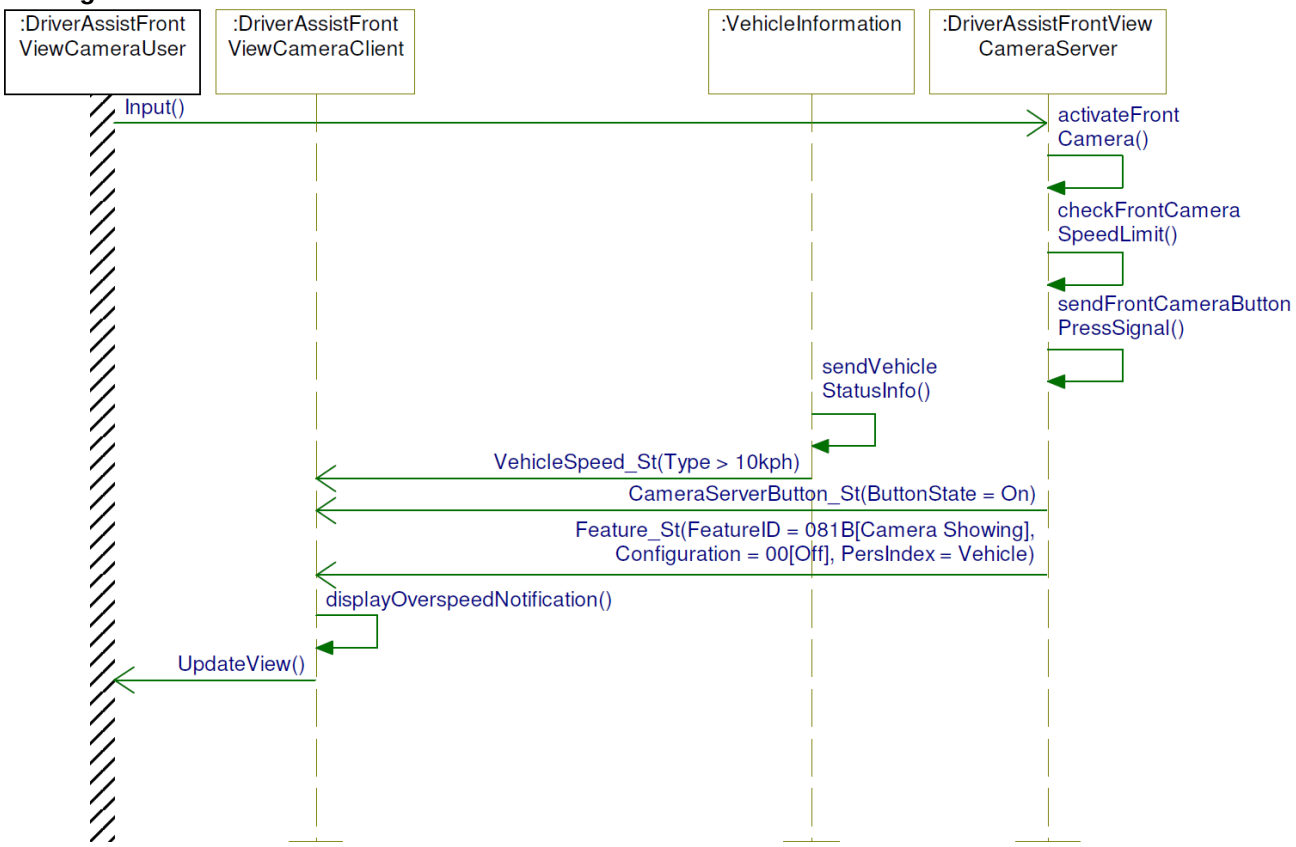
Pre-condition

Ignition_Status = Run

Post-condition

HMI Display shows an over-speed notification.

Sequence Diagram



3.2.2 DAFVCv2-FUN-REQ-128309/B-Activate/Deactivate Driver Assist Front View Camera v2

3.2.2.1 Requirements

3.2.2.1.1 DAFVCv1-FUR-REQ-166641/A-Deactivate FVC

The DriverAssistFrontViewCameraClient shall stop displaying Front View Camera (FVC) image when one of the following conditions is met:

- Vehicle is shifted into 'Reverse' (Rear View Camera image will be shown)
- Vehicle is shifted into 'Park' (No Image shown in 'Park')
- Power Mode does not equal IgnitionOn_2 or Running_2 or Crank_3
- FVC is disabled (Feature_St equals 0x81B Camera Showing and 0x00 Off)
- Vehicle speed exceeds Feature Maximum Speed requirement 014077

3.2.2.1.2 DAFVCv1-FUR-REQ-013997/B-E-Locker Deactivation Delay (TcSE ROIN-266607-1)

If the FrontViewCameraClient is displaying the Front View Camera (FVC) image (all conditions for front camera image display are true) and the E-Locker transistions from 'Locked' (Elocker_St = 0x1:ON) to 'Unlocked' (Elocker_St = 0x0:OFF), the FrontViewCameraClient shall start a timer (T_eLockerDelay) and shall continue to display the FVC image until the expiration of this timer.

If the FrontViewCameraClient detects that the E-Locker transistions back to 'Locked' prior to the expiration of T_eLockerDelay, and all other conditions for front camera image remain true, the FrontViewCameraClient shall cancel the timer and continue to display the FVC image.

3.2.2.1.3 DAFVCv1-TMR-REQ-013998/B-T_eLockerDelay (TcSE ROIN-266609-1)

Name	Description	Units	Range	Resolution	Default
T_eLockerDelay	Maximum time FrontViewCameraClient should wait before stopping the display of the FVC video image to the user according to FAS-FVC-GREQ-266607-E-Locker Deactivation Delay.	msec	4975-5025	5	5000

3.2.2.2 Use Cases

3.2.2.2.1 DAFVCv2-UC-REQ-128182/B-Entering Front Camera - 360

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera or FVC only • The vehicle is in Run/Start • The vehicle is NOT in reverse • The vehicle speed is below limit per CAMERA-REQ-014077-Feature Maximum Speed~~10kph~~
Scenario Description	The driver presses Front Camera Hard Button
Post-conditions	Front Multicamera view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.2.2.2.2 DAFVCv2-UC-REQ-128184/B-Entering Front Camera – Non-360

Actors	Vehicle Occupant
Pre-conditions	• APIM is configured with FVC only (no Multicamera) • Vehicle in Run/Start • Vehicle Not in reverse • Vehicle speed per CAMERA-REQ-014077-Feature Maximum Speed~~below 10kph~~
Scenario Description	• User presses Camera Hard Button
Post-conditions	Front Normal view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.2.2.2.3 DAFVCv1-UC-REQ-128312/B-Activation Attempt During Overspeed Condition

Linked Elements
DAFVCv1-UC-REQ-128310/A-Activate Driver Assist Front View Camera

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case
Scenario Description	The driver attempts to activate the Driver Assist Front View Camera (DAFVC) via hard button interface while traveling at a speed greater than the limit per CAMERA-REQ-014077-Feature Maximum Speed~~feature maximum~~.
Post-conditions	The vehicle display does NOT show the DAFVC image.
List of Exception Use Cases	NA
Interfaces	G-HMI Dedicated Hard Button Vehicle System Interface

3.2.2.2.4 TRG-UC-REQ-102959/A-Vehicle Not in RUN/START

Actors	Vehicle Occupant
Pre-conditions	Same as normal usage use case
Scenario Description	Driver moves the ignition out of Run/Start
Post-conditions	The vehicle returns to non-TRG behavior
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.2.2.2.5 TRG-UC-REQ-102960/A-Loss of communication with IPMB Module

