Research & Vehicle Technology
"Infotainment Systems Product Development"

Feature – Visual Park Assist Graphic Client V2

Subsystem Part Specific Specification (SPSS)

Version 1.2

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Version Date: December 16, 2016

FORD CONFIDENTIAL

Revision History

Date	Ver	Notes	
April 8, 2016	**1.0**	**Draft Release**	
June 13, 2016	**1.1**	**Initial Release**	**First Formal Release**
	VPAv2-FRD-REQ-213624/A-Visual Park Assist Graphic Client V2+		wstephe1: Updated variant designation to reflect parking aid feature team's updated interface
	CAMERA-FUR-REQ-157189/B-General Signal Interface 3		schapeki: Clarify screen interaction with animations
	CAMERA-FUR-REQ-197147/C-Infotainment Graphical Position Definition 11		schapeki: no update, revised in error.
	CAMERA-FUR-REQ-166820/C-HMI Screen Logical Arbitration - Camera		schapeki: update for fault handling bugfixes
	CAMERA-FUR-REQ-166823/D-HMI Screen Logical Arbitration - APA Dedicated Display		schapeki: update for fault handling bugfixes
	CAMERA-FUR-REQ-131023/E-HMI Screen Logical Arbitration - PDC Dedicated Display		schapeki: update for fault handling bugfixes
	CAMERA-FUR-REQ-130483/F-Park Distance Control (PDC) Signal Processing - Positional OUTLINE		schapeki: remove PrkAidSnsFlSide and FrSide, they should have been globally removed in previous revision of the specification.
	235115/B-Base Parking Aid Display Deactivation Interface		schapeki: structure update only.
	201981/C-Base Parking Aid display Deactivation Function		schapeki: structure update to delete MyKey references.
	CAMERA-FUR-REQ-131051/C-Base Parking Aid display Deactivation Function-BPA Close Option Logic		schapeki: bug fix to remove MyKey references.
	CAMERA-FUR-REQ-130503/G-Active Park Assist (APA) Signal Processing - Positional ParkPilot		schapeki: bug fixes, table updates.
December 16, 2016	**1.2**	**Updated Release**	
	MD-REQ-016222/B-IgnKeyType_D_Actl (TcSE ROIN-200609-4)		
	CAMERA-FUR-REQ-166820/D-HMI Screen Logical Arbitration - Camera		schapeki: update so that APA forces RVC exit delay.
	CAMERA-FUR-REQ-166823/E-HMI Screen Logical Arbitration - APA Dedicated Display		schapeki: remove state 5 for "fault" which is already not in any use cases. Add anti-flicker timers transition into state 4, clear variable APADisp.
	CAMERA-FUR-REQ-131023/F-HMI Screen Logical Arbitration - PDC Dedicated Display		schapeki: add anti-flicker timer to transition into states 4, 5; clear PDCDisp
	CAMERA-FUR-REQ-130456/E-Park Distance Control (PDC) Signal list - [SidePrkSnsL1_D_Stat]		Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-130457/E-Park Distance Control (PDC) Signal list - [SidePrkSnsR1_D_Stat]		Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-130458/C-Park Distance Control (PDC) Signal list - [SidePrkSnsL2_D_Stat]		Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-131040/C-Park Distance Control (PDC) Signal list - [SidePrkSnsR2_D_Stat]		Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-131041/C-Park		Update tables to correct copy and paste error.

	Distance Control (PDC) Signal list - [SidePrkSnsL3_D_Stat]	
	CAMERA-FUR-REQ-131042/C-Park Distance Control (PDC) Signal list - [SidePrkSnsR3_D_Stat]	Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-131043/C-Park Distance Control (PDC) Signal list - [SidePrkSnsL4_D_Stat]	Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-131044/C-Park Distance Control (PDC) Signal list - [SidePrkSnsR4_D_Stat]	Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-130474/G-Park Distance Control (PDC) Signal Processing - Positionals SPA_L1_1, SPA_L1_2	Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-130475/G-Park Distance Control (PDC) Signal Processing - Positionals SPA_R1_1, SPA_R1_2	Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-130476/F-Park Distance Control (PDC) Signal Processing - Positionals SPA_L2_1, SPA_L2_2	Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-130477/F-Park Distance Control (PDC) Signal Processing - Positionals SPA_R2_1, SPA_R2_2	Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-130478/F-Park Distance Control (PDC) Signal Processing - Positionals SPA_L3_1, SPA_L3_2	Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-130479/F-Park Distance Control (PDC) Signal Processing - Positionals SPA_R3_1, SPA_R3_2	Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-130480/F-Park Distance Control (PDC) Signal Processing - Positionals SPA_L4_1, SPA_L4_2	Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-130481/F-Park Distance Control (PDC) Signal Processing - Positionals SPA_R4_1, SPA_R4_2	Update tables to correct copy and paste error.
	CAMERA-FUR-REQ-130503/H-Active Park Assist (APA) Signal Processing - Positional ParkPilot+	schapeki: add B479/C519 implementation notes.
	CAMERA-FUR-REQ-130503/I-Active Park Assist (APA) Signal Processing - Positional ParkPilot	schapeki: show both tables, one for 8" and one for 4"

Table of Contents

1 Overview

The Visual Park Assist (VPA) system will provide a display to the user that shows colored bars around a vehicle icon. The bars represent a visualization of the audible chimes that occur in response to objects in close proximity of the vehicle. Visual Park Assist (VPA) is the next generation of the Park Distance Control (PDC) feature and incorporates new parking scenarios for vehicle side object avoidance (Side Parking Assist). A given vehicle configuration will implement the spec content for only one feature, either Visual Park Assist (VPA) or Park Distance Control (PDC), but not both.

2 Architectural Design

2.1 VPAv1-CLD-REQ-014434/A-Visual Park Assist Graphic Client (TcSE ROIN-283948-1)

Responsibility: The Visual Park Assist Graphic Client is the visual interface of the Visual Park Assist function. It displays information to the user relative to objects detected near the exterior of the vehicle.

2.2 VisualParkAssistGraphicClient Interface

2.2.1 VPAv1-IIR-REQ-130705/A-VisualParkAssistGraphicClient_Rx

2.2.1.1 MD-REQ-014247/A-ParkAidSensorFront_St (TcSE ROIN-264265-1)

Message Type: Status

Indicates the distance between front sensors and obstacles.

Name	Literals	Value	Description
FrontLeftCenter	-	-	Distance to front-left-center sensor
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0xB	
	Zone12	0xC	
	Zone13	0xD	
	Zone14	0xE	
	Zone15	0xF	
FrontRightCenter	-	-	Distance to front-right-center sensor
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0xB	
	Zone12	0xC	
	Zone13	0xD	
	Zone14	0xE	
	Zone15	0xF	
FrontLeftCorner	-	-	Distance to front-left-corner sensor
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	

	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0xB	
	Zone12	0xC	
	Zone13	0xD	
	Zone14	0xE	
	Zone15	0xF	
FrontRightCorner	-	-	Distance to front-right-corner sensor
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0xB	
	Zone12	0xC	
	Zone13	0xD	
	Zone14	0xE	
	Zone15	0xF	
FrontLeftSide	-	-	Distance to front-left-side sensor
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0xB	
	Zone12	0xC	
	Zone13	0xD	
	Zone14	0xE	
	Zone15	0xF	
FrontRightSide	-	-	Distance to front-right-side sensor
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	

	Zone9	0x9	
	Zone10	0xA	
	Zone11	0xB	
	Zone12	0xC	
	Zone13	0xD	
	Zone14	0xE	
	Zone15	0xF	

2.2.1.2 MD-REQ-014248/A-ParkAidSensorRear_St (TcSE ROIN-264340-2)

Message Type: Status

Indicates the distance between rear sensors and obstacles.

Name	Literals	Value	Description
RearLeftCenter	-	-	Distance to rear-left-center sensor
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0xB	
	Zone12	0xC	
	Zone13	0xD	
	Zone14	0xE	
	Zone15	0xF	
RearRightCenter	-	-	Distance to rear-right-center sensor
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0xB	
	Zone12	0xC	
	Zone13	0xD	
	Zone14	0xE	
	Zone15	0xF	
RearLeftCorner	-	-	Distance to rear-left-corner sensor
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	

	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0xB	
	Zone12	0xC	
	Zone13	0xD	
	Zone14	0xE	
	Zone15	0xF	
RearRightCorner	-	-	Distance to rear-right-corner sensor
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0xB	
	Zone12	0xC	
	Zone13	0xD	
	Zone14	0xE	
	Zone15	0xF	
RearLeftSide	-	-	Distance to rear-left-side sensor This signal attribute not applicable to Visual Park Assist Graphic. VPA will only show 4 rear sectors (2 center, 2 corner).
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0xB	
	Zone12	0xC	
	Zone13	0xD	
	Zone14	0xE	
	Zone15	0xF	
RearRightSide	-	-	Distance to rear-right-side sensor This signal attribute not applicable to Visual Park Assist Graphic. VPA will only show 4 rear sectors (2 center, 2 corner).
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	

	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0xB	
	Zone12	0xC	
	Zone13	0xD	
	Zone14	0xE	
	Zone15	0xF	

2.2.1.3 MD-REQ-014436/A-ParkAidSensorSide_St (TcSE ROIN-283922-2)

Message Type: Status
Indicates when objects are detected on the side of the vehicle.

Name	Literals	Value	Description
RightSideSector1	-	-	Determines when an object is detected in the front-most, right-side sector with respect to the visual park assist vehicle icon.
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0XB	
	Zone12	0XC	
	NoObjectInSector	0xD	
	SectorNotFullyScannedYet	0xE	
	Reserved	0xF	
RightSideSector2	-	-	Determines when an object is detected in the front-middle, right-side sector with respect to the visual park assist vehicle icon.
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0XB	
	Zone12	0XC	
	NoObjectInSector	0xD	

	SectorNotFullyScannedYet	0xE	
	Reserved	0xF	
RightSideSector3	-	-	Determines when an object is detected in the rear-middle, right-side sector with respect to the visual park assist vehicle icon.
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0XB	
	Zone12	0XC	
	NoObjectInSector	0xD	
	SectorNotFullyScannedYet	0xE	
	Reserved	0xF	
RightSideSector4	-	-	Determines when an object is detected in the rear-most, right-side sector with respect to the visual park assist vehicle icon.
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0XB	
	Zone12	0XC	
	NoObjectInSector	0xD	
	SectorNotFullyScannedYet	0xE	
	Reserved	0xF	
LeftSideSector1	-	-	Determines when an object is detected in the front-most, left-side sector with respect to the visual park assist vehicle icon.
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	

	Zone11	0XB	
	Zone12	0XC	
	NoObjectInSector	0xD	
	SectorNotFullyScannedYet	0xE	
	Reserved	0xF	
LeftSideSector2	-	-	Determines when an object is detected in the front-middle, left-side sector with respect to the visual park assist vehicle icon.
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0XB	
	Zone12	0XC	
	NoObjectInSector	0xD	
	SectorNotFullyScannedYet	0xE	
	Reserved	0xF	
LeftSideSector3	-	-	Determines when an object is detected in the rear-middle, left-side sector with respect to the visual park assist vehicle icon.
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	
	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0XB	
	Zone12	0XC	
	NoObjectInSector	0xD	
	SectorNotFullyScannedYet	0xE	
	Reserved	0xF	
LeftSideSector4	-	-	Determines when an object is detected in the rear-most, left-side sector with respect to the visual park assist vehicle icon.
	Off	0x0	
	Zone1	0x1	
	Zone2	0x2	
	Zone3	0x3	
	Zone4	0x4	
	Zone5	0x5	
	Zone6	0x6	
	Zone7	0x7	

	Zone8	0x8	
	Zone9	0x9	
	Zone10	0xA	
	Zone11	0XB	
	Zone12	0XC	
	NoObjectInSector	0xD	
	SectorNotFullyScannedYet	0xE	
	Reserved	0xF	

2.2.1.4 MD-REQ-014437/C-VisualParkAssist_St (TcSE ROIN-283917-1)

Message Type: Status

Indicates the state of the park aid system relative to sensor activity.

Name	Literals	Value	Description
Type	-	-	-
	AllSensorsOff	0x0	Rear and Front park assist disabled
	RsensorsOnFsensorsOff	0x1	Rear park assist enabled, Front park assist disabled
	RsensorsOffFsensorsOn	0x2	Rear park assist disabled, Front park assist enabled
	NotUsed	0x3	
	NotUsed	0x4	
	RsensorsOnFsensorsOn	0x5	Rear and Front park assist enabled
	ParkSysAlternateMode	0x6	
	NotUsed	0x7	
	R_Sns_Trlr_F_Sns_Blk	0x8	Trailer attached and front sensor blocked.
	FailWithChime	0x9	
	FailNoChime	0xA	Rear or Front park assist malfunction
	NotAvailTrailerAtchd	0xB	Trailer connected when only Rear park assist is enabled or available
	RsensorsOffTrailerAtchd	0xC	Trailer connected when Front park assist is enabled (includes Front & Rear both enabled)
	R_Sns_Blk_F_Sns_ON	0xD	Rear sensor blocked front sensor on.
	R_Sns_ON_F_Sns_Blk	0xE	Rear sensor on front sensor blocked.
	All_Sns_Blk	0xF	All sensor blocked.

2.2.1.5 MD-REQ-016222/B-IgnKeyType_D_Actl (TcSE ROIN-200609-4)

Message Type: Status

This signal represents the MyKey system status and is provided to all affected system components to configure their local modes.

Name	Literals	Value	Description
IgnKeyType_D_Actl	-	-	Type of key that is in the ignition
	KeyReadInProgress	0x0	Key(s) will be read now
	KeyInIgnStandardKey	0x1	Admin (full) mode
	KeyInIgnMyKey	0x2	MyKey restricted mode
	Key_Not_Prgrm_Read_Failure	0x3	Key not programmed
	Unknown	0xE	Disable MyKey System mode
	Invalid	0xF	Initial value

3 General Requirements

3.1 General Signal Interface

3.1.1 CAMERA-FUR-REQ-130570/B-General Signal Interface 1

Any signals received or sent as part of a message defined by the CMDB but NOT listed in the following requirements shall be disregarded by the infotainment display system.
Note:
Examples: At the time of release of this document, the signals [PrkAidSnsRlSide_D_Stat] and [PrkAidSnsRrSide_D_Stat] are not functionally supported by the PAM for any configuration. They are, however, included in the message ParkAid_Aud_Warn_Stat2 which is sent out by the PAM. Similarly, the signals [PrkAidFront_D_Stat] and [PrkAidFront_D_RqDrv] need not be supported by the cluster even if they are still sent by the PAM with messages ParkAid_Aud_Warn_Stat2 and Cluster_Info4_HS1 (see Y2013_CGEA1.3_CMDB_v13.09_Export).

3.1.2 CAMERA-FUR-REQ-130571/B-General Signal Interface 2

If the infotainment display is not a direct receiver of the signals described in this section, the signals shall be transmitted by a gateway module. While uncommon, some gateways may change the signal names; the infotainment display shall map the signals accordingly.
Note:
In general, gateway specifications are beyond the scope of this document. In case signal names are changed by the gateway, the gateway spec owner shall respect the requirements of this specification.

3.1.3 CAMERA-FUR-REQ-157189/B-General Signal Interface 3

Unless otherwise specified, the Infotainment ECU shall respond to a signal state change by updating the display within 100ms of receipt.

Note: If the display system is in process of showing “non-functional” startup screens but functionally fully initialized and receives APA, BPA or camera requests other than “off” or “initialize” (so any of the features requests a screen), the display system shall show the requested screen. This is so that interruption of any screen animations is consistent across features.

3.2 Operational Modes and Voltage Range Definition

Throughout this document, ignition status references shall correspond to the debounced system operational mode as prescribed by the ignition status CAN message.

3.2.1 CAMERA-FUR-REQ-130572/A-Ignition Status Handling

Signal Received By Infotainment	Signal Parameters	Notes
Ignition_Status	State Encoded: $0: Unknown $1: Off $2: Accessory $4: Run $8: Start $F: Invalid	Ignition Status is determined individually by each ECU. Within this document, Ignition Status = RUN shall be defined as the debounced power mode that the subject ECU self-determines using signal Ignition_Status = $4 (Run).

3.2.2 CAMERA-FUR-REQ-130573/A-Voltage Range Definition

Throughout this specification, operating voltages shall be assumed to be within normal operational range. Exceptions shall apply only when a requirement addresses specific voltage ranges.

3.3 Graphical Position Definition

3.3.1 CAMERA-FUR-REQ-130574/B-Infotainment Graphical Position Definition 1

The HMI system shall provide graphics with fixed assignments for each dedicated display area per HMI program-specific graphical specifications.

3.3.2 CAMERA-FUR-REQ-130575/B-Infotainment Graphical Position Definition 2

The infotainment system shall only show sectors/ execute the below requirements if a screen has been requested as per the HMI arbitration defined in this specification.

3.3.3 CAMERA-FUR-REQ-130576/B-Infotainment Graphical Position Definition 3

Specific graphical display locations and content per program shall be provided by HMI and concurred upon by VE and E/ESE Parking Assistance Engineering.

Note:

The above requirement means that the graphical examples provided in this specification are for functional direction only and are not to be implemented exactly as they have been drawn herein.

3.3.4 CAMERA-FUR-REQ-130577/B-Infotainment Graphical Position Definition 4

All defined graphics shall always be supported. Should HMI deem a particular graphic not applicable, it shall achieve this appearance by defining the various states of that graphic as identical to the background.

3.3.5 CAMERA-FUR-REQ-130578/B-Infotainment Graphical Position Definition 5

Segment counting shall always start with the innermost segment: innermost segment is Segment_1; outermost segment is Segment_(1+n).

3.3.6 CAMERA-FUR-REQ-130579/B-Infotainment Graphical Position Definition 6

The term On-Warn means: an object is present in the respective segment and it is lit in its HMI-defined “on color” (e.g. red, yellow or green) or shown with its HMI-defined “on design” (if no colors available).

3.3.7 CAMERA-FUR-REQ-130580/B-Infotainment Graphical Position Definition 7

The term On-Idle means: no object is present in the respective segment and it is shown in the HMI-defined color associated to this state (e.g. gray) or with the corresponding HMI-defined design (if no color available).

3.3.8 CAMERA-FUR-REQ-130581/B-Infotainment Graphical Position Definition 8

The term On-Nostat means: the park aid module is unable to determine status for the respective segment and it is shown in the HMI-defined no-status condition (e.g. background, crosshatch or gray).

Note: an example is when an object is detected in the closest (zone 1) range, the status of the farther sectors in that range (zones 2, 3, 4, et.al.) will be On-Nostat.

3.3.9 CAMERA-FUR-REQ-130582/B-Infotainment Graphical Position Definition 9

The term inactive means: the respective segment is not shown and the graphics shall display as the HMI-defined background.

3.3.10 CAMERA-FUR-REQ-130583/B-Infotainment Graphical Position Definition 10

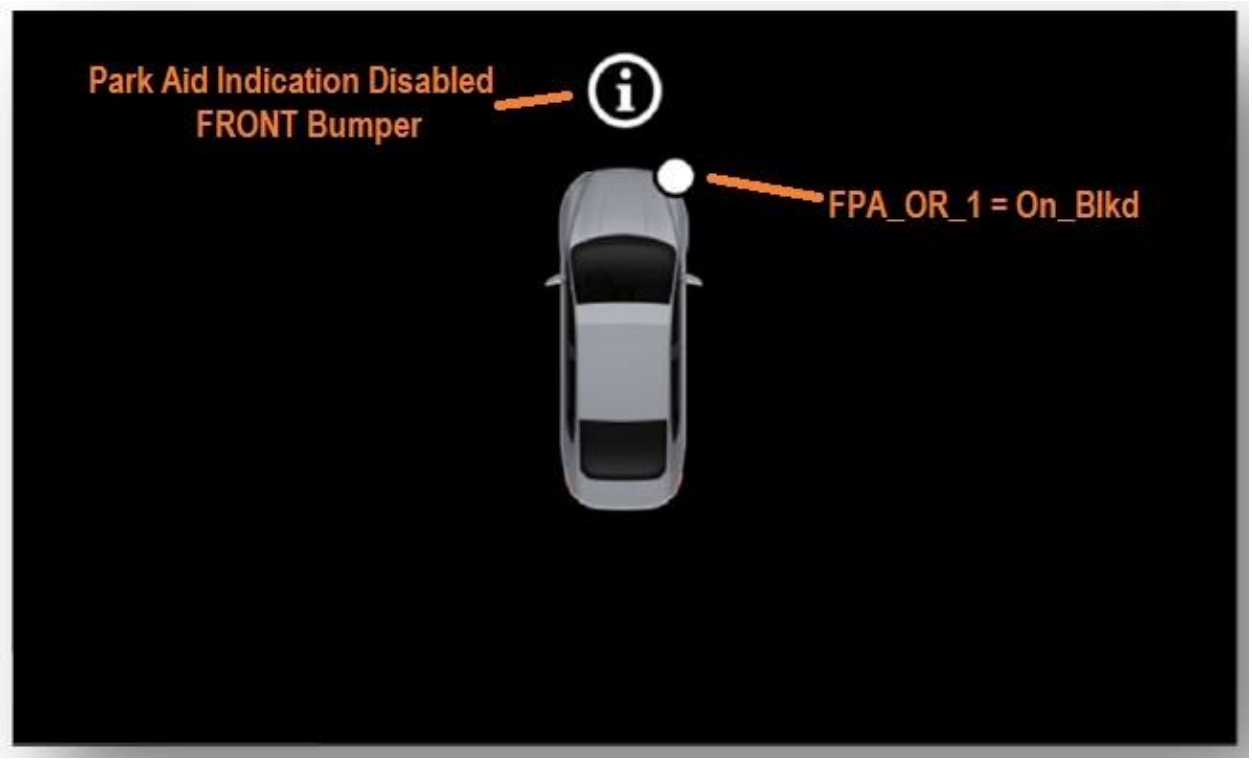
The term On-Trailer means: the portion of the trailer graphic that is contained within the respective segment area. When all defined RPA segments are set to “On-Trailer,” the totality of the HMI-defined trailer graphic shall be represented.

3.3.11 CAMERA-FUR-REQ-197147/C-Infotainment Graphical Position Definition 11

The term On-Blkd means: The respective segment is replaced with an HMI-defined graphic representing a blocked sensor (e.g. white dot or crossed out sector).

