

Primary Text

Introduction

Purpose & Scope

This document contains the requirements for product Short Range Radar, 3rd generation, for Subaru customer.

Usage of DOORS Attributes

Explanation of the specific attributes to be used in this document:

- (1) As the DOORS scripts are based on the conventions defined here, they shall not be changed - otherwise the script will fail.
- (2) The explanations for the attributes must not be changed, only a refinement may be done.
- (3) The master documentation of the DOORS attribute is covered at [3].

_Comment:

Text field available for user entries, e.g. deviations, questions, open issues, comments on the history of this requirement.

_CommentReview:

Text field for review comments.

The approach for object reviews is as follows:

- (1) Baseline the DOORS module (in order to define the scope of review object)
- (2) Invite to the review
- (3) Participants provide (offline) comments using the attribute "_CommentReview":
 - use convention for entries: "<date>: <name>: <comment>"
 - this attribute is not "änderungsrelevant"
- (4) Conduct review meeting via e.g. Walk Through based on "_CommentReview"
- (5) Baseline the DOORS module after the review meeting
- (6) Rework DOORS module based on review comments:
 - Small changes are done during meeting
 - Big changes: are to be documented using the Review Tool

There shall be at minimum one comment in the Review Tool with reference to "_CommentReview", if reasonable, the final comment.

- (7) Baseline the DOORS module after rework / for release.

_Feature Block:

all featureblocks shall be in template, it is allowed to tailor the feature blocks which are not for the respective technology
valid feature list is available in ADAS 2.1

_Importance:

The importance of a DOORS element helps answering the questions:

- *) How much is the overall feature block and its performance endangered, if the requested requirement is not available?
- *) What is the maturity of the feature block in terms of e.g. are all "important" requirements available?

Hints for filling this attribute:

- (1) "High (= Basic)": The requirement is essential for the primary or main use cases of the feature block. Without this requirement the feature block is not usable.
 - (2) "Medium": Besides the primary use cases, there are additional use cases (e.g. exceptions, seldom or special situations).
 - (3) "Low": to be used for requirements which do not fall in the category "high" or "medium" (e.g. address special modes like maintenance).
- But: the requirement may not be a necessary precondition for high / medium requirements or there is a work-around which allows the use of the feature block.

Hints:

- (1) Be aware that all requirements (independent from _Importance) are "must"-requirements and have to be implemented.
- (2) The chosen value shall be consistent with _importance of those elements which are to be satisfied by this DOORS element.
- (3) In case of test specifications, _Importance of test cases is derived automatically from the DOORS elements which are tested.
- (4) Do not mix up _Importance with _SafetyRelevant.
- (5) _Importance does not reflect the urgency.
- (6) For additional hints, see "AD RE Method"

_ObjectType:

Category of the object.

Explanation of values:

- (1) Requirement: Each requirement needs at least one verify link and one satisfy link. Value is used in requirements specifications.
- (2) Design-Decision: in case a L2 requirement has _Responsibility = "System Architect", there must be a corresponding L2 architecture element with _ObjectType = "Design-Decision" and _Responsibility. At least one test case has to be linked (see _TestMethod for source), the test cases are the L2 integration tests.
- (3) Test-Case: has the "heading" of the test case, the following DOORS elements have the detailed specification of the test case.
- (4) Test-Step: steps to be performed in order to conduct the test case. The 1st test step has the test environment to be used.
- (5) Filling-Instruction: instructions what has to be filled in at the particular chapter of a DOORS template.
- (6) Heading: heading of a chapter within the specification
- (7) TBD: indicates, that no decision has been made yet.

Remark: DOORS elements with

_ObjectType = [Requirement | Design-Decisions | Test-Case | Test-Step]

cover the relevant content of a DOORS module and shall be attributed appropriately, while Explanations, Headings, Filling-

_PlannedFor:

Via this attribute the DOORS entries are assigned to a specific sample loop during which the implementation / conduct of

First draft is based on results from PACT workshop, for every sample the value has to be updated if not part of the release

Remark: The usage of this attribute is optional. The standard for planning the implementation / conduct of DOORS entries

(1) The DOORS module is structured according to functions / features / feature blocks.

