Research & Vehicle Technology
"Infotainment Systems Product Development"

Feature – Bezel Diagnostics

Infotainment Subsystem Part Specific Specification (SPSS)

Version 1.9

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Version Date: May 6, 2022

FORD CONFIDENTIAL

Revision History

Date	Version	Notes	
May 30, 2013	**1.0**	**Initial Release**	
October 15, 2013	**1.1**		
	DIAG-GREQ-304169-1-AAM module		<jmyslin2 Oct 10, 2013> Added requirement for when AAM module present
December 10, 2014	**1.2**		
	DIAG-FRD-REQ-016476/B-Bezel Diagnostics (TcSE ROIN-291321-1)		<jmyslin2 / Hans-Christian Zubert> Update Bezel Diagnostics SPSS to include LIN ICP part number interface
	DIAG-SR-REQ-103696/A-LIN ICP Part Number during Bezel Diagnostics		<jmsylin2> New Bezel Diagnostic requirement when have a LIN ICP for displaying part numbers
June 4, 2015	**1.3**		
	DIAG-SR-REQ-115757/A-Request and Response of HWPN (PCB)		hzubert - modified SupplierID and FunctionID in example to wildcard values.
	DIAG-SR-REQ-115758/A-Request and Response of SWPN		hzubert - modified SupplierID and FunctionID in example to wildcard values.
	DIAG-FUN-REQ-164015/A-Bezel Diagnostics - I2C over LVDS+		<Jason Myslinski / Hans-Christian Zubert> New Bezel Diagnostics function for I2C over LVDS
May 7, 2018	**1.4**		
	DIAG-FUN-REQ-273205/A-Bezel Diagnostics - SOA (Ethernet)		<jmyslin2> Initial release of SOA / Ethernet Bezel Diagnostics. New function for FNV2 SYNC, TCU and ECG Bezel Diagnostics over SOA / Ethernet. All requirements in this function are new for this initial release of SOA Bezel Diagnostics.
	473234/A-Interface Requirements - SOA Bezel Diagnostics		473234/A-Interface Requirements - SOA Bezel Diagnostics
	MD-REQ-275119/F-getTcuBezelDiagnosticData		<jmyslin2> Logical API MD for TCU SOA Bezel Diagnostics
	MD-REQ-275359/F-getEcgBezelDiagnosticData		<jmyslin2> Logical API MD for ECG SOA Bezel Diagnostics
	MD-REQ-277459/A-Bezel_Diagnostic.Rq		<jmyslin2> Put interface table description in MD form. Not requirement content change and only a clarification and formatting update
	MD-REQ-277675/A-AHU_Bezel_Diag.St+		<jmyslin2> Put interface table description in MD form. Not requirement content change and only a clarification and formatting update
	MD-REQ-277746/A-DSP_Bezel_Diag.St+		<jmyslin2> Put interface table description in MD form. Not requirement content change and only a clarification and formatting update
	MD-REQ-277747/A-EFP_Bezel_Diag.St+		<jmyslin2> Put interface table description in MD form. Not requirement content change and only a clarification and formatting update
	MD-REQ-278042/A-AHU_Bezel_Diag_Data+		<jmyslin2> Put interface table description in MD form. Not requirement content change and only a clarification and formatting update
	MD-REQ-278042/B-AHU_Bezel_Diag_Data		<jmyslin2> Grammar update only. No content change
	MD-REQ-278043/A-DSP_Bezel_Diag_Data		<jmyslin2> Put interface table description in MD form. Not requirement content change and only a clarification and formatting update
	MD-REQ-278044/A-EFP_Bezel_Diag_Data		<jmyslin2> Put interface table description in MD form. Not requirement content change and only a clarification and formatting update
	MD-REQ-276458/A-Vehicle_Speed.St+		<jmyslin2> created MD
	MD-REQ-276458/B-Vehicle_Speed.St		<jmyslin2> MD clarification
	MD-REQ-276459/A-Vehicle_Speed_QF		<jmyslin2> created MD
	DIAG-FUN-REQ-016450/B-Bezel Diagnostic Session Entry Conditions (TcSE ROIN-291280-1)		<jmyslin2> No update, revision number accidently revised with no changes
	IFS-MMI2C-SR-REQ-140624/B-0x31 Core Assembly FPN+		"<joravec4>
	IFS-MMI2C-SR-REQ-140624/C-0x31 Core Assembly FPN		<hzubert> Generalized wording

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	IFS-MMI2C-SR-REQ-140625/B-0x32 Delivery Assembly FPN+	"<joravec4>
	IFS-MMI2C-SR-REQ-140625/C-0x32 Delivery Assembly FPN	<hzubert> Generalized wording
	IFS-MMI2C-SR-REQ-140626/B-0x33 Software FPN+	"<joravec4>
	IFS-MMI2C-SR-REQ-140626/C-0x33 Software FPN	<hzubert> Generalized wording
	IFS-MMI2C-SR-REQ-140627/B-0x34 Serial Number+	"<joravec4>
	IFS-MMI2C-SR-REQ-140627/C-0x34 Serial Number	<hzubert> Generalized wording
	IFS-MMI2C-SR-REQ-140628/B-0x35 Main Calibration Data FPN+	"<joravec4>
	IFS-MMI2C-SR-REQ-140628/C-0x35 Main Calibration Data FPN	<hzubert> Generalized wording
September 7, 2018	**1.5**	
	DIAG-CLD-REQ-311960/A-Bezel Diagnostic Server - AHU (APIM V2)	<jmyslin2> Requirements apply only to SYNC 4.1 when AHU functionality is integrated into SYNC
	DIAG-FUR-REQ-311961/A-Diagnostics - integrated AHU functionality (APIM v2)	<jmyslin2> Applies to SYNC 4.1 when AHU functionality is integrated into SYNC.
	481093/B-Bezel Diagnostics Interface Requirements - SOA	<jmyslin2> added class descriptions, no content change
	STR-055943/C-Appendix: Reference Documents (TcSE ROIN-291330)	<jmyslin2> added a couple additional references. No content change
January 31, 2019	**1.6**	
	DIAG-UC-REQ-016451/B-Bezel Diagnostics – Enter Bezel Diagnostics (TcSE ROIN-291319-1)	<jmyslin2> Updated use case to move pre-condition that a media source is active to enter bezel diagnostics
	DIAG-UC-REQ-016452/B-Bezel Diagnostics – Cannot enter Bezel Diagnostics (TcSE ROIN-291320-1)	<jmyslin2> updated to remove requirement on active media source
	DIAG-SR-REQ-015060/B-Entry Conditions for user initiated bezel diagnostic session (TcSE ROIN-129519-2)	<jmyslin2> Per a request by the Bezel Diagnostics Client team I updated the requirement to include flexability so a Media Source does not always have to be active to enter bezel diagnostics
February 13, 2019	**1.7**	
	DIAG-UC-REQ-016454/C-Bezel Diagnostics – Exit Bezel Diagnostics (TcSE ROIN-291079-1)	<jmyslin2> Updated to include higher priority feature in use case
	DIAG-SR-REQ-015063/C-Exit Conditions for Bezel Diagnostics (TcSE ROIN-129521-3)	<jmyslin2> updated to include higher priority feature
	DIAG-UC-REQ-016454/C-Bezel Diagnostics – Exit Bezel Diagnostics (TcSE ROIN-291079-1)	<jmyslin2> Updated to include higher priority feature in use case
September 3, 2020	**1.8**	
	MD-REQ-277459/B-Bezel_Diagnostic.Rq	<jmyslin2> updated to include DSP AMP variant 2
	MD-REQ-278042/C-AHU_Bezel_Diag_Data	<jmyslin2> Updated to allow for 24 characters
	MD-REQ-278043/B-DSP_Bezel_Diag_Data	<jmyslin2> updated to allow for 24 characters
	MD-REQ-278044/B-EFP_Bezel_Diag_Data	<jmyslin2> Updated to allow for 24 characters
	STR-473234/B-Interface Requirements - SOA Bezel Diagnostics	jmyslin2: added comment
	DIAG-UC-REQ-016451/C-Bezel Diagnostics – Enter Bezel Diagnostics (TcSE ROIN-291319-1)	jmyslin2: Clarified requirements
	DIAG-UC-REQ-016454/D-Bezel Diagnostics – Exit Bezel Diagnostics (TcSE ROIN-291079-1)	jmyslin2: Clarified requirement by removing voltages, which are covered in power management
	DIAG-UC-REQ-016456/B-Bezel Diagnostics – Entry Bezel Diagnostic and Speaker Walkaround (TcSE ROIN-291069-1)	jmyslin2: removed voltages from the pre-condition
	DIAG-UC-REQ-016457/B-Bezel Diagnostics – Speaker Walk Around – Entry from within Bezel Diagnostics (TcSE ROIN-291075-1)	jmyslin2: removed voltages from the pre-condition
	DIAG-UC-REQ-016458/B-Bezel Diagnostics – Vehicle speed above 5kph during speaker walk around (TcSE ROIN-291076-1)	jmyslin2: removed voltages from the pre-condition
	DIAG-UC-REQ-016459/B-Bezel Diagnostics – Internal Bezel Diagnostics Speaker Walk Around Completed (TcSE ROIN-291077-1)	jmyslin2: removed voltages from the pre-condition
	DIAG-SR-REQ-015067/C-Module controlling the Speaker Walk-Around function (TcSE ROIN-129525-2)	<jmyslin2> updated to include DSP AMP variant 2

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DIAG-UC-REQ-016461/B-Bezel Diagnostics – Main Menu (TcSE ROIN-291070-1)	jmyslin2: removed voltages from the pre-condition
DIAG-UC-REQ-016462/B-Bezel Diagnostics – Module Specific Sub menu (TcSE ROIN-291071-1)	jmyslin2: removed voltages from the pre-condition
DIAG-UC-REQ-016463/C-Bezel Diagnostics – Component Part Numbers (TcSE ROIN-291072-1)	jmyslin2: removed voltages from the pre-condition
DIAG-UC-REQ-016464/B-Bezel Diagnostics – SDARS ESN (TcSE ROIN-291073-1)	jmyslin2: removed voltages from the pre-condition
DIAG-UC-REQ-016465/B-Bezel Diagnostics – AM/FM Signal Strength (TcSE ROIN-291074-1)	jmyslin2: removed voltages from the pre-condition
DIAGv2-FUN-REQ-395945/A-Bezel Diagnostics - SOA (Ethernet) - Variant 2	<jmyslin2> New SOA Ethernet Bezel Diagonostic function replacing the previous version. The previous version was never implemented
MD-REQ-395947/A-SpcmDIDReadReq	jmyslin2: New MD for SOA Bezel Diagnostics
MD-REQ-395949/A-SpcmDIDReadResp	jmyslin2: New MD for SOA Bezel Diagnostics
MD-REQ-395972/A-SpcmDidUpdateInd	jmyslin2: New MD for SOA Bezel Diagnostics
MD-REQ-396962/A-TcuViewDtcReq	jmyslin2: New SOA Bezel Diagnostics MD
MD-REQ-396963/A-TcuViewDtcResp	jmyslin2: New SOA Bezel Diagnostic MD
MD-REQ-396964/A-TcuViewDtcInd	jmyslin2: New SOA Bezel Diagnostic MD
MD-REQ-396528/A-CellularCtrlGetCurrentTechReq	jmyslin2: New Bezel Diagnostics MD
MD-REQ-396908/A-CellularCtrlGetCurrentTechResp	jmyslin2: new MD for SOA Bezel Diag
MD-REQ-396916/A-CellularCtrlTechInd	jmyslin2: new MD for SOA Bezel Diagnostics
MD-REQ-396917/A-CellularCtrlServingCellNasStatusReq	jmyslin2: New Bezel Diagnostic SOA MD requirement
MD-REQ-396918/A-CellularCtrlServingCellNasStatusResp	jmyslin2: New SOA Bezel Diagnostics MD
MD-REQ-396919/A-CellularCtrlServingCellNasStatusInd	jmyslin2: New SOA Bezel Diagnostics MD
MD-REQ-396920/A-CellularCtrlServingCellIdReq	jmyslin2: New SOA Bezel Diagnostics MD
MD-REQ-396921/A-CellularCtrlServingCellIdResp	jmyslin2: New SOA Bezel Diagnostics MD
MD-REQ-396923/A-CellularCtrlServingCellIdInd	jmyslin2: New SOA Bezel Diagnostics MD
MD-REQ-396924/A-CellularCtrlServingCellImeiSvReq	jmyslin2: New SOA Bezel Diagnostics MD
MD-REQ-396925/A-CellularCtrlServingCellImeiSvResp	jmyslin2: New SOA Bezel Diagnostics MD
MD-REQ-396957/A-TcuPdpApnStateReq	jmyslin2: New SOA Bezel Diagnostics MD
MD-REQ-396959/A-TcuPdpApnStateRsp	jmyslin2: New SOA Bezel Diagnostic Requirement
MD-REQ-396960/A-TcuPdpApnStateInd	jmyslin2: New SOA Bezel Diagnostic MD requirement
MD-REQ-396050/A-EcgSpcmCmDidReadReq	jmyslin2: New MD for SOA Bezel Diagnostics
MD-REQ-396051/A-EcgSpcmCmDidReadResp	jmyslin2: New MD for SOA Bezel Diagnostics
MD-REQ-396052/A-EcgSpcmCmDidRefreshInd	jmyslin2: New MD for SOA Bezel Diagnostics
MD-REQ-396059/A-EcgVdmDtcGetReq	jmyslin2: New MD for SOA Bezel Diagnostics
MD-REQ-396060/A-EcgVdmDtcGetResp	jmyslin2: New MD for SOA Bezel Diagnostics
MD-REQ-396061/A-EcgVdmDtcBroadcastResp	jmyslin2: New MD for SOA Bezel Diagnostics
MD-REQ-396064/A-SysStatsReq	jmyslin2: New MD for SOA Bezel Diagnostics
MD-REQ-396065/A-SysStatsResp	jmyslin2: new MD for SOA Bezel Diagnostics
MD-REQ-396086/A-FciGenericService	jmyslin2: New MD for SOA Bezel Diagnostics
MD-REQ-396091/A-BroadcasInfoMessage	jmyslin2: New SOA MD for Bezel Diagnostics
MD-REQ-396090/A-BroadcastMessage	jmyslin2: New SOA MD for Bezel Diagnostics
DIAG-SR-REQ-273206/B-Security protections and Bezel Diagnostics - SOA	jmyslin2: updated requirement with feedback from the software team
DIAG-SR-REQ-395973/A-TCU DID data	jmyslin2: New requirement for SOA Bezel Diagnostics
DIAG-SR-REQ-396965/A-TCU DTC data needed for bezel diagnostics	jmyslin2: New SOA Bezel Diagnostics requirement
DIAG-SR-REQ-396940/A-TCU cellular control data needed for bezel diagnostics	jmyslin2: New SOA Bezel Diagnostic requirement
DIAG-SR-REQ-396961/A-TCU DCM (Data Connection Manager) data needed for bezel diagnostics	jmyslin2: new Bezel Diagnostic requirement
DIAG-SR-REQ-396056/A-ECG DID data	jmyslin2: New requirement for SOA Bezel Diagnostics
DIAG-SR-REQ-396063/A-ECG DTC Data	jmyslin2: New requirement for SOA bezel diagnostics
DIAG-SR-REQ-396066/A-ECG System Statistics	jmyslin2: new SOA Bezel Diagnostic requirement
DIAG-SR-REQ-396094/A-ECG SDN Connection	jmyslin2: New SOA Bezel Diagnostic requirement

May 6, 2022	1.9	
	DIAG-SR-REQ-454057/A-Logical to Physical CAN signal mapping - Bezel Diagnostics	jmyslin2: added logical to physical CAN signal mapping
	MD-REQ-277459/C-Bezel_Diagnostic.Rq	jmyslin2: no content change, removed DSP note
	DIAG-FUN-REQ-016450/C-Bezel Diagnostic Session Entry Conditions (TcSE ROIN-291280-1)	jmyslin2: removed single / dual play requirement (015061) as dual play was never supported so requirement is obsolete
	IFS-MMI2C-SR-REQ-140627/D-0x34 Serial Number	<hzubert> corrected diagram
	MD-REQ-499188/A-BSMStatsReq	vchahar: New SOA Bezel Diagnostic signal MD
	MD-REQ-499272/A-BSMStatsRes	vchahar: New SOA Bezel Diagnostic signal MD
	MD-REQ-499157/A-StackStateReq	vchahar: New SOA Bezel Diagnostic MD
	MD-REQ-499177/A-StackStateRes	vchahar: New SOA Bezel Diagnostic signal MD
	DIAG-SR-REQ-499273/A-TCU CV2X data needed for bezel diagnostics	vchahar: New SOA Bezel Diagnostic requirement
	DIAG-SR-REQ-499274/A-TCU BSM data needed for bezel diagnostics	vchahar: New SOA Bezel Diagnostic requirement

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Table of Contents

1 Architectural Design - CAN

All Infotainment components shall support module diagnostics as defined in the Global Diagnostic Specification (Part I) and Infotainment Diagnostic Specification (IDS). This section only covers Bezel Diagnostics.

Definitions:
Bezel Diagnostic Default Session: Bezel Diagnostic display for selecting specific component Bezel Diagnostic tests.