Actors	Vehicle Occupant
Pre-conditions	Same as normal usage use case
Scenario Description	Driver attempts to do something in TRG and APIM has lost communication with IPMB
Post-conditions	The vehicle shows camera view, without any overlays
List of Exception Use Cases	N/A
Interfaces	G-HMI Vehicle System Interface

3.2.2.2.6 TRG-UC-REQ-102961/A-Valid Camera Video Signal not present

Actors	Vehicle Occupant
Pre-conditions	Same as normal usage use case
Scenario Description	Driver attempts to do something in TRG and APIM is not receiving valid video
Post-conditions	The vehicle returns to non-TRG behavior
List of Exception Use Cases	N/A

Interfaces	G-HMI Vehicle System Interface

3.2.2.2.7 DAFVCv1-UC-REQ-014049/B-Deactivate Driver Assist Front View Camera (TcSE ROIN-290146)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The vehicle system display is showing front view camera image
Scenario Description	The user deactivates the Driver Assist Front View Camera (DAFVC) by one of the following: • Disabling DAFVC via hard button interface • Exceeding the speed limit per CAMERA-REQ-014077-Feature Maximum Speed • Shifting the vehicle into Reverse (RVC image will be shown if conditions for RVC allow it) • Shifting the vehicle into Park (No image shown in 'Park')
Post-conditions	The vehicle display does NOT show the DAFVC image.
List of Exception Use Cases	NA
Interfaces	G-HMI Dedicated Hard Button Vehicle System Interface

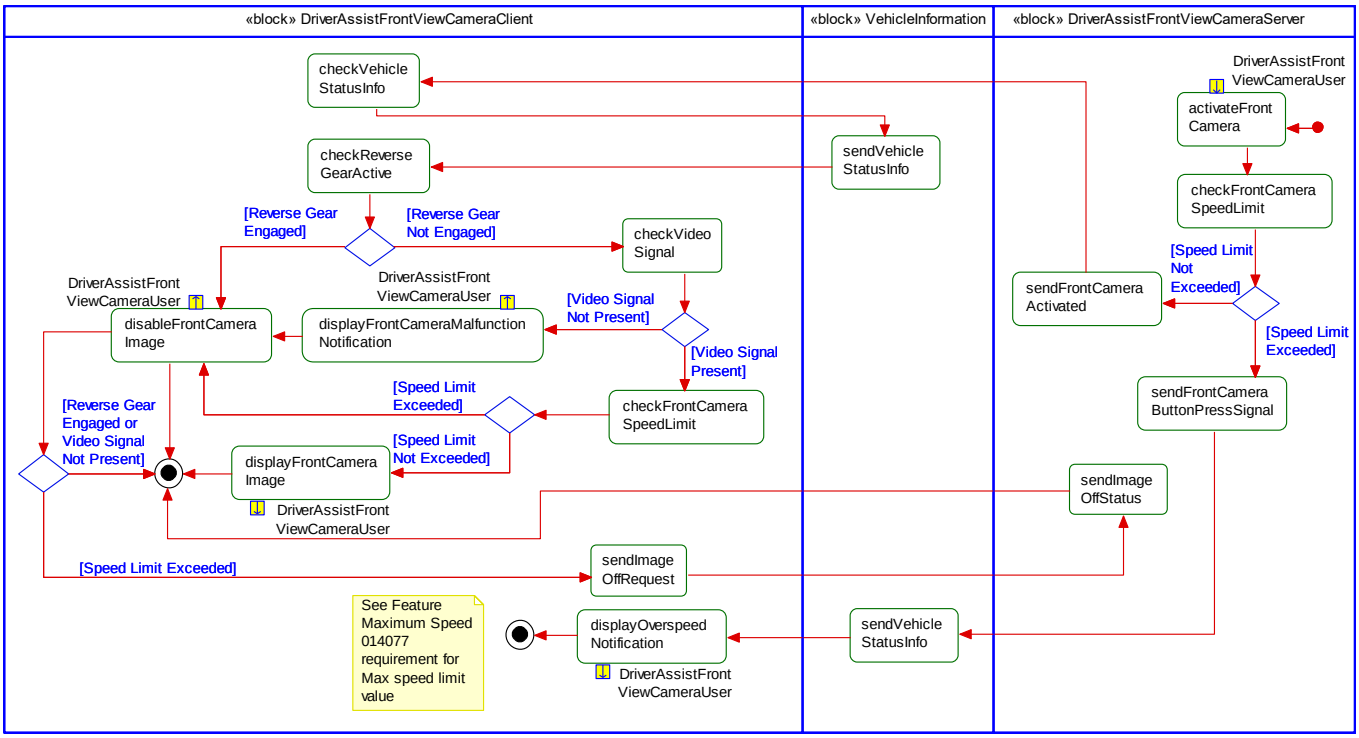
3.2.2.3 White Box View

3.2.2.3.1 Activity Diagrams

3.2.2.3.1.1 DAFVCv1-ACT-REQ-014043/B-Activate/Deactivate Driver Assist Front View Camera (TcSE ROIN-282606-3)

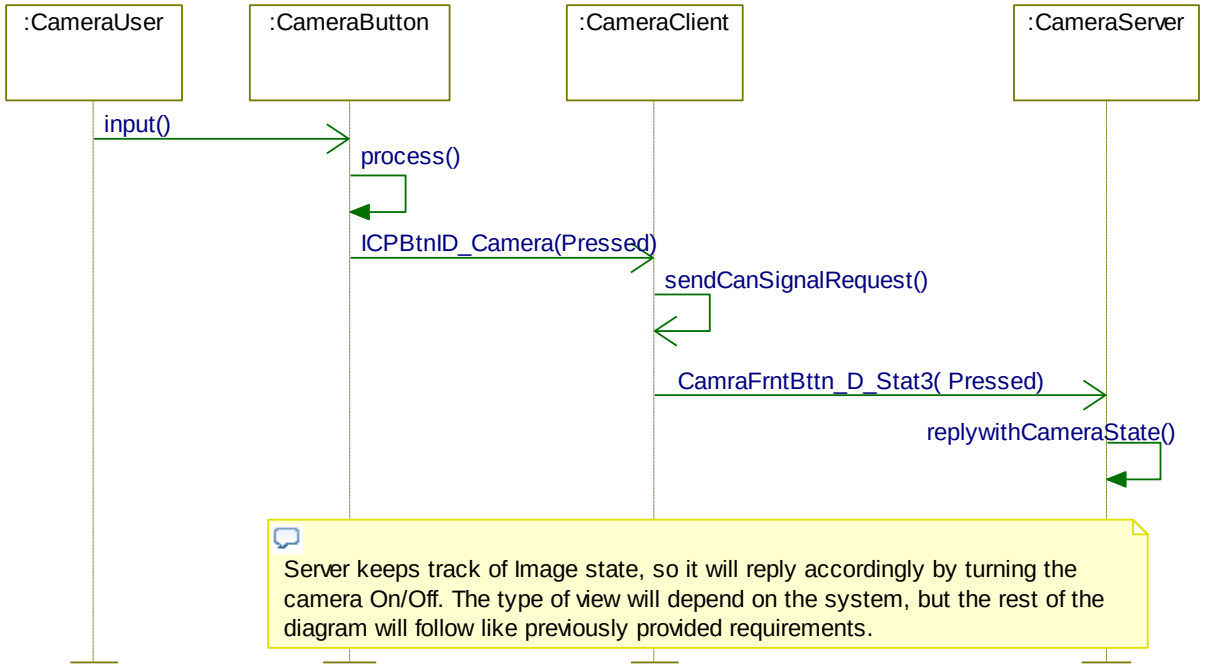
Linked Elements
DAFVCv1-SD-REQ-014051/A-Activation Attempt During Overspeed (TcSE ROIN-287030-1)
DAFVCv1-SD-REQ-014050/C-Activate_Deactivate Driver Asistance Front View Camera (TcSE ROIN-282617-2)