(2) Within the sample loop plan (or sample loop plannings within the project plans) the chapters of the DOORS module are

Has to be defined in project at start, values are tailorable depending on project/ domain

_Project:

Used to identify the project which this requirement/ design decision is valid for.

It is possible to use wildcard project e.g. xMFC4xx means that the requirement is valid for all projects SMFC400, MFC400

If the requirement is not valid for all projects which are part of this project wildcard each individual project has to be mentioned

{LINK title="https://cws1.conti.de/content/11000700/Team%20Documents/01_General%20Information/ADAS%202.1/_ProjectList.html"}

Not all values are mentioned on the left side cause list will increase with every new project.

_SpecialCharacteristics:

TBD - Characteristic has to be determined

D - Characteristic, referring to government regulations and customer requirements with special requirements for documentation

The D-Characteristics indicate a product or process characteristics, which requires achieved documentations.

D-characteristics are related to legal and safety requirements.

Characteristics related to legal and safety requirements, which do not require documentation can be marked as Wcharacteristics

W - Important characteristic for product function or for further processing of the product. (SC, B)

The W-Characteristics indicates the demanded labelling of a product or process characteristics.

A W-characteristic is an important product or process characteristic, whose execution to specification is of special importance

It marks requirements, measures, or activities to be high importance to production, customer, or handling of the product e

NA - not applicable

_Status Project:

for internal documents

Concerns only requirements. For internal use only.

one status per project, if only one project -> also this project shall be referenced, Project value shall be identical to _Project

- TBD: default value, indicates entry where it has to be decided if entry is new or n/a for project. NOT a final/end state,
- New: indicates recently added entry which is valid for the project; NOT a final/end state,
- Changed: indicates changed entry; NOT a final/end state
- Follow Up: Indicates open issues / review. NOT a final/end state
- Ready for review: requirement is specified and ready for review. Indicates open issues / review. NOT a final/end state
- Agreed: Requirement is reviewed (!) and released for implementation and testing. Possible final/end state
- Rejected: This requirement is rejected. Reason(s) for this shall be documented (e.g. attribute _Comment). Indicates an o
- Deleted: This requirement will not be implemented. Reason(s) for this shall be documented (e.g. attribute _Comment). I
- n/a: The status for this object is not applicable. Reason(s) for this: Requirement is not applicable for this application proj

_Test:

_Test defines which tests completely cover the overall DOORS element and which role is responsible for specifying and p

Remarks:

- (1) Value "Review": The owner of the DOORS module is responsible for tracking that the review is being conducted.
- (2) If more than one value is selected for this attribute, the DOORS element shall have a verification criterion which specifies
- (3) In case a system requirement (either L1 or L2) cannot be tested at system level (value != "System Test"), but only at L

_Platform:

_Platform defines which vehicle series shall be applied to requirements.

Terminology and Abbreviations

The following abbreviations are used in this document. See also common glossary LINK:

doors://rbgs854a:40000/?version=2&prodID=0&urn=urn:telelogic::1-503e822e5ec3651e-M-0000cfc0

References

[1] PSAD Process in pKit Version <x.y.z>

{LINK title="http://inprojectkit:8080/pkit/main.do" uri=http://inprojectkit:8080/pkit/main.do}

- > Division Chassis & Safety
- > Passive Safety & ADAS
- > PSAD Process <x.y.z>

[2] ADAS RE Method:

- go to [1] -> Engineering
- > Methods and Guidelines
- > Requirements Engineering Method
- > AD RE Method

[3] DOORS Attribute List

- go to [1] -> Engineering
- > Methods and Guidelines
- > Requirements Engineering Method
- > AD RE DOORS Attributes