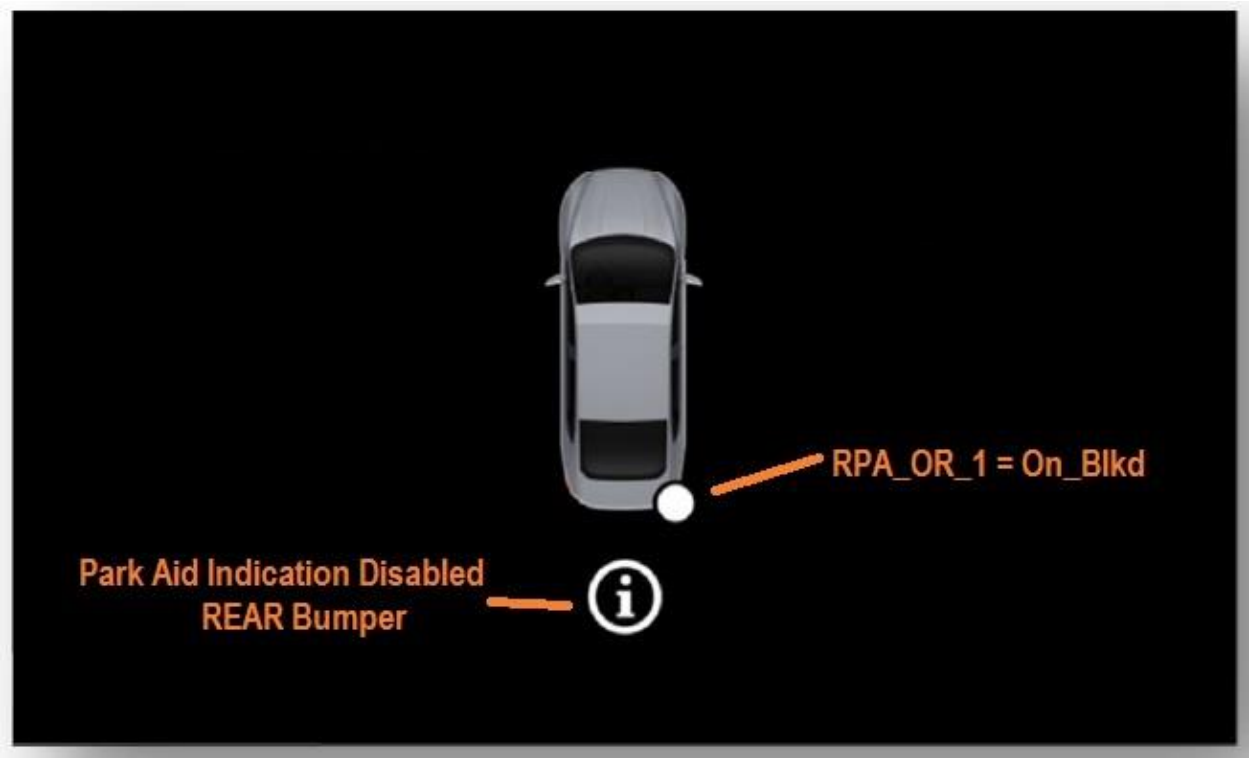
3.3.12 CAMERA-FUR-REQ-211758/A-Infotainment Graphical Position Definition 12

When the status of any front sensor is On-Blkd, in addition to the graphic defined for the individual positional, an HMI-defined graphic shall be displayed which indicates that all front indication sectors are disabled.



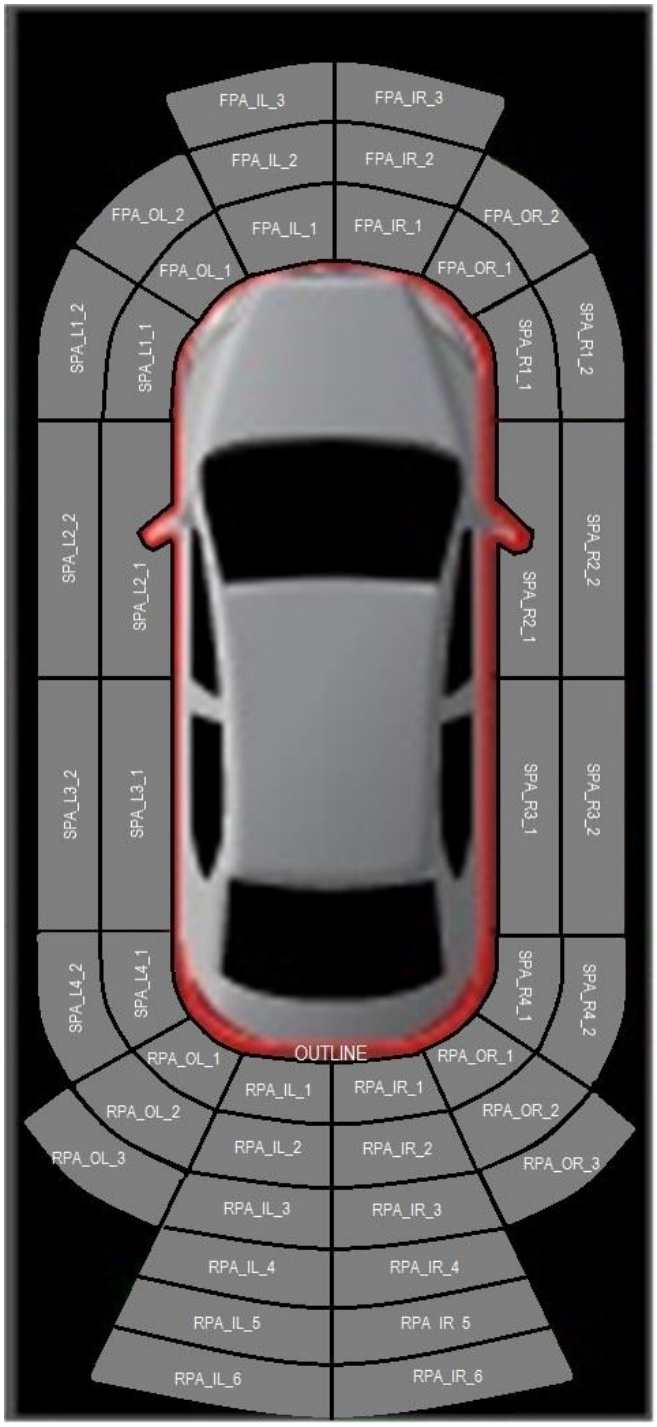
3.3.13 CAMERA-FUR-REQ-211759/A-Infotainment Graphical Position Definition 13

When the status of any rear sensor is On-Blkd, in addition to the graphic defined for the individual positional, an HMI-defined graphic shall be displayed which indicates that all rear indication sectors are disabled.



3.4 Visual Park Aid Graphical Requirements

3.4.1 CAMERA-FUR-REQ-130442/C-Visual Parking Aid Graphical Layout



Actual HMI graphics will be application specific

Position	Abbreviation
RPA_OuterLeft_1	RPA_OL_1
RPA_OuterLeft_2	RPA_OL_2
RPA_OuterLeft_3	RPA_OL_3
RPA_InnerLeft_1	RPA_IL_1
RPA_InnerLeft_2	RPA_IL_2
RPA_InnerLeft_3	RPA_IL_3
RPA_InnerLeft_4	RPA_IL_4
RPA_InnerLeft_5	RPA_IL_5
RPA_InnerLeft_6	RPA_IL_6
RPA_InnerRight_1	RPA_IR_1
RPA_InnerRight_2	RPA_IR_2
RPA_InnerRight_3	RPA_IR_3
RPA_InnerRight_4	RPA_IR_4
RPA_InnerRight_5	RPA_IR_5
RPA_InnerRight_6	RPA_IR_6
RPA_OuterRight_1	RPA_OR_1
RPA_OuterRight_2	RPA_OR_2
RPA_OuterRight_3	RPA_OR_3
FPA_OuterLeft_1	FPA_OL_1
FPA_OuterLeft_2	FPA_OL_2
FPA_InnerLeft_1	FPA_IL_1
FPA_InnerLeft_2	FPA_IL_2
FPA_InnerLeft_3	FPA_IL_3
FPA_InnerRight_1	FPA_IR_1
FPA_InnerRight_2	FPA_IR_2
FPA_InnerRight_3	FPA_IR_3
FPA_OuterRight_1	FPA_OR_1
FPA_OuterRight_2	FPA_OR_2
SPA_Left1_1	SPA_L1_1
SPA_Left1_2	SPA_L1_2
SPA_Right1_1	SPA_R1_1
SPA_Right1_2	SPA_R1_2
SPA_Left2_1	SPA_L2_1
SPA_Left2_2	SPA_L2_2
SPA_Right2_1	SPA_R2_1
SPA_Right2_2	SPA_R2_2
SPA_Left3_1	SPA_L3_1
SPA_Left3_2	SPA_L3_2
SPA_Right3_1	SPA_R3_1
SPA_Right3_2	SPA_R3_2
SPA_Left4_1	SPA_L4_1
SPA_Left4_2	SPA_L4_2
SPA_Right4_1	SPA_R4_1
SPA_Right4_2	SPA_R4_2

HMI Zone Assignment for PDC

3.4.2 CAMERA-FUR-REQ-130775/B-Visual Parking Aid General Graphical Requirements 1

The HMI system screen designer shall align the size and position of the Base Park Aid (BPA) sectors area such that they reflect as closely as possible to the BPA system sector area definitions.

Note:

This requirement aims to assure that the parking aid and HMI engineers are in agreement. The indication of object position must be (as closely as possible) in line with the true object position per tests #27, #28 of CETP: 13.13-R-4171.

3.4.3 CAMERA-FUR-REQ-130776/B-Visual Parking Aid General Graphical Requirements 2

All sectors of Park Distance Control (PDC) shall be supported.
Note:
Which sectors are shown shall be controlled directly by the CAN signaling; PAM configuration shall ensure that the commanded display matches the number of channels available in the vehicle.

3.4.4 CAMERA-FUR-REQ-130777/B-Visual Parking Aid General Graphical Requirements 3

Positional nomenclature follows HMI zone assignment for PDC table. The positional OUTLINE shall consist of an HMI-defined outline of the vehicle that can be activated independent of other segments.
Note:
Typical execution aligns the warning color of the vehicle outline with any segment 1 warning.

3.4.5 Visual Parking Aid RPA Graphical Requirements

3.4.5.1 CAMERA-FUR-REQ-130778/B-Visual Parking Aid RPA Graphical Requirements 1

The two inner/ center RPA sectors RPA_IL, RPA_IR shall consist of six (6) independent bars or segments.

3.4.5.2 CAMERA-FUR-REQ-130779/C-Visual Parking Aid RPA Graphical Requirements 2

The two outer/ corner RPA sectors RPA_OL, RPA_OR shall consist of three (3) independent bars or segments.

3.4.6 Visual Parking Aid FPA Graphical Requirements

3.4.6.1 CAMERA-FUR-REQ-130780/B-Visual Parking Aid FPA Graphical Requirements 1

The two inner/ center FPA sectors FPA_IL, FPA_IR shall consist of three (3) independent bars or segments.

3.4.6.2 CAMERA-FUR-REQ-130781/B-Visual Parking Aid FPA Graphical Requirements 2

The two outer/ corner FPA sectors FPA_OL, FPA_OR shall consist of two (2) independent bars or segments.

3.4.6.3 CAMERA-FUR-REQ-130782/C-Visual Parking Aid FPA Graphical Requirements 3

The two side FPA sectors SPA_L1, SPA_L2 shall consist of two (2) independent bars or segments.

Note:

These side sectors are functionally handled as if they are part of SPA. This is why the nomenclature uses “SPA” here instead of “FPA.”

3.4.7 Visual Parking Aid SPA Graphical Requirements

3.4.7.1 CAMERA-FUR-REQ-130783/B-Visual Parking Aid SPA Graphical Requirements 1

All SPA sectors SPA_L2, SPA_R2, SPA_L3, SPA_R3, SPA_L4 and SPA_L4 shall consist of two (2) independent bars or segments.

3.4.7.2 CAMERA-FUR-REQ-130784/B-Visual Parking Aid SPA Graphical Requirements 2

The SPA sectors SPA_L2 and SPA_R2 shall start at a position at which the driver – when looking at the vehicle symbol - would expect the front axle of the vehicle.

3.4.7.3 CAMERA-FUR-REQ-130785/B-Visual Parking Aid SPA Graphical Requirements 3

The SPA sectors SPA_L3 and SPA_R3 shall end at a position at which the driver – when looking at the vehicle symbol - would expect the rear axle of the vehicle.

3.4.7.4 CAMERA-FUR-REQ-130786/B-Visual Parking Aid SPA Graphical Requirements 4

SPA sectors SPA_L2, SPA_L3 and SPA_R2, SPA_R3 shall have the same length.

3.4.7.5 CAMERA-FUR-REQ-130787/B-Visual Parking Aid SPA Graphical Requirements 5

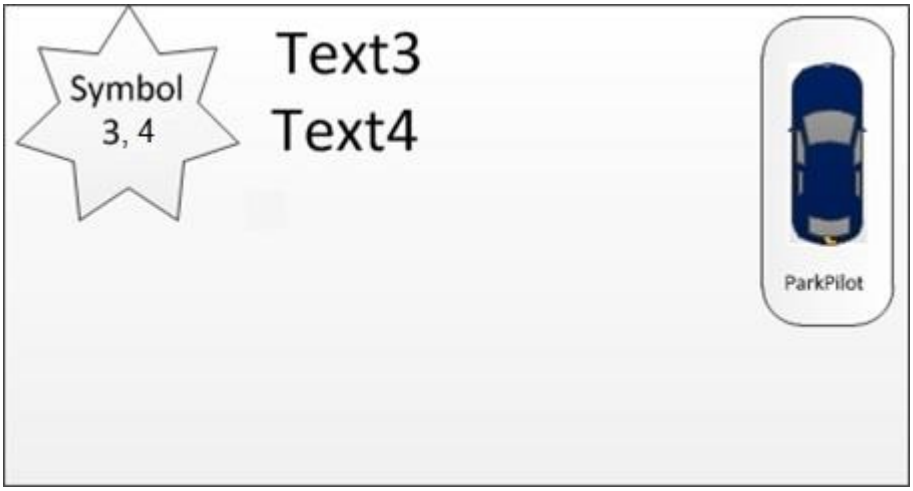
SPA sectors SPA_L1 and SPA_R1 shall start at the end of the FPA corner sectors.

3.4.7.6 CAMERA-FUR-REQ-130788/B-Visual Parking Aid SPA Graphical Requirements 6

SPA sectors SPA_L4 and SPA_R4 shall end at the start of the RPA corner sectors.

3.5 Active Park Assist (APA) and Park Distance Control (PDC) during Rear Video Camera (RVC) Graphical Requirements

3.5.1 CAMERA-FUR-REQ-161276/B-Active Park Assist (APA) and Park Distance Control (PDC) during Rear Video Camera (RVC) Graphical Layout



Actual HMI graphics will be application specific.

Position	Abbreviation
Driver Instruction/Information	Symbol 3
Driver Instruction/Information	Symbol 4
Driver Instruction/Information	Text3
Driver Instruction/Information	Text4
Visual Park Aid Zone Graphic	ParkPilot

HMI Zone Assignment for APA and PDC during RVC

3.5.2 CAMERA-FUR-REQ-161271/B-Active Park Assist (APA) and Park Distance Control (PDC) during Rear Video Camera (RVC) Graphical Requirements 1

The APA and PDC during RVC screen content shall be developed in close cooperation between the APA function owner, HMI and VE.

3.5.3 CAMERA-FUR-REQ-161272/B-Active Park Assist (APA) and Park Distance Control (PDC) during Rear Video Camera (RVC) Graphical Requirements 2

The HMI team shall design the screens such that they reflect the detailed instructions that the driver must follow.

3.5.4 CAMERA-FUR-REQ-161273/B-Active Park Assist (APA) and Park Distance Control (PDC) during Rear Video Camera (RVC) Graphical Requirements 3

The HMI system screen designer shall meet the functional direction of this interface specification (e.g. a graphic shall be provided for each functional block) however the actual graphic and its position shall be placed per HMI team direction.

3.5.5 CAMERA-FUR-REQ-161274/B-Active Park Assist (APA) and Park Distance Control (PDC) during Rear Video Camera (RVC) Graphical Requirements 4

It is acceptable for the HMI design to overlap positionals as deemed necessary. Should this be required, all overlaps shall be reviewed with parking assistance engineering to ensure proper foreground/background priority has been assigned to the overlapping positionals.

3.5.6 CAMERA-FUR-REQ-161275/B-Active Park Assist (APA) and Park Distance Control (PDC) during Rear Video Camera (RVC) Graphical Requirements 5

Each logical value of the simplified signals shall determine the display of each positional as defined in section Active Park Assist (APA) and Park Distance Control (PDC) during Rear Video Camera (RVC) Signal Processing.

3.5.7 CAMERA-FUR-REQ-165415/A-Active Park Assist (APA) and Park Distance Control (PDC) during Rear Video Camera (RVC) Graphical Requirements 6

Upon transition into or out of “Active Park Assist (APA) and Park Distance Control (PDC) during Rear Video Camera (RVC),” active park positionals shall not be displayed until the state of the active park input signals has changed.
Note: this is for flicker prevention. The HMI ECU memorizes the state of the APA signals at RVC screen transition and does not overlay any APA positionals until there is a state change of the input sign

3.6 Display HMI Arbitration

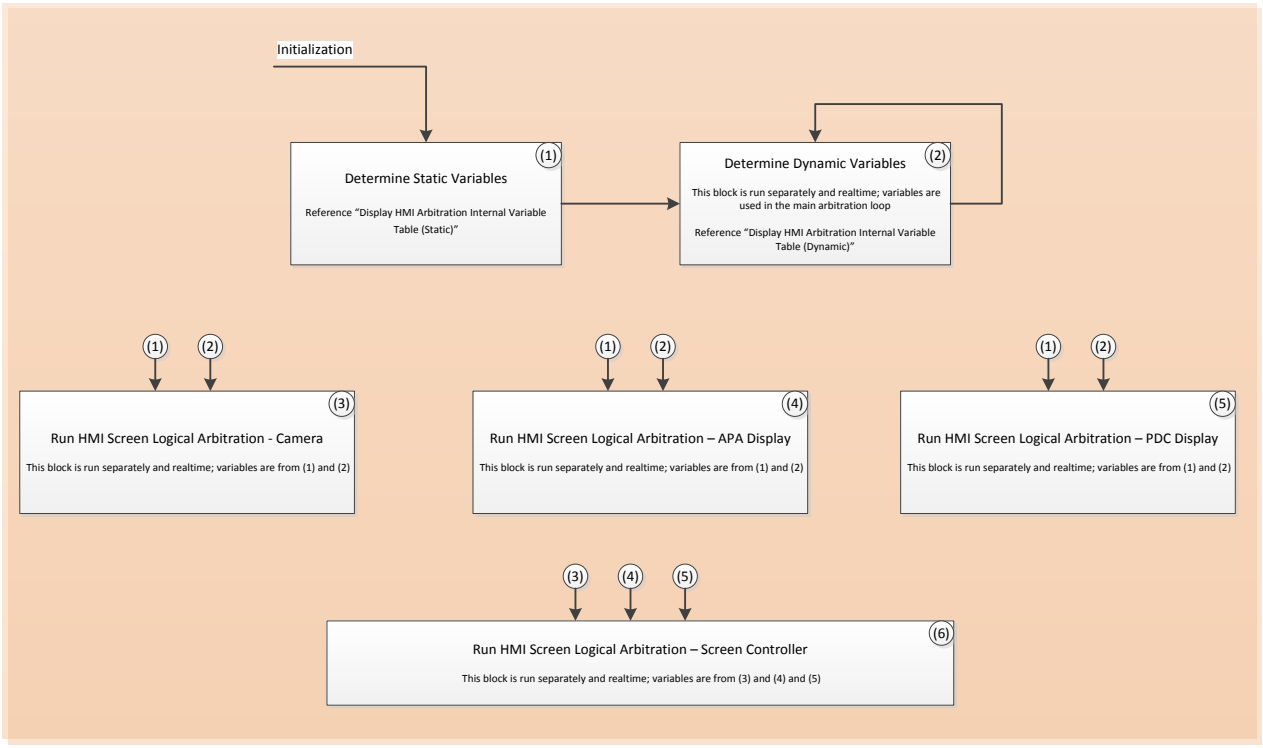
It is essential that the Infotainment ECU seamlessly integrates the Visual Park Aid and Active Park Assist screens into the overall display arbitration.

3.6.1 Display HMI Arbitration General Requirements

HMI Screen Logical Arbitration – Use Diagram
(Reference Only)

The operational steps through this section of the specification are:
1) Determine Static Variables at initialization
2) Determine Dynamic Variables (continuous)
3, 4, 5) Run Camera, APA and PDC engines (continuous)
6) Run screen controller (continuous)

Scheduler Layout



Display HMI Arbitration Use Diagram

3.6.1.1 CAMERA-FUR-REQ-131009/C-Display HMI Arbitration General Requirements 1

The HMI system shall arbitrate between screens with no discernable flicker as per HMI arbitration state machines.

3.6.1.2 CAMERA-FUR-REQ-131010/B-Display HMI Arbitration General Requirements 2

Within the Infotainment ECU overall display arbitration, the Camera, Active Park Assist and Visual Park Assist screens shall have the highest priority. No provision has been made in the screen arbitration to allow for higher priority displays, so any deviations require review and sign-off by Parking Assistance Core Engineering.

Note:

A legal requirement for APA exists. This states, the driver needs to be informed if the function is active and when it has been finished. In some legacy projects an indicator in the APA button has supported this requirement. However, the current design approach is to not use an indicator in the APA switch. The second part of the above requirement respects that (today) "Emergency Assist" has a higher priority than APA.

3.6.1.3 CAMERA-FUR-REQ-131011/C-Display HMI Arbitration General Requirements 3

Static Variables (e.g. configuration checks) shall be determined at transition to stable RUN operating mode, power-on initialization or ECU reset as per the arbitration tables.

3.6.1.4 CAMERA-FUR-REQ-131012/B-Display HMI Arbitration General Requirements 4

Static variables shall hold their state in KAM at key OFF. This is to provide a prior value during key RUN initialization.

3.6.1.5 CAMERA-FUR-REQ-131013/C-Display HMI Arbitration General Requirements 5

If a Park Aid fault screen is shown, the infotainment display system shall time out after a HMI-defined time. In addition to this time out, HMI may also allow a user input to acknowledge the fault and then close the screen.

3.6.1.6 CAMERA-FUR-REQ-131014/B-Display HMI Arbitration General Requirements 6

The HMI display client shall provide for internal timers. Operational value of the non-customer-selectable timers shall be programmable via direct memory write to EEPROM OR via a constant change in flash ROM (Individual vehicle applications may adjust the timers as program requirements dictate). At initialization (entry into stabilized RUN mode, power on reset, ECU reset), all timers shall initialize into state STOPPED AND RESET.

3.6.1.7 CAMERA-FUR-REQ-131015/C-Display HMI Arbitration General Requirements 7

Customer-selectable settings shall store the customer preference in KAM within a key cycle. At key OFF, if the customer-selected value is different than the stored value, the KAM location shall be committed to EEPROM or flash ROM appropriately.