Activity Diagram



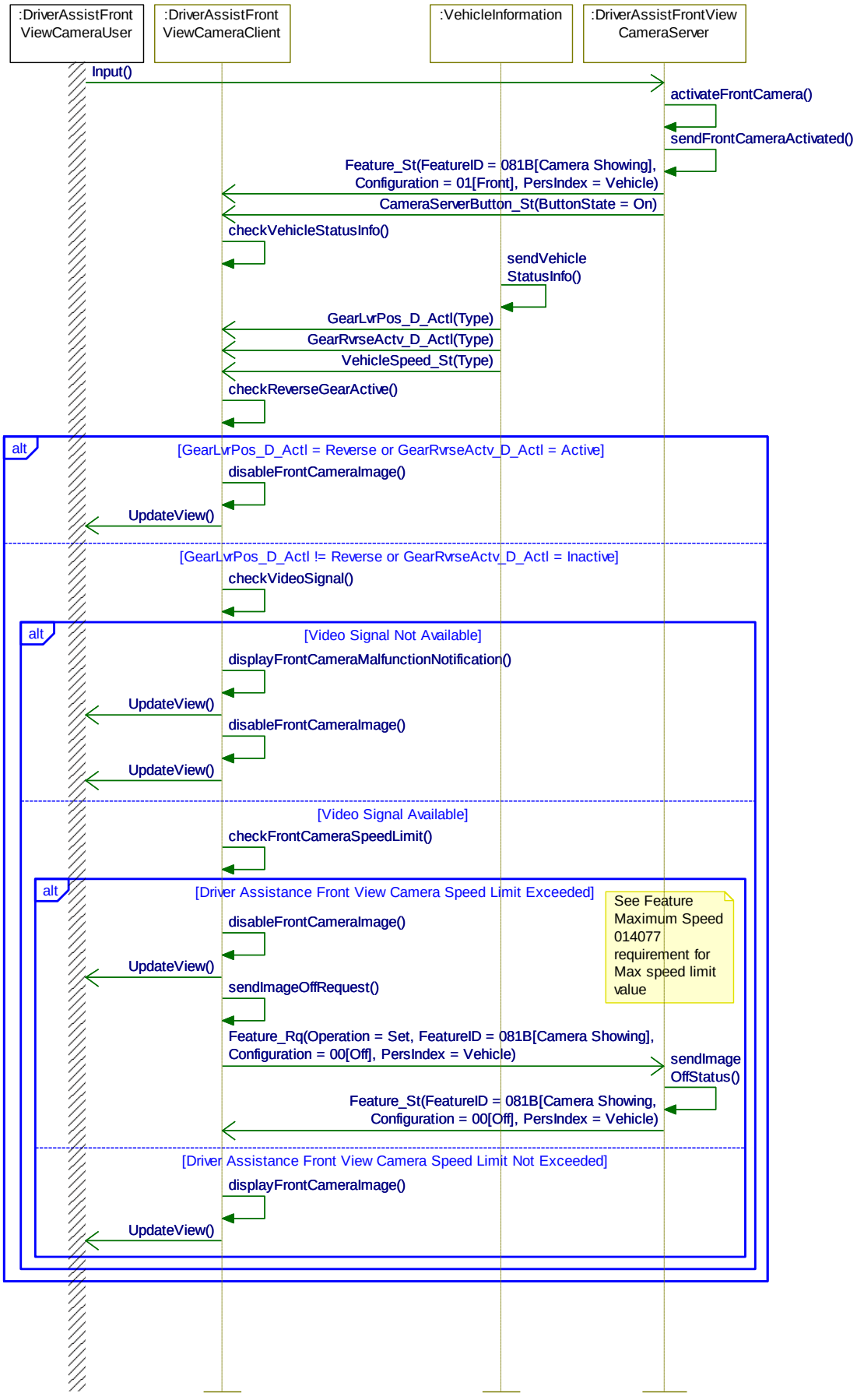
3.2.2.3.2 Sequence Diagrams

3.2.2.3.2.1 REQ-331856/B-Lin Button Camera Request



3.2.2.3.2.2 DAFVCv1-SD-REQ-014050/C-Activate_Deactivate Driver Asistance Front View Camera (TcSE ROIN-282617-2)

Sequence Diagram


:DriverAssistFront ViewCameraUser
:DriverAssistFront ViewCameraClient
:VehicleInformation
:DriverAssistFrontView CameraServer
Input()
activateFrontCamera()
sendFrontCameraActivated()
Feature_St(FeatureID = 081B[Camera Showing], Configuration = 01[Front], PersIndex = Vehicle)
CameraServerButton_St(ButtonState = On)
checkVehicleStatusInfo()
sendVehicle StatusInfo()
GearLvrPos_D_Actl(Type)
GearRvrseActv_D_Actl(Type)
VehicleSpeed_St(Type)
checkReverseGearActive()
alt
[GearLvrPos_D_Actl = Reverse or GearRvrseActv_D_Actl = Active]
disableFrontCameraImage()
UpdateView()
[GearLvrPos_D_Actl != Reverse or GearRvrseActv_D_Actl = Inactive]
checkVideoSignal()
alt
[Video Signal Not Available]
displayFrontCameraMalfunctionNotification()
UpdateView()
disableFrontCameraImage()
UpdateView()
[Video Signal Available]
checkFrontCameraSpeedLimit()
alt
[Driver Assistance Front View Camera Speed Limit Exceeded]
See Feature Maximum Speed 014077 requirement for Max speed limit value
disableFrontCameraImage()
UpdateView()
sendImageOffRequest()
Feature_Rq(Operation = Set, FeatureID = 081B[Camera Showing], Configuration = 00[Off], PersIndex = Vehicle)
sendImage OffStatus()
Feature_St(FeatureID = 081B[Camera Showing, Configuration = 00[Off], PersIndex = Vehicle)
[Driver Assistance Front View Camera Speed Limit Not Exceeded]
displayFrontCameraImage()
UpdateView()

3.2.2.3.2.3 DAFVCv1-SD-REQ-014051/A-Activation Attempt During Overspeed (TcSE ROIN-287030-1)

Scenario

Normal Usage

The user attempts to activate the Driver Assist Front View Camera (DAFVC) by pressing the hard switch while exceeding the ~~DAFVC vehicle~~ speed limit per CAMERA-REQ-014077-Feature Maximum Speed.