[4] ADAS L2 Architectural Design Method:

- go to [1] -> Engineering
- > Methods and Guidelines
- > Architecture Description Method
- > AD_L2_Architectural_Design_Method

[5] ADAS Overall Test Method:

go to [1] -> Engineering
-> Methods and Guidelines
-> AD_Overall_Test_Method

[6] PSAD Review Method:

go to [1] -> Engineering
-> Methods and Guidelines
-> PSAD Review Method

ISO 15765-3:2004 : Road vehicles - Diagnostics on Controller Area Networks (CAN) - Part 3: Implementation of u
MKS path:

{LINK title="http://mks-psad:7001/si/viewrevision?projectName=/nfs/projekte1/PROJECTS/SMR200/05%5fSoftware/02%5f
psad:7001/si/viewrevision?projectName=/nfs/projekte1/PROJECTS/SMR200/05%5fSoftware/02%5fRequirements/02%5f

ISO 14229-1:2006 : Road vehicles - Unified diagnostic services (UDS) - Part 1: Specification and requirements

MKS path:

{LINK title="http://mks-psad:7001/si/viewrevision?projectName=/nfs/projekte1/PROJECTS/SMR200/05%5fSoftware/02%5f
psad:7001/si/viewrevision?projectName=/nfs/projekte1/PROJECTS/SMR200/05%5fSoftware/02%5fRequirements/02%5f

Vector Packages and communication, in Subaru SRR320SU16 project in MKS:

{LINK title="http://mks-psad:7001/si/viewproject?projectName=/nfs/projekte1/SW/SW_SRR3xx/SW_SRR320SU16/M11_A
psad:7001/si/viewproject?projectName=/nfs/projekte1/SW/SW_SRR3xx/SW_SRR320SU16/M11_APPL/01_Supporting_F

Vector Packages in Subaru SRR320SU85 project in JAZZ

{LINK title="https://jazz.conti.de/ccm4/web/projects/Radar_SRR320SU85_DM#action=com.ibm.team.scm.browseElement
wan.com/ccm4/web/projects/Radar_SRR320SU85_DM#action=com.ibm.team.scm.browseElement&workspaceltemId=_5

Terminology, Abbreviations and Definitions

Abbreviations

The following abbreviations are used in this document. See also common glossary LINK: doors://lndp160a.cw01.contiwan.com

Definitions

For explanation of definitions used in this document see Glossary (i.e. follow link)

Note to the wording of the requirements

Classification rules for priority

The priority is defined as follows:

- 1 highest priority

5 lowest priority

Priority of documents

Numbers

All numbers in the document are decimal numbers unless they have prefix. Hexadecimal numbers are labeled with the prefix 0x.

Binary numbers are labeled with the suffix b (example 0011b is equivalent to the decimal number 3).

Reference Documents / Applicable Standards

Design and Implementation Constraints

Reliability

Availability

Due to the limitation of vector stack, two SWs will be provided, Left sensor SW and Right sensor SW. In the upcoming release, the SWs will be merged into one.

Max. response time (real time requirements)

Security

Interfaces

Car

CAN Physical Layer

IPC / MTS

ADC

EEPROM

NVM related requirements

Motor

Radar

Software Interfaces

General

Interfaces/Integration of 3rd-party software packages

On chip (to the micro controller/microprocessor)

On board (to the hardware on the ECU)

Software Configuration / Persistent Data

Functions

System State Transition

Transition scheme:

{IMAGE id=2512878 title="1409_Object_Text_0.bmp" uri="https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources/1409_Object_Text_0.bmp" data-bbox="121 637 1000 652"/>

System States Description

System OFF Mode - System shall be shutdown.

CAN output - no communication

Normal BSD / LCA Mode - Radar shall be Enabled, BSD shall be Enabled, LCA shall be Enabled, RCTA shall be Disabled

This state shall be set when:

- Ignition shall be ON.
- Shift position shall not be R (Rear)
- Vehicle Speed shall be greater or equal to 10 kph.