1.1 DIAG-CLD-REQ-015050/A-Bezel Diagnostic Client (TcSE ROIN-202564-1)

The Bezel Diagnostic Client is the interface and control for the Bezel Diagnostic function

1.2 DIAG-CLD-REQ-016469/A-Bezel Diagnostic Server (TcSE ROIN-202563-1)

The Bezel Diagnostic Server is responsible for performing the requested Bezel Diagnostic operation

1.3 DIAG-CLD-REQ-311960/A-Bezel Diagnostic Server - AHU (APIM V2)

The Bezel Diagnostic Server is responsible for performing the requested Bezel Diagnostic operation

1.3.1 DIAG-FUR-REQ-311961/A-Diagnostics - integrated AHU functionality (APIM v2)

AHU Diagnostics
The AHU shall support the following diagnostic routines when requested:

1. Speaker Walk Around
2. Signal Strength
3. Software Part Number
4. Hardware Part Number
5. Calibration Part Number
6. SDARS ESN

Speaker Walk Around
This function shall execute vehicle speaker walk around test utilizing an internally generated ~~1 KHz~~ tones on the main, ~~a~~ center image channels, and ~~a 60 Hz tone on the~~ subwoofer channels. Refer to the applicable Infotainment Diagnostic Specification for the frequencies of the tones used to test each channel.

Speaker walk around test sequence LF, RF, RR, LR, Aux1 (if applicable), Aux2 (if applicable) for 1.5 seconds each and shall display the speaker being tested on the display. The volume shall be defaulted to volume step ~~9~~ 8 and the volume knob shall adjust the volume in speaker walk around.

The AHU shall transmit the name of each speaker to the proper display device(s) as its being tested during the speaker walk-around test. The following table outlines the text that shall be transmitted when the associated output channel is tested.

Channel Under Test	Display Text
LF Door	**LF DOOR**
LF Tweeter	**LF TWEETER**
RF Door	**RF DOOR**
RF Tweeter	**RF TWEETER**
RR Door	**RR DOOR**
LR Door	**LR DOOR**
Aux 1	**AUX 1**
Aux 2	**AUX 2**

Signal Strength
This function shall enable the viewing of the AHU signal strength via the vehicle display. The display shall be updated every 5 seconds with the 5 second average. The range is 0 to 255 in the units dBuv.
The AHU shall display the current station's radio signal strength.
Software Part Number
This function shall enable the viewing AHU software part number via the vehicle display.

Hardware Part Number
This function shall enable the viewing AHU hardware part number via the vehicle display.

Calibration Part Number
This function shall enable the viewing AHU calibration part number via the vehicle display.

SDARS ESN
This function shall enable the viewing AHU SDARS ESN via the vehicle display.

1.4 Logical to Physical CAN signal mapping - Bezel Diagnostics

1.4.1 DIAG-SR-REQ-454057/A-Logical to Physical CAN signal mapping - Bezel Diagnostics

This bezel diagnostics deployment table maps the bezel diagnostics logical signals to the physical CAN signals.

Note: This is for reference only. If there is a conflict between the name in the CAN signal name column and what is found in the actual CAN dB then the CAN dB takes precedent. Please bring to Ford's attention if there is a conflict.

Logical Signal Name		**CAN signal name**
Bezel_Diagnostic.Rq	Bezel_Diag_State_Rq	Bezel_Diag_State_Rq
	Bezel_Diag_Module_Rq	Bezel_Diag_Module_Rq
	Diagnostic_Operation_Rq	Diagnostic_Operation_Rq
AHU_Bezel_Diag.St		AHU_Bezel_Diag_St
DSP_Bezel_Diag.St		DSP_Bezel_Diag_St
EFP_Bezel_Diag.St		EFP_Bezel_Diag_St
AHU_Bezel_Diag_Data		AHU_Bezel_Diag_Data (see TP SPSS to map this signal to a CAN message)
DSP_Bezel_Diag_Data		DSP_Bezel_Diag_Data (see TP SPSS to map this signal to a CAN message)
EFP_Bezel_Diag_Data		EFP_Bezel_Diag_Data (see TP SPSS to map this signal to a CAN message)
Vehicle_Speed.St		Veh_V_ActlEng
Vehicle_Speed_QF		VehVActlEng_D_Qf

1.5 Interface Requirements - CAN

1.5.1 DIAG-IIR-REQ-015049/B-Bezel Diagnostics Interface Requirements (TcSE ROIN-129515-3)

1.5.1.1 MD-REQ-277459/C-Bezel_Diagnostic.Rq

Message Type: Request

Request signal from the Diagnostic Client to the Diagnostic Server indicating if Bezel Diagnostics is active and what function to perform

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Logical Signal Name		Literals	Value	Description
Bezel_Diagnostic.Rq	Bezel_Diag_State_Rq	Inactive	0x0	
		Active	0x1	
	Bezel_Diag_Module_Rq	Inactive	0x0	
		AHU	0x1	
		DSP AMP	0x2	
		EFP		
		cont.	…	
		Reserved	0xF	
	Diagnostic_Operation_Rq	Inactive	0x0	
		Get All Background Diagnostic Request	0x1	
		Software Part Number	0x2	
		Hardware Part Number	0x3	
		Calibration Part Number	0x4	
		Speaker Walk-Around	0x5	
		SDARS ESN number	0x6	
		Signal Strength	0x7	
		Cont.	…	
		Reserved	0xF	

1.5.1.2 MD-REQ-277675/B-AHU_Bezel_Diag.St

Message Type: Status/Response

Signal from the Bezel Diagnostic Server to the Bezel Diagnostic Client indicating what function is active

Logical Signal Name	Literals	Value	Description
AHU_Bezel_Diag.St	Inactive / No Data Exists	0x0	
	Software Part Number	0x1	
	Hardware Part Number	0x2	
	Calibration Part Number	0x3	
	Speaker Walk-Around	0x4	
	SDARS ESN Number	0x5	
	Signal Strength	0x6	

1.5.1.3 MD-REQ-277746/B-DSP_Bezel_Diag.St

Message Type: Status/Response

Signal from the Bezel Diagnostic Server to the Bezel Diagnostic Client indicating what function is active

Logical Signal Name	Literals	Value	Description
DSP_Bezel_Diag.St	Inactive / No Data Exists	0x0	
	Software Part Number	0x1	
	Hardware Part Number	0x2	
	Calibration Part Number	0x3	
	Speaker Walk-Around	0x4	

1.5.1.4 MD-REQ-277747/B-EFP_Bezel_Diag.St

Message Type: Status/Response

Signal from the Bezel Diagnostic Server to the Bezel Diagnostic Client indicating what function is active

Logical Signal Name	Literals	Value	Description
EFP_Bezel_Diag.St	Inactive / No Data Exists	0x0	
	Software Part Number	0x1	
	Hardware Part Number	0x2	
	Calibration Part Number	0x3	

1.5.1.5 MD-REQ-278042/C-AHU_Bezel_Diag_Data

Message Type: Response

A Transport Protocol Bezel Diagnostic response from the AHU Diagnostic Server to the Diagnostic Client with the information for display on the HMI output

Logical Signal Name		Literals	Value	Description
AHU_Bezel_Diag_Data	Bezel_Diag_Operation	Inactive	0x0	
		Get All Background Request	0x1	
		Software Part Number	0x2	
		Hardware Part Number	0x3	
		Calibration Part Number	0x4	
		Speaker Walk-Around	0x5	
		SDARS ESN Number	0x6	
		Signal Strength	0x7	
		Reserved	0x8 – 0xF	
	Bezel Diagnostic Data	N/A	N/A	Max 24 characters + 1 EOS for any Bezel Diagnostic Operation

Notes:
See TP SPSS to map AHU_Bezel_Diag_Data to a CAN message

When Bezel_Diag_Operation = 0x1 Get All Background Request then the following diagnostic operation data will be sent in this order:

1. Software Part Number (max 24 char + 1 EOS)
2. Hardware Part Number (max 24 char + 1 EOS)
3. Calibration Part Number (max 24 char + 1 EOS)
4. SDARS ESN Number (max 24 char + 1 EOS)

When Bezel_Diag_Operation = 0x2 then the ASCII data will be for the Software Part Number

When Bezel_Diag_Operation = 0x3 then the ASCII data will be for the Hardware Part Number

When Bezel_Diag_Operation = 0x4 then the ASCII data will be for the Calibration Part Number

When Bezel_Diag_Operation = 0x5 then the ASCII data will be for the Speaker Walk-Around test

When Bezel_Diag_Operation = 0x6 then the ASCII data will be for the SDARS ESN Number

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When Bezel_Diag_Operation = 0x7 then the ASCII data will be for the radio signal strength test

1.5.1.6 MD-REQ-278043/B-DSP_Bezel_Diag_Data

Message Type: Response

A Transport Protocol Bezel Diagnostic response from the DSP Diagnostic Server to the Diagnostic Client with the information for display on the HMI output

Logical Signal Name		Literals	Value	Description
DSP_Bezel_Diag_Data	Bezel_Diag_Operation	Inactive	0x0	
		Get All Background Request	0x1	
		Software Part Number	0x2	
		Hardware Part Number	0x3	
		Calibration Part Number	0x4	
		Speaker Walk-Around	0x5	
		Reserved	0x6 – 0xF	
	Bezel Diagnostic Data	N/A	N/A	Max 24 characters + 1 EOS for any Bezel Diagnostic Operation

Notes:
See TP SPSS to map DSP_Bezel_Diag_Data to a CAN message

When Bezel_Diag_Operation = 0x1 Get All Background Request then the following diagnostic operation data will be sent in this order:

1. Software Part Number (max 24 char + 1 EOS)
2. Hardware Part Number (max 24 char + 1 EOS)
3. Calibration Part Number (max 24 char + 1 EOS)

When Bezel_Diag_Operation = 0x2 then the ASCII data will be for the Software Part Number

When Bezel_Diag_Operation = 0x3 then the ASCII data will be for the Hardware Part Number

When Bezel_Diag_Operation = 0x4 then the ASCII data will be for the Calibration Part Number

When Bezel_Diag_Operation = 0x5 then the ASCII data will be for the Speaker Walk-Around test

1.5.1.7 MD-REQ-278044/B-EFP_Bezel_Diag_Data

Message Type: Response

A Transport Protocol Bezel Diagnostic response from the EFP Diagnostic Server to the Diagnostic Client with the information for display on the HMI output

Logical Signal Name		Literals	Value	Description
EFP_Bezel_Diag_Data	Bezel_Diag_Operation	Inactive	0x0	
		Get All Background Request	0x1	
		Software Part Number	0x2	
		Hardware Part Number	0x3	
		Calibration Part Number	0x4	

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		Reserved	0x5 – 0xF	
	Bezel Diagnostic Data	N/A	N/A	Max 24 characters + 1 EOS for any Bezel Diagnostic Operation

Notes:
See TP SPSS to map EFP_Bezel_Diag_Data to a CAN message

When Bezel_Diag_Operation = 0x1 Get All Background Request then the following diagnostic operation data will be sent in this order:

1. Software Part Number (max 24 char + 1 EOS)
2. Hardware Part Number (max 24 char + 1 EOS)
3. Calibration Part Number (max 24 char + 1 EOS)

When Bezel_Diag_Operation = 0x2 then the ASCII data will be for the Software Part Number

When Bezel_Diag_Operation = 0x3 then the ASCII data will be for the Hardware Part Number

When Bezel_Diag_Operation = 0x4 then the ASCII data will be for the Calibration Part Number

1.5.1.8 MD-REQ-276458/B-Vehicle_Speed.St

Message Type: Status

Signal with the current status of the Vehicle Speed

Logical Signal Name	Literals	Value	Description
Vehicle_Speed.St	See info-CAN database for signal details	See info-CAN database for signal details	

1.5.1.9 MD-REQ-276459/A-Vehicle_Speed_QF

Message Type: Status

Signal with the Vehicle Speed Quality Factor

Logical Signal Name	Literals	Value	Description
Vehicle_Speed_QF	Faulty	0x0	
	No_Data_Exists	0x1	
	Not_Within_Specifications	0x2	
	OK	0x3	

2 Architectural Design - LIN

2.1 DIAGv2-CLD-REQ-117487/A-LIN Bezel Diagnostic Client

The Bezel Diagnostic Client is the interface and control for the Bezel Diagnostic function

2.2 DIAGv2-CLD-REQ-117488/A-LIN Bezel Diagnostic Server

The Bezel Diagnostic Server is responsible for performing the requested Bezel Diagnostic operation

2.3 LIN Serial Number Interface

This interface shall be used in parallel and equivalent to LIN part number readout described in LIN Data Link and Physical Layer specification.

Each digit of the serial number is transferred in hex format in one signal and is not ASCII coded.

2.3.1 DIAG-SR-REQ-117486/A-LIN Serial Number Interface

LINStatus (ICPLINStatus)	Method for error reporting	See LIN Data Link and Physical Layer for further information (Chapter “Ford Standard Error Reporting”)

SerialNumber00 (ICPSrNrDigit00)	Method for transferring 1st digit of the year e.g. “2” of year 2014	0x0: not used 0x1: 1 0x2: 2 0x3 – 0xF: not used

SerialNumber01 (ICPSrNrDigit01)	Method for transferring 2nd digit of the year e.g. “0” of year 2014	0x0: 0 0x1: 1 0x2: 2 0x3: 3 0x4: 4 0x5: 5 0x6: 6 0x7: 7 0x8: 8 0x9: 9 0xA – 0xF: not used

SerialNumber02 (ICPSrNrDigit02)	Method for transferring 3rd digit of the year e.g. “1” of year 2014	0x0: 0 0x1: 1 0x2: 2 0x3: 3 0x4: 4 0x5: 5 0x6: 6 0x7: 7

		0x8: 8 0x9: 9 0xA – 0xF: not used
SerialNumber03 (ICPSrNrDigit03)	Method for transferring 4th digit of the year e.g. “4” of year 2014	0x0: 0 0x1: 1 0x2: 2 0x3: 3 0x4: 4 0x5: 5 0x6: 6 0x7: 7 0x8: 8 0x9: 9 0xA – 0xF: not used
SerialNumber04 (ICPSrNrDigit04)	Method for transferring 1st digit of the month e.g. “1” of month December (->12)	0x0: 0 0x1: 1 0x2 – 0xF: not used
SerialNumber05 (ICPSrNrDigit05)	Method for transferring 2nd digit of the month e.g. “2” of month December (->12)	0x0: 0 0x1: 1 0x2: 2 0x3: 3 0x4: 4 0x5: 5 0x6: 6 0x7: 7 0x8: 8 0x9: 9 0xA – 0xF: not used
SerialNumber06 (ICPSrNrDigit06)	Method for transferring 1st digit of the day e.g. “0” of day 05	0x0: 0 0x1: 1 0x2: 2 0x3: 3 0x4 – 0xF: not used
SerialNumber07 (ICPSrNrDigit07)	Method for transferring 2nd digit of the day e.g. “5” of day 05	0x0: 0 0x1: 1 0x2: 2 0x3: 3 0x4: 4 0x5: 5 0x6: 6 0x7: 7 0x8: 8 0x9: 9 0xA – 0xF: not used

SerialNumber08 (ICPSrNrDigit08)	Method for transferring 1st digit of the hour e.g. “1” of time 13:40:52	0x0: 0 0x1: 1 0x2: 2 0x3 – 0xF: not used
SerialNumber09 (ICPSrNrDigit09)	Method for transferring 2nd digit of the hour e.g. “3” of time 13:40:52	0x0: 0 0x1: 1 0x2: 2 0x3: 3 0x4: 4 0x5: 5 0x6: 6 0x7: 7 0x8: 8 0x9: 9 0xA – 0xF: not used
SerialNumber10 (ICPSrNrDigit10)	Method for transferring 1st digit of the minute e.g. “4” of time 13:40:52	0x0: 0 0x1: 1 0x2: 2 0x3: 3 0x4: 4 0x5: 5 0x6 – 0xF: not used
SerialNumber11 (ICPSrNrDigit11)	Method for transferring 2nd digit of the minute e.g. “0” of time 13:40:52	0x0: 0 0x1: 1 0x2: 2 0x3: 3 0x4: 4 0x5: 5 0x6: 6 0x7: 7 0x8: 8 0x9: 9 0xA – 0xF: not used
SerialNumber12 (ICPSrNrDigit12)	Method for transferring 1st digit of the second e.g. “5” of time 13:40:52	0x0: 0 0x1: 1 0x2: 2 0x3: 3 0x4: 4 0x5: 5 0x6 – 0xF: not used
SerialNumber13 (ICPSrNrDigit13)	Method for transferring 2nd digit of the second e.g. “2” of time 13:40:52	0x0: 0 0x1: 1 0x2: 2 0x3: 3 0x4: 4 0x5: 5 0x6: 6 0x7: 7 0x8: 8 0x9: 9 0xA – 0xF: not used

2.4 LIN Extended Part Numbers Interface

2.4.1 DIAG-IIR-REQ-115763/A-LIN MasterReqXx

MasterReqXx (MasterReqXx) Ex. MasterReqB0, MasterReqB1,…	Method for transferring data like hardware part number and software part number.	See “DIAG-FUN-REQ-115753/A-Bezel Diagnostics LIN Extended Part Number Readout” in this specification

2.4.2 DIAG-IIR-REQ-115764/A-LIN SlaveRespXx

SlaveRespXx (SlaveRespXx) Ex. SlaveRespB0, SlaveRespB1,…	Method for transferring data like hardware part number and software part number.	See “DIAG-FUN-REQ-115753/A-Bezel Diagnostics LIN Extended Part Number Readout” in this specification

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3 Architectural Design - I2C over LVDS

3.1 DIAG-CLD-REQ-163996/A-I2C Bezel Diagnostic Client

The Bezel Diagnostic Client is the interface and control for the Bezel Diagnostic function and is located in the I2C Master.