Constraints

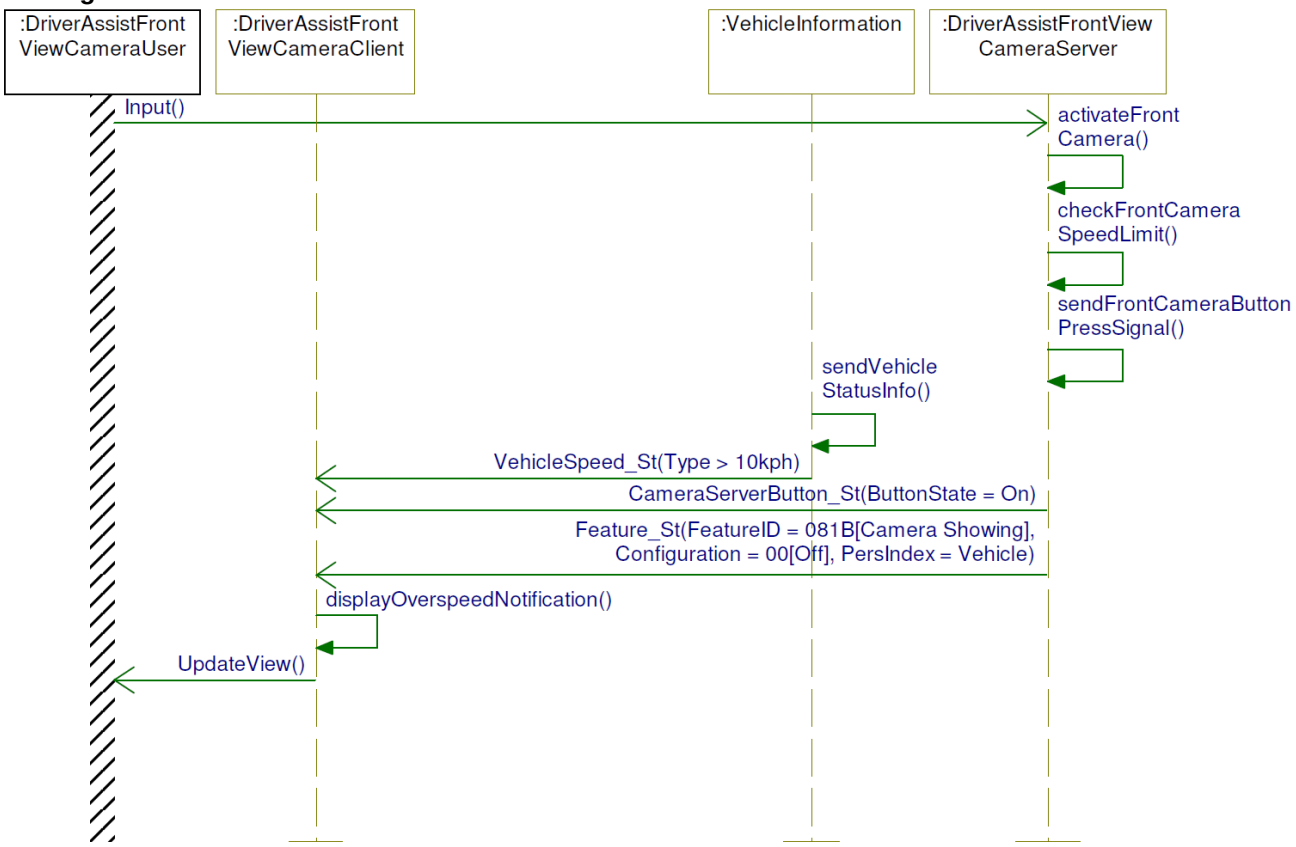
Pre-condition

Ignition_Status = Run

Post-condition

HMI Display shows an over-speed notification.

Sequence Diagram



3.2.3 DAFVCv1-FUN-REQ-014052/A-Driver Assist Front Camera Image View (TcSE ROIN-293390)

3.2.3.1 Use Cases

3.2.3.1.1 DAFVCv1-UC-REQ-014053/A-Select Front Camera Split-View (TcSE ROIN-290147)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The gear position status is NOT Reverse. The vehicle display is showing the Driver Assist Front View Camera image.
Scenario Description	The driver selects split-view image setting via hard switch interface.
Post-conditions	The vehicle display continues to show the Driver Assist Front View Camera image.

	The video feed from the Driver Assist Front View Camera contains a split-view image.
List of Exception Use Cases	NA
Interfaces	G-HMI Dedicated Hard Button Vehicle System Interface

3.2.3.1.2 DAFVCv1-UC-REQ-014054/A-Select Front Camera 360-View (TcSE ROIN-290148)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The gear position status is NOT Reverse. The vehicle display is showing the Driver Assist Front View Camera image.
Scenario Description	The driver selects 360-view image setting via hard switch interface.
Post-conditions	The vehicle display continues to show the Driver Assist Front View Camera image. The video feed from the Driver Assist Front View Camera contains a 360-view image.
List of Exception Use Cases	NA
Interfaces	G-HMI Dedicated Hard Button Vehicle System Interface

3.2.3.1.3 DAFVCv1-UC-REQ-014055/A-Select Front Camera Normal View (TcSE ROIN-290149)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The gear position status is NOT Reverse. The vehicle display is showing the Driver Assist Front View Camera image.
Scenario Description	The driver selects normal view image setting via hard switch interface.
Post-conditions	The vehicle display continues to show the Driver Assist Front View Camera image. The video feed from the Driver Assist Front View Camera contains a normal view image.
List of Exception Use Cases	NA
Interfaces	G-HMI Dedicated Hard Button Vehicle System Interface

3.2.3.1.4 DAFVCv1-UC-REQ-014056/A-Select Front Camera Image Off (TcSE ROIN-290150)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The gear position status is NOT Reverse.

	The vehicle display is showing the Driver Assist Front View Camera image.
Scenario Description	The driver selects image off setting via hard switch interface.
Post-conditions	The vehicle display returns to the state previous to entering Driver Assist Front View Camera.
List of Exception Use Cases	NA
Interfaces	G-HMI Dedicated Hard Button Vehicle System Interface