3.6.1.8 CAMERA-FUR-REQ-211760/A-Display HMI Arbitration General Requirements 8

Fault screen appearance shall be approved by the camera, active park and park aid core teams respectively.

3.6.2 Display HMI Arbitration Internal Arbitration Variables

3.6.2.1 CAMERA-FUR-REQ-131016/D-Display HMI Arbitration Internal Variable Table (Static)

Variable Name	Value at initialization (battery connect)	Value at transition into RUN state	Notes
APA_Cfg	False	Use prior value	This looks at method II variables in the HMI ECU to determine whether or not to show the APA screens
Camra_Cfg	False	Use prior value	This looks at method II variables in the HMI ECU to determine whether or not to show the camera screens
FVC_Cfg	False	Use prior value	This looks at method II variables in the HMI ECU to determine maximum allowable speed limit for RVC exit
PDC_Cfg	False	Use prior value	This looks at method II variables in the HMI ECU to determine whether or not to show the PDC screens
OffRoadCamera_Cfg	False	Use prior value	This looks at method II variables in the HMI ECU to determine the speed thresholds for FVC screen deactivation
CamraDisable_Cfg	Use stored value	Use stored value	This is a internal parameter (not method 2 configurable) representing the vehicle speed at which the camera delay is overridden. **Typical setting is 10kph.**
CamraOffRoadDisable_Cfg	Use stored value	Use stored value	This is a internal parameter (not method 2 configurable) representing the vehicle speed at which the front camera delay is overridden when off-road capability has been enabled by the user. **Typical setting is 24kph.**

3.6.2.2 CAMERA-FUR-REQ-161326/C-Display HMI Arbitration Internal Variable Table (Dynamic)

Variable Name	Value at initialization (battery connect)	Value at transition into RUN state	Notes
APADisp	FALSE	FALSE	Internal parameter that represents the real-time state of the APA screen request. Used by the screen controller.
APA_Mode	NOT_APA	NOT_APA	Real-time (not debounced) variable used by the APA state machine. Debounce is handled on the PAM side.
APA_Sys_Stat	OFF	OFF	Real-time (not debounced) variable used by the APA state machine. Debounce is handled on the PAM side.
APA_Gear_Shif	NO_REQUEST	NO_REQUEST	Real-time (not debounced) variable used by the APA state machine. Debounce is handled on the PAM side.
FVCDisp	FALSE	FALSE	Internal parameter that represents the real-time state of the FVC screen request. Used by the screen controller.
FVC_OverSpd_Thres	CamraDisable_Cfg	CamraDisable_Cfg	Used as speed threshold for FVC screen deactivation
FVCScrRq	FALSE	FALSE	Internal parameter that is used to represent the real-time state of the Front Video Camera (FVC) user request status
GearPosHMI	PARK	PARK	Debounced internal parameter (see timer section for debounce characteristics) that is set and used within the arbitration state machines
Park_Brake_Merged	NOT_APPLIED	NOT_APPLIED	Real-time (not debounced) variable used in the gear input processing table – park brake status is required in order to determine PARK on manual transmission variants
PDC_Stat	INACTIVE	INACTIVE	
PDCDisp	FALSE	FALSE	Internal parameter that represents the real-time state of the PDC screen request. Used by the screen controller.
RVC_OverSpd_Thres	CamraDisable_Cfg	CamraDisable_Cfg	Used as speed threshold for RVC screen deactivation
RVCDisp	FALSE	FALSE	Internal parameter that represents the real-time state of the RVC screen request. Used by the screen controller.

3.6.2.3 CAMERA-FUR-REQ-161327/D-Display HMI Arbitration Internal Variable Table (Timers and Debounce)

Variable Name	Minimum Programmable Value	Maximum Programmable Value	Initial (default, not program specific) Value	Notes
APA_Actv_MM_Timr_Cfg	0	5000ms	250ms	Time to missing message fault while APA is actively displaying
APA_Mode_Timr_Cfg	0	2000ms	0ms	Timer for debouncing active park input data Note: should already be debounced by source.
Camra_Actv_MM_Timer_Cfg	0	5000ms	1000ms	Time to missing message fault while camera is actively displaying
Camra_Exit_Timr_Cfg	0	5000ms	2000	Minimum RVC camera screen display time when exiting using Camera Exit Delay.
GearPosHMI_Timr_Cfg	0	2000ms	250ms	Camera screen entry time Note: 2000ms is the FMVSS111 maximum time. Ford maximum per Rqt131305-007773 is 750ms for the entire system.
Camra_Fault_Timr_Cfg	0	5000ms	1000ms	Timer for debouncing data “faulty”
Park_Brake_Timr_Cfg	0	2000ms	0ms	Timer for debouncing park brake input data Note: should already be debounced by source.
PDC_Stat_Timr_Cfg	0	2000ms	0ms	Timer for debouncing park aid input data Note: should already be debounced by source.

Variable Name	Minimum Programmable Value	Maximum Programmable Value	Initial (default, not program specific) Value	Notes
PDC_Actv_MM_Timr_Cfg	0	5000ms	250ms	Time to missing message fault while PDC is actively displaying
PDC_Fault_Timr_Cfg	0	5000ms	250ms	Timer for debouncing data “faulty”

3.6.3 CAMERA-FUR-REQ-131018/D-HMI Screen Logical Arbitration - Determine Static Variables (Camra_Cfg)

The following decision table creates Camra_Cfg based on Method II camera configuration values.

Method 2 “Rear Camera”	Method 2 ”RVC Split View”	Method 2 “DAFVC Split View”	Method 2 “360 Camera View”	“Camra_Cfg”
NOT_ AVAILABLE	NOT_ AVAILABLE	NOT_ AVAILABLE	NOT_ AVAILABLE	**FALSE**
All Other Cases				**TRUE**

Screen Arbitration Configuration Variables: Camera

3.6.4 CAMERA-FUR-REQ-131019/C-HMI Screen Logical Arbitration - Determine Static Variables (APA_Cfg, PDC_Cfg)

HMI Configuration for Parking Assistance	APA_Cfg	PDC_Cfg
NO_PDC_PSM_SAPP (or NOT_USED)	**FALSE**	**FALSE**
REAR_PDC | REARFRONT_PDC	**FALSE**	**TRUE**
REARFRONT_PDC_SAPP_NA | REAR_SAPP_NA | REARFRONT_PDC_EU | REAR_SAPP_EU | REARFRONT_PDC_APA | APALITE | APALITE_PLUS	**TRUE**	**TRUE**

Screen Arbitration Configuration Variables: Active Park Assist (APA) & Park Distance Control (PDC)

3.6.5 CAMERA-FUR-REQ-131020/E-HMI Screen Logical Arbitration - Determine Dynamic Variables (GearPosHMI)

The following decision table determines the parking brake status for use in the gear input processing table associated with manual transmissions. The parking brake may be mechanical or electronic-based, and there are separate CAN signals for each.
PrkBrkStatus is a CAN signal that contains numerous states such as REAR_CALIPER_CLOSED and REAR_CALIPER_TRANSITION. The table below assumes a simplified mapping of the signal into ACTIVE and INACTIVE.

PrkBrkActv_B_Actl	PrkBrkStatus	Park_Brake_Merged
DON'T CARE	ACTIVE consecutive samples for (T>= Park_Brake_Timr_Cfg)	**APPLIED**
DON'T CARE	INACTIVE consecutive samples for (T>= Park_Brake_Timr_Cfg)	**NOT_APPLIED**
ACTIVE consecutive samples for (T>= Park_Brake_Timr_Cfg)	DON'T CARE	**APPLIED**
INACTIVE consecutive samples for (T>= Park_Brake_Timr_Cfg)	DON'T CARE	**NOT_APPLIED**

The following two decision tables take the Gear Lever Position and Gear Reverse CAN input signals that are used for automatic and manual transmissions, respectively, and produce GearPosHMI.

TrnType	GearRvrse_ D_Actl_ ComStat	GearRvrse_D_Actl	Park_Brake_ Merged	ApaSteScanMde_D_Stat	GearPosHMI
MANUAL	MISSING for >=Camra_Actv_ MM_Timr_Cfg	DON'T CARE	DON'T CARE	DON'T CARE	MISSING
MANUAL	PRESENT	ACTIVE_CONFIRMED | ACTIVE_NOT_ CONFIRMED consecutive samples for (T>=GearPosHMI_Timr_Cfg)	DON'T CARE	DON'T CARE	REVERSE
MANUAL	PRESENT	INACTIVE_ NOT_CONFIRMED | INACTIVE_ CONFIRMED After consecutive samples for (T>=GearPosHMI_Timr_Cfg)	APPLIED	NULL | NOT_SCANNING | SCANNING (No debounce)	PARK
MANUAL	PRESENT	INACTIVE_ NOT_CONFIRMED | INACTIVE_ CONFIRMED | ACTIVE_ NOT_CONFIRMED After consecutive samples for (T>=GearPosHMI_Timr_Cfg)	NOT_ APPLIED	NULL | NOT_SCANNING | SCANNING (No debounce)	NOT_PARK_ REVERSE
MANUAL	PRESENT	FAULT for >= Camra_Fault_Timr_Cfg	DON'T CARE	DON'T CARE	GEAR_FAULT

TrnType	GearLvrPos_ D_Actl_ComStat	GearLvrPos_D_Actl	ApaSteScanMde_ D_Stat	GearPosHMI
AUTO	MISSING for >= Camra_Actv_ MM_Timr_Cfg	DON'T CARE	DON'T CARE	MISSING
AUTO	PRESENT	REVERSE After consecutive samples for (T>=GearPosHMI_Timr_Cfg)	DON'T CARE	REVERSE
AUTO	PRESENT	FAULT for >= Camra_Fault_Timr_Cfg	DON'T CARE	GEAR_FAULT
AUTO	PRESENT	PARK After consecutive samples for (T>=GearPosHMI_Timr_Cfg)	NULL | NOT_SCANNING | SCANNING (No debounce)	PARK
AUTO	PRESENT	NEUTRAL | DRIVE | SPORT_DRIVESPORT | LOW |	NULL | NOT_SCANNING | SCANNING (No debounce)	NOT_PARK_ REVERSE

		FIRST | SECOND | THIRD | FOURTH | FIFTH | SIXTH | UNKNOWN_POSITION After consecutive samples for (T>=GearPosHMI_Timr_Cfg)		

General Screen Arbitration: Gear Position Determination

3.6.6 CAMERA-FUR-REQ-161328/B-HMI Screen Logical Arbitration - Determine Dynamic Variables (FVCScrRq)

CtrStkFeatNoActl (FeatConfig for 0x081B)	FVCScrRq
OFF	OFF
FRONT360 | FRONTNORMAL | FRONTSPLIT (feature number coded; no debounce)	FRONT
REAR | REAR360 | REARNORMAL | REARSPLIT | REARZOOM | CHMSL | CHMSLZOOM | AUX | TRG | TRGREARNORMAL | STRAIGHTBACKUP MODE (feature number coded; no debounce)	REAR

General Screen Arbitration: Front Camera Status Determination

3.6.7 CAMERA-FUR-REQ-196894/A-HMI Screen Logical Arbitration - Determine Dynamic Variables (RVC_OverSpd_Thres)

The following decision table creates FVC_OverSpd_Thres based on the Off Road status and mode. RVC_OverSpd_Thres is set to CamraDisable_Cfg (only one speed threshold applies to rear camera).

OffRoad Camera_Cfg	AWDStat_D_RqDsply	FVC_OverSpd_Thres	RVC_OverSpd_Thres
TRUE	_4x4_Off_Road_Mode | _4x4_Exiting_Off_Road | _4x4_Extreme_Off_Road_Mode | _4x4_Off_Road_Speed (No debounce)	Value of CamraOffRoadDisable_Cfg (24 KPH)	Value of CamraDisable_Cfg (10 KPH)
TRUE	!=(_4x4_Off_Road_Mode | _4x4_Exiting_Off_Road | _4x4_Extreme_Off_Road_Mode | _4x4_Off_Road_Speed) (No debounce)	Value of CamraDisable_Cfg (10 KPH)	Value of CamraDisable_Cfg (10 KPH)
FALSE	DON'T CARE	Value of CamraDisable_Cfg (10 KPH)	Value of CamraDisable_Cfg (10 KPH)

FALSE	DON'T CARE	Value of CamraDisable_Cfg (10 KPH)	Value of CamraDisable_Cfg (10 KPH)

Front & Rear Camera Overspeed Threshold Input Processing Table

3.6.8 CAMERA-FUR-REQ-196895/A-HMI Screen Logical Arbitration - Determine Dynamic Variables (APA_Mode)

The following decision table creates APA_Mode from the ApaMde_D_Stat CAN signal.

ApaMde_D_Stat_ComStat	ApaMde_D_Stat	APA_Mode
MISSING for >= APA_Actv_MM_Timr_Cfg	DON'T CARE	MISSING
PRESENT	SAPP | PPA | POA After consecutive samples for (T>=APA_Mode_Timr_Cfg)	APA
PRESENT	NULL | OFF After consecutive samples for (T>=APA_Mode_Timr_Cfg)	NOT_APA

APA Mode Input Processing Table

3.6.9 CAMERA-FUR-REQ-196896/A-HMI Screen Logical Arbitration - Determine Dynamic Variables (APA_Sys_Stat)

ApaSys_D_Stat	APA_Sys_Stat
NULL (No Debounce)	NULL
OFF (No Debounce)	OFF
ON (No Debounce)	ON
OVERSPEED (No Debounce)	OVERSPEED
APA_CANCELLED (No Debounce)	APA_CANCELLED
NOT_ACCESSIBLE (No Debounce)	NOT_ACCESSIBLE
FINISHED (No Debounce)	FINISHED
FAULTY for >=APA_Fault_Timr_Cfg	APA_SYS_FAULT

APA System Status Input Processing Table

3.6.10 CAMERA-FUR-REQ-196897/A-HMI Screen Logical Arbitration - Determine Dynamic Variables (APA_Gear_Shif)

ApaGearShif_D_RqDrv	APA_Gear_Shif
NULL (No Debounce)	NULL
NO_REQUEST (No Debounce)	NO_REQUEST
SHIFT_TO_R (No Debounce)	SHIFT_TO_R
SHIFT_TO_D (No Debounce)	SHIFT_TO_D
SHIFT_TO_N (No Debounce)	SHIFT_TO_N
SHIFT_TO_P (No Debounce)	SHIFT_TO_P

APA Gear Shift Input Processing Table

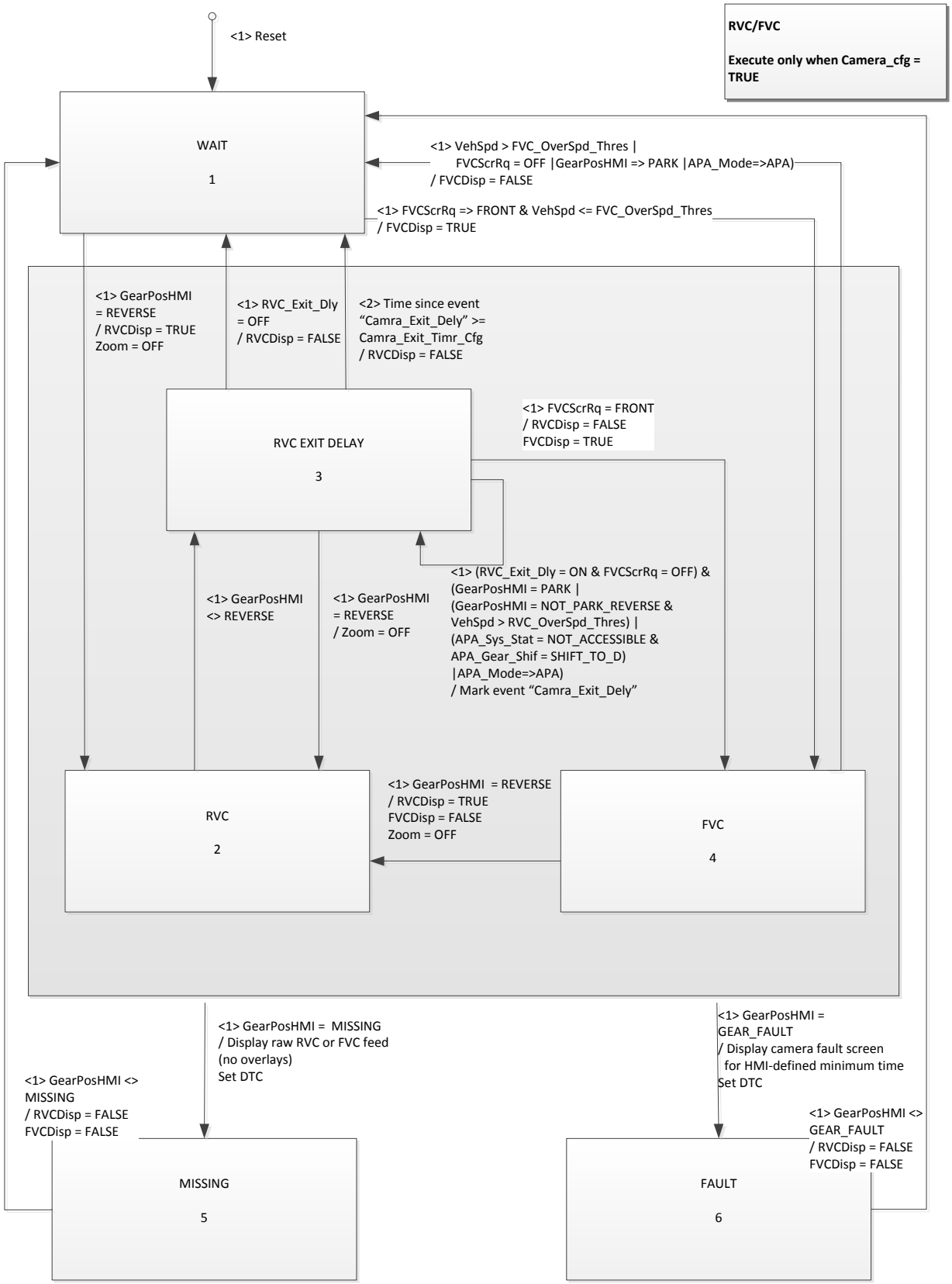
3.6.11 CAMERA-FUR-REQ-196898/C-HMI Screen Logical Arbitration - Determine Dynamic Variables (PDC_Stat)

PrkAidMsgTxt_D_Rq_ComStat	PrkAidMsgTxt_D_Rq	PDC_Stat
MISSING for >= PDC_ Actv_MM_Timr_Cfg	DON'T CARE	MISSING
PRESENT	R_SNSRS_ON_F_SNSRS_OFF | R_SNSRS_OFF_F_SNSRS_ON | R_SNSRS_ON_F_SNSRS_ON | | FAIL_MODE_NO_CHIME | FAIL_MODE_WITH_CHIME |R_SNS_INACTIVE_TRLR_ATCH | R_Sns_Trlr_F_Sns_Blk | R_Sns_Blk_F_Sns_On | R_Sns_On_F_Sns_Blk | All_Sns_Blk After consecutive samples for (T>=PDC_Stat_Timr_Cfg)	ACTIVE
PRESENT	ALL_PARK_SENSORS_OFF | PARK_SYS_ALTERNATE_MODE | NOT_USED | NOT_AVAIL_TRLR_ATTCHD After consecutive samples for (T>=PDC_Stat_Timr_Cfg)	INACTIVE
PRESENT	FAULT for >= PDC_Fault_Timr_Cfg	PDC_STAT_

		FAULT

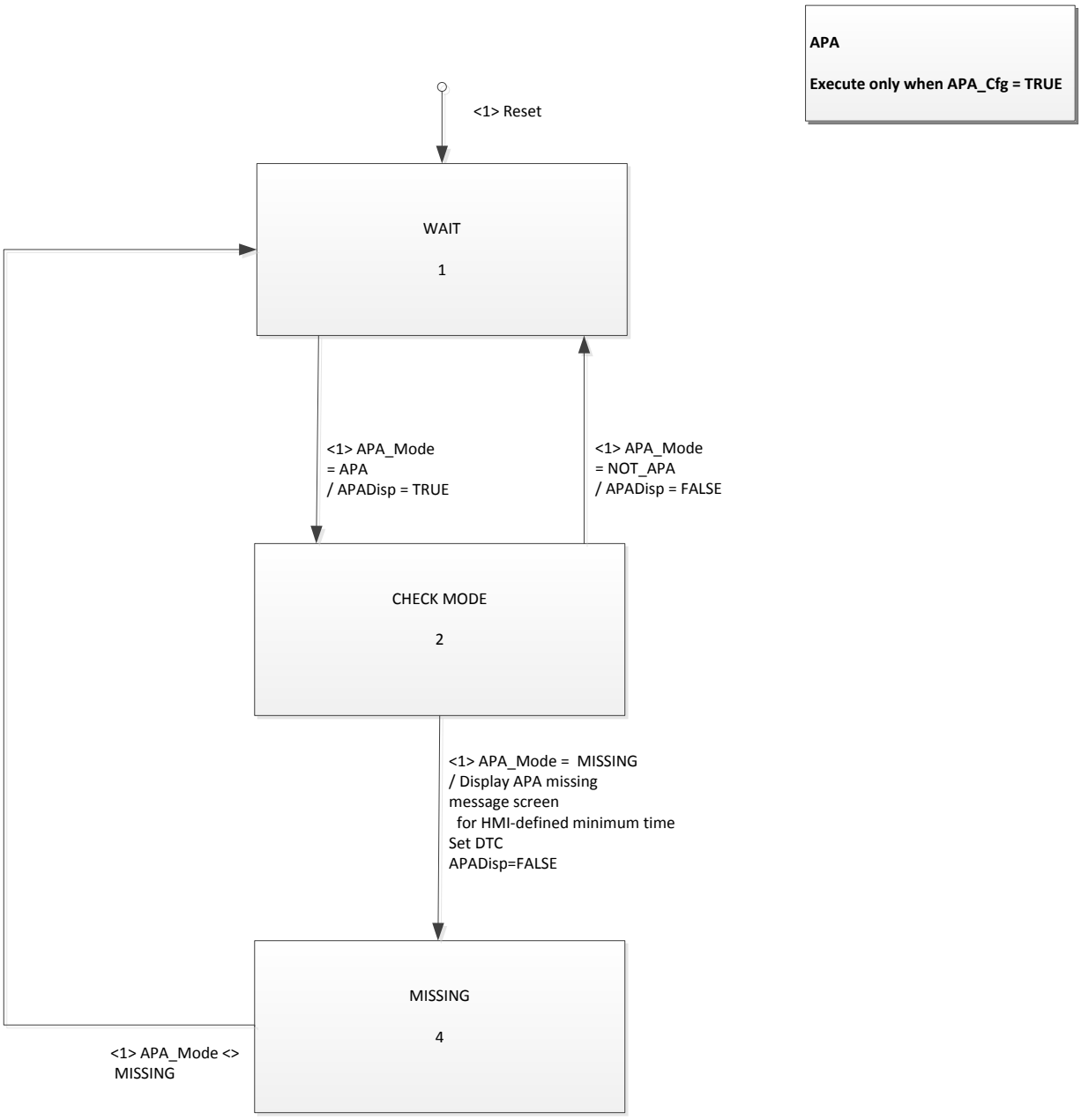
Park Aid Message Text Input Processing Table