3.2 DIAG-CLD-REQ-163997/A-I2C Bezel Diagnostic Server

The Bezel Diagnostic Server is responsible for performing the requested Bezel Diagnostic operation and is located in the I2C Slave.

4 Architectural Design - SOA_Ethernet

4.1 DIAG-CLD-REQ-278463/A-Bezel Diagnostic Client - SOA

The Bezel Diagnostic Client is the interface and control for the Bezel Diagnostic function

4.2 DIAG-CLD-REQ-278390/A-Bezel Diagnostic Server - SOA (ECG)

The Bezel Diagnostic Server is responsible for performing the requested Bezel Diagnostic operation

4.3 DIAG-CLD-REQ-273355/A-Bezel Diagnostic Server - SOA (TCU)

The Bezel Diagnostic Server is responsible for performing the requested Bezel Diagnostic operation

4.4 Interface Requirements - SOA Bezel Diagnostics

See SOA / Ethernet function for SOA Bezel Diagnostic MD's

5 General Requirements

5.1 DIAG-SR-REQ-103696/A-LIN ICP Part Number during Bezel Diagnostics

ICP Assembly, Hardware, Software and Serial Number part number(s) are sent over LIN to the Bezel Diagnostics Client.

If ICP button panel is LIN based then:

- the LIN protocol supports sending the Assembly part number and the Serial Number using SAE standard (See "LIN Data Link and Physical Layer" spec), and
- sending the Software and Hardware part number as described in this Bezel Diagnostics SPSS function "DIAG-FUN-REQ-115753-Bezel Diagnostics LIN Extended Part Number Readout"

The Bezel Diagnostic Client shall display the LIN ICP part numbers when showing the ICP part number(s) screen in bezel diagnostics (can use the EFP part number HMI screen if needed).

If the Bezel Diagnostic HMI just has 3 slots that displays the Software Part Number, Hardware Part Number and Calibration Part Number then the following ICP LIN part numbers shall be used for those Bezel Diagnostics HMI display:

1. Software Part Number HMI displays ICP Software part number
2. Hardware Part Number HMI displays the ICP Hardware part number
3. Calibration Part Number HMI displays the ICP Assembly part number

Note: it is preferred if all 4 part numbers could be shown in bezel diagnostics HMI but if not the 3 above shall be used.

6 Functional Definition

6.1 DIAG-FUN-REQ-016449/A-Bezel Diagnostic Get All Background Diagnostic Request during Initialization (TcSE ROIN-291276-1)

6.1.1 DIAG-SR-REQ-015054/B-Bezel Diagnostic Client Get All Background Diagnostic Request initialization (TcSE ROIN-129499-1)

Upon system start-up the Bezel Diagnostic Client shall set the signal _Bezel_Diagnostic.Rq : Diagnostic_Operation.Rq == "Get All Background Diagnostic Request" and request from the Bezel Diagnostic Servers the following information:
1. Software Part Number
2. Hardware Part Number
3. Calibration Part Number
4. SDARS ESN Number (applicable only to SDARS server)

Note:
user initiated Bezel Diagnostic events shall take priority over non-user activated events. For example at start-up if the user initiates a speaker walk-around event with Bezel_Diag_State_Rq = Active then the Bezel Diagnostic Client wouldn't initiate a request for "Get All Background Diagnostic Request" while speaker walk-around was occurring.

6.1.2 DIAG-SR-REQ-015055/A-Bezel Diagnostic Client storing Bezel Diagnostic Background Diagnostic Request data (TcSE ROIN-129516-1)

Upon the Bezel Diagnostic Client receiving the diagnostic information (TP data) the Bezel Diagnostic Client shall store this information to be displayed during a Bezel Diagnostics session.

6.1.3 DIAG-SR-REQ-015056/A-Bezel Diagnostic Server response during a Get All Background Diagnostic request (TcSE ROIN-205229-1)

The Bezel Diagnostic Servers will provide the "Get All Background Diagnostic Request" data when _Bezel_Diagnostic.Rq : Diagnostic_Operation.Rq == "Get All Background Diagnostic Request".

The _Bezel_Diag.St periodic signal from the Bezel Diagnostic Servers remain set as inactive during a Get All Background Diagnostic Request.

The Bezel Diagnostic Client can send a Get All Background Diagnostic Request whether Bezel_Diag_State_Rq = Active or Inactive.

6.1.4 DIAG-TMR-REQ-015057/B-T_Diagnostic_Request (TcSE ROIN-129518-1)

Name	Description	Units	Range	Resolution	Default
T_Diagnostic_Request	While getting the bezel diagnostic background data T_Diagnostic_Request is the max time from the Bezel Diagnostic Client receiving previous bezel diagnostic data from one Bezel Diagnostic Server until the Bezel Diagnostic Client request data from the next Bezel Diagnostic Server. Note: Use the default value	msec	0-1000	5	75

6.1.5 DIAG-SD-REQ-015058/A-Bezel Diagnostics - Get All Background Diagnostic Request during Initialization (TcSE ROIN-129508-1)

Scenarios

Scenario

The Infotainment System starts up (HMIAudioMode turns ON) and the Bezel Diagnostic Client then requests the bezel diagnostic data

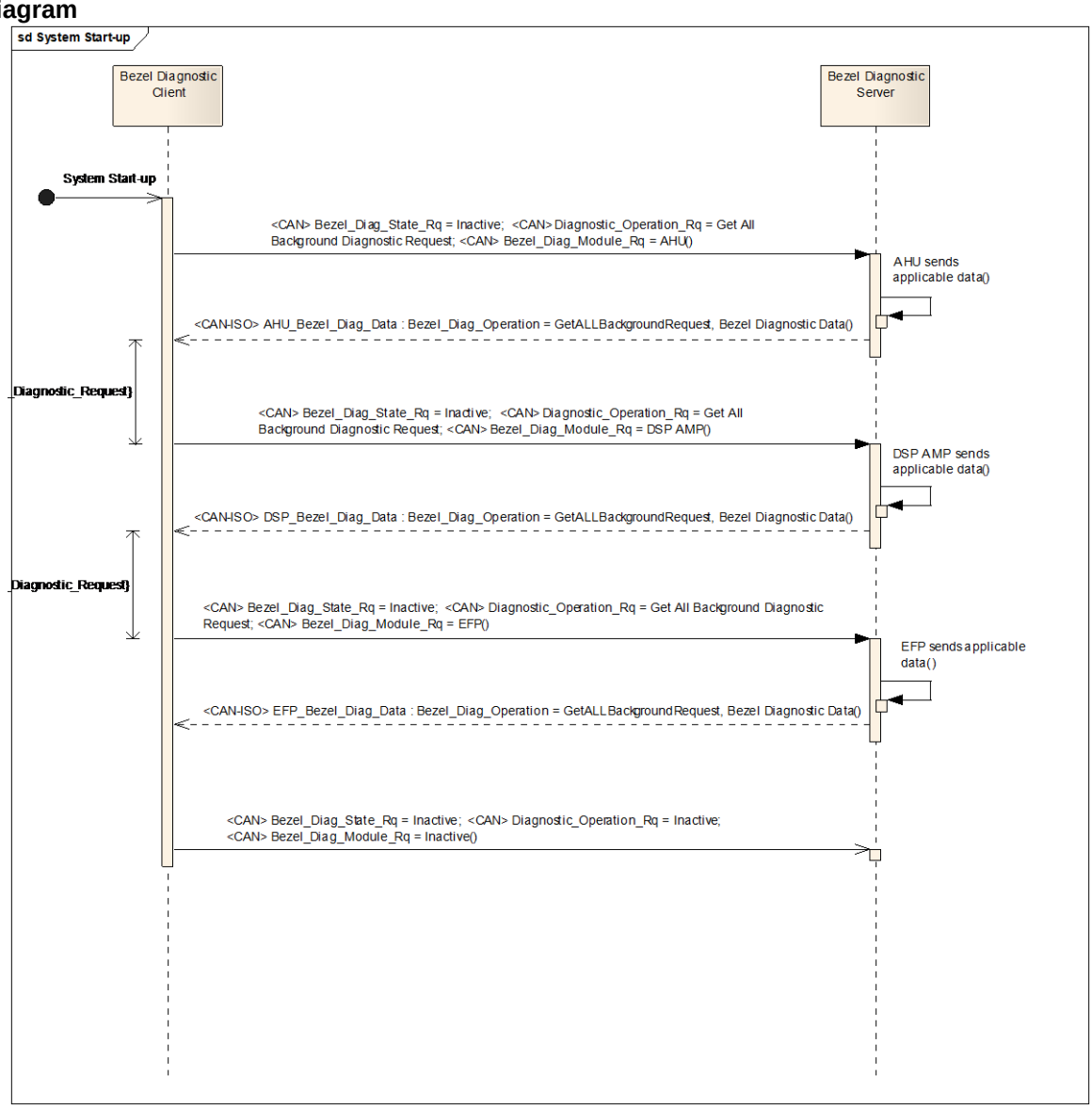
Note:
When a Get All Background Request is sent while a Bezel Diagnostic session is not active (such as system start-up) the Bezel_Diag_State_Rq equals Inactive.

Constraints

Pre-condition
Infotainment System is OFF

Post-condition
Diagnostic Client has the Bezel Diagnostic ASCII data saved

Sequence Diagram



6.2 DIAG-FUN-REQ-016450/C-Bezel Diagnostic Session Entry Conditions (TcSE ROIN-291280-1)

There may be further Bezel Diagnostic Entry Conditions restrictions defined in the Use Cases, Functional Requirements and HMI for each specific diagnostic operation then what is defined below. At a minimum the following shall be met:

6.2.1 DIAG-UC-REQ-016451/C-Bezel Diagnostics – Enter Bezel Diagnostics (TcSE ROIN-291319-1)

Actors	User
Pre-conditions	Infotainment System Powered On ~~There is an Active Media Source (AM/FM, CD, SDARS, USB…)~~ A phone call is not active No other higher priority feature preventing bezel diagnostics from being entered.
Scenario Description	User presses two designated buttons as defined by the HMI
Post-conditions	Bezel Diagnostics is entered. Bezel diagnostics will start speaker walk-around and if conditions not met for speaker walk-around then will enter the main bezel diagnostics screen.
List of Exception Use Cases	E1–DIAG-GUC-291320-1-Bezel Diagnostics – Cannot enter Bezel Diagnostics
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch) Audio OUT
Notes	Note for the pre-condition, the Bezel Diagnostic Client could choose to have "There is an Active Media Source (AM/FM, CD, SDARS, USB…)" as a pre-condition for entering Bezel Diagnostics. That is up to the Bezel Diagnostic Client team.

6.2.2 DIAG-UC-REQ-016452/B-Bezel Diagnostics – Cannot enter Bezel Diagnostics (TcSE ROIN-291320-1)

Linked Elements
DIAG-UC-REQ-016451/C-Bezel Diagnostics – Enter Bezel Diagnostics (TcSE ROIN-291319-1)

Actors	User
Pre-conditions	Infotainment System Powered On There is an Active Phone Call
Scenario Description	User presses two designated buttons as defined by the HMI
Post-conditions	Bezel Diagnostics is NOT entered.
List of Exception Use Cases	
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch) Audio OUT

6.2.3 DIAG-SR-REQ-015060/B-Entry Conditions for user initiated bezel diagnostic session (TcSE ROIN-129519-2)

Bezel Diagnostics can only be entered by the Bezel Diagnostic Client when the user selects <Bezel Diagnostics> via HMI and there is no Phone call or other higher priority features that are active.

- An example of higher priority feature could be Rear View Camera or any other feature the Bezel Diagnostic Client team determines is higher priority.

If no priority table for "other higher priority features" the Bezel Diagnostic Client could limit entering Bezel Diagnostic to while there is an Active Media Audio Source (ie AM/FM, CD, SDARS, Aux...) or Audio Off condition (empty audio stack). At a minimum Bezel Diagnostics shall be able to be entered whenever there is an Active Media Audio Source.

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6.3 DIAG-FUN-REQ-016453/A-Bezel Diagnostic Session Exit Conditions (TcSE ROIN-291277-1)

6.3.1 DIAG-UC-REQ-016454/D-Bezel Diagnostics – Exit Bezel Diagnostics (TcSE ROIN-291079-1)

Actors	User
Pre-conditions	Infotainment System Powered On Bezel Diagnostics is Active
Scenario Description	Exit Bezel Diagnostics is selected by: -- Pressing the power button. -- Pressing the <Exit Bezel Diagnostics> HMI button -- The ignition status changes -- There is a higher priority feature active (ex place a phone call)
Post-conditions	Bezel Diagnostics is exited
List of Exception Use Cases	
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch)

6.3.2 DIAG-SR-REQ-015063/C-Exit Conditions for Bezel Diagnostics (TcSE ROIN-129521-3)

Bezel Diagnostics shall be exited by the Bezel Diagonstic Client when the user selects <Exit Bezel Diagnostics> via the HMI, when the ignition status changes, power button press, there is a higher priority feature active (ex phone call), there is a battery disconnect or there is a Diagnostic reset via Linked based Diagnostics.

6.4 DIAG-FUN-REQ-016455/A-Bezel Diagnostic Speaker Walk-Around (TcSE ROIN-291278-1)

6.4.1 DIAG-UC-REQ-016456/B-Bezel Diagnostics – Entry Bezel Diagnostic and Speaker Walkaround (TcSE ROIN-291069-1)

Actors	User
Pre-conditions	Infotainment System Powered On Vehicle Speed is below 5KPH.
Scenario Description	User presses two designated buttons as defined by the HMI and the display switches to Speaker Walkaround screen.
Post-conditions	Infotainment system speakers plays a tone for a defined period of time (covered in IDS functional specification) in a clockwise transition starting with the Driver's seat to individual speakers. The speaker names are displayed which are playing the audio. Display goes to main Bezel Diagnostics screen if no operator interaction or End Test is selected via HMI.
List of Exception Use Cases	E1- DIAG-GUC-291076-1-Bezel Diagnostics – Vehicle speed above 5kph during speaker walk around
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch) Audio OUT

6.4.2 DIAG-UC-REQ-016457/B-Bezel Diagnostics – Speaker Walk Around – Entry from within Bezel Diagnostics (TcSE ROIN-291075-1)

Actors	User
Pre-conditions	Infotainment System Powered On Vehicle Speed is below 5KPH. Bezel Diagnostic is active
Scenario Description	User selects speaker walk-around in the component bezel diagnostics submenu.
Post-conditions	Infotainment system speakers plays a tone for a defined period (covered in the IDS functional specification) in a clockwise transition starting with the Driver's seat to individual speakers. The speaker names are displayed which are playing the audio.
List of Exception Use Cases	E1-DIAG-GUC-291076-1-Bezel Diagnostics – Vehicle speed above 5kph during speaker walk around
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch) Audio OUT

6.4.3 DIAG-UC-REQ-016458/B-Bezel Diagnostics – Vehicle speed above 5kph during speaker walk around (TcSE ROIN-291076-1)

Linked Elements
DIAG-UC-REQ-016451/C-Bezel Diagnostics – Enter Bezel Diagnostics (TcSE ROIN-291319-1)
DIAG-UC-REQ-016452/B-Bezel Diagnostics – Cannot enter Bezel Diagnostics (TcSE ROIN-291320-1)
DIAG-UC-REQ-016457/B-Bezel Diagnostics – Speaker Walk Around – Entry from within Bezel Diagnostics (TcSE ROIN-291075-1)
DIAG-UC-REQ-016456/B-Bezel Diagnostics – Entry Bezel Diagnostic and Speaker Walkaround (TcSE ROIN-291069-1)

Actors	User
Pre-conditions	Speaker Walkaround Active Vehicle speed is less than 5kph. Infotainment System Powered On
Scenario Description	Vehicle speed increases above 5kph.
Post-conditions	Speaker Walkaround is exited
List of Exception Use Cases	
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch)

6.4.4 DIAG-UC-REQ-016459/B-Bezel Diagnostics – Internal Bezel Diagnostics Speaker Walk Around Completed (TcSE ROIN-291077-1)

Actors	User
Pre-conditions	Speaker Walkaround Active Vehicle speed is less than 5kph. Infotainment System Powered On
Scenario Description	User selects HMI to end speaker walkaround. Speaker Walkaround is exited
Post-conditions	Enter Bezel Diagnostic Component Submenu.
List of Exception Use Cases	
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch)

6.4.5 DIAG-SR-REQ-015065/A-Speaker Walk-Around initiation at entry of Bezel Diagnostic session (TcSE ROIN-129523-2)

Speaker Walk-Around shall be the initial test requested by the Bezel Diagnostic Client when entering Bezel Diagnostics as long as the vehicle speed is ~~in park or neutral~~ below 5kph. After the Speaker Walk-Around test is completed the Bezel Diagnostic Default Session shall be entered.

If the vehicle speed is ~~not in Park, not in Neutral, or in Neutral but~~ equal to or above 5kph when Bezel Diagnostics session is entered than the Bezel Diagnostic Client does not request from the Bezel Diagnostic Server the speaker walk-around test but instead the Bezel Diagnostic Default Session shall be entered.

6.4.6 DIAG-SR-REQ-015066/A-Chime operation during Speaker Walk-Around (TcSE ROIN-129524-1)

Chimes are not operable during the speaker walk-around test when the infotainment system is the Chime Audio Source. The infotainment components shall not transfer control of the chimes back to the Cluster during speaker walk-around.