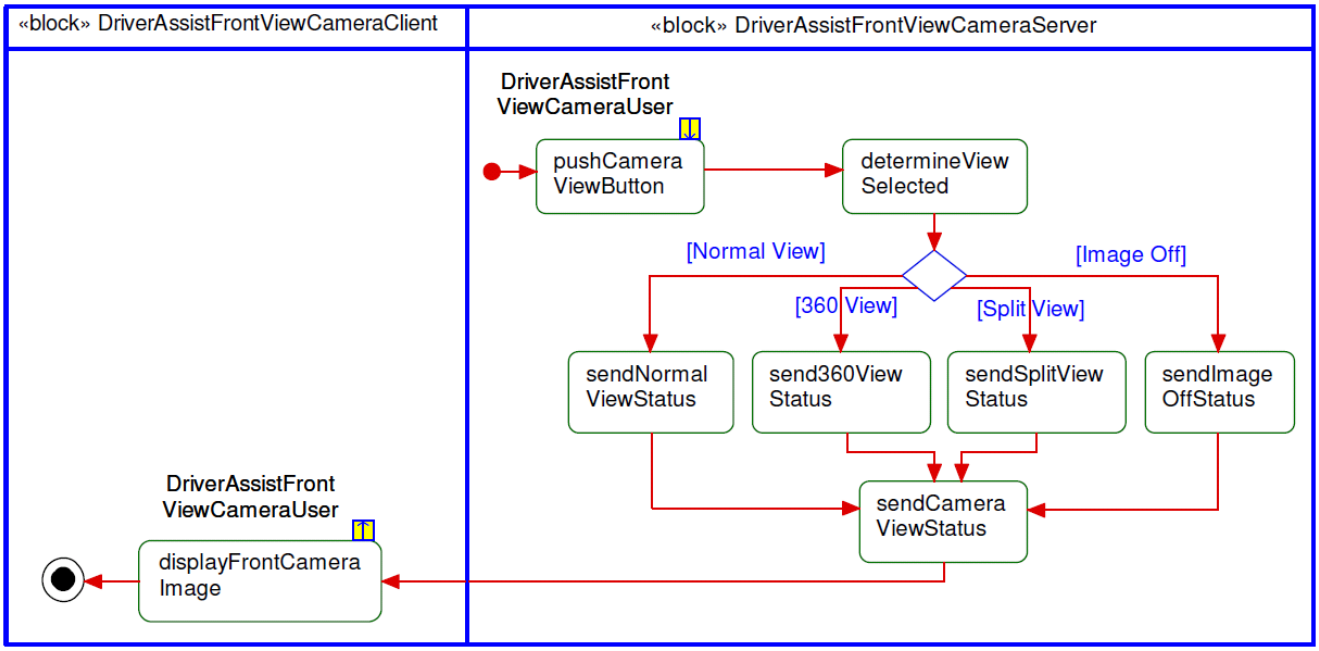
3.2.3.2 White Box View

3.2.3.2.1 Activity Diagrams

3.2.3.2.1.1 DAFVCv1-ACT-REQ-014044/A-Change Camera View Setting (TcSE ROIN-282608-2)

Linked Elements
DAFVCv1-SD-REQ-014057/A-Change Camera View Setting (TcSE ROIN-282599-3)

Activity Diagram



3.2.3.2.2 Sequence Diagrams

3.2.3.2.2.1 DAFVCv1-SD-REQ-014057/A-Change Camera View Setting (TcSE ROIN-282599-3)

Scenario

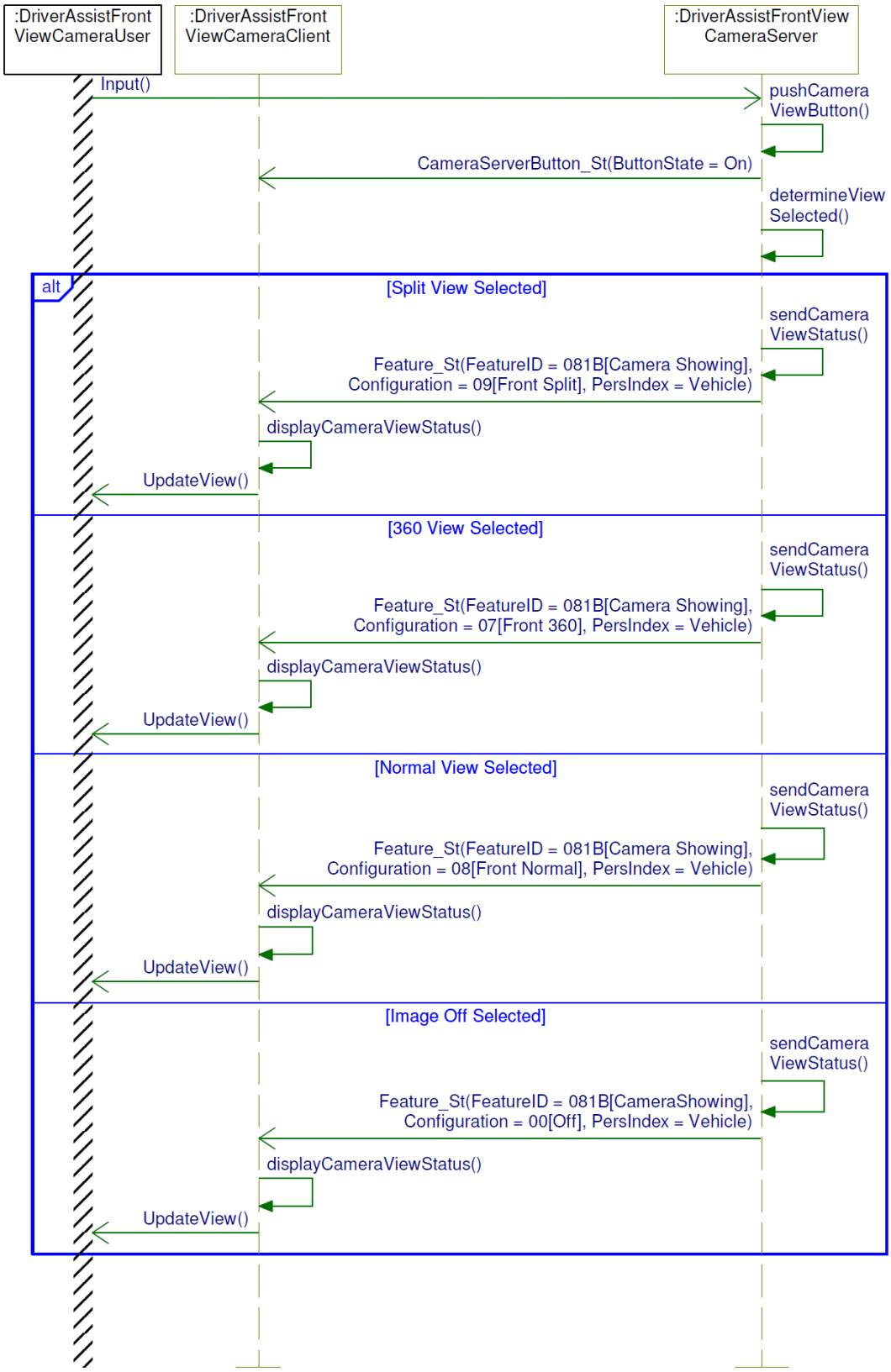
Normal Usage
The user selects alternate view image setting via hard switch interface.

Constraints

Pre-condition
Ignition_Status = Run

Post-condition
The HMI display is showing the Driver Assist Front Video Camera image that reflects the updated alternate view setting.

Sequence Diagram



3.2.4 DAFVCv2-FUN-REQ-127102/A-Driver Assist Front Camera Image View v2

3.2.4.1 Use Cases

3.2.4.1.1 DAFVCv2-UC-REQ-128183/A-Press Front 360 View Button

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera or FVC only • The vehicle is in Run/Start • Front Camera is shown, and not in Front 360 view.
Scenario Description	The user presses Front 360 soft Button
Post-conditions	Front 360 view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.2.4.1.2 DAFVCv2-UC-REQ-128185/A-Press Front Normal View Button

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with front camera • The vehicle is in Run/Start • Front Camera View is shown but not in Front Normal View
Scenario Description	The driver presses Front Normal view soft Button
Post-conditions	Front Normal View shown.
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.2.4.1.3 DAFVCv2-UC-REQ-128186/A-Press Front Split View

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with front camera • The vehicle is in Run/Start • Front Camera view is shown, but not in Front Split View
Scenario Description	Thre driver presses Front Split soft Button
Post-conditions	Front Split View shown
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.2.4.1.4 DAFVCv2-UC-REQ-128187/A-Press Rear button From Front camera

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with front camera • The vehicle is in Run/Start • Front Camera view is shown
Scenario Description	The Driver presses rear soft Button
Post-conditions	Rear Camera View shows
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