3.6.12 CAMERA-FUR-REQ-166820/D-HMI Screen Logical Arbitration - Camera



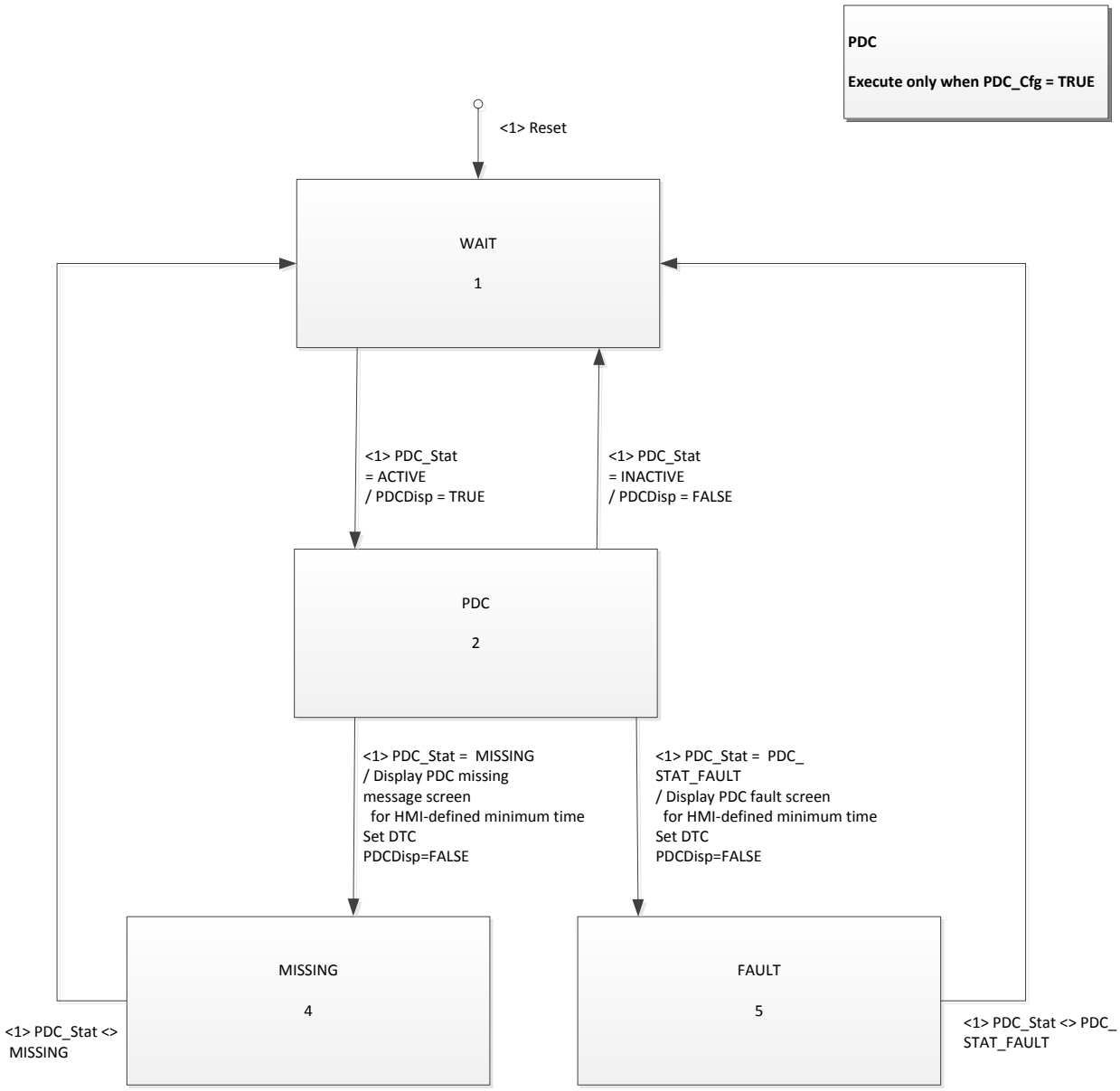
General Screen Arbitration: Step #1 Camera

3.6.13 CAMERA-FUR-REQ-166823/E-HMI Screen Logical Arbitration - APA Dedicated Display



General Screen Arbitration: Active Park Assist (APA)

3.6.14 CAMERA-FUR-REQ-131023/F-HMI Screen Logical Arbitration - PDC Dedicated Display

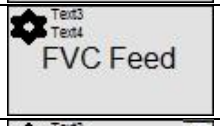
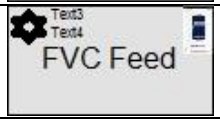


General Screen Arbitration: Park Distance Control (PDC)

3.6.15 CAMERA-FUR-REQ-196899/A-HMI Screen Logical Arbitration - Screen Controller

Screens shall be assigned real time as per the following state table

FVCDisp	RVCDisp	APADisp	PDCDisp	Screen displayed	Reference: Sample Screen
0	0	0	0	No display (release control to HMI ECU)	
0	0	0	1	Dedicated PDC	

0	0	1	0	APA (PDC will not be shown)	
0	0	1	1	APA (PDC will be shown)	
0	1	0	0	RVC (APA instructions not shown, PDC will not be shown)	
0	1	0	1	RVC (APA instructions not shown, PDC will be shown)	
0	1	1	0	RVC (APA instructions will be shown, PDC will not be shown)	
0	1	1	1	RVC (APA instructions will be shown, PDC will be shown)	
1	0	0	0	FVC (APA instructions not shown, PDC will not be shown)	
1	0	0	1	FVC (APA instructions not shown, PDC will be shown)	
1	0	1	0	FVC (APA instructions will be shown, PDC will not be shown)	
1	0	1	1	FVC (APA instructions will be shown, PDC will be shown)	
1	1	0	0	Combination prohibited by the RVC/FVC state machine (FVC & RVC images not displayed simultaneously)	N/A
1	1	0	1		
1	1	1	0		
1	1	1	1		

Screen Arbitration Controller

3.7 Base Park Aid Signal Interface

This section lists all the signals that shall be used by the infotainment display to show the Park Distance Control (PDC) graphic. The action that the display needs to take for each signal will be provided in following sections.

3.7.1 Park Distance Control (PDC) Signal list – Received by Infotainment ECU (from PAM)

3.7.1.1 CAMERA-FUR-REQ-130452/E-Park Distance Control (PDC) Signal list - [PrkAidMsgTxt_D_Rq]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[PrkAidMsgTxt_D_Rq]	State Encoded: $0: All_Park_Sensors_Off $1: R_Snsrs_On_F_Snsrs_Off $2: R_Snsrs_Off_F_Snsrs_On $3: NotUsed $4: NotUsed $5: R_Snsrs_On_F_Snsrs_On $6: Park_Sys_Alternate_Mode $7: NotUsed $8: R_Sns_Trlr_F_Sns_Blk $9: Fail_Mode_with_Chime $A: Fail_Mode_no_Chime $B: Not_Avail_Trlr_attchd $C: R_Sns_Inactive_Trlr_atch $D: R_Sns_Blk_F_Sns_ON $E: R_Sns_ON_F_Sns_Blk $F: All_Sns_Blk	All PDC	

-**Note:** this is the only signal that can cause display of the trailer; this is why it is shown as the HMI sample.

3.7.1.2 CAMERA-FUR-REQ-130453/C-Park Distance Control (PDC) Signal list - [PrkAidSnsRlCrnr_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[PrkAidSnsRlCrnr_D_Stat]	State Encoded: $0: Off $1: Zone_1 $2: Zone_2 $3: Zone_3 $4: Zone_4 $5: Zone_5 $6: Zone_6 $7: Zone_7 $8: Zone_8 $9: Zone_9 $A: Zone_10 $B: Zone_11 $C: Zone_12 $D: Zone_13 $E: Zone_14 $F: Zone_15	RPA_OL_1 RPA_OL_2 RPA_OL_3 OUTLINE	

3.7.1.3 CAMERA-FUR-REQ-131031/B-Park Distance Control (PDC) Signal list - [PrkAidSnsRlCntr_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[PrkAidSnsRlCntr_D_Stat]	State Encoded: $0: Off $1: Zone_1 $2: Zone_2 $3: Zone_3 $4: Zone_4 $5: Zone_5 $6: Zone_6 $7: Zone_7 $8: Zone_8 $9: Zone_9 $A: Zone_10 $B: Zone_11 $C: Zone_12 $D: Zone_13 $E: Zone_14 $F: Zone_15	RPA_IL_1 RPA_IL_2 RPA_IL_3 RPA_IL_4 RPA_IL_5 RPA_IL_6 OUTLINE	

3.7.1.4 CAMERA-FUR-REQ-131032/B-Park Distance Control (PDC) Signal list - [PrkAidSnsRrCntr_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[PrkAidSnsRrCntr_D_Stat]	State Encoded: $0: Off $1: Zone_1 $2: Zone_2 $3: Zone_3 $4: Zone_4 $5: Zone_5 $6: Zone_6 $7: Zone_7 $8: Zone_8 $9: Zone_9 $A: Zone_10 $B: Zone_11 $C: Zone_12 $D: Zone_13 $E: Zone_14 $F: Zone_15	RPA_IR_1 RPA_IR_2 RPA_IR_3 RPA_IR_4 RPA_IR_5 RPA_IR_6 OUTLINE	

3.7.1.5 CAMERA-FUR-REQ-131033/C-Park Distance Control (PDC) Signal list - [PrkAidSnsRrCrnr_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[PrkAidSnsRrCrnr_D_Stat]	State Encoded: $0: Off $1: Zone_1 $2: Zone_2 $3: Zone_3 $4: Zone_4 $5: Zone_5 $6: Zone_6 $7: Zone_7 $8: Zone_8 $9: Zone_9 $A: Zone_10 $B: Zone_11 $C: Zone_12 $D: Zone_13 $E: Zone_14 $F: Zone_15	RPA_OR_1 RPA_OR_2 RPA_OR_3 OUTLINE	

3.7.1.6 CAMERA-FUR-REQ-130454/B-Park Distance Control (PDC) Signal list - [PrkAidSnsFlCrnr_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[PrkAidSnsFlCrnr_D_Stat]	State Encoded: $0: Off $1: Zone_1 $2: Zone_2 $3: Zone_3 $4: Zone_4 $5: Zone_5 $6: Zone_6 $7: Zone_7 $8: Zone_8 $9: Zone_9 $A: Zone_10 $B: Zone_11 $C: Zone_12 $D: Zone_13 $E: Zone_14 $F: Zone_15	FPA_OL_1 FPA_OL_2 OUTLINE	

3.7.1.7 CAMERA-FUR-REQ-131034/B-Park Distance Control (PDC) Signal list - [PrkAidSnsFlCntr_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[PrkAidSnsFlCntr_D_Stat]	State Encoded: $0: Off $1: Zone_1 $2: Zone_2 $3: Zone_3 $4: Zone_4 $5: Zone_5 $6: Zone_6 $7: Zone_7 $8: Zone_8 $9: Zone_9 $A: Zone_10 $B: Zone_11 $C: Zone_12 $D: Zone_13 $E: Zone_14 $F: Zone_15	FPA_IL_1 FPA_IL_2 FPA_IL_3 OUTLINE	

3.7.1.8 CAMERA-FUR-REQ-131035/B-Park Distance Control (PDC) Signal list - [PrkAidSnsFrCntr_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[PrkAidSnsFrCntr_D_Stat]	State Encoded: $0: Off $1: Zone_1 $2: Zone_2 $3: Zone_3 $4: Zone_4 $5: Zone_5 $6: Zone_6 $7: Zone_7 $8: Zone_8 $9: Zone_9 $A: Zone_10 $B: Zone_11 $C: Zone_12 $D: Zone_13 $E: Zone_14 $F: Zone_15	FPA_IR_1 FPA_IR_2 FPA_IR_3 OUTLINE	

3.7.1.9 CAMERA-FUR-REQ-131036/B-Park Distance Control (PDC) Signal list - [PrkAidSnsFrCrnr_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[PrkAidSnsFrCrnr_D_Stat]	State Encoded: $0: Off $1: Zone_1 $2: Zone_2 $3: Zone_3 $4: Zone_4 $5: Zone_5 $6: Zone_6 $7: Zone_7 $8: Zone_8 $9: Zone_9 $A: Zone_10 $B: Zone_11 $C: Zone_12 $D: Zone_13 $E: Zone_14 $F: Zone_15	FPA_OR_1 FPA_OR_2 OUTLINE	

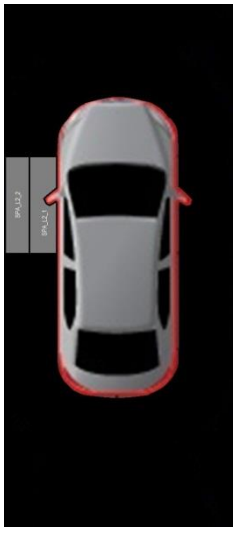
3.7.1.10 CAMERA-FUR-REQ-130456/E-Park Distance Control (PDC) Signal list - [SidePrkSnsL1_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[SidePrkSnsL1_D_Stat]	State Encoded: $0: Off $1: Zone1 $2: Zone2 $3: Zone3 $4: Zone4 $5: Zone5 $6: Zone6 $7: Zone7 $8: Zone8 $9: Zone9 $A: Zone10 $B: Zone11 $C: Zone12 $D: NoObjectInSector $E: NotFullyScannedYet $F: NotUsed	SPA_L1_1 SPA_L1_2 OUTLINE	

3.7.1.11 CAMERA-FUR-REQ-130457/E-Park Distance Control (PDC) Signal list - [SidePrkSnsR1_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[SidePrkSnsR1_D_Stat]	State Encoded: $0: Off $1: Zone1 $2: Zone2 $3: Zone3 $4: Zone4 $5: Zone5 $6: Zone6 $7: Zone7 $8: Zone8 $9: Zone9 $A: Zone10 $B: Zone11 $C: Zone12 $D: NoObjectInSector $E: NotFullyScannedYet $F: NotUsed	SPA_R1_1 SPA_R1_2 OUTLINE	0 

3.7.1.12 CAMERA-FUR-REQ-130458/C-Park Distance Control (PDC) Signal list - [SidePrkSnsL2_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[SidePrkSnsL2_D_Stat]	State Encoded: $0: Off $1: Zone1 $2: Zone2 $3: Zone3 $4: Zone4 $5: Zone5 $6: Zone6 $7: Zone7 $8: Zone8 $9: Zone9 $A: Zone10 $B: Zone11 $C: Zone12 $D: NoObjectInSector $E: NotFullyScannedYet $F: NotUsed	SPA_L2_1 SPA_L2_2 OUTLINE	

3.7.1.13 CAMERA-FUR-REQ-131040/C-Park Distance Control (PDC) Signal list - [SidePrkSnsR2_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[SidePrkSnsR2_D_Stat]	State Encoded: $0: Off $1: Zone1 $2: Zone2 $3: Zone3 $4: Zone4 $5: Zone5 $6: Zone6 $7: Zone7 $8: Zone8 $9: Zone9 $A: Zone10 $B: Zone11 $C: Zone12 $D: NoObjectInSector $E: NotFullySscannedYet $F: NotUsed	SPA_R2_1 SPA_R2_2 OUTLINE	

3.7.1.14 CAMERA-FUR-REQ-131041/C-Park Distance Control (PDC) Signal list - [SidePrkSnsL3_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[SidePrkSnsL3_D_Stat]	State Encoded: $0: Off $1: Zone1 $2: Zone2 $3: Zone3 $4: Zone4 $5: Zone5 $6: Zone6 $7: Zone7 $8: Zone8 $9: Zone9 $A: Zone10 $B: Zone11 $C: Zone12 $D: NoObjectInSector $E: NotFullySscannedYet $F: NotUsed	SPA_L3_1 SPA_L3_2 OUTLINE	

3.7.1.15 CAMERA-FUR-REQ-131042/C-Park Distance Control (PDC) Signal list - [SidePrkSnsR3_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[SidePrkSnsR3_D_Stat]	State Encoded: $0: Off $1: Zone1 $2: Zone2 $3: Zone3 $4: Zone4 $5: Zone5 $6: Zone6 $7: Zone7 $8: Zone8 $9: Zone9 $A: Zone10 $B: Zone11 $C: Zone12 $D: NoObjectInSector $E: NotFullyScannedYet $F: NotUsed	SPA_R3_1 SPA_R3_2 OUTLINE	

3.7.1.16 CAMERA-FUR-REQ-131043/C-Park Distance Control (PDC) Signal list - [SidePrkSnsL4_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)
[SidePrkSnsL4_D_Stat]	State Encoded: $0: Off $1: Zone1 $2: Zone2 $3: Zone3 $4: Zone4 $5: Zone5 $6: Zone6 $7: Zone7 $8: Zone8 $9: Zone9 $A: Zone10 $B: Zone11 $C: Zone12 $D: NoObjectInSector $E: NotFullyScannedYet $F: NotUsed	SPA_L4_1 SPA_L4_2 OUTLINE	

3.7.1.17 CAMERA-FUR-REQ-131044/C-Park Distance Control (PDC) Signal list - [SidePrkSnsR4_D_Stat]

Signal Received By Infotainment	Signal Parameters	Affected Display Position	Sample HMI (Reference Only)

[SidePrkSnsR4_D_Stat]	State Encoded: $0: Off $1: Zone1 $2: Zone2 $3: Zone3 $4: Zone4 $5: Zone5 $6: Zone6 $7: Zone7 $8: Zone8 $9: Zone9 $A: Zone10 $B: Zone11 $C: Zone12 $D: NoObjectInSector $E: NotFullyScannedYet $F: NotUsed	SPA_R4_1 SPA_R4_2 OUTLINE	

3.7.2 Park Distance Control (PDC) Signal Processing

Individual positionals are controlled as per the following state tables. Preconditions for arriving at these tables are in the arbitration section.

3.7.2.1 CAMERA-FUR-REQ-130461/E-Park Distance Control (PDC) Signal Processing - Positionals RPA_OL_1, RPA_OL_2, RPA_OL_3

PDCDisp	PrkAidMsgTxt_D_Rq	PrkAidSnsRlCrnr_D_Stat	RPA_OL_1	RPA_OL_2	RPA_OL_3
TRUE	!= 0xC || 0x8 || 0xD || 0xF	0x0 (Off)	Inactive	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat	On-Nostat
		0x2 (Zone_2)	On-Idle	On-Warn	On-Nostat
		0x3 (Zone_3)	On-Idle	On-Warn	On-Nostat
		0x4 (Zone_4)	On-Idle	On-Idle	On-Warn
		0x5 (Zone_5)	On-Idle	On-Idle	On-Idle
		0x6 (Zone_6)	On-Idle	On-Idle	On-Idle
		0x7 (Zone_7)	On-Idle	On-Idle	On-Idle
		0x8 (Zone_8)	On-Idle	On-Idle	On-Idle
		0x9 (Zone_9)	On-Idle	On-Idle	On-Idle
		0xA (Zone_10)	On-Idle	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle	On-Idle
		0xD (Zone_13)	On-Idle	On-Idle	On-Idle
		0xE (Zone_14)	On-Idle	On-Idle	On-Idle
		0xF (Zone_15)	On-Idle	On-Idle	On-Idle
	= 0xC || 0x8	X	On-Trailer		
	= 0xD || 0xF	0x1 (Zone_1)	On-Blkd	On-Nostat	On-Nostat
	= 0xD || 0xF	0x0 (Off)	On-Nostat	On-Nostat	On-Nostat
All Other Cases			Inactive	Inactive	Inactive

For definition of “On-Warn,” “On-Idle,” “On-Nostat,” “Inactive” and “On-Trailer” reference Graphical Position Definition.

Park Distance Control (PDC) Positional RPA_OL_x

3.7.2.2 *CAMERA-FUR-REQ-130463/E-Park Distance Control (PDC) Signal Processing - Positionals RPA_IL_1, RPA_IL_2, RPA_IL_3, RPA_IL_4, RPA_IL_5, RPA_IL_6*

PDCDisp	PrkAidMsgTxt_D_Rq	PrkAidSnsRlCntr_D_Stat	RPA_IL_1	RPA_IL_2	RPA_IL_3	RPA_IL_4	RPA_IL_5	RPA_IL_6
TRUE	!= 0xC || 0x8 || 0xD || 0xF	0x0 (Off)	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive
		0x1 (Zone_1)	**On-Warn**	On-Nostat	On-Nostat	On-Nostat	On-Nostat	On-Nostat
		0x2 (Zone_2)	On-Idle	**On-Warn**	On-Nostat	On-Nostat	On-Nostat	On-Nostat
		0x3 (Zone_3)	On-Idle	**On-Warn**	On-Nostat	On-Nostat	On-Nostat	On-Nostat
		0x4 (Zone_4)	On-Idle	On-Idle	**On-Warn**	On-Nostat	On-Nostat	On-Nostat
		0x5 (Zone_5)	On-Idle	On-Idle	**On-Warn**	On-Nostat	On-Nostat	On-Nostat
		0x6 (Zone_6)	On-Idle	On-Idle	On-Idle	**On-Warn**	On-Nostat	On-Nostat
		0x7 (Zone_7)	On-Idle	On-Idle	On-Idle	**On-Warn**	On-Nostat	On-Nostat
		0x8 (Zone_8)	On-Idle	On-Idle	On-Idle	On-Idle	**On-Warn**	On-Nostat
		0x9 (Zone_9)	On-Idle	On-Idle	On-Idle	On-Idle	**On-Warn**	On-Nostat
		0xA (Zone_10)	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle	**On-Warn**
		0xB (Zone_11)	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle	**On-Warn**
		0xC (Zone_12)	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle
		0xD (Zone_13)	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle
		0xE (Zone_14)	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle
		0xF (Zone_15)	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle
	= 0xC || 0x8	X	**On-Trailer**	**On-Trailer**	**On-Trailer**	**On-Trailer**	**On-Trailer**	**On-Trailer**
	= 0xD || 0xF	0x1 (Zone_1)	On-Blkd	On-Nostat	On-Nostat	On-Nostat	On-Nostat	On-Nostat
	= 0xD || 0xF	0x0 (Off)	On-Nostat	On-Nostat	On-Nostat	On-Nostat	On-Nostat	On-Nostat
All Other Cases			Inactive	Inactive	Inactive	Inactive	Inactive	Inactive

- For definition of "On-Warn," "On-Idle," "On-Nostat," "Inactive" and "On-Trailer" reference Graphical Position Definition.