In this state when objects are detected the sensors must enter in BSD Level 1 (signals RDR228_7_3_WARN_LCA_L_1S)

Normal RCTA Mode - Radar shall be Enabled, BSD shall be Disabled, LCA shall be Disabled, RCTA shall be Enabled.

This state shall be set when:

- Ignition shall be ON.
- Shift position shall be R (Rear)
- No speed condition.

In this state when objects are detected both LEDs must be ON and one of the signals RDR228_7_7_WARN_RCTA_L or

Fail Safe Mode - Radar shall be Disabled, BSD shall be Disabled, LCA shall be Disabled, RCTA shall be Disabled.

This state shall be set when:

If a DTC was detected RDR228_2_4_FAIL_RDRSYS shall be set to 1.

or

If a Cancel Code was detected RDR228_2_5_STOP_RDRSYS shall be set to 1.

Blockage Mode - Radar shall be Enabled, BSD shall be Disabled, LCA shall be Disabled, RCTA shall be Disabled.

This state shall be set when:

The car is running and no object is detected for a long period of time (600 seconds times)

When the sensor it is in this state the signal RDR228_2_7_BLOCKAGE_FORMING must be set on 1.

Normal OFF Mode - Radar shall be Disabled, BSD shall be Disabled, LCA shall be Disabled, RCTA shall be Disabled.

This state shall be set when:

Main SW should be switch OFF.

System States Transition conditions

System OFF Mode -> Normal BSD / LCA Mode

- Ignition shall be ON.
- Shift position shall not be R (Rear)
- Vehicle Speed shall be greater or equal to 10 kph.

System OFF Mode -> Normal RCTA Mode

- Ignition shall be ON.
- Shift position shall be R (Rear)
- No speed condition.

Normal BSW / LCA Mode -> Blockage Mode

- Blockage of the sensor shall be detected. (Sensor is blocked).

Normal BSW / LCA Mode -> Fail Safe Mode

- Any DTC/Cancel Code was detected.

Normal BSW / LCA Mode -> Normal RCTA Mode

- Shift position shall be R (Rear)
- No speed condition.

Normal BSW / LCA Mode -> Normal OFF Mode

- Main Switch shall be OFF.

Normal BSW / LCA Mode -> System OFF Mode

- Ignition shall be OFF.

Normal RCTA Mode -> Fail Safe Mode

- Any DTC was detected.

Normal RCTA Mode -> Normal BSW / LCA Mode

- Shift position shall not be R (Rear)
- Vehicle Speed shall be greater or equal to 10 kph.

Normal RCTA Mode -> Normal OFF Mode

- Main Switch shall be OFF.

Normal RCTA Mode -> System OFF Mode

- Ignition shall be OFF.

Normal OFF Mode -> Fail Safe Mode

- ~~- Main Switch shall be ON.(TBD)~~
- Any DTC was detected.

Normal OFF Mode -> Normal BSW / LCA Mode

- Main Switch shall be ON.
- Shift position shall not be R (Rear)
- Vehicle Speed shall be greater or equal to 10 kph.

Normal OFF Mode - Normal RCTA Mode

- Main Switch shall be ON.
- Shift position shall be R (Rear)
- No speed condition.

Normal OFF Mode -> System OFF Mode

- Ignition shall be OFF.

Fail Safe Mode -> Normal OFF Mode

- Main Switch shall be OFF.

Fail Safe Mode -> Normal BSW / LCA Mode

- DTC is not qualified anymore (only for recoverable DTCs)
- Shift position shall not be R (Rear)
- Vehicle Speed shall be greater or equal to 10 kph.

Fail Safe Mode - Normal RCTA Mode

- DTC is not qualified anymore (only for recoverable DTCs)
- Shift position shall be R (Rear)
- No speed condition.