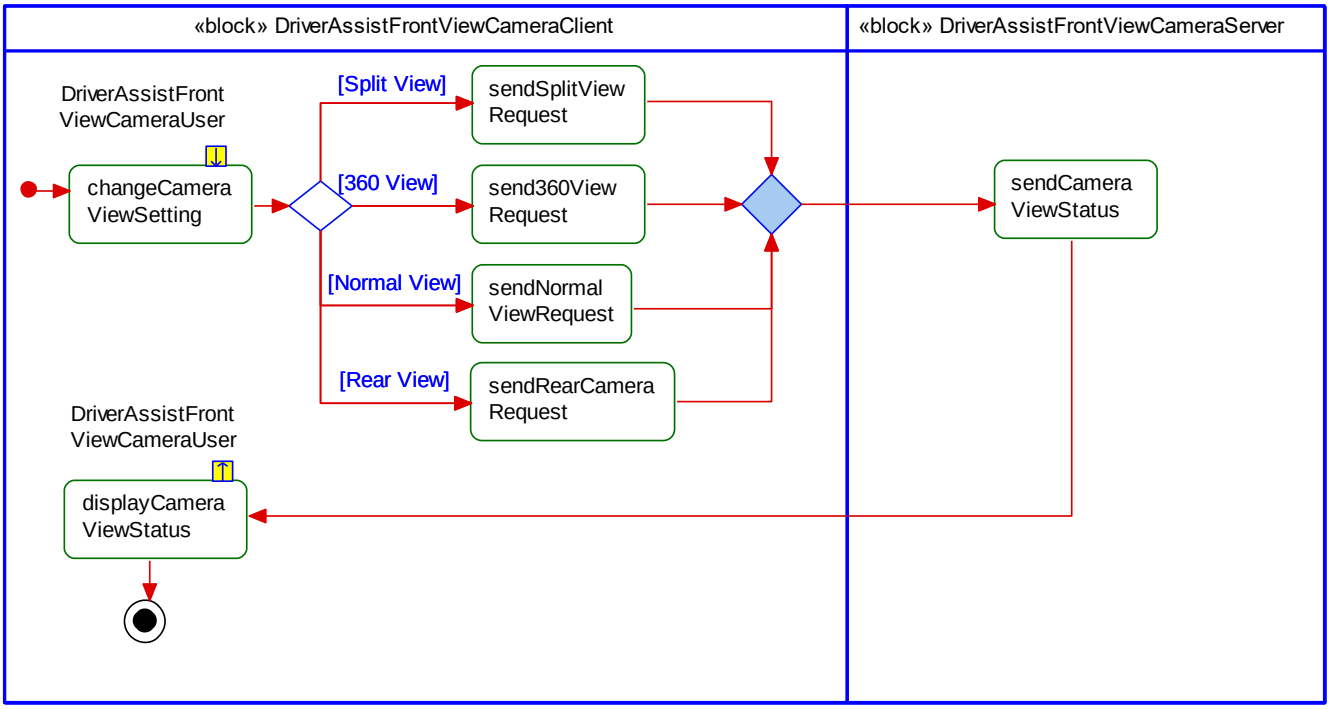
3.2.4.2 White Box View

3.2.4.2.1 Activity Diagrams

3.2.4.2.1.1 DAFVCv2-ACT-REQ-127100/A-Change Camera View Setting

Linked Elements
DAFVCv1-SD-REQ-014057/A-Change Camera View Setting (TcSE ROIN-282599-3)

Activity Diagram



3.2.4.2.2 Sequence Diagrams

3.2.4.2.2.1 DAFVCv2-SD-REQ-127099/A-Change Camera View Setting

Scenario

Normal Usage

The user selects alternate view image setting via soft button interface.

Constraints

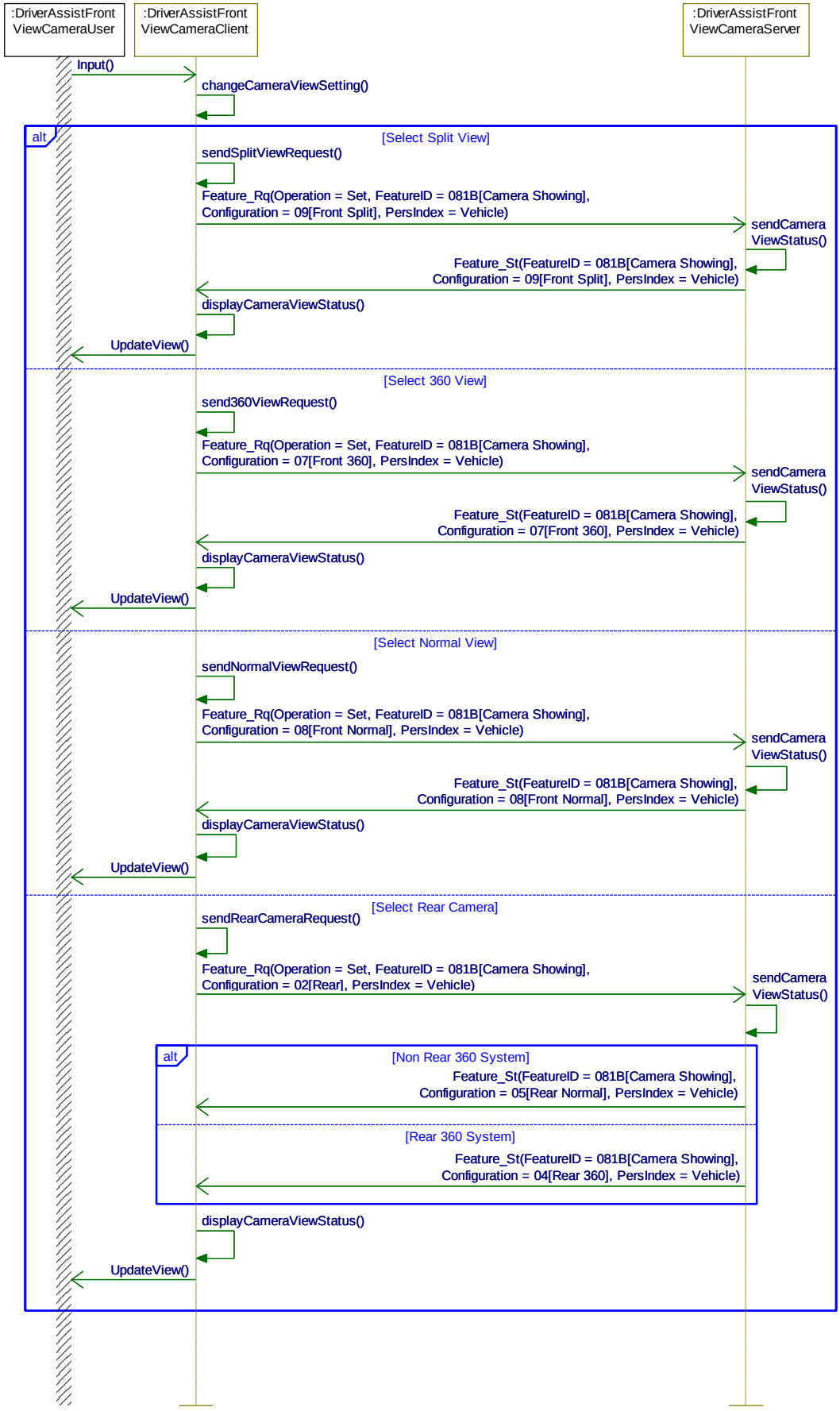
Pre-condition

Ignition_Status = Run

Post-condition

The HMI display is showing the Camera image that reflects the updated alternate view setting.