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After the speaker walk-around test has ended the Chimes shall return to the Infotainment System.

6.4.7 DIAG-SR-REQ-015067/C-Module controlling the Speaker Walk-Around function (TcSE ROIN-129525-2)

For the speaker walk-around test if there is both an AHU and DSP AMP / DSP AMP variant 2 on the vehicle at the same time then the DSP AMP / DSP AMP variant 2 shall perform the speaker walk around test.

For the speaker walk-around test if there is both an AHU and AAM (Audio Amp Module) on the vehicle at the same time then the AHU shall perform the speaker walk around test.

The Bezel Diagnostic Client shall request the proper module to perform the speaker walk-around operation.

6.4.8 DIAG-SR-REQ-015068/A-Cancelling Speaker Walk-Around because vehicle in motion (TcSE ROIN-129526-1)

During the speaker walk-around test (or any test that requires audio) if the vehicle speed becomes ~~is shifted out of park, or shifted out of Neutral, or in Neutral but the speed is~~ greater than 5kph then the speaker walk-around session (or other diagnostic audio session) shall be ended by the Bezel Diagnostic Client.

The Bezel Diagnostic Client ends the test by changing the "Diagnostic_Operation.Rq" signal so that it does not equal "Speaker Walk-Around". See requirement DIAG-GREQ-129533-1-Bezel Diagnostic Default Session for entering the Bezel Diagnostic Default Session.

6.5 DIAG-FUN-REQ-016460/A-Bezel Diagnostic Activation Events (TcSE ROIN-291279-1)

6.5.1 DIAG-UC-REQ-016461/B-Bezel Diagnostics – Main Menu (TcSE ROIN-291070-1)

Actors	User
Pre-conditions	Infotainment System Powered ON Bezel Diagnostics is active
Scenario Description	Speaker Walkaround complete or exited, or Speaker Walkaround entry conditions not met when bezel diagnostics entered, or While in bezel diagnostic submenu exit out of the submenu
Post-conditions	Enter main menu of Bezel Diagnostics with all bezel diagnostic components listed as separate menu picks. (ex. APIM Diagnostics, Audio Diagnostics, EFP Diagnostics)
List of Exception Use Cases	
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch)

6.5.2 DIAG-UC-REQ-016462/B-Bezel Diagnostics – Module Specific Sub menu (TcSE ROIN-291071-1)

Actors	User
Pre-conditions	Infotainment System Powered On. Bezel Diagnostics is active
Scenario Description	Module Component Diagnostic Submenu is selected by User.
Post-conditions	Module component submenu HMI is displayed (i.e. Part Numbers, SDARS ESN, Signal Strength, Speaker Walkaround)
List of Exception Use Cases	
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch)

6.5.3 DIAG-UC-REQ-016463/C-Bezel Diagnostics – Component Part Numbers (TcSE ROIN-291072-1)

Actors	User
Pre-conditions	Infotainment System Powered OnBezel Diagnostics is active
Scenario Description	Component Part Numbers Menu selected by User in Component Bezel Diag Submenu.
Post-conditions	HMI displays individual component Part Numbers.
List of Exception Use Cases	
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch)

6.5.4 DIAG-UC-REQ-016464/B-Bezel Diagnostics – SDARS ESN (TcSE ROIN-291073-1)

Actors	User
Pre-conditions	Infotainment System Powered On Bezel Diagnostic is active
Scenario Description	The menu pick for displaying the SDARS ESN is selected by User
Post-conditions	HMI displays SDARS ESN
List of Exception Use Cases	
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch)

6.5.5 DIAG-UC-REQ-016465/B-Bezel Diagnostics – AM/FM Signal Strength (TcSE ROIN-291074-1)

Actors	User
Pre-conditions	Infotainment System Powered On Bezel Diagnostics is Active Current audio mode is AM or FM.
Scenario Description	Signal Strength Menu selected by user
Post-conditions	Display value of signal strength in unit dBuV.
List of Exception Use Cases	
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch)

6.5.6 DIAG-SR-REQ-015070/A-Signals to enter a Bezel Diagnostic session (TcSE ROIN-129527-1)

When a Bezel Diagnostic Entry event occurs the Bezel Diagnostic Client shall tell Bezel Diagnostic Server(s) to enter Bezel Diagnostics mode with the signal 'Bezel_Diag_State_Rq' equal to 'Active'. The default shall be set to 'Inactive' when not in Bezel Diagnostics.

6.5.7 DIAG-SR-REQ-015071/A-Signals to identify what Bezel Diagnostic operation to perform (TcSE ROIN-129528-1)

The Diagnostic Client Tx the Diagnostic_Operation.Rq signal to the Diagnostic Server to identify the diagnostic operation is to be performed.

Note: if the Diagnostic Client has the user requested information stored from initialization then no request is necessary from the Diagnostic Server.

6.5.8 DIAG-SR-REQ-015072/A-Identification of the module to perform the Bezel Diagnostic operation (TcSE ROIN-129529-1)

The Bezel Diagnostic Client Tx the Bezel_Diag_Module_Rq signal to the infotainment modules to identify the module that will be the Bezel Diagnostic Server performing the Diagnostic operation.

6.5.9 DIAG-SR-REQ-015073/A-Initiation of Speaker Walk-Around (TcSE ROIN-129530-1)

Upon entry into a Bezel Diagnostics session the Bezel Diagnostic Client shall set the signal Diagnostic_Operation_Rq equal to 'Speaker Walk-Around' if the speaker walk-around entry conditions are met. If the speaker walkaround entry conditions are not met then the Bezel Diagnostic Default Session shall be entered.

6.5.10 DIAG-SR-REQ-015074/A-Signal to cancel a Bezel Diagnostic session (TcSE ROIN-129531-1)

The Bezel Diagnostic Client can cancel the Bezel Diagnostic session at any time by setting the 'Bezel_Diag_State_Rq' signal equal to 'Inactive'.

6.5.11 DIAG-SR-REQ-015075/A-Bezel Diagnostic HMI Output (TcSE ROIN-129532-1)

The Bezel Diagnostic Client shall update the HMI Output using the Transport Protocol (TP) data from the method "_Bezel_Diagnostic_Data" sent from the Diagnostic Server(s).

6.5.12 DIAG-SR-REQ-015076/A-Bezel Diagnostic Default Session (TcSE ROIN-129533-1)

The Bezel Diagnostic Default Session shall be entered when the Diagnostic Client signals are set as follows:

1. Bezel_Diag_State_Rq = Active, and
2. Diagnostic_Operation_Rq = Inactive, and
3. Bezel_Diag_Module_Rq = Inactive

6.5.13 DIAG-REQ-015077/A-AAM module (TcSE ROIN-304169-1)

The AAM and DSP AMP are mutually exclusive but both support Bezel Diagnostics. The AAM uses some of the same CAN signals as the DSP AMP as defined in the CAN dB. The AAM bezel diagnostic information shall be displayed on the HMI output.

6.5.14 Sequence Diagrams

6.5.14.1 DIAG-SD-REQ-015078/A-Bezel Diagnostics - Normal Operation (TcSE ROIN-129501-2)

Scenarios

Scenario

User initiates a Bezel Diagnostics session

Constraints

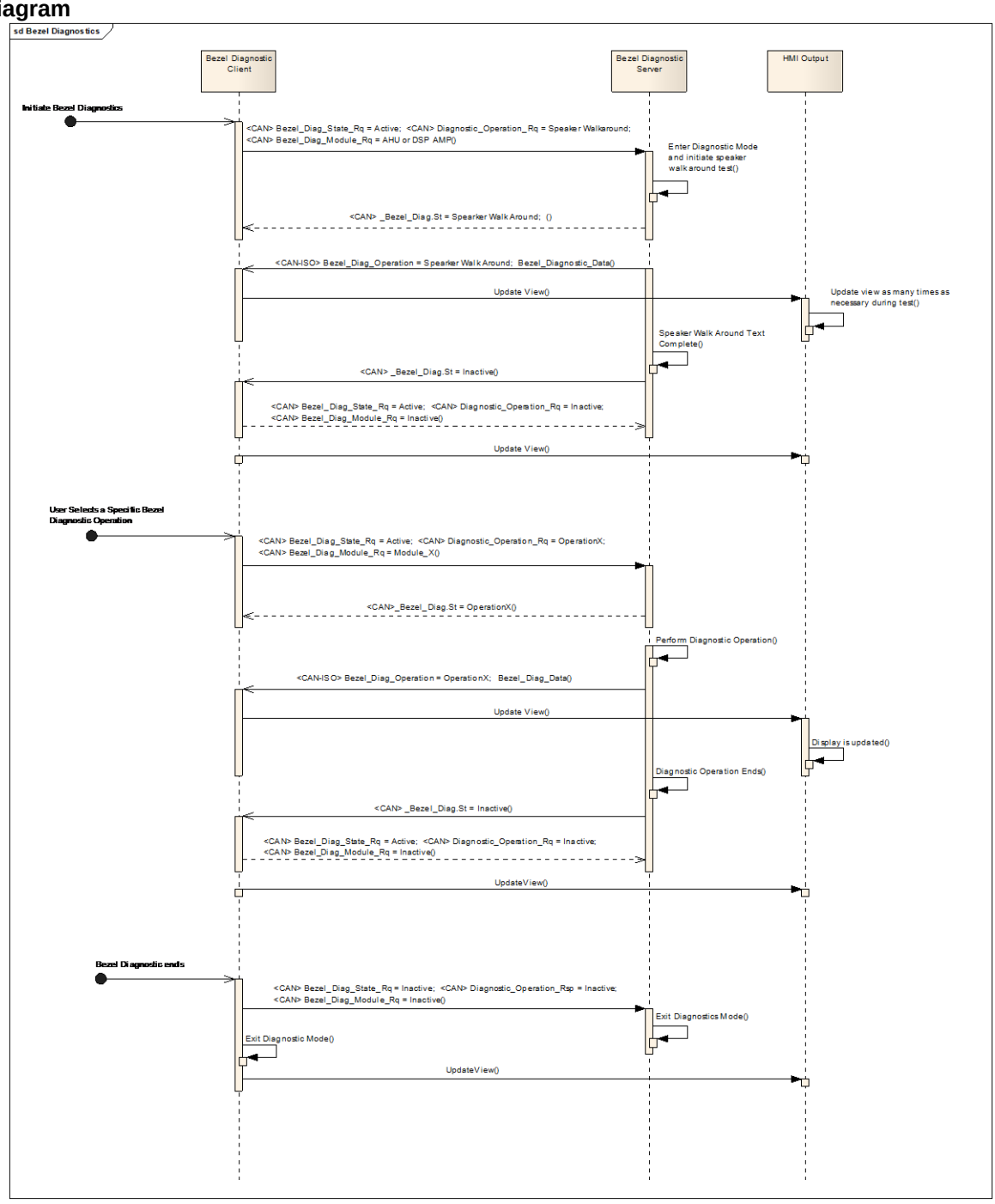
Pre-condition

Bezel Diagnostics is not active

Post-condition

Bezel Diagnostics session ends and return to normal operation

Sequence Diagram



6.6 DIAG-FUN-REQ-115753/A-Bezel Diagnostics LIN Extended Part Number Readout

6.6.1 DIAG-SR-REQ-115754/A-Signal Flow

Due to the fact that part number readout is not used very often on request and due to the need to reduce cycle timing for the states of the buttons an extra schedule table has been added. For activating this the Master has to switch the schedule table. While this is active no buttons, states or errors can be transmitted from the ICP to the Master but this will only occur for a short time while activating the diagnosis session on CAN.
To see an overview of how the schedule tables are defined see actual LDF-File.

If the Master requests a part number it sends this request in a SF with the ID-Field 0x3C, the NAD 0x10, the PCI 0x06; the SID 0xB2 followed by an Identifier dependent on the number (e.g. software number) it wants to have. This is followed by the Supplier and the Function IDs. These are determined by the consortium for LIN 2.x and for the ICP have to be set to 0x3B for the supplier ID LSB and to 0x00 for the MSB. The Function ID must be set to 0x08 for the LSB and 0x00 for the MSB.

If User-Defined information is requested the slave must respond in multi-frame format.

The answer frames always begin with 0x7D as ID-Field.
If the frame contains User-Defined information the first frame is of type FF followed by frames of type CF.
Frame type FF begins with a NAD of 0x10, followed by the PCI of 0x10, as only data length lower than 256 bytes is needed for this time. The next byte shows the lower 8 bytes of the length of all bytes to transfer including the RSID. The RSID itself also has a value of 0xF2. At least the first four bytes of the requested number will be coded in ASCII.
After the FF Frame only frames of type CF will follow. These begin with a NAD of 0x10, too. The next byte is the PCI. This includes a frame counter, too. So the first CF has a value of 0x21, the second 0x22 and so on. The last six bytes are only data bytes. This means the characters of the requested part numbers can be found coded in ASCII.
The total number of frames depends on the count of characters that should be transferred. Usually it will be one FF Frame followed by one or two CF-Frames.

Additional information for clarification:
The Service Identifier (SID) specifies the request that shall be performed by the slave node addressed. Here it is every time 0xB2 (Read by Identifier) as defined in the LIN consortium spec. Means we are using only 0xB2 for SID.
The Response Service Identifier (RSID) specifies the contents of the response. The RSID for a positive response is always SID + 0x40. This means we are using only 0xF2 for RSID.

6.6.2 DIAG-SR-REQ-115755/A-Coding of PCI

The PCI contains data described below. Examples can be found later in this document.

Type	PCI Type				Additional information			
	B7	B6	B5	B4	B3	B2	B1	B0
SF	0	0	0	0	Length			
FF	0	0	0	1	Length/256			
CF	0	0	1	0	Frame counter			

Structure of the PCI byte

6.6.3 Examples

In the following requirements are examples for each type of request with an example of an answer from the slave.

6.6.3.1 DIAG-SR-REQ-115757/A-Request and Response of HWPN (PCB)

This is an example for the SF request of a HWPN (hardware part number) of the master.
Protected ID-Field has 0x3C:

MasterReq B0	MasterReq B1	MasterReq B2	MasterReq B3	MasterReqB4	MasterReqB5	MasterReqB6	MasterReqB7

NAD	PCI	SID	Identifier	Supplier ID LSB	Supplier ID MSB	Function ID LSB	Function ID MSB
0x10	0x06	0xB2	0x21	0xFF*	0x7F*	0xFF*	0xFF*

Example for request frame of HWPN

*Supplier ID is supplier dependent but wildcards shall be used.
*Function ID is supplier dependent but wildcards shall be used.

Related to this an ICP with the hardware number "F1ET-14F571-HA001" (no EOS!) will response with following answer (data of part number is ASCII coded):

The 1st Frame is of type FF with the protected ID 0x7D and looks like this:

SlaveRespB 0	SlaveRespB 1	SlaveRespB 2	SlaveRespB 3	SlaveRespB 4	SlaveRespB 5	SlaveRespB 6	SlaveRespB 7
NAD	PCI	LEN	RSID	D1	D2	D3	D4
0x10	0x10	0x12	0xF2	0x46	0x31	0x45	0x54

Example for 1st response frame of HWPN

The 2nd Frame is of type CF with the protected ID 0x7D and looks like this:

SlaveRespB 0	SlaveRespB 1	SlaveRespB 2	SlaveRespB 3	SlaveRespB 4	SlaveRespB 5	SlaveRespB 6	SlaveRespB 7
NAD	PCI	D1	D2	D3	D4	D5	D6
0x10	0x21	0x2D	0x31	0x34	0x46	0x35	0x37

Example for 2nd response frame of HWPN

The 3rd Frame is also of type CF with the protected ID 0x7D and looks like this:

SlaveRespB 0	SlaveRespB 1	SlaveRespB 2	SlaveRespB 3	SlaveRespB 4	SlaveRespB 5	SlaveRespB 6	SlaveRespB 7
NAD	PCI	D1	D2	D3	D4	D5	D6
0x10	0x22	0x31	0x2D	0x48	0x41	0x30	0x30

Example for 3rd response frame of HWPN

The 4th Frame is also of type CF with the protected ID 0x7D and looks like this:

SlaveRespB 0	SlaveRespB 1	SlaveRespB 2	SlaveRespB 3	SlaveRespB 4	SlaveRespB 5	SlaveRespB 6	SlaveRespB 7
NAD	PCI	D1	D2	D3	D4	D5	D6
0x10	0x23	0x31	0x00	0x00	0x00	0x00	0x00

Example for 3rd response frame of HWPN

6.6.3.2 DIAG-SR-REQ-115758/A-Request and Response of SWPN

The following is an example for the SF request of a SWPN (software part number) of the master.
Protected ID-Field has 0x3C:

MasterReq B0	MasterReq B1	MasterReq B2	MasterReq B3	MasterReqB 4	MasterReqB5	MasterReqB6	MasterReqB7
NAD	PCI	SID	Identifier	Supplier ID LSB	Supplier ID MSB	Function ID LSB	Function ID MSB
0x10	0x06	0xB2	0x22	0xFF*	0x7F*	0xFF*	0xFF*

Example for request frame of SWPN

*Supplier ID is supplier dependent but wildcards shall be used.
*Function ID is supplier dependent but wildcards shall be used.