Park Distance Control (PDC) Positional RPA_IL_x

3.7.2.3 *CAMERA-FUR-REQ-130464/E-Park Distance Control (PDC) Signal Processing - Positionals RPA_IR_1, RPA_IR_2, RPA_IR_3, RPA_IR_4, RPA_IR_5, RPA_IR_6*

PDCDisp	PrkAidMsgTxt_D_Rq	PrkAidSnsRrCntr_D_Stat	RPA_IR_1	RPA_IR_2	RPA_IR_3	RPA_IR_4	RPA_IR_5	RPA_IR_6
TRUE	!= 0xC || 0x8 || 0xD || 0xF	0x0 (Off)	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive
		0x1 (Zone_1)	**On-Warn**	On-Nostat	On-Nostat	On-Nostat	On-Nostat	On-Nostat
		0x2 (Zone_2)	On-Idle	**On-Warn**	On-Nostat	On-Nostat	On-Nostat	On-Nostat
		0x3 (Zone_3)	On-Idle	**On-Warn**	On-Nostat	On-Nostat	On-Nostat	On-Nostat
		0x4 (Zone_4)	On-Idle	On-Idle	**On-Warn**	On-Nostat	On-Nostat	On-Nostat
		0x5 (Zone_5)	On-Idle	On-Idle	**On-Warn**	On-Nostat	On-Nostat	On-Nostat
		0x6 (Zone_6)	On-Idle	On-Idle	On-Idle	**On-Warn**	On-Nostat	On-Nostat
		0x7 (Zone_7)	On-Idle	On-Idle	On-Idle	**On-Warn**	On-Nostat	On-Nostat
		0x8 (Zone_8)	On-Idle	On-Idle	On-Idle	On-Idle	**On-Warn**	On-Nostat
		0x9 (Zone_9)	On-Idle	On-Idle	On-Idle	On-Idle	**On-Warn**	On-Nostat
		0xA (Zone_10)	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle	**On-Warn**
		0xB (Zone_11)	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle	**On-Warn**
		0xC (Zone_12)	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle
		0xD (Zone_13)	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle
		0xE (Zone_14)	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle
		0xF (Zone_15)	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle	On-Idle
	= 0xC || 0x8	X	**On-Trailer**	**On-Trailer**	**On-Trailer**	**On-Trailer**	**On-Trailer**	**On-Trailer**
	= 0xD || 0xF	0x1 (Zone_1)	On-Blkd	On-Nostat	On-Nostat	On-Nostat	On-Nostat	On-Nostat
	= 0xD || 0xF	0x0 (Off)	On-Nostat	On-Nostat	On-Nostat	On-Nostat	On-Nostat	On-Nostat
All Other Cases			Inactive	Inactive	Inactive	Inactive	Inactive	Inactive

- For definition of “On-Warn,” “On-Idle,” “On-Nostat,” “Inactive” and “On-Trailer” reference Graphical Position Definition.

Park Distance Control (PDC) Positional RPA_IR_x

3.7.2.4 *CAMERA-FUR-REQ-130467/E-Park Distance Control (PDC) Signal Processing - Positionals RPA_OR_1, RPA_OR_2, RPA_OR_3*

PDCDisp	PrkAidMsgTxt_D_Rq	PrkAidSnsRrCrnr_D_Stat	RPA_OR_1	RPA_OR_2	RPA_OR_3
TRUE	!=0xC || 0x8 || 0xD || 0xF	0x0 (Off)	Inactive	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat	On-Nostat
		0x2 (Zone_2)	On-Idle	On-Warn	On-Nostat
		0x3 (Zone_3)	On-Idle	On-Warn	On-Nostat
		0x4 (Zone_4)	On-Idle	On-Idle	On-Warn
		0x5 (Zone_5)	On-Idle	On-Idle	On-Idle
		0x6 (Zone_6)	On-Idle	On-Idle	On-Idle
		0x7 (Zone_7)	On-Idle	On-Idle	On-Idle
		0x8 (Zone_8)	On-Idle	On-Idle	On-Idle
		0x9 (Zone_9)	On-Idle	On-Idle	On-Idle
		0xA (Zone_10)	On-Idle	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle	On-Idle
		0xD (Zone_13)	On-Idle	On-Idle	On-Idle
		0xE (Zone_14)	On-Idle	On-Idle	On-Idle
		0xF (Zone_15)	On-Idle	On-Idle	On-Idle
	= 0xC || 0x8	X	On-Trailer		
	= 0xD || 0xF	0x1 (Zone_1)	On-Blkd	On-Nostat	On-Nostat
	= 0xD || 0xF	0x0 (Off)	On-Nostat	On-Nostat	On-Nostat
All Other Cases			Inactive	Inactive	Inactive

For definition of “On-Warn,” “On-Idle,” “On-Nostat,” “Inactive” and “On-Trailer” reference Graphical Position Definition.

Park Distance Control (PDC) Positional RPA_OR_x

3.7.2.5 CAMERA-FUR-REQ-130468/E-Park Distance Control (PDC) Signal Processing - Positionals FPA_OL_1, FPA_OL_2

PDCDisp	PrkAidMsgTxt_D_Rq	PrkAidSnsFlCrnr_D_Stat	FPA_OL_1	FPA_OL_2
TRUE	!=0xE || 0xF || 0x8	0x0 (Off)	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat
		0x2 (Zone_2)	On-Idle	On-Warn
		0x3 (Zone_3)	On-Idle	On-Warn
		0x4 (Zone_4)	On-Idle	On-Idle
		0x5 (Zone_5)	On-Idle	On-Idle
		0x6 (Zone_6)	On-Idle	On-Idle
		0x7 (Zone_7)	On-Idle	On-Idle
		0x8 (Zone_8)	On-Idle	On-Idle
		0x9 (Zone_9)	On-Idle	On-Idle
		0xA (Zone_10)	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle
		0xD (Zone_13)	On-Idle	On-Idle
		0xE (Zone_14)	On-Idle	On-Idle
		0xF (Zone_15)	On-Idle	On-Idle
	= 0xE || 0xF || 0x8	0x1 (Zone_1)	On-Blkd	On-Nostat
	= 0xE || 0xF || 0x8	0x0 (Off)	On-Nostat	On-Nostat
All Other Cases			Inactive	Inactive

- For definition of “On-Warn,” “On-Idle,” “On-Nostat,” “Inactive” and “On-Trailer” reference Graphical Position Definition.

Park Distance Control (PDC) Positional RPA_IR_x

3.7.2.6 CAMERA-FUR-REQ-130469/E-Park Distance Control (PDC) Signal Processing - Positionals FPA_IL_1, FPA_IL_2, FPA_IL_3

PDCDisp	PrkAidMsgTxt_D_Rq	PrkAidSnsFlCntr_D_Stat	FPA_IL_1	FPA_IL_2	FPA_IL_3
TRUE	!=0xE || 0xF || 0x8	0x0 (Off)	Inactive	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat	On-Nostat
		0x2 (Zone_2)	On-Idle	On-Warn	On-Nostat
		0x3 (Zone_3)	On-Idle	On-Warn	On-Nostat
		0x4 (Zone_4)	On-Idle	On-Idle	On-Warn
		0x5 (Zone_5)	On-Idle	On-Idle	On-Warn
		0x6 (Zone_6)	On-Idle	On-Idle	On-Idle
		0x7 (Zone_7)	On-Idle	On-Idle	On-Idle
		0x8 (Zone_8)	On-Idle	On-Idle	On-Idle
		0x9 (Zone_9)	On-Idle	On-Idle	On-Idle
		0xA (Zone_10)	On-Idle	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle	On-Idle
		0xD (Zone_13)	On-Idle	On-Idle	On-Idle
		0xE (Zone_14)	On-Idle	On-Idle	On-Idle
		0xF (Zone_15)	On-Idle	On-Idle	On-Idle
	= 0xE || 0xF || 0x8	0x1 (Zone_1)	On-Blkd	On-Nostat	On-Nostat
	= 0xE || 0xF || 0x8	0x0 (Off)	On-Nostat	On-Nostat	On-Nostat
All Other Cases			Inactive	Inactive	Inactive

- For definition of “On-Warn,” “On-Idle,” “On-Nostat,” “Inactive” and “On-Trailer” reference Graphical Position Definition.

Park Distance Control (PDC) Positional FPA_II_x

3.7.2.7 CAMERA-FUR-REQ-130470/E-Park Distance Control (PDC) Signal Processing - Positionals FPA_IR_1, FPA_IR_2, FPA_IR_3

PDCDisp	PrkAidMsgTxt_D_Rq	PrkAidSnsFrCntr_D_Stat	FPA_IR_1	FPA_IR_2	FPA_IR_3
TRUE	!=0xE || 0xF || 0x8	0x0 (Off)	Inactive	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat	On-Nostat
		0x2 (Zone_2)	On-Idle	On-Warn	On-Nostat
		0x3 (Zone_3)	On-Idle	On-Warn	On-Nostat
		0x4 (Zone_4)	On-Idle	On-Idle	On-Warn
		0x5 (Zone_5)	On-Idle	On-Idle	On-Warn
		0x6 (Zone_6)	On-Idle	On-Idle	On-Idle
		0x7 (Zone_7)	On-Idle	On-Idle	On-Idle
		0x8 (Zone_8)	On-Idle	On-Idle	On-Idle
		0x9 (Zone_9)	On-Idle	On-Idle	On-Idle
		0xA (Zone_10)	On-Idle	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle	On-Idle

PDCDisp	PrkAidMsgTxt_D_Rq	PrkAidSnsFrCntr_D_Stat	FPA_IR_1	FPA_IR_2	FPA_IR_3
		0xD (Zone_13)	On-Idle	On-Idle	On-Idle
		0xE (Zone_14)	On-Idle	On-Idle	On-Idle
		0xF (Zone_15)	On-Idle	On-Idle	On-Idle
	= 0xE || 0xF || 0x8	0x1 (Zone_1)	On-Blkd	On-Nostat	On-Nostat
	= 0xE || 0xF || 0x8	0x0 (Off)	On-Nostat	On-Nostat	On-Nostat
All Other Cases			Inactive	Inactive	Inactive

- For definition of “On-Warn,” “On-Idle,” “On-Nostat,” “Inactive” and “On-Trailer” reference Graphical Position Definition.

Park Distance Control (PDC) Positional FPA_IR_x

3.7.2.8 CAMERA-FUR-REQ-130472/E-Park Distance Control (PDC) Signal Processing - Positionals FPA_OR_1, FPA_OR_2

PDCDisp	PrkAidMsgTxt_D_Rq	PrkAidSnsFrCrnr_D_Stat	FPA_OR_1	FPA_OR_2
TRUE	!=0xE || 0xF || 0x8	0x0 (Off)	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat
		0x2 (Zone_2)	On-Idle	On-Warn
		0x3 (Zone_3)	On-Idle	On-Warn
		0x4 (Zone_4)	On-Idle	On-Idle
		0x5 (Zone_5)	On-Idle	On-Idle
		0x6 (Zone_6)	On-Idle	On-Idle
		0x7 (Zone_7)	On-Idle	On-Idle
		0x8 (Zone_8)	On-Idle	On-Idle
		0x9 (Zone_9)	On-Idle	On-Idle
		0xA (Zone_10)	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle
		0xD (Zone_13)	On-Idle	On-Idle
		0xE (Zone_14)	On-Idle	On-Idle
		0xF (Zone_15)	On-Idle	On-Idle
	= 0xE || 0xF || 0x8	0x1 (Zone_1)	On-Blkd	On-Nostat
	= 0xE || 0xF || 0x8	0x0 (Off)	On-Nostat	On-Nostat
All Other Cases			Inactive	Inactive

- For definition of “On-Warn,” “On-Idle,” “On-Nostat,” “Inactive” and “On-Trailer” reference Graphical Position Definition.

Park Distance Control (PDC) Positional FPA_OR_x

3.7.2.9 CAMERA-FUR-REQ-130474/G-Park Distance Control (PDC) Signal Processing - Positionals SPA_L1_1, SPA_L1_2

PDCDisp	PrkAidMsgTxt_D_Rq	SidePrkSnsL1_D_Stat	SPA_L1_1	SPA_L1_2
TRUE	!=0xE || 0xF || 0x8	0x0 (Off)	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat
		0x2 (Zone_2)	On-Warn	On-Nostat
		0x3 (Zone_3)	On-Warn	On-Nostat
		0x4 (Zone_4)	On-Warn	On-Nostat
		0x5 (Zone_5)	On-Idle	On-Warn
		0x6 (Zone_6)	On-Idle	On-Warn
		0x7 (Zone_7)	On-Idle	On-Warn
		0x8 (Zone_8)	On-Idle	On-Warn
		0x9 (Zone_9)	On-Idle	On-Idle
		0xA (Zone_10)	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle
		0xD (NoObjectInSector)	On-Idle	On-Idle
		0xE (NotFullyScannedYet)	Inactive	Inactive
		0xF (NotUsed)	Inactive	Inactive
	= 0xE || 0xF || 0x8	0x1 (Zone_1)	On-Blkd	On-Nostat
	= 0xE || 0xF || 0x8	0x0 (Off)	On-Nostat	On-Nostat
All Other Cases			Inactive	Inactive

X = Don't Care

For definition of "On-Warn," "On-Idle," "On-Nostat," "Inactive" and "On-Trailer" reference Graphical Position Definition.

Park Distance Control (PDC) Positional FPA_L1_x

3.7.2.10 CAMERA-FUR-REQ-130475/G-Park Distance Control (PDC) Signal Processing - Positionals SPA_R1_1, SPA_R1_2

PDCDisp	PrkAidMsgTxt_D_Rq	SidePrkSnsR1_D_Stat	SPA_R1_1	SPA_R1_2
TRUE	!=0xE || 0xF || 0x8	0x0 (Off)	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat
		0x2 (Zone_2)	On-Warn	On-Nostat
		0x3 (Zone_3)	On-Warn	On-Nostat
		0x4 (Zone_4)	On-Warn	On-Nostat
		0x5 (Zone_5)	On-Idle	On-Warn
		0x6 (Zone_6)	On-Idle	On-Warn

PDCDisp	PrkAidMsgTxt_D_Rq	SidePrkSnsR1_D_Stat	SPA_R1_1	SPA_R1_2
		0x7 (Zone_7)	On-Idle	On-Warn
		0x8 (Zone_8)	On-Idle	On-Warn
		0x9 (Zone_9)	On-Idle	On-Idle
		0xA (Zone_10)	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle
		0xD (NoObjectInSector)	On-Idle	On-Idle
		0xE (NotFullyScannedYet)	Inactive	Inactive
		0xF (NotUsed)	Inactive	Inactive
	= 0xE || 0xF || 0x8	0x1 (Zone_1)	On-Blkd	On-Nostat
	= 0xE || 0xF || 0x8	0x0 (Off)	On-Nostat	On-Nostat
All Other Cases			Inactive	Inactive

X = Don't Care

For definition of "On-Warn," "On-Idle," "On-Nostat," "Inactive" and "On-Trailer" reference Graphical Position Definition.
Park Distance Control (PDC) Positional FPA_R1_x

3.7.2.11 CAMERA-FUR-REQ-130476/F-Park Distance Control (PDC) Signal Processing - Positionals SPA_L2_1, SPA_L2_2

PDCDisp	PrkAidMsgTxt_D_Rq	SidePrkSnsL2_D_Stat	SPA_L2_1	SPA_L2_2
TRUE	X	0x0 (Off)	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat
		0x2 (Zone_2)	On-Warn	On-Nostat
		0x3 (Zone_3)	On-Warn	On-Nostat
		0x4 (Zone_4)	On-Warn	On-Nostat
		0x5 (Zone_5)	On-Idle	On-Warn
		0x6 (Zone_6)	On-Idle	On-Warn
		0x7 (Zone_7)	On-Idle	On-Warn
		0x8 (Zone_8)	On-Idle	On-Warn
		0x9 (Zone_9)	On-Idle	On-Idle
		0xA (Zone_10)	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle
		0xD (NoObjectInSector)	On-Idle	On-Idle

PDCDisp	PrkAidMsgTxt_D_Rq	SidePrkSnsL2_D_Stat	SPA_L2_1	SPA_L2_2
		0xE (NotFullyScannedYet)	Inactive	Inactive
		0xF (NotUsed)	Inactive	Inactive
All Other Cases			Inactive	Inactive

- For definition of “On-Warn,” “On-Idle,” “On-Nostat,” “Inactive” and “On-Trailer” reference Graphical Position Definition.

Park Distance Control (PDC) Positional FPA_L2_x

3.7.2.12 *CAMERA-FUR-REQ-130477/F-Park Distance Control (PDC) Signal Processing - Positionals SPA_R2_1, SPA_R2_2*

PDCDisp	PrkAidMsgTxt_D_Rq	SidePrkSnsR2_D_Stat	SPA_R2_1	SPA_R2_2
TRUE	X	0x0 (Off)	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat
		0x2 (Zone_2)	On-Warn	On-Nostat
		0x3 (Zone_3)	On-Warn	On-Nostat
		0x4 (Zone_4)	On-Warn	On-Nostat
		0x5 (Zone_5)	On-Idle	On-Warn
		0x6 (Zone_6)	On-Idle	On-Warn
		0x7 (Zone_7)	On-Idle	On-Warn
		0x8 (Zone_8)	On-Idle	On-Warn
		0x9 (Zone_9)	On-Idle	On-Idle
		0xA (Zone_10)	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle
		0xD (NoObjectInSector)	On-Idle	On-Idle
		0xE (NotFullyScannedYet)	Inactive	Inactive
		0xF (NotFullyScannedYet)	Inactive	Inactive
All Other Cases			Inactive	Inactive

For definition of “On-Warn,” “On-Idle,” “On-Nostat,” “Inactive” and “On-Trailer” reference Graphical Position Definition.

Park Distance Control (PDC) Positional FPA_R2_x

3.7.2.13 CAMERA-FUR-REQ-130478/F-Park Distance Control (PDC) Signal Processing - Positionals SPA_L3_1, SPA_L3_2

PDCDisp	PrkAidMsgTxt_D_Rq	SidePrkSnsL3_D_Stat	SPA_L3_1	SPA_L3_2
TRUE	X	0x0 (Off)	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat
		0x2 (Zone_2)	On-Warn	On-Nostat
		0x3 (Zone_3)	On-Warn	On-Nostat
		0x4 (Zone_4)	On-Warn	On-Nostat
		0x5 (Zone_5)	On-Idle	On-Warn
		0x6 (Zone_6)	On-Idle	On-Warn
		0x7 (Zone_7)	On-Idle	On-Warn
		0x8 (Zone_8)	On-Idle	On-Warn
		0x9 (Zone_9)	On-Idle	On-Idle
		0xA (Zone_10)	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle
		0xD (NoObjectInSector)	On-Idle	On-Idle
		0xE (NotFullyScannedYet)	Inactive	Inactive
		0xF (NotUsed)	Inactive	Inactive
All Other Cases			Inactive	Inactive

For definition of “On-Warn,” “On-Idle,” “On-Nostat,” “Inactive” and “On-Trailer” reference Graphical Position Definition.

Park Distance Control (PDC) Positional FPA_L3_x

3.7.2.14 CAMERA-FUR-REQ-130479/F-Park Distance Control (PDC) Signal Processing - Positionals SPA_R3_1, SPA_R3_2

PDCDisp	PrkAidMsgTxt_D_Rq	SidePrkSnsR3_D_Stat	SPA_R3_1	SPA_R3_2
TRUE	X	0x0 (Off)	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat
		0x2 (Zone_2)	On-Warn	On-Nostat
		0x3 (Zone_3)	On-Warn	On-Nostat
		0x4 (Zone_4)	On-Warn	On-Nostat
		0x5 (Zone_5)	On-Idle	On-Warn
		0x6 (Zone_6)	On-Idle	On-Warn
		0x7 (Zone_7)	On-Idle	On-Warn
		0x8 (Zone_8)	On-Idle	On-Warn
		0x9 (Zone_9)	On-Idle	On-Idle

PDCDisp	PrkAidMsgTxt_D_Rq	SidePrkSnsR3_D_Stat	SPA_R3_1	SPA_R3_2
		0xA (Zone_10)	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle
		0xD (NoObjectInSector)	On-Idle	On-Idle
		0xE (NotFullyScannedYet)	Inactive	Inactive
		0xF (NotUsed)	Inactive	Inactive
All Other Cases			Inactive	Inactive

For definition of “On-Warn,” “On-Idle,” “On-Nostat,” “Inactive” and “On-Trailer” reference Graphical Position Definition.

Park Distance Control (PDC) Positional FPA_R3_x

3.7.2.15 CAMERA-FUR-REQ-130480/F-Park Distance Control (PDC) Signal Processing - Positionals SPA_L4_1, SPA_L4_2

PDCDisp	PrkAidMsgTxt_D_Rq	SidePrkSnsL4_D_Stat	SPA_L4_1	SPA_L4_2
TRUE	!=0xD || 0xF	0x0 (Off)	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat
		0x2 (Zone_2)	On-Warn	On-Nostat
		0x3 (Zone_3)	On-Warn	On-Nostat
		0x4 (Zone_4)	On-Warn	On-Nostat
		0x5 (Zone_5)	On-Idle	On-Warn
		0x6 (Zone_6)	On-Idle	On-Warn
		0x7 (Zone_7)	On-Idle	On-Warn
		0x8 (Zone_8)	On-Idle	On-Warn
		0x9 (Zone_9)	On-Idle	On-Idle
		0xA (Zone_10)	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle
		0xD (NoObjectInSector)	On-Idle	On-Idle
		0xE (NotFullyScannedYet)	Inactive	Inactive
		0xF (NotUsed)	Inactive	Inactive
	=0xD || 0xF	0x1 (Zone_1)	On-Blkd	On-Nostat
	=0xD || 0xF	0x0 (Off)	On-Nostat	On-Nostat
All Other Cases			Inactive	Inactive

For definition of “On-Warn,” “On-Idle,” “On-Nostat,” “Inactive” and “On-Trailer” reference Graphical Position Definition.