Fail Safe Mode -> System OFF Mode

- Ignition shall be OFF.

Blockage Mode -> Normal BSW / LCA Mode

- Sensor blockage was solved, sensor is not blocked anymore.
- Shift position shall not be R (Rear)
- Vehicle Speed shall be greater or equal to 10 kph.

Blockage Mode -> Normal OFF Mode

- Main Switch shall be OFF.

Blockage Mode -> System OFF Mode

- Ignition shall be OFF.

Power Mode Control

Role of Main Switch (Can be ~~Hard~~/Soft)

Main switch could be either hard or soft switch (CAN based), this can be used to stop/start SRVD system.

When SRVD system is not functioning (Stop or off) ,the warning indicator set off and radar beam emission shall be enable

In the current system the value of ON is 1, and Off is 0.

SRVD module shall receive switch information from software switch only.

Only **software switch** shall be available. Software switch handling is referred to L3_SW_2772.

Store the status of Switch in Nvram whenever change in the status of Main switch.

At IG1 position, SRVD module should have complete function if no problem found after completing the initial diagnosis at

Switch state

In each switch state, SRVD system and output signals of RDR228_2_3 and RDR228_2_6 shall be set to below:

State 1:

- SRVD system = ON
- RDR228_2_3_SENSING_RDRSYS = 0
- RDR228_2_6_ON_OFF_RDRSYS = 1

State 2:

- SRVD system = ON
- RDR228_2_3_SENSING_RDRSYS = 1
- RDR228_2_6_ON_OFF_RDRSYS = 1

State 3:

- SRVD system = OFF
- RDR228_2_3_SENSING_RDRSYS = 1
- RDR228_2_6_ON_OFF_RDRSYS = 0

{EMBEDDED id=2535544 title="_2938.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_3LWZkIC7Ee-Gkrm

Software switch state

The software switch state shall have 6 different state transition depending on condition of Destination, ELK mode and Last Memory

Note*

Destination : refer to L3_SW_1949

ELK mode : refer to L3_SW_2912

Last Memory flag : refer to L3_SW_3430

Diagram of 6 different state transition: (Double-click to open PDF)

{EMBEDDED id=2512875 title="3774_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_XZ

Not China & Not ELK mode

If Destination is Not China and Not ELK mode is available,
the Main switch shall operate as "2 state for Not China & Not ELK mode".
Last memory flag is ignored in the state transition.

In the "2 state for Not China & Not ELK mode",
the switch state shall be transferred as state 2 -> 3 -> 2 when the switch change condition (refer to L3_SW_856 or 2772)
SRVD System default condition shall be last memory when vehicle engine starts, after that SRVD status should be worked

{EMBEDDED id=2535635 title="_3778.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_9auwl1C_Ee-Gkrm

{EMBEDDED id=2512877 title="3778_Object_Text_0.zip" uri=https://jazz-1.automotive-wan.com/rm4/resources/WR_XZ

Not China & ELK mode without Last memory

If Destination is not China, ELK mode is available and Last memory flag is equal to 0,
the Main switch shall operate as "2 state for Not China & ELK mode without last memory".

In the "2 state for Not China & ELK mode without last memory",
the switch state shall be transferred as state 1 -> 3 -> 1 when the switch change condition (refer to L3_SW_2772) is fulfilled
SRVD System default condition shall be "ON" and output value of 228_2_3 shall be "0" when vehicle engine starts.

{EMBEDDED id=2535633 title="_3782.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_65MAc1C_Ee-Gkrm

Not China & ELK mode with Last memory

If Destination is not China, ELK mode is available and Last memory flag is equal to 1,
the Main switch shall operate as "2 state for Not China & ELK mode with last memory".