Sequence Diagram


:DriverAssistFront ViewCameraUser
:DriverAssistFront ViewCameraClient
:DriverAssistFront ViewCameraServer
Input()
changeCameraViewSetting()
alt
[Select Split View]
sendSplitViewRequest()
Feature_Rq(Operation = Set, FeatureID = 081B[Camera Showing], Configuration = 09[Front Split], PersIndex = Vehicle)
sendCamera ViewStatus()
Feature_St(FeatureID = 081B[Camera Showing], Configuration = 09[Front Split], PersIndex = Vehicle)
displayCameraViewStatus()
UpdateView()
[Select 360 View]
send360ViewRequest()
Feature_Rq(Operation = Set, FeatureID = 081B[Camera Showing], Configuration = 07[Front 360], PersIndex = Vehicle)
sendCamera ViewStatus()
Feature_St(FeatureID = 081B[Camera Showing], Configuration = 07[Front 360], PersIndex = Vehicle)
displayCameraViewStatus()
UpdateView()
[Select Normal View]
sendNormalViewRequest()
Feature_Rq(Operation = Set, FeatureID = 081B[Camera Showing], Configuration = 08[Front Normal], PersIndex = Vehicle)
sendCamera ViewStatus()
Feature_St(FeatureID = 081B[Camera Showing], Configuration = 08[Front Normal], PersIndex = Vehicle)
displayCameraViewStatus()
UpdateView()
[Select Rear Camera]
sendRearCameraRequest()
Feature_Rq(Operation = Set, FeatureID = 081B[Camera Showing], Configuration = 02[Rear], PersIndex = Vehicle)
sendCamera ViewStatus()
alt
[Non Rear 360 System]
Feature_St(FeatureID = 081B[Camera Showing], Configuration = 05[Rear Normal], PersIndex = Vehicle)
[Rear 360 System]
Feature_St(FeatureID = 081B[Camera Showing], Configuration = 04[Rear 360], PersIndex = Vehicle)
displayCameraViewStatus()
UpdateView()

3.3 CAMERA-FUN-REQ-331348/A-Offset View

3.3.1 CAMERA-UC-REQ-331349/A-Press Rear Offset View Button from Rear 360

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START • Rear 360 is shown
Scenario Description	The driver presses rear offset view button
Post-conditions	Rear RWD Offset View appears with overlays
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.3.2 CAMERA-UC-REQ-331350/A-Press Rear Offset View Button from Front 360

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START • Front 360 view is shown
Scenario Description	The driver presses rear offset view button
Post-conditions	Front RWD Offset View appears with overlays
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.3.3 CAMERA-UC-REQ-331351/A-Press Rear Left Corner View Button from Rear 360

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START • Rear 360 camera is shown
Scenario Description	The driver presses rear left corner view button
Post-conditions	Multicamera Rear_RL_Corner view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	Vehicle System Interface

3.3.4 CAMERA-UC-REQ-331352/A-Press Rear Left Corner View Button from Front 360

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START

	• Front 360 camera is shown
Scenario Description	The driver presses rear left corner view button
Post-conditions	Multicamera Front_RL_Corner view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	Vehicle System Interface

3.3.5 CAMERA-UC-REQ-331353/A-Press Rear Right Corner View Button from Rear 360

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START • Rear 360 camera is shown
Scenario Description	The driver presses rear right corner view button
Post-conditions	Multicamera Rear_RR_Corner view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	Vehicle System Interface

3.3.6 CAMERA-UC-REQ-331354/A-Press Rear Right Corner View Button from Front 360

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START • Front 360 camera is shown
Scenario Description	The driver presses rear right corner view button
Post-conditions	Multicamera Front_RR_Corner view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	Vehicle System Interface

3.3.7 CAMERA-UC-REQ-331356/A-Press Front Offset View Button from Rear 360

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START • Rear 360 is shown
Scenario Description	The driver presses front offset view button
Post-conditions	Rear FWD Offset View appears with overlays
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI

	Vehicle System Interface

3.3.8 CAMERA-UC-REQ-331360/A-Press Front Offset View Button from Front 360

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START • Front 360 view is shown
Scenario Description	The driver presses front offset view button
Post-conditions	Front FWD Offset View appears with overlays
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	G-HMI Vehicle System Interface

3.3.9 CAMERA-UC-REQ-331365/A-Press Front Left Corner View Button from Rear 360

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START • Rear 360 camera is shown
Scenario Description	The driver presses rear left corner view button
Post-conditions	Multicamera Rear_FL_Corner view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	Vehicle System Interface

3.3.10 CAMERA-UC-REQ-331369/A-Press Front Left Corner View Button from Front 360

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START • Front 360 camera is shown
Scenario Description	The driver presses front left corner view button
Post-conditions	Multicamera Front_FL_Corner view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	Vehicle System Interface

3.3.11 CAMERA-UC-REQ-331373/A-Press Front Right Corner View Button from Rear 360

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera

	• The vehicle is in RUN/START • Rear 360 camera is shown
Scenario Description	The driver presses front right corner view button
Post-conditions	Multicamera Rear_FR_Corner view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	Vehicle System Interface

3.3.12 CAMERA-UC-REQ-331374/A-Press Front Right Corner View Button from Front 360

Actors	Vehicle Occupant
Pre-conditions	• The vehicle is configured with Multicamera • The vehicle is in RUN/START • Front 360 camera is shown
Scenario Description	The driver presses front right corner view button
Post-conditions	Multicamera Front_FR_Corner view appears
List of Exception Use Cases	E1 – Vehicle is not RUN/START E2 – Loss of communication with Camera Server E3 – Valid camera video signal not present
Interfaces	Vehicle System Interface

3.4 Views At Speed

3.4.1 CAMERA-FUN-REQ-354982/A-Views At Speed

3.4.1.1 Requirements

3.4.1.1.1 CAMERA-REQ-354992/A-Views At Speed Availability

Views At Speed are a set of views that are available even when vehicle reaches speeds above those mentioned in req 014077, while not in reverse drive.

For some implementations the views will deactivate under the speed limitations of req 014077, the user will be able to reactivate the applicable views again by button press.

The user is able to request a view change and Server will decide on what kind of views to display.
Available views are setup through Method II configuration.

3.4.1.1.2 CAMERA-REQ-354993/A-Views At Speed List

Views at Speed include the following views:

View Name	Config Value
CHMSL	0x0B
Aux	0x0D
Hitch	0x26
RCOD*	0x27

*This is the RCOD in multicamera SPSS with Config value 0x27, not to be confused with Rear Camera On Demand SPSS which also is commonly referred to RCOD.

3.4.1.1.3 CAMERA-REQ-358450/A-Off Road Mode Views At Speed

When the vehicle is configured for off road mode views at speed and off road mode is active, there is no max speed limit for showing Off Road Front Camera Image.