Park Distance Control (PDC) Positional FPA_L4_x

3.7.2.16 CAMERA-FUR-REQ-130481/F-Park Distance Control (PDC) Signal Processing - Positionals SPA_R4_1, SPA_R4_2

PDCDisp	PrkAidMsgTxt_D_Rq	SidePrkSnsR4_D_Stat	SPA_R4_1	SPA_R4_2
TRUE	!=0xD || 0xF	0x0 (Off)	Inactive	Inactive
		0x1 (Zone_1)	On-Warn	On-Nostat
		0x2 (Zone_2)	On-Warn	On-Nostat
		0x3 (Zone_3)	On-Warn	On-Nostat
		0x4 (Zone_4)	On-Warn	On-Nostat
		0x5 (Zone_5)	On-Idle	On-Warn
		0x6 (Zone_6)	On-Idle	On-Warn
		0x7 (Zone_7)	On-Idle	On-Warn
		0x8 (Zone_8)	On-Idle	On-Warn
		0x9 (Zone_9)	On-Idle	On-Idle
		0xA (Zone_10)	On-Idle	On-Idle
		0xB (Zone_11)	On-Idle	On-Idle
		0xC (Zone_12)	On-Idle	On-Idle
		0xD (NoObjectInSector)	On-Idle	On-Idle
		0xE (NotFullyScannedYet)	Inactive	Inactive
		0xF (NotUsed)	Inactive	Inactive
	= 0xD || 0xF	0x1 (Zone_1)	On-Blkd	On-Nostat
	= 0xD || 0xF	0x0 (Off)	On-Nostat	On-Nostat
All Other Cases			Inactive	Inactive

For definition of “On-Warn,” “On-Idle,” “On-Nostat,” “Inactive” and “On-Trailer” reference Graphical Position Definition.

Park Distance Control (PDC) Positional FPA_R4_x

3.7.2.17 CAMERA-FUR-REQ-130483/F-Park Distance Control (PDC) Signal Processing - Positional OUTLINE

PDCDisp	PrkAidMsgTxt_D_Rq	PrkAidSnsRlCrnr_D_Stat	PrkAidSnsRlCntr_D_Stat	PrkAidSnsRrCntr_D_Stat	PrkAidSnsRrCrnr_D_Stat	PrkAidSnsFlCrnr_D_Stat	PrkAidSnsFlCntr_D_Stat	PrkAidSnsFrCntr_D_Stat	PrkAidSnsFrCrnr_D_Stat	SidePrkSnsL1_D_Stat	SidePrkSnsR1_D_Stat	SidePrkSnsL2_D_Stat	SidePrkSnsR2_D_Stat	SidePrkSnsL3_D_Stat	SidePrkSnsR3_D_Stat	SidePrkSnsL4_D_Stat	SidePrkSnsR4_D_Stat	OUTLINE
TRUE	X	0x1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	On-Warn
		X	0x1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	On-Warn
		X	X	0x1	X	X	X	X	X	X	X	X	X	X	X	X	X	On-Warn
		X	X	X	0x1	X	X	X	X	X	X	X	X	X	X	X	X	On-Warn
		X	X	X	X	0x1	X	X	X	X	X	X	X	X	X	X	X	On-Warn
		X	X	X	X	X	0x1	X	X	X	X	X	X	X	X	X	X	On-Warn
		X	X	X	X	X	X	0x1	X	X	X	X	X	X	X	X	X	On-Warn
		X	X	X	X	X	X	X	0x1	X	X	X	X	X	X	X	X	On-Warn
		X	X	X	X	X	X	X	X	0x1-4	X	X	X	X	X	X	X	On-Warn
		X	X	X	X	X	X	X	X	X	0x1-4	X	X	X	X	X	X	On-Warn
		X	X	X	X	X	X	X	X	X	X	0x1-4	X	X	X	X	X	On-Warn
		X	X	X	X	X	X	X	X	X	X	X	0x1-4	X	X	X	X	On-Warn
		X	X	X	X	X	X	X	X	X	X	X	X	0x1-4	X	X	X	On-Warn
		X	X	X	X	X	X	X	X	X	X	X	X	X	0x1-4	X	X	On-Warn
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	0x1-4	X	On-Warn
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0x1-4	On-Warn
All Other Cases																		Inactive

X = Don't Care, (0x1-4) is an abbreviation which means (0x1||0x2||0x3||0x4)
For definition of "On-Warn," "On-Idle," "On-Nostat," "Inactive" and "On-Trailer" reference Graphical Position Definition.
Park Distance Control (PDC) Positional OUTLINE

3.7.3 Visual Park Aid Graphic - Visual Driving tube

3.7.3.1 CAMERA-FUR-REQ-197149/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 1

When the vehicle is equipped with Park Aid (PCD_Cfg=TRUE) and non-camera PDC is active (FVCDisp=false, RVCDisp=false, PDCDisp=true) the infotainment system shall show the vehicle's driving path illustrated on top of the VPA graphic in the center stack display.

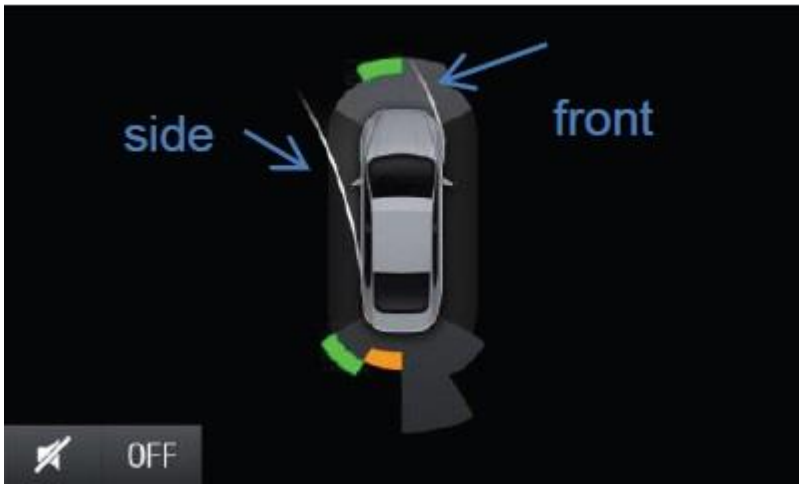
Base Park Aid visual driving tube concept.

3.7.3.2 CAMERA-FUR-REQ-197150/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 2

The infotainment system shall contain a method 2 configuation variable which is capable of configuring on and off the BPA driving tube feature. This configuration option should be internal to the infotainment system and shall not be available to driver.
Note: The intent of this requirement is to allow the disabling of the visual driving tube feature when the vehicle is RPA-only (4-channel) or when the parking aid system is otherwise not capable of providing this functionality.

3.7.3.3 CAMERA-FUR-REQ-197151/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 3

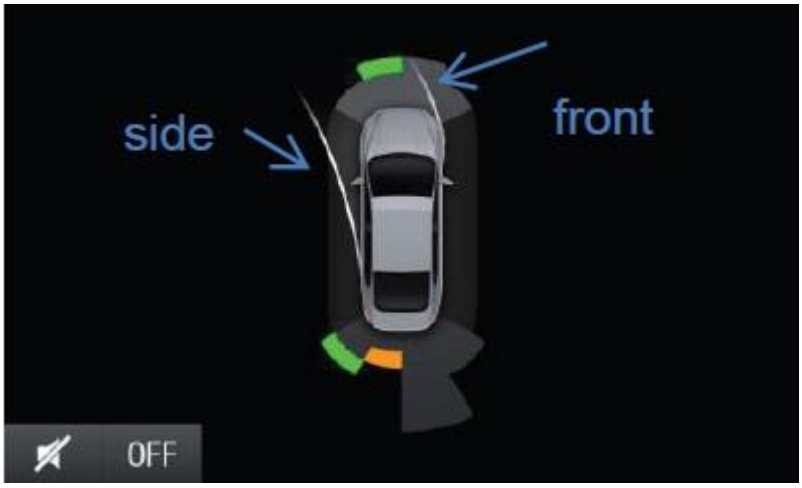
The vehicle driving path shall depend on the vehicle's driving direction provided by the Parking Aid System. When the vehicle is traveling forward, [PrkAidDrvDir_D_Stat]="Forward" the driving path illustration shall extend towards the front and side of the vehicle.



Forward visual driving tube concept.

3.7.3.4 CAMERA-FUR-REQ-197152/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 4

When the vehicle is traveling rearwards, [PrkAidDrvDir_D_Stat]="Rearward" the driving path illustration shall project towards the rear and side of the vehicle.



Rearward visual driving tube concept.

3.7.3.5 CAMERA-FUR-REQ-197153/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 5

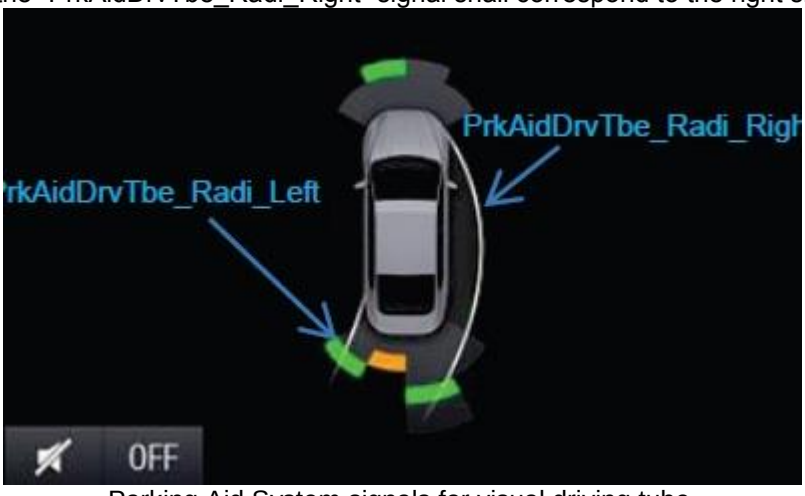
The infotainment system shall build the BPA visual driving tube feature by representing two curves/lines along the sides of the vehicle. These curves shall illustrate the vehicle's driving path and shall vary upon the receipt of the vehicle's turning radius information transmitted by the Parking Aid System.

3.7.3.6 CAMERA-FUR-REQ-197155/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 6

To build the driving tube curves/lines the infotainment system display shall create 2 dynamic semi-circles, one for the right curve/line and another for the left curve/line; the radius of these semi-circles shall be adjusted upon the request of the parking aid system signals "PrkAidDrvTbe_Radi_Left" and "PrkAidDrvTbe_Radi_Right".

3.7.3.7 CAMERA-FUR-REQ-197156/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 7

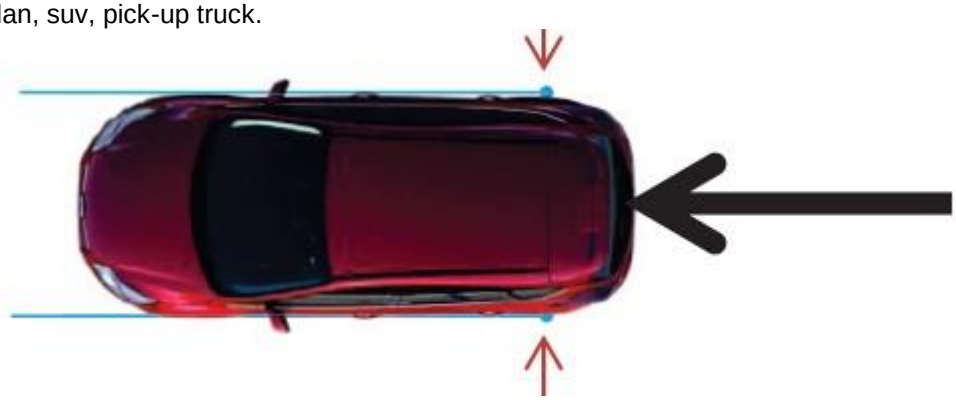
The turning radius provided with the "PrkAidDrvTbe_Radi_Left" signal shall correspond to the left side driving tube curve. The turning radius provided with the "PrkAidDrvTbe_Radi_Right" signal shall correspond to the right side driving tube curve.



Parking Aid System signals for visual driving tube.

3.7.3.8 CAMERA-FUR-REQ-197157/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 8

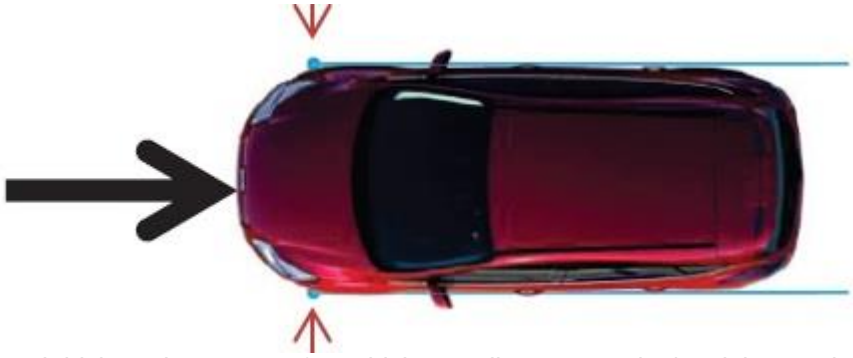
When the vehicle is traveling forward [PrkAidDrvDir_D_Stat]=”Forward” with a straight steering wheel angle [PrkAidDrvTbe_Radi_Right] = [PrkAidDrvTbe_Radi_Left] = “1000”, the infotainment system shall draw two straight parallel lines along the side of the vehicle with starting points in ends of the rear wheel axle, as shown in the illustration provided below. The position of these points in the infotainment display shall be tunable in order to adjust the VPA graphic for different vehicle types, i.e. sedan, suv, pick-up truck.



BPA visual driving tube concept for vehicle traveling forward w/straight steering wheel.

3.7.3.9 CAMERA-FUR-REQ-197158/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 9

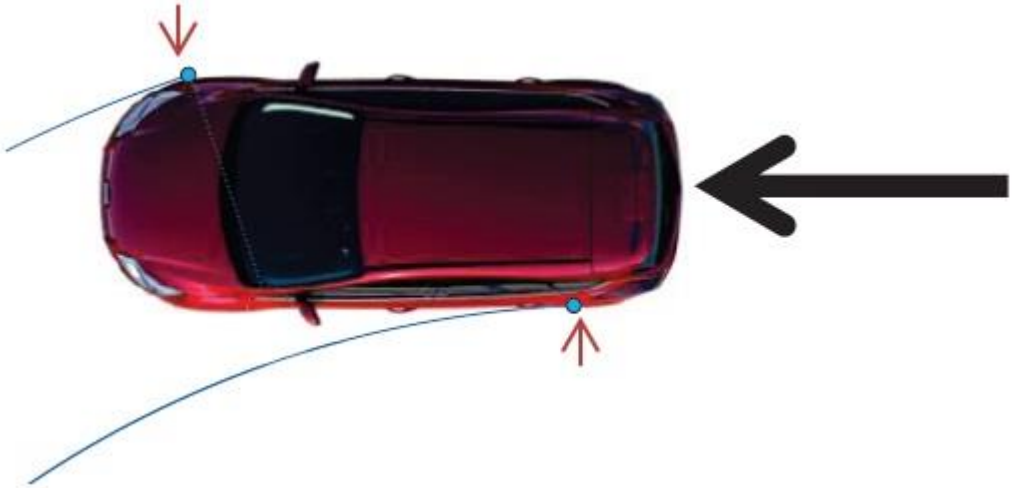
When the vehicle is traveling rearward [PrkAidDrvDir_D_Stat]=”Rearward” with a straight steering wheel angle [PrkAidDrvTbe_Radi_Right] = [PrkAidDrvTbe_Radi_Left] = “1000”, the infotainment system shall draw two straight parallel lines along the side of the vehicle with starting points in the outer most points of the front end of the vehicle. The position of these points in the infotainment display shall be tunable in order to adjust the VPA graphic for different vehicle types, i.e. sedan, suv, pick-up truck.



BPA visual driving tube concept for vehicle traveling rearward w/straight steering wheel.

3.7.3.10 CAMERA-FUR-REQ-197159/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 10

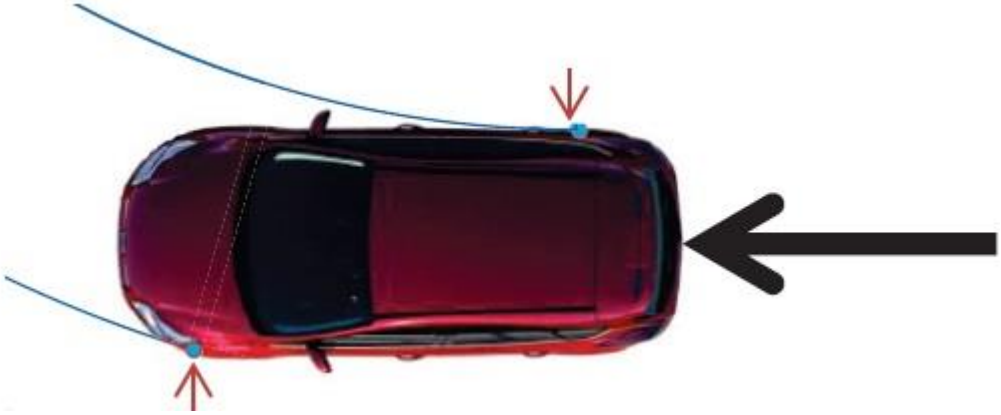
When the vehicle is traveling forward [PrkAidDrvDir_D_Stat]=”Forward” with a steering wheel angle turned towards the left side [PrkAidDrvTbe_Radi_Right] OR [PrkAidDrvTbe_Radi_Left] != “1000” && negative value (-), the starting point of the driving tube left curve shall be the end of the rear wheel axle, and the starting point of the driving tube right curve shall be the outer most point of the front end of the vehicle as shown in the illustration below. These points shall be used as points of tangency to build the dynamic semi-circles corresponding to the vehicle’s driving path as detailed in later requirements of this specification. The position of these points in the infotainment display shall be tunable in order to adjust the VPA graphic for different vehicle types, i.e. sedan, suv, pick-up truck.



BPA visual driving tube concept for vehicle traveling forward w/steering wheel turned left.

3.7.3.11 CAMERA-FUR-REQ-197160/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 11

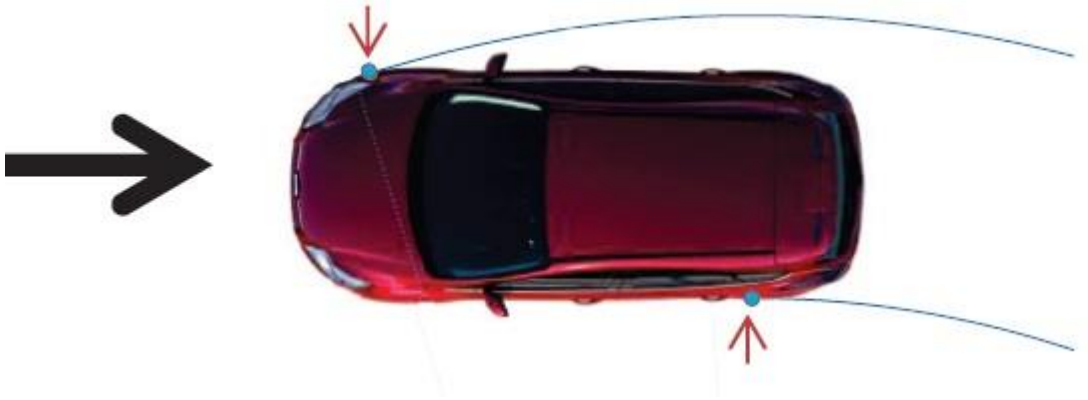
When the vehicle is traveling forward [PrkAidDrvDir_D_Stat]="Forward" with a steering wheel angle turned to the right side [PrkAidDrvTbe_Radi_Right] OR [PrkAidDrvTbe_Radi_Left] != "1000" && positive value (+), the starting point of the driving tube right curve shall be the end of the rear wheel axle, and the starting point of the driving tube left curve shall be the outer most point of the front end of the vehicle as shown in the illustration below. These points shall be used as points of tangency to build the dynamic semi-circles corresponding to the vehicle's driving path as detailed in later requirements of this specification. The position of these points in the infotainment display shall be tunable in order to adjust the VPA graphic for different vehicle types, i.e. sedan, suv, pick-up truck.



BPA visual driving tube concept for vehicle traveling forward w/steering wheel turned right.

3.7.3.12 CAMERA-FUR-REQ-197161/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 12

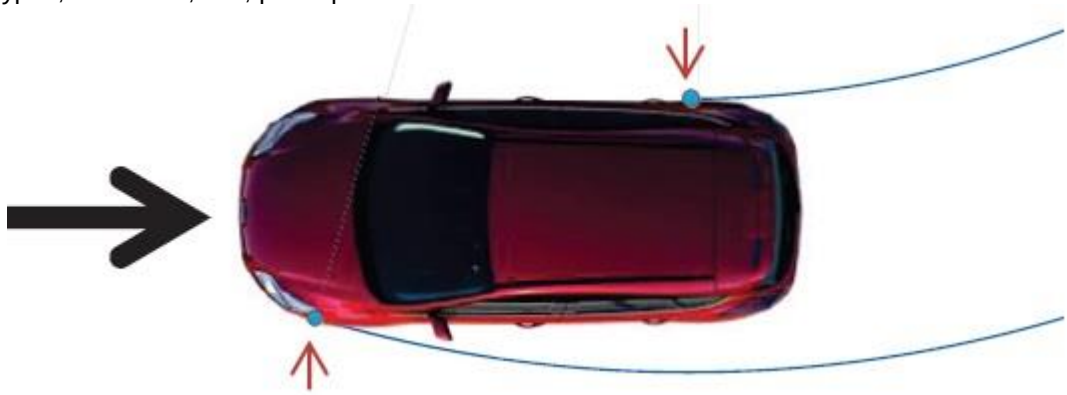
When the vehicle is traveling rearward [PrkAidDrvDir_D_Stat]="Rearward" with a steering wheel angle turned to the left side [PrkAidDrvTbe_Radi_Right] OR [PrkAidDrvTbe_Radi_Left] != "1000" && negative value (-), the starting point of the driving tube left curve shall be the end of the rear wheel axle, and the starting point of the driving tube right curve shall be the outer most point of the front end of the vehicle as shown in the illustration below. These points shall be used as points of tangency to build the dynamic semi-circles corresponding to the vehicle's driving path as detailed in later requirements of this specification. The position of these points in the infotainment display shall be tunable in order to adjust the VPA graphic for different vehicle types, i.e. sedan, suv, pick-up truck.



BPA visual driving tube concept for vehicle traveling rearward w/steering wheel turned left.