Related to this an ICP with the software number "F1ET-14F565-HA001" (no EOS!) will response with following answer (data of part number is ASCII coded):

The 1st Frame is of type FF with the protected ID 0x7D and looks like this:

SlaveRespB 0	SlaveRespB 1	SlaveRespB 2	SlaveRespB 3	SlaveRespB 4	SlaveRespB 5	SlaveRespB 6	SlaveRespB 7
NAD	PCI	LEN	RSID	D1	D2	D3	D4
0x10	0x10	0x12	0xF2	0x46	0x31	0x45	0x54

Example for 1st response frame of SWPN

The 2nd Frame is also of type CF with the protected ID 0x7D and looks like this:

SlaveRespB 0	SlaveRespB 1	SlaveRespB 2	SlaveRespB 3	SlaveRespB 4	SlaveRespB 5	SlaveRespB 6	SlaveRespB 7
NAD	PCI	D1	D2	D3	D4	D5	D6
0x10	0x21	0x2D	0x31	0x34	0x46	0x35	0x36

Example for 2nd response frame of SWPN

The 3rd Frame is also of type CF with the protected ID 0x7D and looks like this:

SlaveRespB 0	SlaveRespB 1	SlaveRespB 2	SlaveRespB 3	SlaveRespB 4	SlaveRespB 5	SlaveRespB 6	SlaveRespB 7
NAD	PCI	D1	D2	D3	D4	D5	D6
0x10	0x22	0x35	0x2D	0x48	0x41	0x30	0x30

Example for 3rd response frame of SWPN

The 4th Frame is also of type CF with the protected ID 0x7D and looks like this:

SlaveRespB 0	SlaveRespB 1	SlaveRespB 2	SlaveRespB 3	SlaveRespB 4	SlaveRespB 5	SlaveRespB 6	SlaveRespB 7
NAD	PCI	D1	D2	D3	D4	D5	D6
0x10	0x23	0x31	0x00	0x00	0x00	0x00	0x00

Example for 4th response frame of SWPN

6.7 DIAG-FUN-REQ-164015/B-Bezel Diagnostics - I2C over LVDS

6.7.1 ECU Core Assembly Number

6.7.1.1 IFS-MMI2C-SR-REQ-140624/C-0x31 Core Assembly FPN

The I²C Slave Core Assembly message provides a mechanism to transmit a Ford Part Number back to the I²C Master.

Subaddress: 0x31
Access: Read-Only
Default: n/a

	7	6	5	4	3	2	1	0
[0]	Core Assembly character[0]							
…	…							
[24]	Core Assembly character[24]							

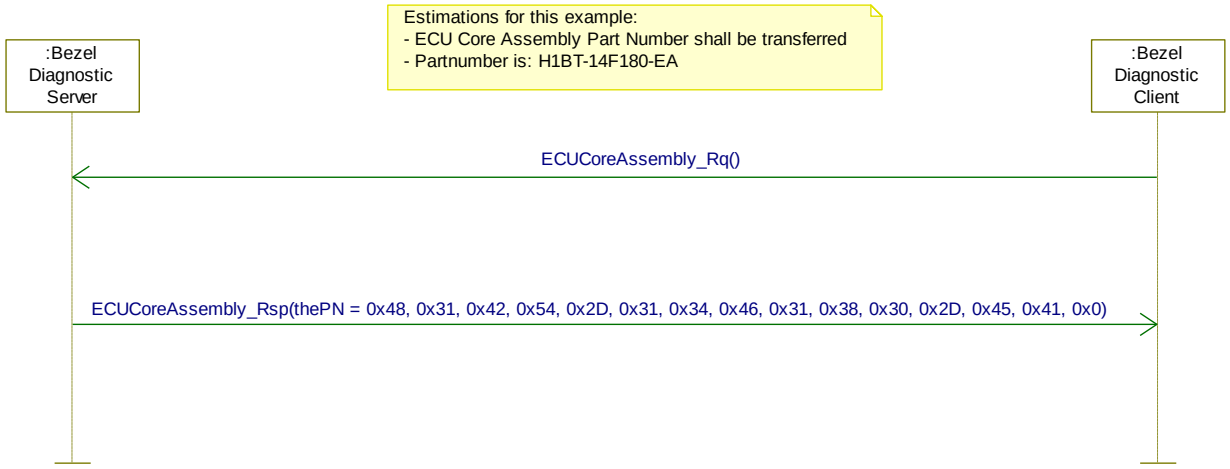
- Core Assembly: Released (or prototype) Ford Part Number
  Null-terminated string. For example “H1BT-14F180-FA”.
  Maximum length 24 characters plus NULL.

The I²C Master shall read a maximum of 25 bytes, be robust to receiving non-ASCII bytes, and be robust to receiving non-NULL terminated data.

If the I2C Slave is not released with this kind of Ford Part Number, the I²C Slave shall indicate that the subaddress is unsupported as described in REQ-140565. In this case the I²C Slave would leave SDA undriven resulting in Data = 0xFF.

6.7.1.2 DIAG-SD-REQ-164017/B-Sequence example showing a core assembly part number readout in principle

Reference requirement TBD



6.7.2 ECU Delivery Assembly Number

6.7.2.1 IFS-MMI2C-SR-REQ-140625/C-0x32 Delivery Assembly FPN

The Delivery Assembly message provides a mechanism to transmit a Ford Part Number back to the I²C Master.

Subaddress: 0x32

Access: Read-Only
Default: n/a

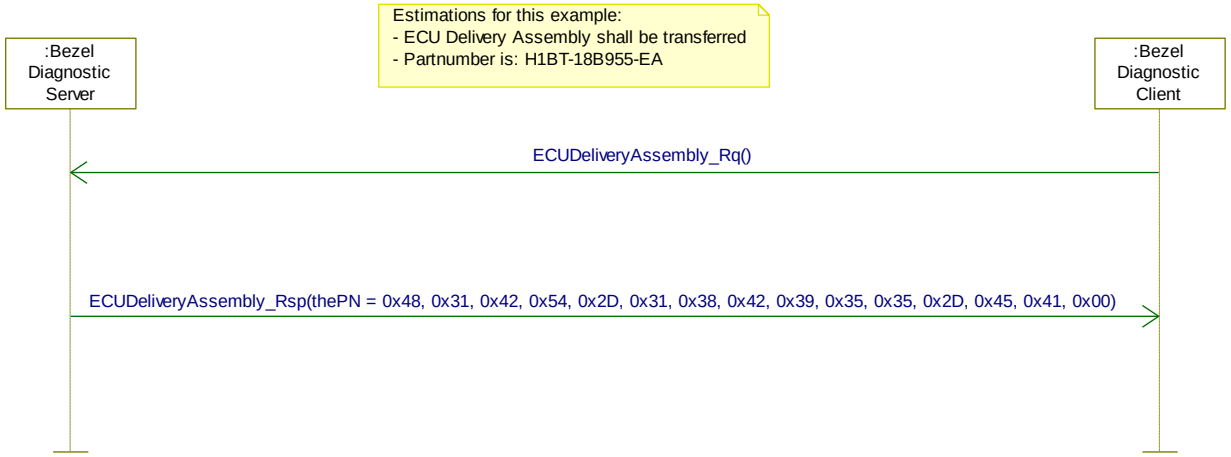
	7	6	5	4	3	2	1	0
[0]	Delivery Assembly FPN character[0]							
…	…							
[24]	Delivery Assembly FPN character[24]							

- Delivery Assembly FPN: Released (or prototype) Ford Part Number
  Null-terminated string. . For example “H1BT-18B955-FA”
  Maximum length 24 characters plus NULL.

The I²C Master shall read a maximum of 25 bytes, be robust to receiving non-ASCII bytes, and be robust to receiving non-NULL terminated data.

If the I²C Slave is not released with this kind of Ford Part Number, the I²C Slave shall indicate that the subaddress is unsupported as described in REQ-140565. In this case the I²C Slave would leave SDA undriven resulting in Data = 0xFF.

6.7.2.2 DIAG-SD-REQ-164016/A-Sequence example for showing delivery assembly part number readout in principle



6.7.3 ECU Software Part Number

6.7.3.1 IFS-MMI2C-SR-REQ-140626/C-0x33 Software FPN

The Software Part Number message provides a mechanism to transmit a Ford Part Number back to the I²C Master.

Subaddress: 0x33
Access: Read-Only
Default: n/a

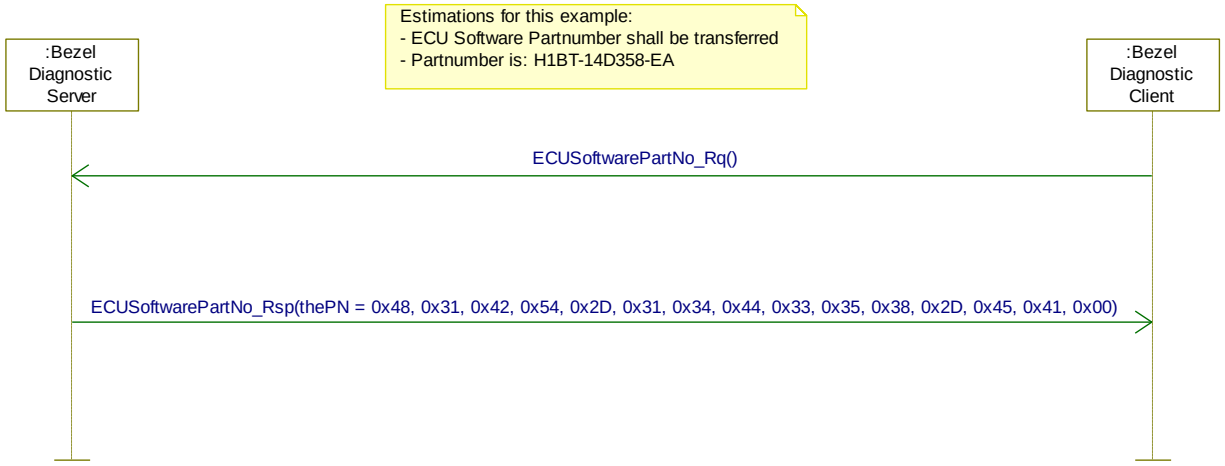
	7	6	5	4	3	2	1	0
[0]	Software FPN character[0]							
…	…							
[24]	Software FPN character[24]							

- Software FPN: Released (or prototype) Ford Part Number
  Null-terminated string. For example “H1BT-14D358-FA”
  Maximum length 24 characters plus NULL.

The I²C Master shall read a maximum of 25 bytes, be robust to receiving non-ASCII bytes, and be robust to receiving non-NULL terminated data.

If the I²C Slave is not released with this kind of Ford Part Number, the I²C Slave shall indicate that the subaddress is unsupported as described in REQ-140565. In this case the I²C Slave would leave SDA undriven resulting in Data = 0xFF.

6.7.3.2 DIAG-SD-REQ-164018/A-Sequence example showing a software part number readout in principle



6.7.4 ECU Serial Number

6.7.4.1 IFS-MMI2C-SR-REQ-140627/D-0x34 Serial Number

The Serial Number message provides a mechanism to transmit an electronic serial number back to the I²C Master.

Subaddress: 0x34
Access: Read-Only
Default Value: n/a

	7	6	5	4	3	2	1	0
[0]	Serial Number character[0]							
…	…							
[24]	Serial Number character[24]							

- Serial Number:
  Null-terminated string.
  Maximum length 24 characters plus NULL.

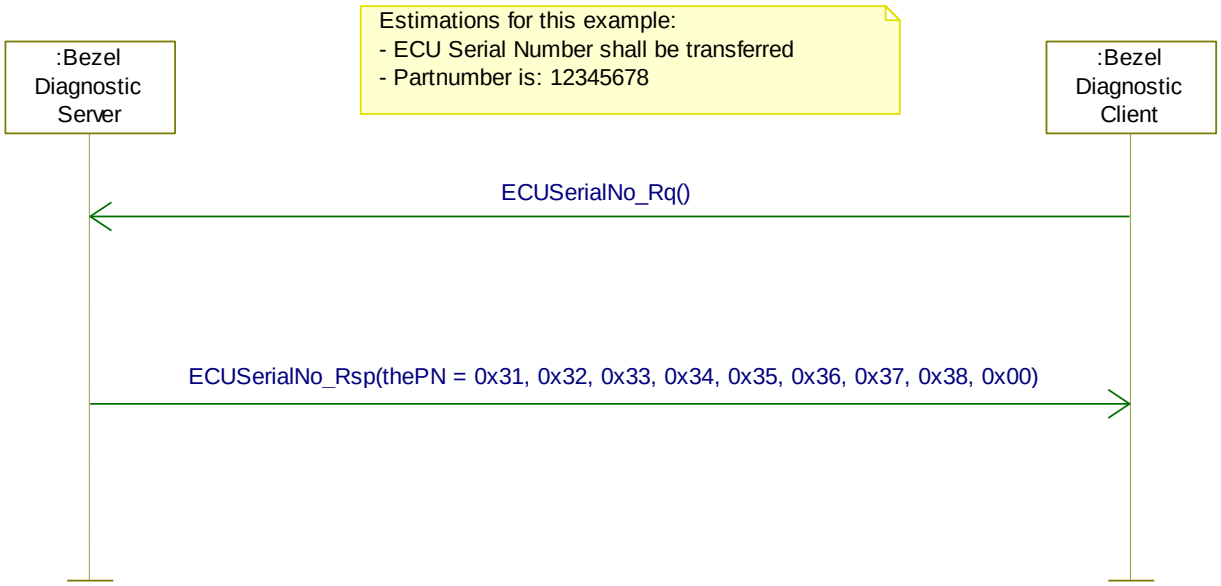
Note: This specification contains no functional requirement about the format of the serial number.

The I²C Master shall read a maximum of 25 bytes, be robust to receiving non-ASCII bytes, and be robust to receiving non-NULL terminated data.

If the I²C Slave contains no serial number, the I²C Slave shall indicate that the subaddress is unsupported as described in REQ-140565. In this case the I²C Slave would leave SDA undriven resulting in Data = 0xFF.

The information contained in this document is Proprietary to Ford Motor Company.

6.7.4.2 DIAG-SD-REQ-164019/A-Sequence example showing a serial part number readout in principle



6.7.5 ECU Main Calibration Data Number

6.7.5.1 IFS-MMI2C-SR-REQ-140628/C-0x35 Main Calibration Data FPN

The Main Calibration Data message provides a mechanism to transmit a Ford Part Number back to the I²C Master.

Subaddress: 0x35
Access: Read-Only
Default Value: n/a

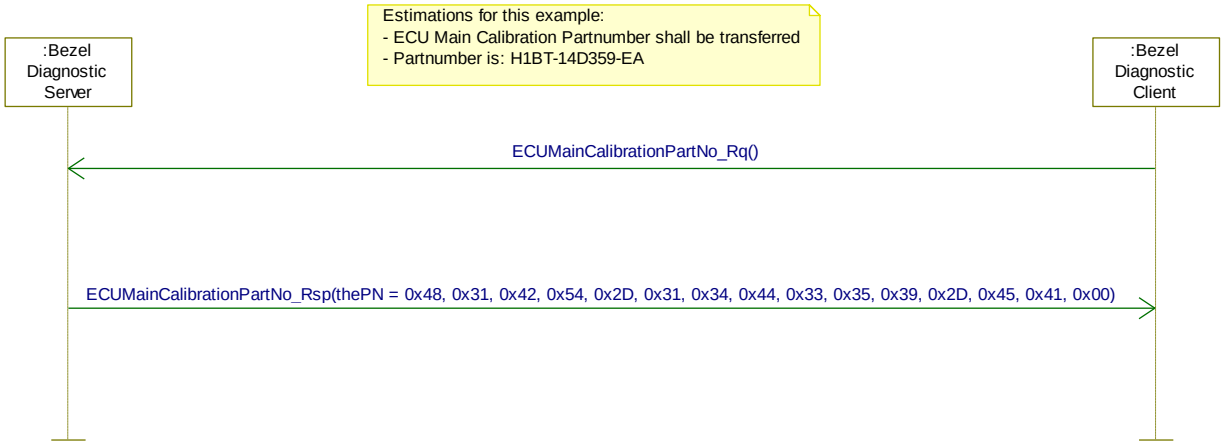
	7	6	5	4	3	2	1	0
[0]	Main Calibration Data FPN character[0]							
…	…							
[24]	Main Calibration Data FPN character[24]							

- Main Calibration Data FPN: Released (or prototype) Ford Part Number
  Null-terminated string. No example provided.
  Maximum length 24 characters plus NULL.

The I²C Master shall read a maximum of 25 bytes, be robust to receiving non-ASCII bytes, and be robust to receiving non-NULL terminated data.

If the I²C Slave is not released with this kind of Ford Part Number, the I²C Slave shall indicate that the subaddress is unsupported as described in REQ-140565. In this case the I²C Slave would leave SDA undriven resulting in Data = 0xFF.

6.7.5.2 DIAG-SD-REQ-164293/A-Sequence example showing ECU main calibration data number in principle



6.8 DIAGv2-FUN-REQ-395945/A-Bezel Diagnostics - SOA (Ethernet) - Variant 2

6.8.1 DIAG-CLD-REQ-278463/A-Bezel Diagnostic Client - SOA

The Bezel Diagnostic Client is the interface and control for the Bezel Diagnostic function

6.8.2 DIAG-CLD-REQ-278390/A-Bezel Diagnostic Server - SOA (ECG)

The Bezel Diagnostic Server is responsible for performing the requested Bezel Diagnostic operation

6.8.3 DIAG-CLD-REQ-273355/A-Bezel Diagnostic Server - SOA (TCU)

The Bezel Diagnostic Server is responsible for performing the requested Bezel Diagnostic operation

6.8.4 Physical Mapping of Classes

The table below shows how the logical classes may be mapped to physical modules for the SOA Bezel Diagnostics feature. The table below covers the lead program.