3.4.1.2 Use Cases

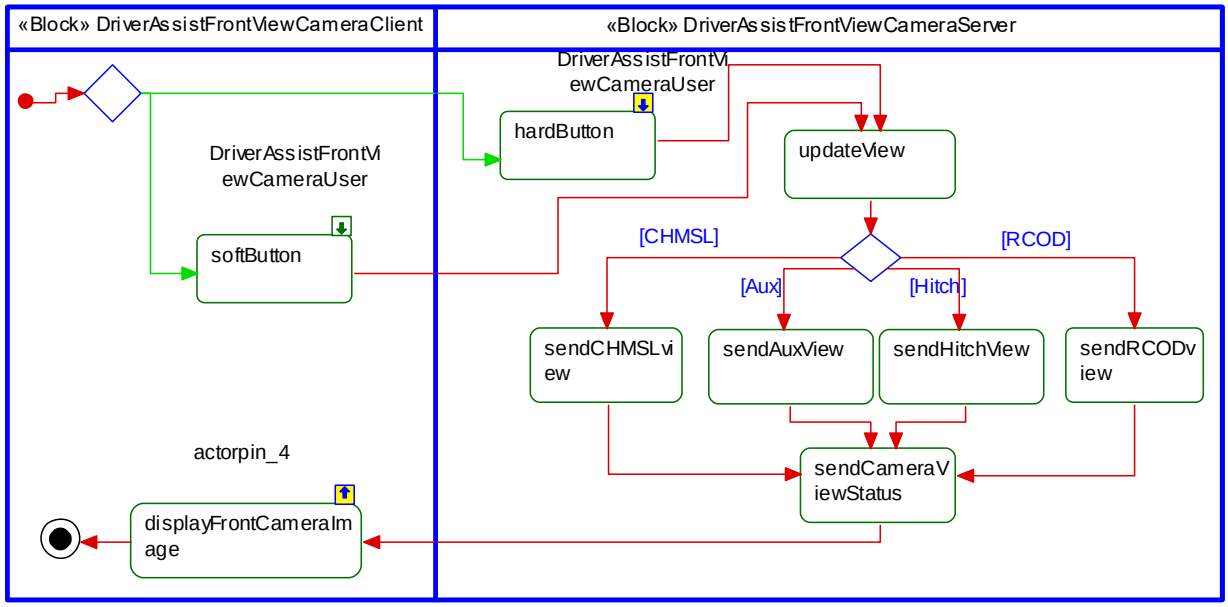
3.4.1.2.1 CAMERA-UC-REQ-355016/A-Views At Speed Trigger

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. Vehicle is in Drive above 10kph. Vehicle is equipped with 360 camera with any or all of the views at speed: Aux, CHMSL, HITCH, RCOD No camera view is active.
Scenario Description	Customer presses Camera button.
Post-conditions	Client displays available view at speed per camera request.
List of Exception Use Cases	
Interfaces	G-HMI Vehicle System Interface

3.4.1.3 White Box Views

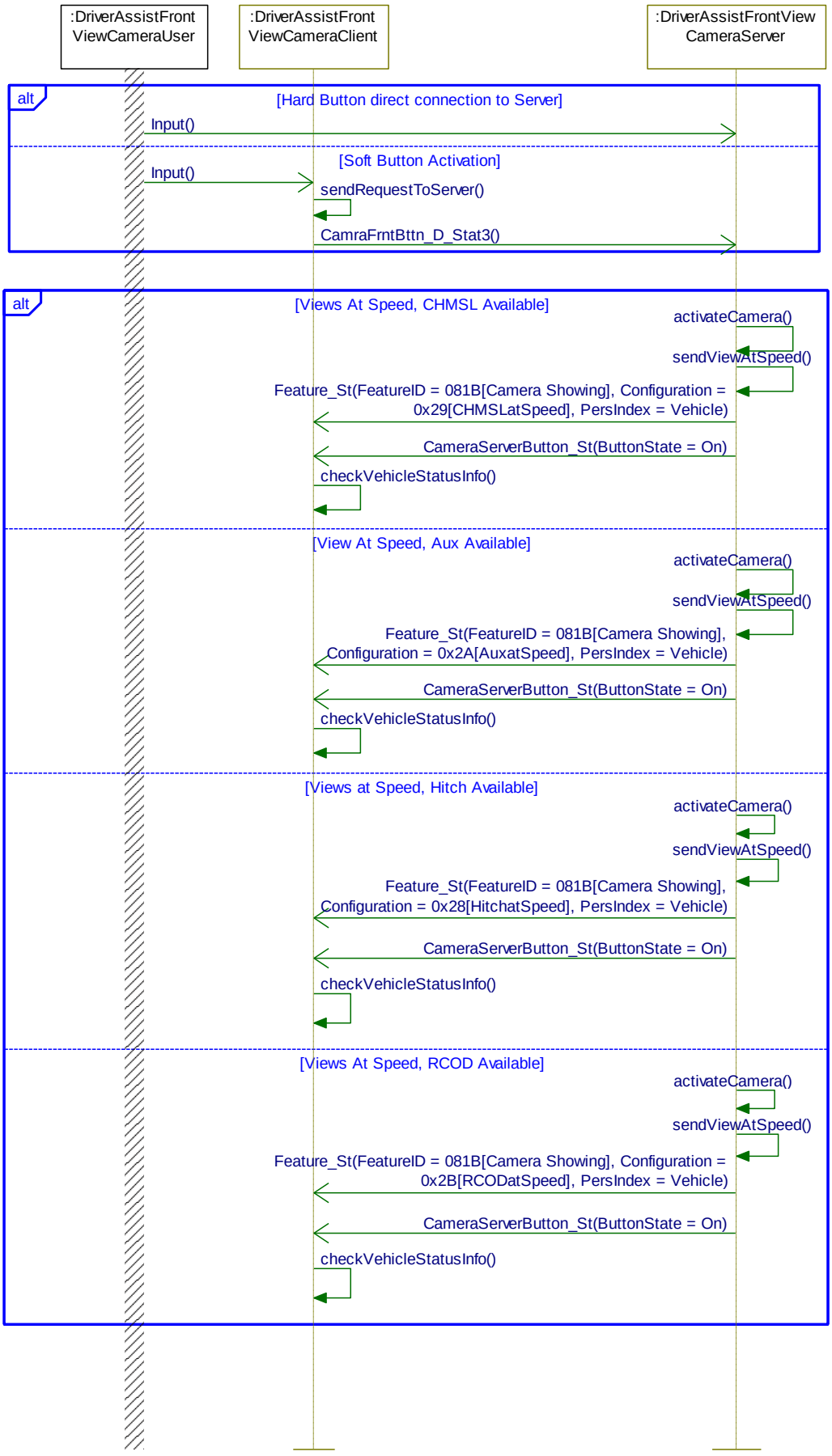
3.4.1.3.1 Activity Diagram

3.4.1.3.1.1 CAMERA-ACT-REQ-358468/A-Views At Speed



3.4.1.3.2 Sequence Diagram

3.4.1.3.2.1 CAMERA-SD-REQ-354994/A-Views At Speed


:DriverAssistFront ViewCameraUser
:DriverAssistFront ViewCameraClient
:DriverAssistFrontView CameraServer
alt
[Hard Button direct connection to Server]
Input()
[Soft Button Activation]
Input()
sendRequestToServer()
CamraFrntBttn_D_Stat3()
alt
[Views At Speed, CHMSL Available]
activateCamera()
sendViewAtSpeed()
Feature_St(FeatureID = 081B[Camera Showing], Configuration = 0x29[CHMSLatSpeed], PersIndex = Vehicle)
CameraServerButton_St(ButtonState = On)
checkVehicleStatusInfo()
[View At Speed, Aux Available]
activateCamera()
sendViewAtSpeed()
Feature_St(FeatureID = 081B[Camera Showing], Configuration = 0x2A[AuxatSpeed], PersIndex = Vehicle)
CameraServerButton_St(ButtonState = On)
checkVehicleStatusInfo()
[Views at Speed, Hitch Available]
activateCamera()
sendViewAtSpeed()
Feature_St(FeatureID = 081B[Camera Showing], Configuration = 0x28[HitchatSpeed], PersIndex = Vehicle)
CameraServerButton_St(ButtonState = On)
checkVehicleStatusInfo()
[Views At Speed, RCOD Available]
activateCamera()
sendViewAtSpeed()
Feature_St(FeatureID = 081B[Camera Showing], Configuration = 0x2B[RCODatSpeed], PersIndex = Vehicle)
CameraServerButton_St(ButtonState = On)
checkVehicleStatusInfo()

4 Appendix: Reference Documents

Reference #	Document Title
1	
2	
3	
4	
5	