3.7.3.13 CAMERA-FUR-REQ-197162/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 13

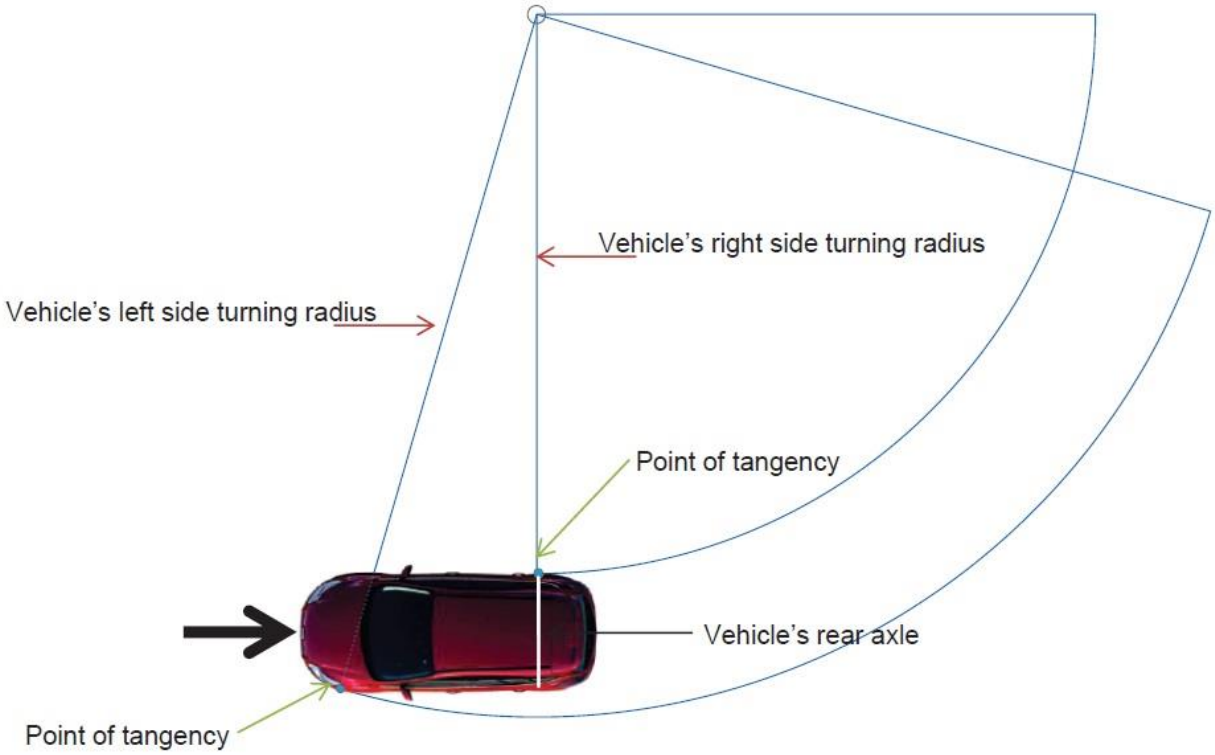
When the vehicle is traveling rearward [PrkAidDrvDir_D_Stat]=”Rearward” with a steering wheel angle turned to the right side [PrkAidDrvTbe_Radi_Right] OR [PrkAidDrvTbe_Radi_Left] != “1000” && positive value (+), the starting point of the driving tube right curve shall be the end of the rear wheel axle, and the starting point of the driving tube left curve shall be the outer most point of the front end of the vehicle as shown in the illustration below. These points shall be used as points of tangency to build the dynamic semi-circles corresponding to the vehicle’s driving path as detailed in later requirements of this specification. The position of these points in the infotainment display shall be tunable in order to adjust the VPA graphic for different vehicle types, i.e. sedan, suv, pick-up truck.



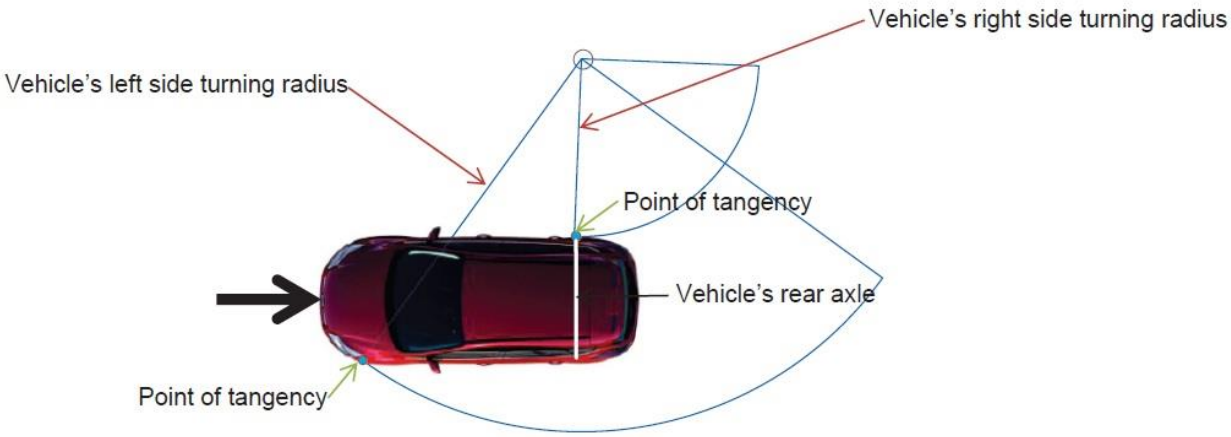
BPA visual driving tube concept for vehicle traveling rearward w/steering wheel turned right.

3.7.3.14 CAMERA-FUR-REQ-197163/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 14

The semi-circles created to simulate the vehicle’s path shall have as points of tangency the driving tube curve starting points defined in requirements listed above. The center/origin of the driving tube semi-circles shall be common and its position shall dynamically vary upon the turning radius provided by the parking aid system along the vehicle’s rear axle axis/plane. Please see the illustrations provided below for further detail, note how the position of center of the semi-circles varies upon different turning radius defined.



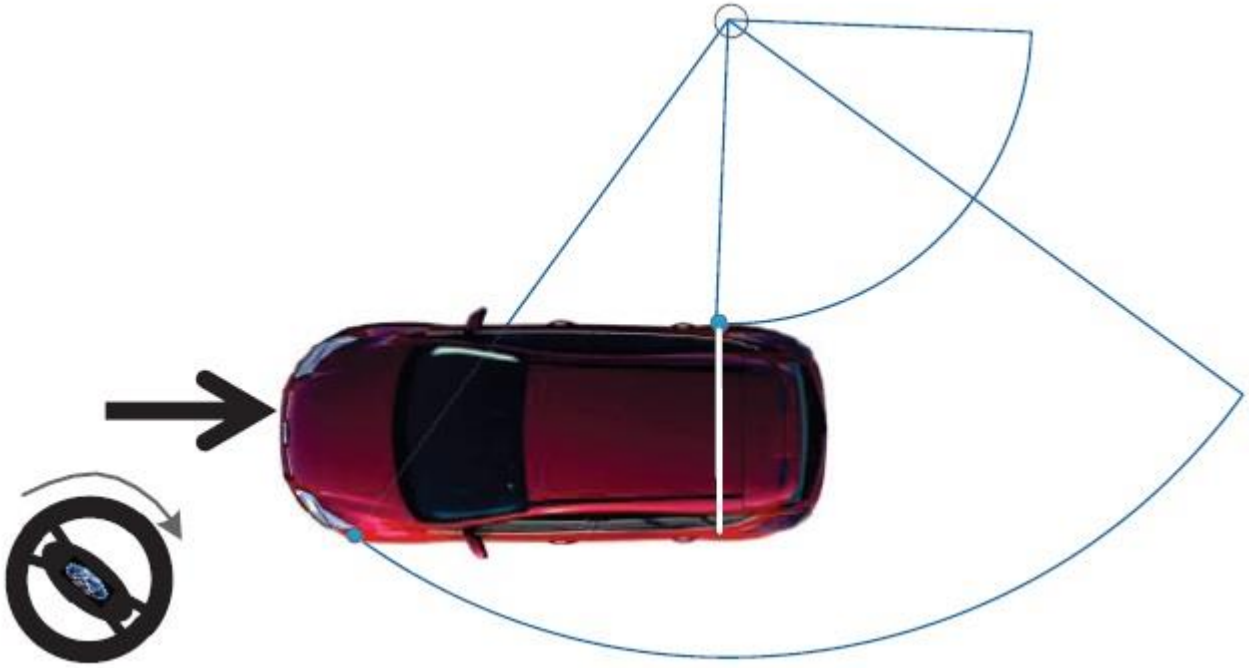
Vehicle turning radius traveling rearward with steering wheel angle slightly turned to the right side.



Vehicle turning radius traveling rearward with steering wheel angle fully turned to the right side.

3.7.3.15 CAMERA-FUR-REQ-197164/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 15

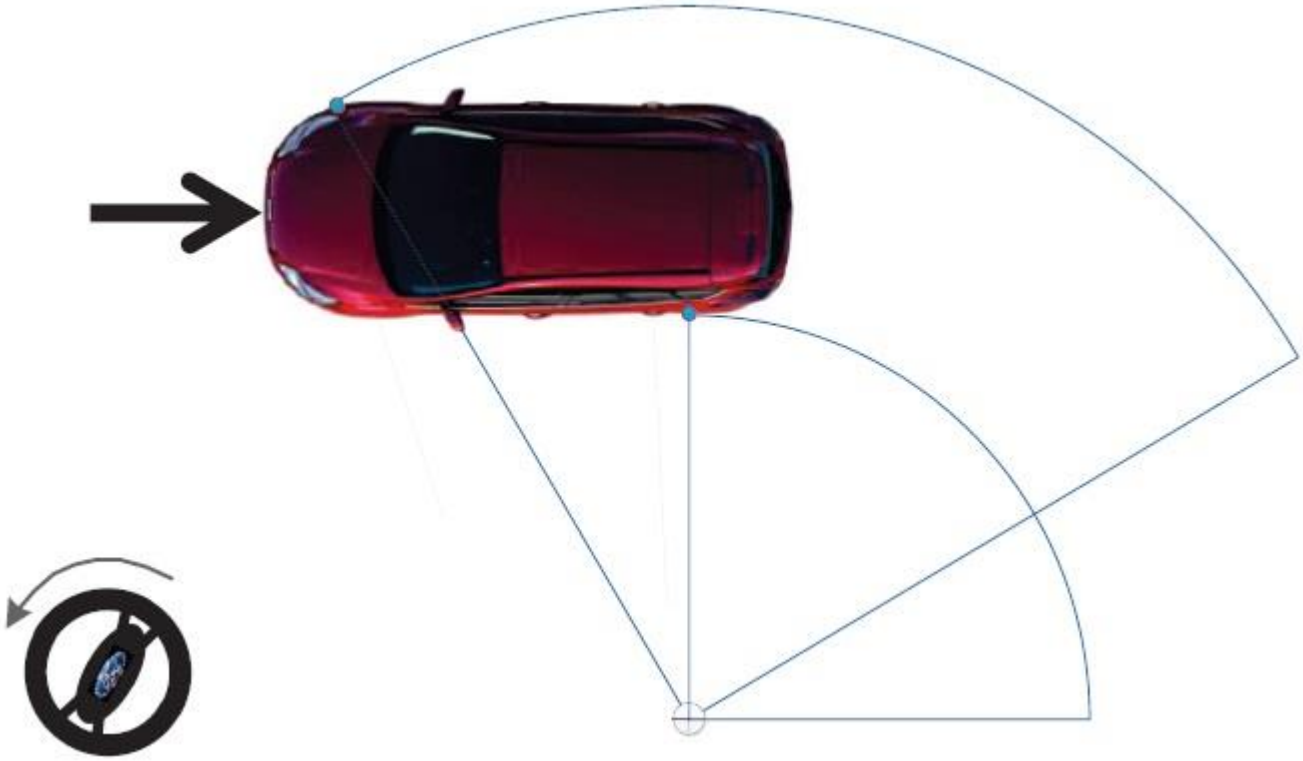
When the turning radius provided by the Parking Aid System is positive the centre of the driving tube semi-circles shall be located to the right side of the vehicle.
Note: This means the vehicle is turning in clockwise direction.



Positive turning radius, steering wheel turned towards the right side of the vehicle.

3.7.3.16 CAMERA-FUR-REQ-197165/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 16

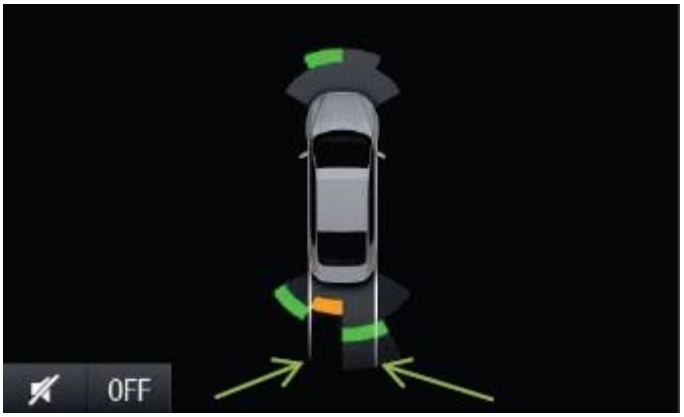
When the turning radius provided by the Parking Aid System is negative, the centre of the driving tube semi-circles shall be located to the left side of the vehicle. As shown in illustration provided below.
Note: This means the vehicle is turning in counterclockwise direction.



Negative turning radius, steering wheel turned towards the left side of the vehicle.

3.7.3.17 CAMERA-FUR-REQ-197166/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 17

The BPA visual driving tube curves/lines shall extend to cover the VPA field of view sectors when the vehicle is driving straight or turning as shown in the illustrations provided below. Please note that the length of the rear driving tube curves/lines is smaller than the front driving tube curves/lines, this variance is created due to the different sector field of view coverage.



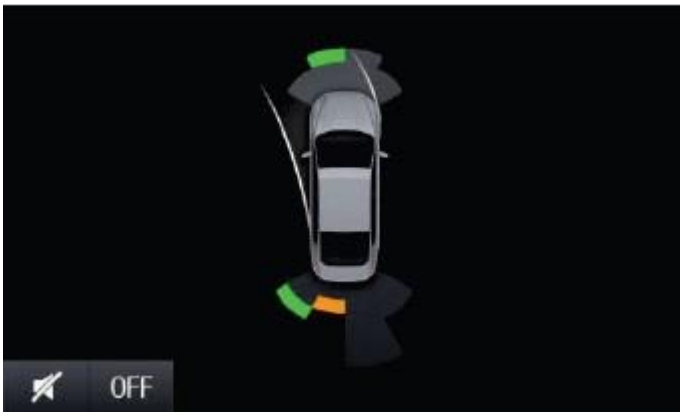
BPA rear visual driving tube curve/line length straight steering wheel.

BPA rear visual driving tube curve/line length turned steering wheel.

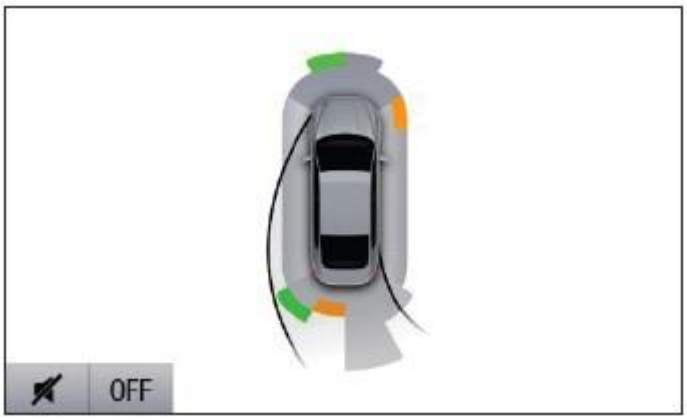
BPA front visual driving tube curve/line length turned steering wheel.

3.7.3.18 CAMERA-FUR-REQ-197167/A-Visual Park Aid Graphic - Visual Driving Tube General Requirements 18

The color of the BPA visual driving tube curves/lines shall be implemented such that allows the driver to visualize the vehicle's driving path as per the illustrations provided below. It shall not conflict with the existing VPA visual warning colors, i.e. amber, green or red.



BPA visual driving tube nighttime curve/line color concept.



BPA visual driving tube daytime curve/line color concept.

3.7.4 Base Parking Aid Display Deactivation Interface

3.7.4.1 Base Parking Aid display Deactivation Function

3.7.4.1.1 CAMERA-FUR-REQ-130487/B-Base Parking Aid display Deactivation General Requirements 1

The infotainment display shall provide a soft-button interface called the "close-option". This shall remove the PDC overlay from the screen.

3.7.4.1.2 CAMERA-FUR-REQ-131045/B-Base Parking Aid display Deactivation General Requirements 2

The close-option logic shall be contained entirely within the Infotainment ECU. No close-option status indication is required to be returned to the Park Aid ECU.

3.7.4.1.3 CAMERA-FUR-REQ-131046/B-Base Parking Aid display Deactivation General Requirements 3

The close-option logic shall operate with no discernable flicker and shall be seamlessly integrated into the overall HMI ECU screen arbitration algorithm.

3.7.4.1.4 CAMERA-FUR-REQ-131047/B-Base Parking Aid display Deactivation General Requirements 4

If the driver has used the close-option to switch off the BPA screen and [PDCScrReq] toggles from "True" to "False" to "True", the close-option shall reset and the BPA screen shall be shown as per previous requirements.

Note:

An example of this would be a driver closing the BPA screen because he or she is aware of the obstacle present; then later during the same ignition cycle, another obstacle is detected. The driver must again be notified when this next obstacle is detected.

3.7.4.1.5 CAMERA-FUR-REQ-131048/B-Base Parking Aid display Deactivation General Requirements 5

If the driver has used the close-option to switch off the BPA screen [GearPosHMI transitions from (Not Reverse→Reverse) or from (Reverse→Not Reverse), the close-option shall reset and the BPA screen shall be shown as per previous requirements.

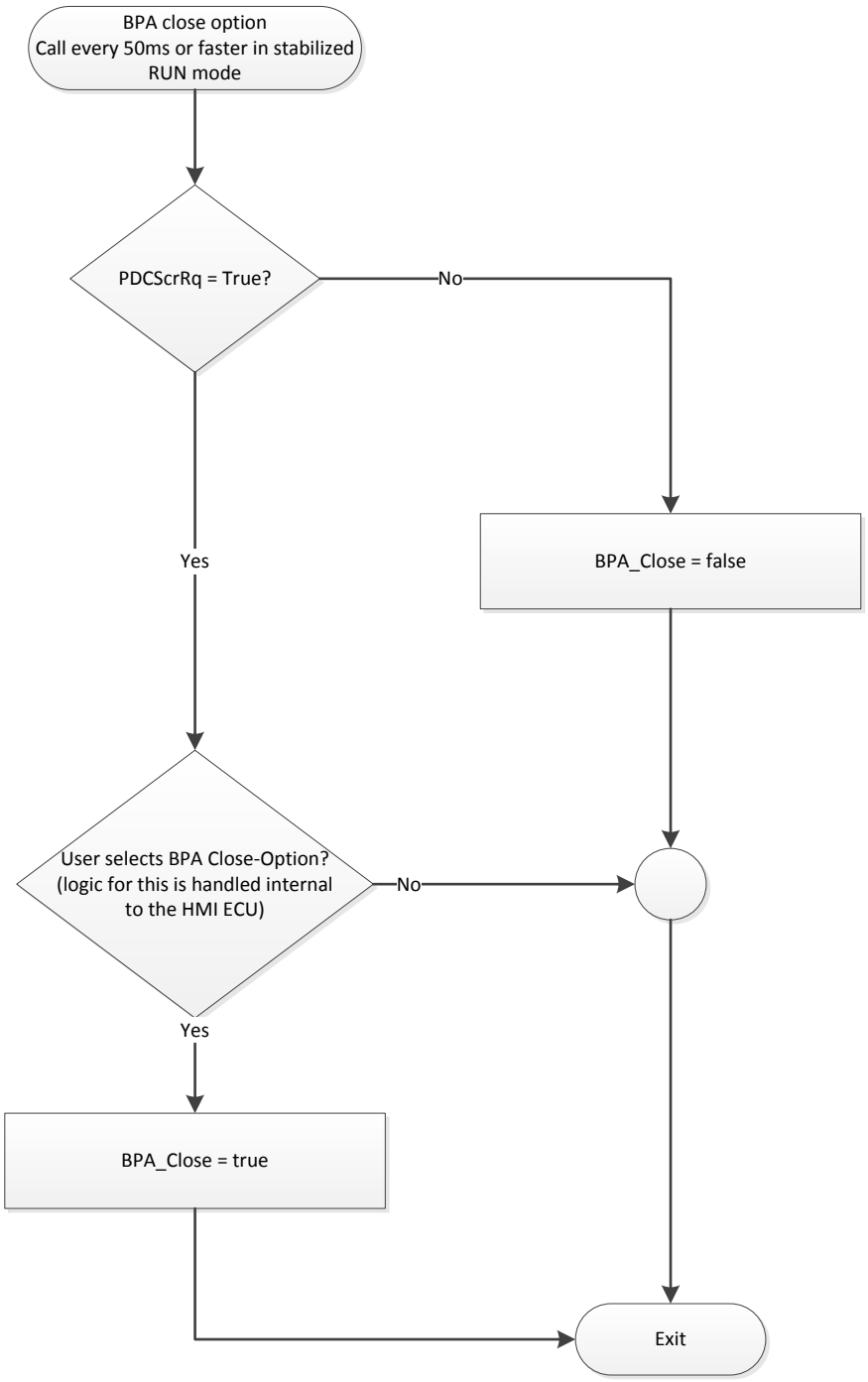
Note:

An example of this would be a driver closing the BPA screen because he or she is aware of the obstacle present; then changes gears and the obstacle is still detected. The driver must again be notified since the driving conditions have changed.

3.7.4.1.6 CAMERA-FUR-REQ-131049/B-Base Parking Aid display Deactivation General Requirements 6

[BPA_Close] is an internal parameter that is used by the HMI ECU to track whether the close option is active (true) or inactive (false).

3.7.4.1.7 CAMERA-FUR-REQ-131051/C-Base Parking Aid display Deactivation Function-BPA Close Option Logic



BPA Close Option Logic

3.8 REQ-132682/A-MyKey Notification Requirement

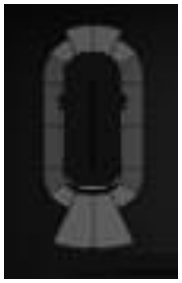
When VPA close-option is not available due to a MyKey, a visual notification shall be provided at center stack display.

3.9 CAMERA-FUR-REQ-161354/A-Reverse Video Camera with Active Park Assist (APA) and Park Distance Control (PDC) - Positional ParkPilot

As per Active Park Assist (APA) Signal Interface

3.10 CAMERA-FUR-REQ-130503/I-Active Park Assist (APA) Signal Processing - Positional ParkPilot

8” (or equivalent) displays

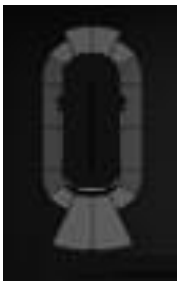
Operational Mode	[ApaSys_D_Stat]	[ApaSteScanMde_D_Stat]	[ApaActvSide2_D_Stat]	[ApaMde_D_Stat]	[ApaSelSapp_D_Stat]	[ApaSelPpa_D_Stat]	[ApaSelPoa_D_Stat]	[ApaScan_D_Stat]	[ApaLongCtl_D_RqDrv]	[ApaGearShif_D_RqDrv]	[ApaSteWhl_D_RqDrv]	[ApaAcsy_D_RqDrv]	[ApaTrgtDist_D_Stat]†	[ApaMsgTxt_D_Rq]‡	[PrkAidMsgTxt_D_Rq]	Display HMI/REF#
Run (as per Operational Modes and Voltage Range Definition)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0x1	 Follow Base Park Aid Signal Interface/083
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0x2	
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0x5	
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0x8	
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0x9	
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0xA	
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0xC	
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0xD	
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0xE	
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0xF	
All Other Cases																Blank (Do not show ParkPilot)

Active Park Assist (APA) Positional ParkPilot

† - Only if supported by the implementing program as per REQ-130570. If not supported but required by signal processing tables, treat as data 0xF.