At the time the specification was written the below table was the latest. If there are additional modules deployed to the class descriptions or the vehicle architecture changed since the spec was written and released, then the applicable implementation guide class description would cover those modules. If there is a conflict between the implementation guide and the table below the implementation guide takes precedent.

Logical Class	Physical Module (ECU)
Bezel Diagnostic Client- SOA	APIM
Bezel Diagnostic Server – SOA (ECG)	ECG
Bezel Diagnostic Server – SOA (TCU)	TCU

6.8.5 Interface Requirements

6.8.5.1 Disclaimer

For any conflict between the SOA MD's for the Topic, Command ID and IDL files as called out in the MD's and the GPB, the GPB shall always take precedence.

6.8.5.2 Interface Requirements - TCU

6.8.5.2.1 TCU DID MD's

6.8.5.2.1.1 MD-REQ-395947/A-SpcmDIDReadReq

This API is used by the Bezel Diagnostic Client to request DID information from the TCU Bezel Diagnostic Server.

API Name	SpcmDidReadReq
Operation	Request
Method Type	One-Shot
QoS Level	0 (default)
Retained	No
Topic	SERVICES/REQUEST/TCU/SPCM
Command ID	SPCM_DID_READ_REQ (0x0)
IDL File(s)	tcu_spcm_soa.proto, tcu_spcm_common.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
Repeated	did_address	Int32	-	0x00000000 - 0xFFFFFFFF	Requested TCU DID address
Optional	requester	Enum	TCU_INTERNAL	0x0	If ECU not listed then use TCU_Internal (ex APIM uses TCU_Internal)
			ECG_INTERNAL	0x1	
			ECG_FTCP	0x2	
			TCU_CAN	0x3	

6.8.5.2.1.2 MD-REQ-395949/A-SpcmDIDReadResp

This API from the TCU Bezel Diagnostic Server is the response to the SpcmDIDReadReq

API Name	SpcmDidReadResp
Operation	Response
Method Type	One-Shot
QoS Level	0 (Default)
Retained	No
Topic	N/A – Supplied by request
Command ID	SPCM_DID_READ_RESP (0x1)
IDL File(s)	tcu_spcm_soa.proto, tcu_spcm_common.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	response_status	Enum	-	-	Response to initial request
			Success	0x00	
			Wait	0x01	
			Fail-Param Does Not Exist	0x02	
			Fail-Param Read Only	0x03	
			Fail-Param Out Of Range	0x04	
			Fail-Param Size Incorrect	0x05	
			Fail-Unknown Command Type	0x06	
			Fail-TCU Internal Error	0x07	
			Fail-Command Already In Progress	0x08	
			Fail-Command Not Permitted	0x09	
			Fail-Internal Memory Error	0x0A	
			Fail-Invalid Config Data	0x0B	
			Fail-Part2No Mismatch	0x0C	
			Fail-Invalid Apply Type Combo	0x0D	
			Fail-Access Denied	0x0E	

			Fail-Config Item Mismatch	0x0F	
			Fail-Already In Same State	0x10	
repeated	did_read_data	SpcmDidData	-	-	
optional	SpcmDidData : did_address	Int32	-	0x00000000 - 0xFFFFFFFF	DID address
optional	SpcmDidData : did_config_data	String	-	-	DID Data

6.8.5.2.1.3 MD-REQ-395972/A-SpcmDidUpdateInd

This API is used to receive updated DID information from the TCU. The TCU publishes all DID updates via this API.

API Name	SpcmDIDUpdateInd
Operation	Broadcast (OnChange)
Method Type	One-Shot
QoS Level	0 (Default)
Retained	Yes
Topic	SERVICES/INDICATION/TCU/SPCM
Command ID	SPCM_DID_UPDATE_IND (0x100)
IDL File(s)	tcu_spcm_soa.proto, tcu_spcm_common.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
repeated	did_update_list	SpcmDidData	-	-	
optional	SpcmDidData : did_address	Int32	-	0x00000000 - 0xFFFFFFFF	DID address
optional	SpcmDidData : did_config_data	String	-	-	DID Data

6.8.5.2.2 TCU DTC MD's

6.8.5.2.2.1 MD-REQ-396962/A-TcuViewDtcReq

This API is used by the Bezel Diagnostic Client to request Diagnostic Trouble Code (DTC) information from the TCU Bezel Diagnostic Server.

API Name	TcuViewDtcReq
Operation	Request
Method Type	One-Shot
QoS Level	0 (default)
Retained	No
Topic	SERVICES/REQUEST/TCU/TVDM
Command ID	TVDM_VIEW_DTC_REQ (1001)
IDL File(s)	SoaTvdm.proto, tvdm_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	Tcu_view_dtc	bool	-	-	Unsure what the intended purpose of this field was. TCU Bezel Diagnostics Server ignores it.
optional	__apiVersion	enum	-	-	Specify API version. Unused now since there is only one version

Note that both fields are ignored by the TCU Bezel Diagnostics Server. Sending the TcuViewDtcReq will always result in a TcuViewDtcResp message.

6.8.5.2.2.2 MD-REQ-396963/A-TcuViewDtcResp

This API from the TCU Bezel Diagnostic Server is the response to the TcuViewDtcReq

API Name	TcuViewDtcResp
Operation	Response
Method Type	One-Shot
QoS Level	0 (Default)
Retained	No
Topic	SERVICES/RESPONSE/TCU/TVDM
Command ID	TVDM_VIEW_DTC_RSP (1002)
IDL File(s)	SoaTvdm.proto, tvdm_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
repeated	active_dtc_list	TcuViewDtcInfo	-	-	List of active DTCs on the TCU
repeated	confirmed_dtc_list	TcuViewDtcInfo	-	-	List of confirmed DTCs on the TCU
optional	TcuViewDtcInfo: dtc_number	Int32	-	-	DTC code
optional	TcuViewDtcInfo: dtc_desc	String	-	-	Description of the matching DTC code
repeated	TcuViewDtcInfo: dtcDescription	enum	-	-	Pass or fail status of the enum
			DTC_PASS	0x1	
			DTC_FAIL	0x2	
optional	__apiVersion	enum	-	-	Specify API version. Unused now since there is

					only one version

6.8.5.2.2.3 MD-REQ-396964/A-TcuViewDtcInd

This API is used to receive updated DTC information from the TCU. The TCU publishes all DTC updates via this API.

API Name	TcuViewDtcInd
Operation	Broadcast (OnChange)
Method Type	One-Shot
QoS Level	0 (Default)
Retained	Yes
Topic	SERVICES/DATA/TCU/TVDM
Command ID	TVDM_DTC_UPDATE_IND (1202)
IDL File(s)	SoaTvdm.proto, tvdm_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
repeated	updated_dtc_list	TcuViewDtcInfo	-	-	List of confirmed DTCs on the TCU
optional	TcuViewDtcInfo: dtc_number	Int32	-	-	DTC code
optional	TcuViewDtcInfo: dtc_desc	String	-	-	Description of the matching DTC code
repeated	TcuViewDtcInfo: dtcDescription	enum	-	-	Pass or fail status of the enum
			DTC_PASS	0x1	
			DTC_FAIL	0x2	
optional	__apiVersion	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.3 TCU Cellular Controls MD's

6.8.5.2.3.1 MD-REQ-396528/A-CellularCtrlGetCurrentTechReq

This API is used by the Bezel Diagnostic Client to request cellular technology information from the TCU Bezel Diagnostic Server.

API Name	CellularCtrlGetCurrentTechReq
Operation	Request
Method Type	One-Shot
QoS Level	0 (default)
Retained	No
Topic	SERVICES/REQUEST/TCU/CELLULARCTRL
Command ID	GET_CURRENT_TECH_REQ (0)
IDL File(s)	SoaCellularctl.proto, CommonCellularctrl.proto, cellularctrl_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.3.2 MD-REQ-396908/A-CellularCtrlGetCurrentTechResp

This API from the TCU Bezel Diagnostic Server is the response to the CellularCtrlGetCurrentTechReq

API Name	CellularCtrlGetCurrentTechResp
Operation	Response
Method Type	One-Shot
QoS Level	0 (Default)
Retained	No
Topic	SERVICES/RESPONSE/TCU/TCUMAIND
Command ID	GET_CURRENT_TECH_RESP (1)
IDL File(s)	SoaCellularctl.proto, CommonCellularctrl.proto, cellularctrl_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	response_status	enum	-	-	Success status of the request
			CELLULARCTRL_RESP_SUCCESS	0x0	
			CELLULARCTRL_RESP_FAILED	0x1	
optional	rat	enum	-	-	The radio access technology being used by the TCU
			NO_NW	0x0	
			GSM	0x1	
			GPRS	0x2	
			EDGE	0x3	
			UMTS	0x4	
			HSPA_P	0x5	
			LTE	0x6	

optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.3.3 MD-REQ-396916/A-CellularCtrlTechInd

This API is used to receive updated cellular technology information from the TCU. The TCU publishes all cellular technology updates via this API.

API Name	CellularCtrlTechInd
Operation	Broadcast (OnChange)
Method Type	One-Shot
QoS Level	0 (Default)
Retained	Yes
Topic	SERVICES/DATA/CELLULARCTRL
Command ID	TECH_IND (200)
IDL File(s)	SoaCellularctl.proto, CommonCellularctrl.proto, cellularctrl_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	rat	enum	-	-	The radio access technology being used by the TCU
			NO_NW	0x0	
			GSM	0x1	
			GPRS	0x2	
			EDGE	0x3	
			UMTS	0x4	
			HSPA_P	0x5	
			LTE	0x6	
optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.3.4 MD-REQ-396917/A-CellularCtrlServingCellNasStatusReq

This API is used by the Bezel Diagnostic Client to request NAS status from the TCU Bezel Diagnostic Server.

API Name	CellularCtrlServingCellNasStatusReq
Operation	Request
Method Type	One-Shot
QoS Level	0 (default)

Retained	No
Topic	SERVICES/REQUEST/TCU/CELLULARCTRL
Command ID	SERVING_CELL_INFO_NAS_STATUS_REQ (2)
IDL File(s)	SoaCellularctl.proto, CommonCellularctrl.proto, cellularctrl_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.3.5 MD-REQ-396918/A-CellularCtrlServingCellNasStatusResp

This API from the TCU Bezel Diagnostic Server is the response to the CellularCtrlServingCellNasStatusReq

API Name	CellularCtrlServingCellNasStatusResp
Operation	Response
Method Type	One-Shot
QoS Level	0 (Default)
Retained	No
Topic	SERVICES/RESPONSE/TCU/TCUMAIND
Command ID	SERVING_CELL_INFO_NAS_STATUS_RESP (3)
IDL File(s)	SoaCellularctl.proto, CommonCellularctrl.proto, cellularctrl_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	response_status	enum	-	-	Success status of the request
			CELLULARCTRL_RESP_SUCCESS	0x0	
			CELLULARCTRL_RESP_FAILED	0x1	
optional	nas_status	string	-	-	The NAS status of the TCU
optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.3.6 MD-REQ-396919/A-CellularCtrlServingCellNasStatusInd

This API is used to receive updated NAS status information from the TCU. The TCU publishes all NAS status updates via this API.

API Name	CellularCtrlServingCellNasStatusInd
Operation	Broadcast (OnChange)
Method Type	One-Shot
QoS Level	0 (Default)
Retained	Yes

Topic	SERVICES/DATA/CELLULARCTRL
Command ID	SERVING_CELL_INFO_NAS_STATUS_IND (201)
IDL File(s)	SoaCellularctl.proto, CommonCellularctrl.proto, cellularctrl_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	nas_status	string	-	-	The NAS status of the TCU
optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.3.7 MD-REQ-396920/A-CellularCtrlServingCellIdReq

This API is used by the Bezel Diagnostic Client to request the serving cell tower ID from the TCU Bezel Diagnostic Server.

API Name	CellularCtrlServingCellIdReq
Operation	Request
Method Type	One-Shot
QoS Level	0 (default)
Retained	No
Topic	SERVICES/REQUEST/TCU/CELLULARCTRL
Command ID	SERVING_CELL_ID_REQ (4)
IDL File(s)	SoaCellularctl.proto, CommonCellularctrl.proto, cellularctrl_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.3.8 MD-REQ-396921/A-CellularCtrlServingCellIdResp

This API from the TCU Bezel Diagnostic Server is the response to the CellularCtrlServingCellIdReq

API Name	CellularCtrlServingCellIdResp
Operation	Response
Method Type	One-Shot
QoS Level	0 (Default)
Retained	No
Topic	SERVICES/RESPONSE/TCU/TCUMAIND
Command ID	SERVING_CELL_ID_RESP (5)
IDL File(s)	SoaCellularctl.proto, CommonCellularctrl.proto, cellularctrl_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	response_status	enum	-	-	Success status of the request

			CELLULARCTRL_RESP_SUCCESS	0x0	
			CELLULARCTRL_RESP_FAILED	0x1	
optional	cell_id	string	-	-	The serving cell tower ID of the tower the TCU is connected to
optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.3.9 MD-REQ-396923/A-CellularCtrlServingCellIdInd

This API is used to receive updated NAS status information from the TCU. The TCU publishes all NAS status updates via this API.

API Name	CellularCtrlServingCellIdInd
Operation	Broadcast (OnChange)
Method Type	One-Shot
QoS Level	0 (Default)
Retained	Yes
Topic	SERVICES/DATA/CELLULARCTRL
Command ID	SERVING_CELL_ID_IND (202)
IDL File(s)	SoaCellularctl.proto, CommonCellularctrl.proto, cellularctrl_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	cell_id	string	-	-	The serving cell tower ID of the tower the TCU is connected to
optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.3.10 MD-REQ-396924/A-CellularCtrlServingCellImeiSvReq

This API is used by the Bezel Diagnostic Client to request the International Mobile Equipment Identity Software Version (IMEI SV) from the TCU Bezel Diagnostic Server.

API Name	CellularCtrlServingCellImeiSvReq
Operation	Request
Method Type	One-Shot
QoS Level	0 (default)
Retained	No
Topic	SERVICES/REQUEST/TCU/CELLULARCTRL
Command ID	IMEI_SV_REQ (6)
IDL File(s)	SoaCellularctl.proto, CommonCellularctrl.proto, cellularctrl_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.3.11 MD-REQ-396925/A-CellularCtrlServingCellImeiSvResp

This API from the TCU Bezel Diagnostic Server is the response to the CellularCtrlServingCellImeiSvReq

API Name	CellularCtrlServingCellImeiSvResp
Operation	Response
Method Type	One-Shot
QoS Level	0 (Default)
Retained	No
Topic	SERVICES/RESPONSE/TCU/TCUMAIND
Command ID	IMEI_SV_RESP (7)
IDL File(s)	SoaCellularctl.proto, CommonCellularctrl.proto, cellularctrl_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	response_status	enum	-	-	Success status of the request
			CELLULARCTRL_RESP_SUCCESS	0x0	
			CELLULARCTRL_RESP_FAILED	0x1	
optional	imei	string	-	-	The IMEI SV of the TCU
optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

Note that there is no broadcast message for the IMEI SV. That is because it can only change when the software updates which would cause a reboot.

6.8.5.2.4 TCU DCM (Data Connection Manager) MD's

6.8.5.2.4.1 MD-REQ-396957/A-TcuPdpApnStateReq

This API is used by the Bezel Diagnostic Client to request Data Connection Manager (DCM) information from the TCU Bezel Diagnostic Server.

API Name	TcuPdpApnStateReq
Operation	Request
Method Type	One-Shot
QoS Level	0 (default)

Retained	No
Topic	SERVICES/REQUEST/TCU/DCM
Command ID	TCU_PDP_APN_STATE_REQ (1001)
IDL File(s)	SoaDcm.proto, dcm_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	apn_type	enum	-	-	Specifies the APN type you are requesting information for
			CNC_APN	0x1	
			MHS_APN	0x2	
optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.4.2 MD-REQ-396959/A-TcuPdpApnStateRsp

This API from the TCU Bezel Diagnostic Server is the response to the TcuPdpApnStateReq

API Name	TcuPdpApnStateRsp
Operation	Response
Method Type	One-Shot
QoS Level	0 (Default)
Retained	No
Topic	SERVICES/RESPONSE/TCU/DCM
Command ID	TCU_PDP_APN_STATE_RSP (1002)
IDL File(s)	SoaTvdm.proto, tvdm_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	apn_type	enum	-	-	Specifies the APN type in the response
			CNC_APN	0x1	
			MHS_APN	0x2	
optional	pdp_state	String	-	-	String specifying the state of the apn
optional	__apiVersion	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.4.3 MD-REQ-396960/A-TcuPdpApnStateInd

This API is used to receive updated DCM information from the TCU. The TCU publishes all DCM updates via this API.

API Name	TcuPdpApnStateInd
Operation	Broadcast (OnChange)

Method Type	One-Shot
QoS Level	0 (Default)
Retained	Yes
Topic	SERVICES/DATA/TCU/DCM
Command ID	TCU_PDP_APN_STATE_IND (1201)
IDL File(s)	SoaTvdm.proto, tvdm_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	apn_type	enum	-	-	Specifies the APN type in the response
			CNC_APN	0x1	
			MHS_APN	0x2	
optional	pdp_state	String	-	-	String specifying the state of the apn
optional	__apiVersion	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.5 TCU BSM (Basic Safety Message) MD's (Only applicable for China variants)

6.8.5.2.5.1 MD-REQ-499188/A-BSMStatsReq

This API is used by the Bezel Diagnostic Client to request BSM stats from the TCU Bezel Diagnostic Server.