‡ - Only if supported by the implementing program as per REQ-130570. If not supported but required by signal processing tables, treat as data 0x1.

4” displays

Operational Mode	[ApaSys_D_Stat]	[ApaSteScanMde_D_Stat]	[ApaActvSide2_D_Stat]	[ApaMde_D_Stat]	[ApaSelSapp_D_Stat]	[ApaSelPpa_D_Stat]	[ApaSelPoa_D_Stat]	[ApaScan_D_Stat]	[ApaLongCtl_D_RqDrv]	[ApaGearShif_D_RqDrv]	[ApaSteWhl_D_RqDrv]	[ApaAcsy_D_RqDrv]	[PrkAidMsgTxt_D_Rq]	Display HMI/REF#
Run (as per Operational Modes and Voltage Range Definition)	X	X	X	X	X	X	X	X	X	X	X	X	0x1	 Follow Base Park Aid Signal Interface/083
	X	X	X	X	X	X	X	X	X	X	X	X	0x2	
	X	X	X	X	X	X	X	X	X	X	X	X	0x5	
	X	X	X	X	X	X	X	X	X	X	X	X	0x8	
	X	X	X	X	X	X	X	X	X	X	X	X	0x9	
	X	X	X	X	X	X	X	X	X	X	X	X	0xA	
	X	X	X	X	X	X	X	X	X	X	X	X	0xC	
	X	X	X	X	X	X	X	X	X	X	X	X	0xD	
	X	X	X	X	X	X	X	X	X	X	X	X	0xE	
	X	X	X	X	X	X	X	X	X	X	X	X	0xF	
All Other Cases														Blank (Do not show ParkPilot)

4 Functional Definition

4.1 VPAv1-FUN-REQ-130706/A-Enable/Disable Visual Park Assist

4.1.1 Use Cases

4.1.1.1 VPAv1-UC-REQ-014399/A-Enable Visual Park Assist (TcSE ROIN-289855)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The Visual Park Assist system is disabled.
Scenario Description	The user enables the Visual Park Assist (VPA) system via hard switch interface.
Post-conditions	The VPA system is enabled by the VisualParkAssistServer.
List of Exception Use Cases	NA
Interfaces	Dedicated Hard Button Vehicle System Interface

4.1.1.2 VPAv1-UC-REQ-014400/A-Disable Visual Park Assist (TcSE ROIN-289856)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The Visual Park Assist system is enabled.
Scenario Description	The user disables the Visual Park Assist (VPA) system via hard switch interface.
Post-conditions	The VPA system is disabled by the VisualParkAssistServer.
List of Exception Use Cases	NA
Interfaces	Dedicated Hard Button Vehicle System Interface

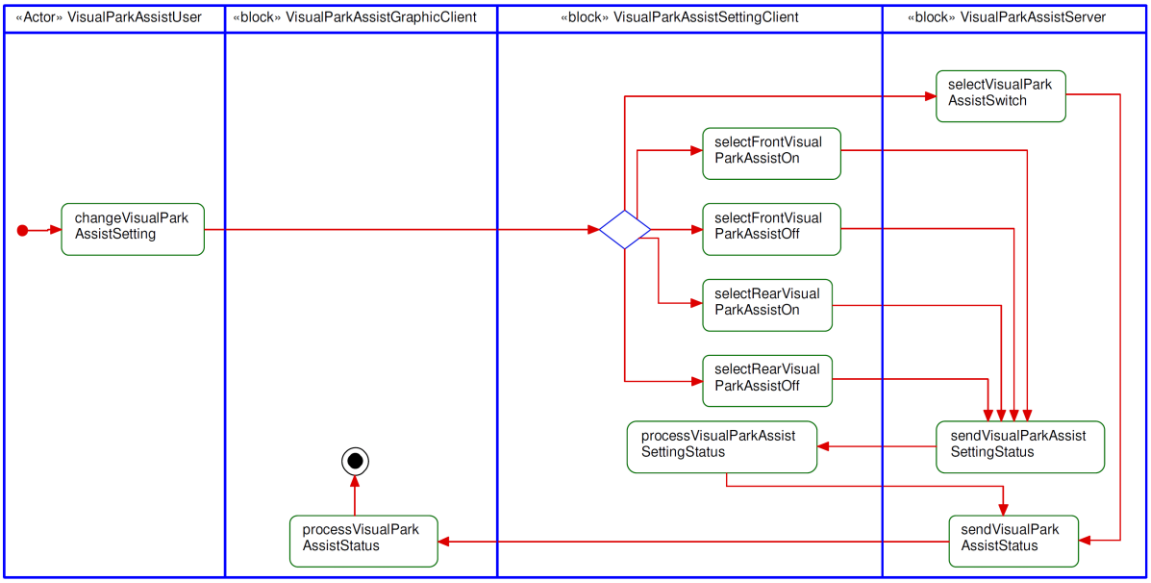
4.1.2 White Box View

4.1.2.1 Activity Diagrams

4.1.2.1.1 VPAv1-ACT-REQ-014396/A-Enable/Disable Visual Park Assist (TcSE ROIN-283929-1)

Linked Elements
VPAv1-SD-REQ-014430/A-Enable/Disable Rear Visual Park Assist (TcSE ROIN-283902-1)
VPAv1-SD-REQ-014429/A-Enable/Disable Front Visual Park Assist (TcSE ROIN-283888-1)
VPAv1-SD-REQ-014401/A-Enable/Disable Visual Park Assist Via Switch (TcSE ROIN-283909-1)

Activity Diagram



4.1.2.2 Sequence Diagrams

4.1.2.2.1 VPAv1-SD-REQ-014401/A-Enable/Disable Visual Park Assist Via Switch (TcSE ROIN-283909-1)

Scenarios

Normal Usage

The user enables or disables the full (front and rear) visual park assist system via hard switch interface.

Constraints

Pre-condition

Enable:

The full visual park assist system is disabled.

Disable:

The full visual park assist system is enabled.

Post-condition

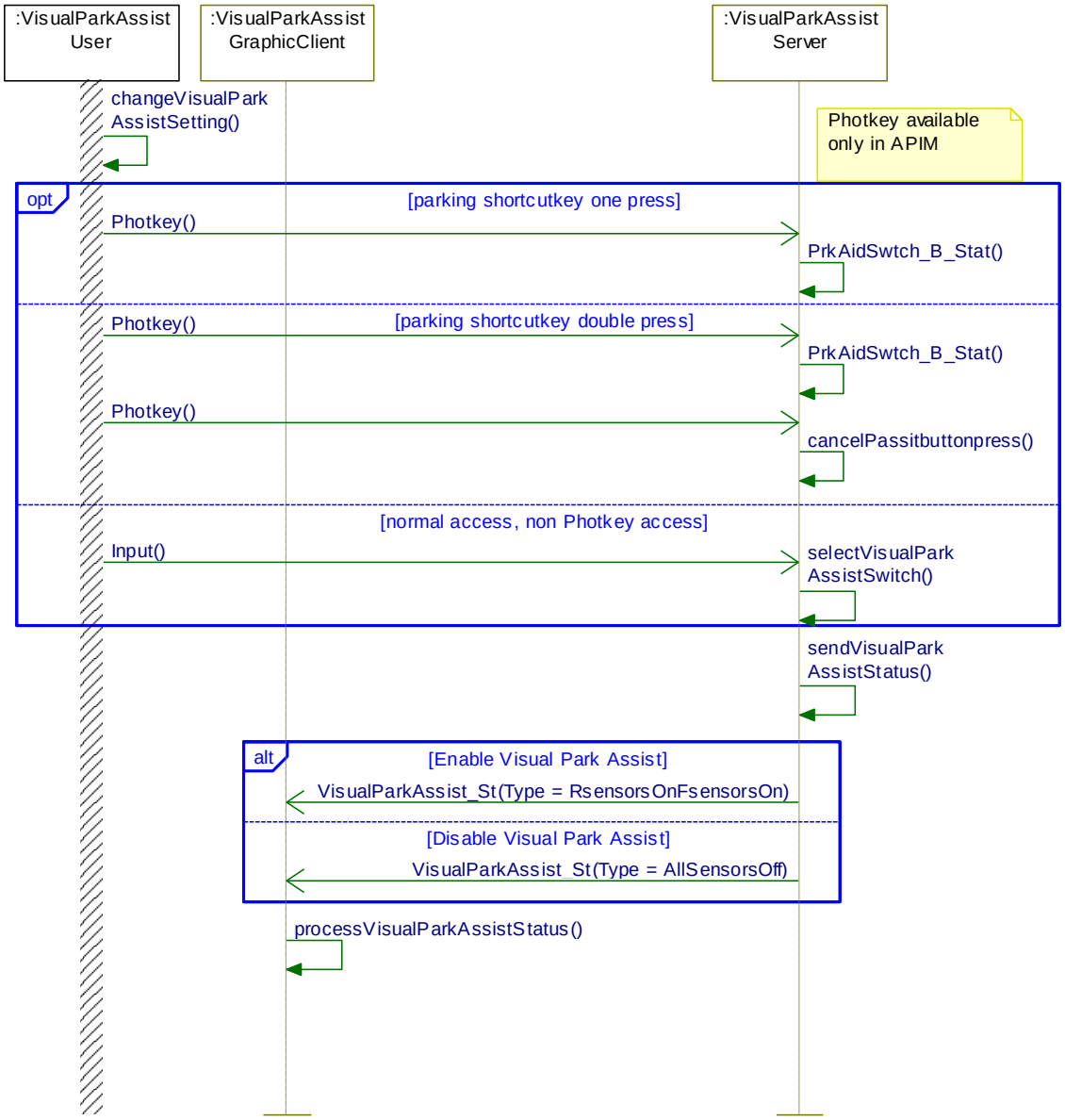
Enable:

The full visual park assist system is enabled.

Disable:

The full visual park assist system is disabled.

Sequence Diagram



4.2 VPAv1-FUN-REQ-130707/B-Display Visual Park Assist

4.2.1 Requirements

4.2.1.1 REQ-131084/A-VPA Displays Definition Requirement

VPA HMI displays are dependent on the encoding of the ParkAidSensorFront_St, ParkAidSensorRear_St, ParkAidSensorSide_St, VisualParkAssist_St and IgnKeyType_D_Actl signals.

4.2.1.2 REQ-131002/A-VPA Logic Names and CAN Signal Names Translation Table

Logic Name		CAN Signal Name
ParkAidSensorFront_St	FrontLeftCenter	PrkAidSnsFlCntr_D_Stat
	FrontRightCenter	PrkAidSnsFlCntr_D_Stat
	FrontLeftCorner	PrkAidSnsFlCrnr_D_Stat
	FrontRightCorner	PrkAidSnsFrCrnr_D_Stat

	FrontLeftSide	PrkAidSnsFlSide_D_Stat
	FrontRightSide	PrkAidSnsFrSide_D_Stat
ParkAidSensorRear_St	RearLeftCenter	PrkAidSnsRlCntr_D_Stat
	RearRightCenter	PrkAidSnsRrCntr_D_Stat
	RearLeftCorner	PrkAidSnsRlCrnr_D_Stat
	RearRightCorner	PrkAidSnsRrCrnr_D_Stat
	RearLeftSide	N/A to VPA
	RearRightSide	N/A to VPA
ParkAidSensorSide_St	RightSideSector1	SidePrkSnsR1_D_Stat
	RightSideSector2	SidePrkSnsR2_D_Stat
	RightSideSector3	SidePrkSnsR3_D_Stat
	RightSideSector4	SidePrkSnsR4_D_Stat
	LeftSideSector1	SidePrkSnsL1_D_Stat
	LeftSideSector2	SidePrkSnsL2_D_Stat
	LeftSideSector3	SidePrkSnsL3_D_Stat
	LeftSideSector4	SidePrkSnsL4_D_Stat
VisualParkAssist_St		PrkAidMsgTxt_D_Rq

4.2.2 Use Cases

4.2.2.1 VPAv1-UC-REQ-014424/A-Display Visual Park Assist (TcSE ROIN-289863)

Linked Elements

VPAv1-HMI-REQ-014405/A-Display Visual Park Assist When Camera Image Is Not Available (TcSE ROIN-294140-1)
VPAv1-HMI-REQ-014406/A-Display Visual Park Assist When Camera Image Is Available (TcSE ROIN-294141-1)
VPAv1-HMI-REQ-014407/A-Active Park Assist Override Of Visual Park Assist (TcSE ROIN-294142-2)
VPAv1-HMI-REQ-014408/A-VPA Display when Gear position changes: "Reverse to Non-Reverse" or "non-Reverse to non-Reverse" (TcSE ROIN-294143-2)
VPAv1-HMI-REQ-014409/A-Visual Park Assist Display When Gear Position Changes from Non-reverse to Reverse (TcSE ROIN-294144-1)
VPAv1-HMI-REQ-014410/A-Display Visual Park Assist when MyKey is present. (TcSE ROIN-294145-2)
VPAv1-HMI-REQ-014411/A-Disable VPA overlay from vehicle camera screen. (TcSE ROIN-294146-1)
VPAv1-HMI-REQ-014412/A-Multi-camera View Override of Visual Park Assist (TcSE ROIN-294147-2)
VPAv1-HMI-REQ-014413/A-4 or 6 Channel Park Aid Conditions for Not Displaying VPA Graphic (TcSE ROIN-294148-1)
VPAv1-HMI-REQ-014414/A-4 or 6 Channel Park Aid Conditions for Displaying VPA Graphic Fault (TcSE ROIN-294149-1)
VPAv1-HMI-REQ-014415/A-4 or 6 Channel Park Aid VPA Graphic Type (TcSE ROIN-294150-1)
VPAv1-HMI-REQ-014417/A-8, 10, or 12 Channel Park Aid conditions for not displaying VPA graphic (TcSE ROIN-294152-1)
VPAv1-HMI-REQ-014418/A-8, 10, or 12 Channel Park Aid Conditions for Displaying VPA Graphic Fault (TcSE ROIN-294153-1)
VPAv1-HMI-REQ-014419/A-8, 10, or 12 Channel Park Aid VPA Graphic Type (TcSE ROIN-294154-1)
VPAv1-HMI-REQ-014420/A-8, 10, or 12 channel Park Aid VPA Graphic Type (TcSE ROIN-294155-1)
VPAv1-HMI-REQ-014421/A-8, 10, or 12 channel Park Aid VPA Graphic Type (TcSE ROIN-294156-1)
VPAv1-HMI-REQ-014422/A-8, 10, or 12 channel Park Aid VPA Graphic Type (TcSE ROIN-294157-1)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start.
Scenario Description	The vehicle system indicates Visual Park Assist (VPA) is enabled and an indication should be provided to the user.
Post-conditions	The VPA information is displayed to the user according to HMI requirements.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

4.2.2.2 VPAv1-UC-REQ-014425/A-Cancel Display of Visual Park Assist (TcSE ROIN-293590)

Linked Elements

VPAv1-HMI-REQ-014416/A-4 or 6 Channel Park Aid VPA Graphic Closure Conditions (TcSE ROIN-294151-2)
VPAv1-HMI-REQ-014423/A-8, 10, or 12 Channel Park Aid VPA Graphic Closure Conditions (TcSE ROIN-294158-2)

Actors	Vehicle Occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. The Visual Park Assist information is displayed to the user.
Scenario Description	The user closes the Visual Park Assist (VPA) graphic via HMI interface.
Post-conditions	The VPA information is no longer displayed to the user.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

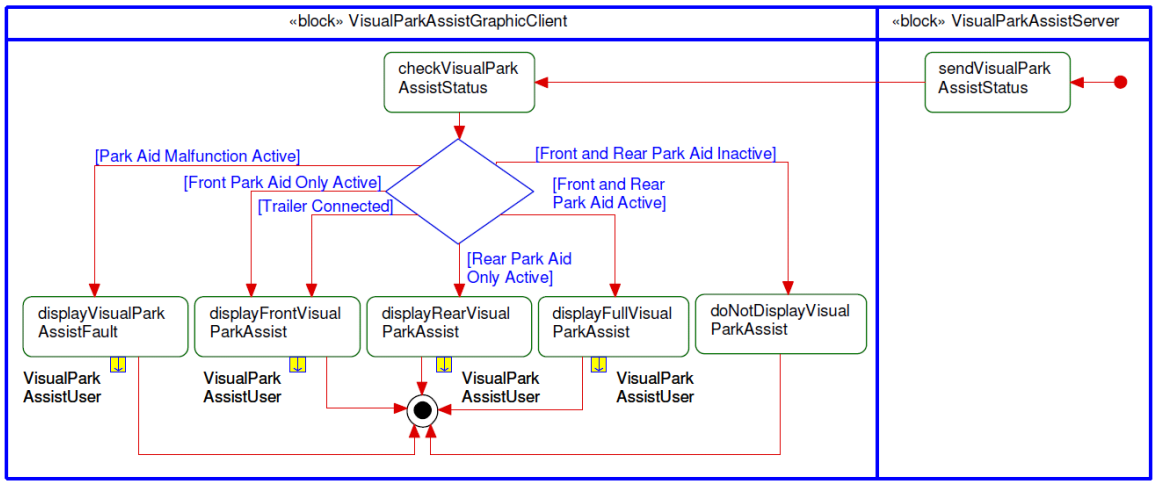
4.2.3 White Box View

4.2.3.1 Activity Diagrams

4.2.3.1.1 VPAv1-ACT-REQ-014397/A-Display Visual Park Assist (TcSE ROIN-283933-2)

Linked Elements
VPAv1-SD-REQ-014426/A-Display Visual Park Assist (TcSE ROIN-283895-2)

Activity Diagram



4.2.3.2 Sequence Diagrams

4.2.3.2.1 VPAv1-SD-REQ-014426/A-Display Visual Park Assist (TcSE ROIN-283895-2)

Scenarios

Normal Usage
The system displays the visual park assist graphic to the user.

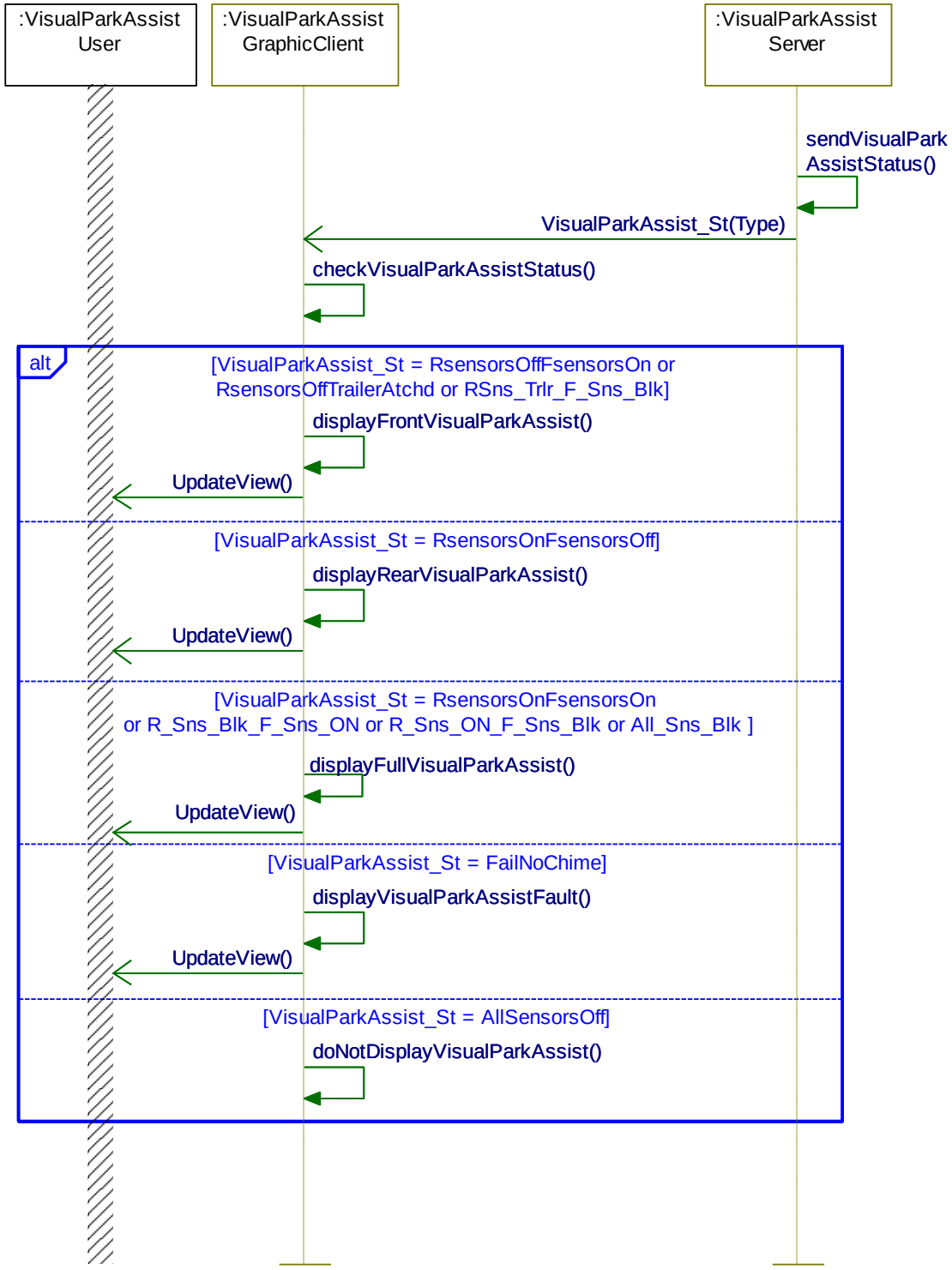
Please refer to table in the requirement number 196898 for a list of all signals affecting the displays in sequence diagram.

Constraints

Pre-condition
The infotainment system is active.

Post-condition
The visual park assist graphic is displayed to the user via the HMI interface.

Sequence Diagram



5 Appendix: Reference Documents

Reference #	Document Title
1	A59_SYNC Gen II Notifications and Alerts
2	A36a_SHMI Driver Assist - RVC-FlankGuard
3	A36c_PDC_distance_bar_signal_mapping_PAMtoHMI
4	
5	