API Name	BSMStatsReq
Operation	Request
Method Type	One-Shot
QoS Level	0 (default)
Retained	No
Topic	SERVICES/REQUEST/BSM/STATS
Command ID	CMD_BSM_STATS_REQ (3)
IDL File(s)	v2x_app.proto, v2x_msgs.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	req_type	enum	-	-	Specify request type
			REQ_TYPE_BSM_RX_STATS	0x1	
			REQ_TYPE_BSM_TX_STATS	0x2	
			REQ_TYPE_BSM_RV_STATS	0x3	

			REQ_TYPE_BSM_CONN_STATE	0x4	
			REQ_TYPE_BSM_STATS_ALL	0x5	
optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.5.2 MD-REQ-499272/A-BSMStatsRes

This API from the TCU Bezel Diagnostic Server is the response to the BSMStatsReq.

API Name	BSMStatsRes
Operation	Response
Method Type	One-Shot
QoS Level	0 (Default)
Retained	No
Topic	SERVICES/RESPONSE/BSM/STATS
Command ID	CMD_BSM_STATS_RSP(4)
IDL File(s)	v2x_app.proto, v2x_msgs.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
repeated	bsm_rx_stats	BsmRxStats	-	-	Specify number of BSM events successfully received in past 1 min, 5 mins, 30 mins
	BsmRxStats: msgType	enum	-	-	
			BSM_MSG_TYPE_HVBSM	0x1	
			BSM_MSG_TYPE_RVBSM_LIST	0x2	
			BSM_MSG_TYPE_EVENT_RVBSM	0x3	
			BSM_MSG_TYPE_SPAT	0x4	
			BSM_MSG_TYPE_MAP	0x5	
			BSM_MSG_TYPE_UNKNOWN	0xFF	
	BsmRxStats: bsm_stats	BsmStatsCount	-	-	
	BsmStatsCount: oneMinCount	uint32	-	-	
	BsmStatsCount: fiveMinsCount	uint32	-	-	

	BsmStatsCount: thirtyMinsCount	uint32	-	-	
repeated	bsm_tx_stats	BsmTxStats	-	-	Specify number of BSM events successfully transmitted and failed to transmit over SOA in past 1 min, 5 mins, 30 mins
	BsmTxStats: txStatus	enum	-	-	
			TX_STATUS_FAILED	0x0	
			TX_STATUS_SUCCESS	0x1	
	BsmTxStats: bsm_stats	BsmStatsCount	-	-	
	BsmStatsCount: oneMinCount	uint32	-	-	
	BsmStatsCount: fiveMinsCount	uint32	-	-	
	BsmStatsCount: thirtyMinsCount	uint32	-	-	
repeated	bsm_rv_stats	BsmRvStats	-	-	Specify number of RV per classification zone in the past 1 min, 5 mins, 30 mins
	BsmRvStats: zone	enum	-	-	
			Classification_SameDirectionAhead	0x1	
			Classification_SameDirectionBehind	0x2	
			Classification_OncomingAhead	0x3	
			Classification_OncomingBehind	0x4	
			Classification_IntersectingRight	0x5	
			Classification_IntersectingLeft	0x6	
			Classification_Unclassified	0x7	
	BsmRvStats: bsm_stats	BsmStatsCount	-	-	
	BsmStatsCount: oneMinCount	uint32	-	-	

	BsmStatsCount: fiveMinsCount	uint32	-	-	
	BsmStatsCount: thirtyMinsCount	uint32	-	-	
optional	stack_conn_state	enum	-	-	Specify status of the data socket used by the stack for inbound traffic
			STATE_CONNECTED	0x1	
			STATE_DISCONNECTED	0x2	
optional	__apiVersion	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.6 TCU CV2X (Cellular Vehicle to Everything) MD's (only applicable for China variants)

6.8.5.2.6.1 MD-REQ-499157/A-StackStateReq

This API is used by the Bezel Diagnostic Client to request CV2X stack state from the TCU Bezel Diagnostic Server.

API Name	StackStateReq
Operation	Request
Method Type	One-Shot
QoS Level	0 (default)
Retained	No
Topic	SERVICES/REQUEST/V2X/STATE
Command ID	CMD_SERVICE_STATUS_REQ (1)
IDL File(s)	v2x_app.proto, v2x_msgs.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	__api_version	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.2.6.2 MD-REQ-499177/A-StackStateRes

This API from the TCU Bezel Diagnostic Server is the response to the StackStateReq.

API Name	StackStateRes
Operation	Response
Method Type	One-Shot
QoS Level	0 (Default)
Retained	No

Topic	SERVICES/RESPONSE/V2X/STATE
Command ID	CMD_SERVICE_STATUS_RSP(2)
IDL File(s)	v2x_app.proto, v2x_msgs.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	status_msg	ServiceStatus Message	-	-	V2X service status information
optional	ServiceStatusMessage: result_code	enum	-	-	
			RESULT_SUCCESS	0x1	
			RESULT_ERROR_GENERIC	0x2	
optional	ServiceStatusMessage: timestamp_ms_since_epoch	uint64	-	-	
optional	ServiceStatusMessage: service_status	enum	-	-	Specify service status
			STATUS_UNKNOWN	0x1	
			STATUS_FEATURE_UNSUPPORTED	0x2	
			STATUS_CONFIGURATION	0x3	
			STATUS_READY	0x4	
			STATUS_RUNNING	0x5	
			STATUS_TEMPORARY_ERROR	0x6	
			STATUS_FATAL_ERROR	0x7	
optional	ServiceStatusMessage: prefilter_status	enum	-	-	Specify pre-filter status

			PREFILTER_NONE	0x1	
			PREFILTER_ACTIVE	0x2	
			PREFILTER_CRITICAL	0x3	
optional	ServiceStatusMessage: error_description	string	-	-	Specify current error description if stack is in error condition
optional	ServiceStatusMessage: duration_sec_in_current_state	uint32	-	-	Specify duration (Seconds) in current state
optional	__apiVersion	enum	-	-	Specify API version. Unused now since there is only one version

6.8.5.3 Interface Requirements - ECG

6.8.5.3.1 ECG DID MD's

6.8.5.3.1.1 MD-REQ-396050/A-EcgSpcmCmDidReadReq

This API is used by the Bezel Diagnostic Client to request DID information from the ECG Bezel Diagnostic Server.

API Name	EcgSpcmCmDidReadReq
Operation	Request
Method Type	One-Shot
QoS Level	0 (default)
Retained	No
Topic	SERVICES/REQUEST/ECG/SPCM/CM/DID_READ
Command ID	ECG_SPCM_CM_DID_READ_REQ (0x0)
IDL File(s)	ecg_spcm_cm.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
Repeated	DidAddress	Int32	-	0x00000000 - 0xFFFFFFFF	Requested ECG DID address

6.8.5.3.1.2 MD-REQ-396051/A-EcgSpcmCmDidReadResp

This API from the ECG Bezel Diagnostic Server is the response to the EcgSpcmCmDidReadReq

API Name	EcgSpcmCmDidReadResp
Operation	Response
Method Type	One-Shot
QoS Level	0 (Default)
Retained	No
Topic	N/A – Supplied by request
Command ID	ECG_SPCM_CM_DID_READ_RESP (0x1)
IDL File(s)	ecg_spcm_cm.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	responseStatus	Enum	-	-	Response to initial request
			Success	0x00	
			Error Internal	0x01	
			Error Access Permission	0x02	
			Error Invalid Parameter	0x03	
			Error Not Initialized	0x04	
repeated	ResponseData	EcgSpcmCmDidData	-	-	
optional	EcgSpcmCmDidData: Address	Int32	-	0x00000000 - 0xFFFFFFFF	DID address

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optional	EcgSpcmCmDid Data: Data	String	-	-	DID Data

6.8.5.3.1.3 MD-REQ-396052/A-EcgSpcmCmDidRefreshInd

This API is used to receive updated DID information from the ECG. The ECG publishes all DID updates via this API.

API Name	EcgSpcmCmDidRefreshInd
Operation	Broadcast (OnChange)
Method Type	One-Shot
QoS Level	0 (Default)
Retained	Yes
Topic	SERVICES/DATA/ECG/SPCM/CM/DID_REFRESH
Command ID	ECG_SPCM_CM_DID_REFRESH_IND (0x100)
IDL File(s)	ecg_spcm_cm.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
repeated	refreshList	EcgSpcmCmDidData	-	-	
optional	EcgSpcmCmDid Data: Address	Int32	-	0x00000000 - 0xFFFFFFFF	DID address
optional	EcgSpcmCmDid Data: Data	String	-	-	DID Data

6.8.5.3.2 ECG DTC MD's

6.8.5.3.2.1 MD-REQ-396059/A-EcgVdmDtcGetReq

This API is used by the Bezel Diagnostic Client to request Diagnostic Trouble Code (DTC) information from the ECG Bezel Diagnostic Server.

API Name	EcgVdmDtcGetReq
Operation	Request
Method Type	One-Shot
QoS Level	0 (default)
Retained	No
Topic	SERVICES/REQUEST/ECG/VDM/DTC_GET
Command ID	ECG_VDM_DTC_GET_REQ (0x2)
IDL File(s)	ecg_vdm.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
Optional	dtcCode	String	-	-	Requested ECG DTC. Blank represents a request for all DTCs.

Note that Bezel Diagnostics never requests individual DTCs. Requests are always sent with a blank dtcCode meaning the request is for all DTCs

6.8.5.3.2.2 MD-REQ-396060/A-EcgVdmDtcGetResp

This API from the ECG Bezel Diagnostic Server is the response to the EcgVdmDtcGetReq

API Name	EcgVdmDtcGetResp
Operation	Response
Method Type	One-Shot
QoS Level	0 (Default)
Retained	No
Topic	N/A – Supplied by request
Command ID	N/A – Not required in response
IDL File(s)	ecg_vdm.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	responseStatus	Enum	-	-	Response to initial request
			Success	0x00	
			Failed	0x01	
			Download Request Error	0x02	
			Download Transfer Data Error	0x03	
			Download Transfer Exit Error	0x04	
			Download Busy Error	0x05	
			Download Checksum Error	0x06	
			ECU Request Timeout	0x07	
			Invalid NRC Length	0x08	
			External Tester Detected	0x09	
			Can Bus Not Available	0x0A	
			VMCU Software Error	0x0B	
			Denied Low Power	0x0C	
			ECU Not Responding	0x0D	
			ECU Not Present in Detected ECU List	0x0E	
			Resource Unavailable	0x0F	
			External Tester Detected On ECG	0x10	
repeated	dtcResponseData	EcgVdmDtc	-	-	
optional	EcgVdmDtc: dtcCode	String	-	-	DTC code
optional	EcgVdmDtc: dtcStatus	String	-	-	DTC status bits

repeated	dtcDescription	String	-	-	Description of the matching DTC code

6.8.5.3.2.3 MD-REQ-396061/A-EcgVdmDtcBroadcastResp

This API is used to receive updated DTC information from the ECG. The ECG publishes all DTC updates via this API.

API Name	EcgVdmDtcBroadcastResp
Operation	Broadcast (OnChange)
Method Type	One-Shot
QoS Level	0 (Default)
Retained	Yes
Topic	SERVICES/REQUEST/ECG/VDM/DTC_ONCHANGE
Command ID	N/A – Not required in broadcast
IDL File(s)	ecg_vdm.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
repeated	dtcResponseData	EcgVdmDtc	-	-	
optional	EcgVdmDtc: dtcCode	String	-	-	DTC code
optional	EcgVdmDtc: dtcStatus	String	-	-	DTC status bits

6.8.5.3.3 System Statistics MD's

6.8.5.3.3.1 MD-REQ-396064/A-SysStatsReq

This API is used by the Bezel Diagnostic Client to request system statistics information from the ECG Bezel Diagnostic Server.

API Name	SysStatsReq
Operation	Request
Method Type	One-Shot
QoS Level	0 (default)
Retained	No
Topic	SERVICES/REQUEST/ECG/SPCM/SYSSTAT
Command ID	N/A
IDL File(s)	ecg_spcm_common.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
Optional	clientCorrelationId	Int32	-	-	If set this value will also be set in the

					response message. This can be used to tie requests to their response messages.

Note that Bezel Diagnostics never uses clientCorrelationIds. Responses are simply assumed to be the latest values.

6.8.5.3.3.2 MD-REQ-396065/A-SysStatsResp

This API from the ECG Bezel Diagnostic Server is the response to the SysStatsReq

API Name	SysStatsResp
Operation	Response
Method Type	One-Shot
QoS Level	0 (Default)
Retained	No
Topic	N/A – Supplied by request
Command ID	N/A – Not required in response
IDL File(s)	ecg_spcm_common.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	isRespValid	Int32	-	-	Used as bool to indicate if the response is valid
optional	clientCorrelationId	Int32	-	-	Matches the value sent in the request if there was one.
optional	ecgCpuCore0Idle	Int32	-	-	Idle percentage for core 0
optional	ecgCpuCore1Idle	Int32	-	-	Idle percentage for core 1
optional	ecgCpuCore2Idle	Int32	-	-	Idle percentage for core 2
optional	ecgCpuCore3Idle	Int32	-	-	Idle percentage for core 3
optional	ecgCpuAllCoresAvgIdle	Int32	-	-	Average idle percentage across all cores
optional	ecgRamMegabytesTotal	Int32	-	-	Total Device Ram in Megabytes
optional	ecgRamMegabytesAvailable	Int32	-	-	Available Device Ram in Megabytes
optional	ecgDiskKilobytesTotal	Int32	-	-	Total Device Flash in Kilobytes

optional	ecgDiskKilobytes Used	Int32	-	-	Used Device Flash in Kilobytes

Bezel Diagnostics only displays three stats: Ram usage, Disk Usage, and Processor Usage. All 3 require some small processing before being displayed. Processor Usage is the inverted percentage of all cores average idle. Disk Usage is calculated as the disk used value over the disk available value converted to percent. Ram usage is calculated as the Ram total minus the Ram available to get the ram used, then that value over the Ram total converted to percent.

6.8.5.3.4 ECG SDN Connection MD's

6.8.5.3.4.1 MD-REQ-396086/A-FciGenericService

This API is used by the Bezel Diagnostic Client to request information about the connection to the Service Delivery Network (SDN) from the ECG Bezel Diagnostic Server.

API Name	FciGenericService
Operation	Request
Method Type	One-Shot
QoS Level	0 (default)
Retained	No
Topic	SERVICES/REQUEST/FNV/FCI/GENSERVICE
Command ID	SDN_CONNECT_STATUS (0x0)
IDL File(s)	fci_service.proto, fci_broadcast.proto, fci_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	serviceType	Enum	-	-	The service that this request is for
			SDN Connect	0x0	
			TCU SMS	0x1	
			Request Broadcast Info	0x2	
			Vehicle Status Update	0x3	
			Command Handle Register	0x4	
optional	rpcResponse Required	bool	-	-	Set when you want a response to the message
optional	sdnConnMsg	SdnConnectMessage	-	-	Contains fields for sending SDN Connect messages
optional	tcuSmsMsg	TcuSmsMessage	-	-	Contains fields for sending TCU SMS messages
optional	reqBroadcastInfoType	Enum	-	-	Select the information to request
			Connection Status	0x0	
			Power State	0x1	

			All	0x2	
optional	vstatusUpdateMsg	VehicleStatusUpdateMessage	-	-	Contains fields for sending vehicle status update messages
optional	cmdHandlerMsg	CmdHandlerRegisterMessage	-	-	Contains fields for command handle register messages
optional	__api_version	Enum	-	-	Specify API version. Unused now since there is only one version

The additional fields found in SdnConnectMessage, TcuSmsMessage, VehicleStatusUpdateMessage, and CmdHandlerRegiserMessage have all been omitted since they are never used by Bezel Diagnostics. Bezel Diagnostics only requests broadcast information.

When Making this request the serviceType is set to request broadcast info (0x2), rpcResponseRequired is set to true, and reqBroadcastInfoType is set to Connection Status (0x0). All other fields are ignored as they are not used.

6.8.5.3.4.2 MD-REQ-396091/A-BroadcasInfoMessage

This API from the ECG Bezel Diagnostic Server is the response to the FciGenericService

API Name	BroadcasInfoMessage
Operation	Response
Method Type	One-Shot
QoS Level	0 (Default)
Retained	No
Topic	N/A – Supplied by request
Command ID	N/A – Not required in response
IDL File(s)	fci_service.proto, fci_broadcast.proto, fci_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	reqBroadcastInfoType	Enum	-	-	Indicates the information in the response
			Connection Status	0x0	
			Power State	0x1	
			All	0x2	
optional	sdnConnStatusMsg	SdnConnStatusMessage	-	-	Contains the connection status information
optional	SdnConnStatusMessage: ifType	Enum	-	-	Indicates the connection path to the SDN

			Unknown	0x0	
			TCU Cellular	0x1	
			TCU Wifi	0x2	
			SYNC Wifi	0x3	
			SYNC SDL	0x4	
optional	SdnConnStatusMessage: connStatus	Enum	-	-	Indicates the status of the connection
			Connected	0x0	
			Disconnected	0x1	
optional	powerStateMsg	PowerStateMessage	-	-	Contains the power state information
optional	__api_version	Enum	-	-	Specify API version. Unused now since there is only one version

The additional fields found in PowerStateMessage have been omitted since they are never used by Bezel Diagnostics. Bezel Diagnostics only requests the connection status.

6.8.5.3.4.3 MD-REQ-396090/A-BroadcastMessage

This API is used to receive changes in the SDN connection status from the ECG.

API Name	BroadcastMessage
Operation	Broadcast (OnChange)
Method Type	One-Shot
QoS Level	0 (Default)
Retained	Yes
Topic	SERVICES/DATA/FNV/FCI/BROADCAST
Command ID	N/A – Not required in broadcast
IDL File(s)	fci_service.proto, fci_broadcast.proto, fci_info.proto

Required/ Optional/ Repeated	Name	Type	Literals	Value	Description
optional	timeStamp	Uint32	-	-	Seconds since Jan 1 1970
optional	broadcastType	Enum	-	-	Indicates the information in the broadcast
			Connection Status	0x0	
			Power State	0x1	
			All	0x2	
optional	sdnConnStatusMsg	SdnConnStatusMessage	-	-	Contains the connection

					status information
optional	SdnConnStatus Message: ifType	Enum	-	-	Indicates the connection path to the SDN
			Unknown	0x0	
			TCU Cellular	0x1	
			TCU Wifi	0x2	
			SYNC Wifi	0x3	
			SYNC SDL	0x4	
optional	SdnConnStatus Message: connStatus	Enum	-	-	Indicates the status of the connection
			Connected	0x0	
			Disconnected	0x1	
optional	powerStateMsg	PowerStateMessage	-	-	Contains the power state information
optional	smsMsg	SmsMessage	-	-	Contains information for sending a broadcast SMS
optional	__api_version	Enum	-	-	Specify API version. Unused now since there is only one version

The additional fields found in PowerStateMessage and SmsMessage have been omitted since they are never used by Bezel Diagnostics. Bezel Diagnostics only monitors the connection status.

6.8.6 Use Cases

6.8.6.1 DIAG-UC-REQ-016451/C-Bezel Diagnostics – Enter Bezel Diagnostics (TcSE ROIN-291319-1)

Actors	User
Pre-conditions	Infotainment System Powered On ~~There is an Active Media Source (AM/FM, CD, SDARS, USB…)~~ A phone call is not active No other higher priority feature preventing bezel diagnostics from being entered.
Scenario Description	User presses two designated buttons as defined by the HMI
Post-conditions	Bezel Diagnostics is entered. Bezel diagnostics will start speaker walk-around and if conditions not met for speaker walk-around then will enter the main bezel diagnostics screen.
List of Exception Use Cases	E1–DIAG-GUC-291320-1-Bezel Diagnostics – Cannot enter Bezel Diagnostics
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch) Audio OUT
Notes	Note for the pre-condition, the Bezel Diagnostic Client could choose to have "There is an Active Media Source (AM/FM, CD, SDARS, USB…)" as a pre-condition for entering Bezel Diagnostics. That is up to the Bezel Diagnostic Client team.

6.8.6.2 DIAG-UC-REQ-016454/D-Bezel Diagnostics – Exit Bezel Diagnostics (TcSE ROIN-291079-1)

Actors	User
Pre-conditions	Infotainment System Powered On Bezel Diagnostics is Active
Scenario Description	Exit Bezel Diagnostics is selected by: -- Pressing the power button. -- Pressing the <Exit Bezel Diagnostics> HMI button -- The ignition status changes -- There is a higher priority feature active (ex place a phone call)
Post-conditions	Bezel Diagnostics is exited
List of Exception Use Cases	
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch)

6.8.6.3 DIAG-UC-REQ-016461/B-Bezel Diagnostics – Main Menu (TcSE ROIN-291070-1)

Actors	User
Pre-conditions	Infotainment System Powered ON Bezel Diagnostics is active
Scenario Description	Speaker Walkaround complete or exited, or Speaker Walkaround entry conditions not met when bezel diagnostics entered, or While in bezel diagnostic submenu exit out of the submenu
Post-conditions	Enter main menu of Bezel Diagnostics with all bezel diagnostic components listed as separate menu picks. (ex. APIM Diagnostics, Audio Diagnostics, EFP Diagnostics)
List of Exception Use Cases	
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch)

6.8.6.4 DIAG-UC-REQ-016462/B-Bezel Diagnostics – Module Specific Sub menu (TcSE ROIN-291071-1)

Actors	User
Pre-conditions	Infotainment System Powered On. Bezel Diagnostics is active
Scenario Description	Module Component Diagnostic Submenu is selected by User.
Post-conditions	Module component submenu HMI is displayed (i.e. Part Numbers, SDARS ESN, Signal Strength, Speaker Walkaround)
List of Exception Use Cases	
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch)

6.8.6.5 DIAG-UC-REQ-016463/C-Bezel Diagnostics – Component Part Numbers (TcSE ROIN-291072-1)

Actors	User
Pre-conditions	Infotainment System Powered OnBezel Diagnostics is active
Scenario Description	Component Part Numbers Menu selected by User in Component Bezel Diag Submenu.
Post-conditions	HMI displays individual component Part Numbers.
List of Exception Use Cases	
Interfaces	G-HMI (Graphic HMI) CBI (Center Stack Button Interface – Touch/Non Touch)

6.8.7 General Requirements

6.8.7.1 DIAG-SR-REQ-273206/B-Security protections and Bezel Diagnostics - SOA

There are no security protections preventing a user from entering Bezel Diagnostics (i.e. press and hold a button combination to access bezel diagnostics mode). Once inside the bezel diagnostics menu there are some items that will not be displayed if the users SYNC has a secure software load on it and does not have the 'sync_ap_debug' token. Those items are the TCU and ECG DTCs, as well as the home and provisioning URLs for the ECG. If the token check fails the menu will display "Diagnostics Data Unavailable" for those items.

6.8.8 Requirements

6.8.8.1 Requirements TCU

6.8.8.1.1 TCU DID requirements

6.8.8.1.1.1 DIAG-SR-REQ-395973/A-TCU DID data

When Bezel Diagnostics is activated the Bezel Diagnostic Client shall make the API call using SpcmDIDReadReq to the TCU Bezel Diagnostic Server for the data in the table below. This would be a single request with all the DID's. This data will all be returned in a SpcmDIDReadResp message. The string config data would use 7-bit ASCII.

If any of the DID values change, they will be broadcasted in a SpcmDidUpdateInd message and updated in the Bezel Diagnostics menu.

The DIDs requested are listed in this table below

Requested Data	DID Address	Config data	Description
TCU Provisioning Status	0xD021	Factory Mode (0x30) Unprovisioned Mode (0x31) Provisioned Mode (0x32)	Show TCU provisioning status (authorization state)
TCU VMCU Software Version Number	0xFD14	String	Show the CAN VMCU SW version
TCU Hardware part number	0xF111	String	Show the modem SW version
TCU ESN	0xF17F	String	Show the modem hardware part number
TCU ICCID	0x41AE	String	Show the Electronic Serial Number for the TCU
TCU AP SW Number	0xFD12	String	Show the unique serial number that represents the SIM
TCU AP Part Number	0xF120	String	Show the AP software part number
TCU AP Bootloader SW Number	0xFD13	String	Show the AP bootloader software number
TCU AP Bootloader Part Number	0x8068	String	Show the AP bootloader part number
TCU VMCU Part Number	0xF188	String	Show the VMCU part number
TCU VMCU Bootloader SW Version Number	0xFD15	String	Show the VMCU bootloader software version number
TCU VMCU Bootloader Part Number	0xD027	String	Show the VMCU bootloader part number
TCU Modem Part Number	0xF121	String	Show the TCU modem part number

6.8.8.1.2 TCU DTC Data

6.8.8.1.2.1 DIAG-SR-REQ-396965/A-TCU DTC data needed for bezel diagnostics

When Bezel Diagnostics is activated the Bezel Diagnostic Client shall make the API call using TcuViewDtcReq to the TCU Bezel Diagnostic Server for the current status of all Diagnostic Trouble Codes (DTCs). This would be a single request for all the DTCs. The string config data would use 7-bit ASCII.

The DTCs are returned already split into active and confirmed DTC lists. It is possible for a DTC to be both active and confirmed, so a DTC may appear in both lists. These lists are not stored in SYNC and will be re-requested each time bezel diagnostics is opened.

Whenever any DTC status changes that information will be sent in a TcuViewDtcInd. The lists will be updated with any new active or confirmed DTCs.

DTCs are one of the Bezel Diagnostics items that are hidden when security requirements are not met. If the SYNC is running secure software and the 'sync_ap_debug' token is not present, the DTC list will not be displayed and the Bezel Diagnostics menu will instead show 'Diagnostics Data Unavailable'

6.8.8.1.3 TCU Cellular Controls

6.8.8.1.3.1 DIAG-SR-REQ-396940/A-TCU cellular control data needed for bezel diagnostics

When Bezel Diagnostics is activated the Bezel Diagnostic Client shall make four API calls: CellularCtrlGetCurrentTechReq, CellularCtrlServingCellNasStatusReq, CellularCtrlServingCellIdReq, and CellularCtrlServingCellImeiSvReq. There are no fields that need to be set in these requests. The TCU Bezel Diagnostics Server will respond with the corresponding response messages: CellularCtrlGetCurrentTechResp, CellularCtrlServingCellNasStatusResp, CellularCtrlServingCellIdResp, and CellularCtrlServingCellImeiSvResp. Each response contains a single string or enum that will be displayed in the Bezel Diagnostics menu, along with a response status and api version for internal use only.

Whenever the RAT, NAS Status, or serving cell tower ID changes that information will be sent in a CellularCtrlTechInd, CellularCtrlServingCellNasStatusInd, or CellularCtrlServingCellIdInd broadcast message. The corresponding value is then updated in Bezel Diagnostics. Note that the IMEI SV cannot change while the device is running so there is no broadcast message for that field.

6.8.8.1.4 TCU DCM (Data Connection Manager)

6.8.8.1.4.1 DIAG-SR-REQ-396961/A-TCU DCM (Data Connection Manager) data needed for bezel diagnostics

When Bezel Diagnostics is activated the Bezel Diagnostic Client shall make two API calls using TcuPdpApnStateReq to the TCU Bezel Diagnostic Server, one for each APN type. Each call will set a different APN type in the apn_type field. The TCU Bezel Diagnostics Server will respond with two TcuPdpApnStateRsp messages, one for each APN type. The Bezel Diagnostics Menu will display the PDP state string.

Whenever any DCM status changes that information will be sent in a TcuPdpApnStateInd. The PDP state for the APN will be updated to the new state in Bezel Diagnostics.

6.8.8.1.5 TCU CV2X (Cellular Vehicle to Everything) (Only applicable in China variants)

6.8.8.1.5.1 DIAG-SR-REQ-499273/A-TCU CV2X data needed for bezel diagnostics

When Bezel Diagnostics is activated the Bezel Diagnostic Client shall make the API call using StackStateReq to the TCU Bezel Diagnostic Server for the current status of CV2X stack. The TCU Bezel Diagnostics Server will respond with StackStateRes which contains stack state, pre-filter state, error description if stack is in error condition and duration in current state. The Bezel Diagnostics Menu will display the V2X stack state.

Bezel Diagnostic Client will request for CV2X data only if it's connected to TCU2 CV2X and will re-request data in every minute to get updated stack state from TCU Bezel Diagnostic Server.

6.8.8.1.6 TCU BSM (Basic Safety Message) (Only applicable for China variants)

6.8.8.1.6.1 DIAG-SR-REQ-499274/A-TCU BSM data needed for bezel diagnostics

When Bezel Diagnostics is activated the Bezel Diagnostic Client shall make the API call using BsmStatsReq to the TCU Bezel Diagnostic Server for the BSM stats. The TCU Bezel Diagnostics Server will respond with BsmStatsRes which contains BSM Rx stats, BSM Tx stats, BSM RV stats and stack connection status. The Bezel Diagnostics Menu will display the BSM stats.

Bezel Diagnostic Client will request for BSM stats only if it's connected to TCU2 CV2X and will re-request data in every minute to get updated BSM stats from TCU Bezel Diagnostic Server.

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6.8.8.2 Requirements ECG

6.8.8.2.1 ECG DID Requirements

6.8.8.2.1.1 DIAG-SR-REQ-396056/A-ECG DID data

When Bezel Diagnostics is activated the Bezel Diagnostic Client shall make the API call using EcgSpcmCmDidReadReq to the ECG Bezel Diagnostic Server for the data in the table below. This would be a single request with all the DIDs listed in the repeated DidAddress field. The string config data would use 7-bit ASCII. If any DID values change, they will be broadcasted in an EcgSpcmCmDidRefreshInd message and updated in the Bezel Diagnostics menu.

Home and provisioning URLs are two of the Bezel Diagnostics items that are hidden when security requirements are not met. If the SYNC is running secure software and the 'sync_ap_debug' token is not present, the URLs will not be displayed, and the Bezel Diagnostics menu will instead show 'Diagnostics Data Unavailable'

The DIDs requested are listed in this table below

Requested Data	DID Address	Config data	Description
ECG Provisioning Status	0xD021	Factory Mode Default (0x20) Unprovisioned Mode (0x21) Waiting for ECG Response (0x22) Waiting for TCU Response (0x23) Waiting for Home URL (0x24) Connecting to Home URL (0x25) Provisioned Mode (0x26)	Show ECG provisioning status (authorization state)
ECG Hardware Part Number	0xF111	String	Show the Hardware Part Number
ECG VMCU Software Number	0xFD14	String	Show the VMCU software version
ECG VMCU Configuration Part Number	0xF188	String	Show the VMCU configuration part number
ECG VMCU Bootloader Software Number	0xFD15	String	Show the VMCU bootloader software version
ECG VMCU Bootloader Part Number	0xD027	String	Show the VMCU bootloader part number
ECG AP Software Number	0xFD12	String	Show the AP software part number
ECG AP Configuration Number	0x8033	String	Show the AP configuration number
ECG AP Bootloader Software Number	0xFD13	String	Show the AP bootloader software number
ECG AP Bootloader Part Number	0x8068	String	Show the AP bootloader part number
ECG ESN	0xF17F	String	Show the Electronic Serial Number
ECG Application Part Numbers	0x8060	String	Show the part numbers for the applications on the ECG
ECG Application Part Numbers 2	0x8061	String	Show the part numbers for the applications on the ECG
ECG Provisioning URL	0xD01E	String	Show the URL the ECG connects to for provisioning

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ECG Home URL	0xFD24	String	Show the URL the ECG connects to after it is provisioned

6.8.8.2.2 ECG DTC data

6.8.8.2.2.1 DIAG-SR-REQ-396063/A-ECG DTC Data

When Bezel Diagnostics is activated the Bezel Diagnostic Client shall make the API call using EcgVdmDtcGetReq to the ECG Bezel Diagnostic Server for the current status of all Diagnostic Trouble Codes (DTCs). This would be a single request for all the DTCs which is done by leaving the dtcCode field blank. The string config data would use 7 bit ASCII.

The status bits are analyzed to form two lists of all active and confirmed DTCs. If the first bit is set they are placed in the active DTC list and if the fourth bit is set they are placed in the confirmed DTC list. It is possible for both bits to be set in which case the DTC will appear in both lists. These lists are not stored in SYNC and will be re-requested each time bezel diagnostics is opened.

Whenever any DTC status changes that information will be sent in an EcgVdmDtcBroadcastResp. The lists will be updated with any new active or confirmed DTCs.

DTCs are one of the Bezel Diagnostics items that are hidden when security requirements are not met. If the SYNC is running secure software and the 'sync_ap_debug' token is not present, the DTC list will not be displayed and the Bezel Diagnostics menu will instead show 'Diagnostics Data Unavailable'

6.8.8.2.3 ECG System Statistics

6.8.8.2.3.1 DIAG-SR-REQ-396066/A-ECG System Statistics

When Bezel Diagnostics is activated the Bezel Diagnostic Client shall make the API call using SysStatsReq to the ECG Bezel Diagnostic Server for the current system statistics. This would be a single request leaving the clientCorrelationId field blank. These values are returned in SysStatsResp.

These values are constantly changing so there is no broadcast message for them. Bezel Diagnostics simply re-requests the system stats every 5 seconds with another SysStatsReq message.

6.8.8.2.4 ECG SDN Connection

6.8.8.2.4.1 DIAG-SR-REQ-396094/A-ECG SDN Connection

When Bezel Diagnostics is activated the Bezel Diagnostic Client shall make the API call using FciGenericService to the ECG Bezel Diagnostic Server for the current Service Delivery Network (SDN) connection status. When Making this request the serviceType is set to request broadcast info (0x2), rpcResponseRequired is set to true, and reqBroadcastInfoType is set to Connection Status (0x0). All other fields are ignored as they are not used.

Responses come back as BroadcasInfoMessage messages. The only field Bezel Diagnostics reports is the connStatus enum within the sdnConnStatusMsg portion of the BroadcasInfoMessage.

Whenever the SDN connection status changes that information will be sent in a BroadcastMessage. Again, the only field Bezel Diagnostics reports is the connection status enum within the SDN connection status message.

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7 Appendix: Reference Documents

Reference #	Document Title
1	Reference APIM IDS (infotainment diagnostic spec) for additional ways to initiate speaker walk-around with the test tool
2	H39 Bezel Diagnostics HMI spec
3	A65 Button HMI spec – contains button combination for entering bezel diagnostics
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