In the "2 state for Not China & ELK mode with last memory",
the switch state shall be transferred as state 1 -> 3 -> 1 when the switch change condition (refer to L3_SW_2772) is fulfilled
SRVD System default condition shall be last memory when vehicle engine starts, after that SRVD status should be worked

{EMBEDDED id=2535631 title="_3786.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_4sSEAFc_Ee-Gkrm

China & Not ELK mode

If Destination is China and Not ELK mode is available,
the Main switch shall operate as "2 state for China & Not ELK mode".
Last memory flag is ignored in the state transition.

In the "2 state for Not China & Not ELK mode",
the switch state shall be transferred as state 2 -> 3 -> 2 when the switch change condition (refer to L3_SW_856 or 2772)
SRVD System default condition shall be "ON" and output value of 228_2_3 shall be "1" when vehicle engine starts.

{EMBEDDED id=2535628 title="_3790.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_13lb0FC_Ee-Gkrm

China & ELK mode without Last memory

If Destination is China, ELK mode is available and Last memory flag is equal to 0, the Main switch shall operate as "2 state for China & ELK mode without last memory".

In the "2 state for China & ELK mode without last memory", the switch state shall be transferred as state 1 -> 3 -> 1 when the switch change condition (refer to L3_SW_2772) is fulfilled. SRVD System default condition shall be "ON" and output value of 228_2_3 shall be "0" when vehicle engine starts.

{EMBEDDED id=2535625 title="_3794.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_zb2sMIC_Ee-Gkrm}

China & ELK mode with Last memory

If Destination is China, ELK mode is available and Last memory flag is equal to 1, the Main switch shall operate as "2 state for China & ELK mode with last memory".

(Note: in the state, last memory function is not available)

In the "2 state for China & ELK mode with last memory", the switch state shall be transferred as state 1 -> 3 -> 1 when the switch change condition (refer to L3_SW_2772) is fulfilled. SRVD System default condition shall be "ON" and output value of 228_2_3 shall be "0" when vehicle engine starts.

{EMBEDDED id=2535623 title="_3798.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_xY5V8IC_Ee-Gkrm}

Default Setting Switch

The requirement shall be removed since SW 03.00.00.

References:

Judgement condition of Switch state mode and SRVD system at IG-ON:

Switch type MET390

3

DESTINATION MET390_3_1

FLG_EYE_SIGHT EYE321_3_3

ELK_OFF_IND EYE321_4_2

LAST_MEMORY Switch state transition mode SRD system at IG-ON

Software

Not China 0 0 n/a 2 state for Not China & Not ELK mode Last memory

e

Not China 0 0 n/a 2 state for Not China & Not ELK mode Last memory

1 1 0 2 state for Not China & ELK mode without Last memory ON start

t

1 1 1 2 state for Not China & ELK mode with Last memory Last memory

y

China 0 0 n/a 2 state for China & Not ELK mode ON start

t

1 1 0 2 state for China & ELK mode without Last memory ON start

t

1 1 1 2 state for China & ELK mode with Last memory ON start

t

Switching of Peripherals

Monitoring

Power supplies

Behavior in low and high voltage situations

Low voltage situation must be considered when voltage input is below 9.00 V.

~~Because this condition has to be valid also at extreme temperatures (-40 deg) the internal limit shall be set to 8.34V, know~~

Low voltage situation must conduct to low voltage event setting (~~MON_LOW_BATT~~-> MON_LOW_BATT_PERMANENT)

In low voltage situation, all CAN fault monitoring (Timeout faults, Message counter faults, checksum faults, CAN unit failure)

High voltage situation must be considered when voltage input is above 16.00 V.

~~Because this condition has to be valid also at extreme temperatures (+85 deg) the internal limit shall be set to 15.608 V, know~~

High voltage situation must conduct to high voltage event setting (~~MON_HIGH_BATT~~ -> MON_HIGH_BATT_PERMANENT)

Radar

Radar Beam Emission

CAN

A CAN message shall be considered valid if:

- the message counter is correct
 - the timeout for this messages has not elapsed
 - the message CRC is correct
 - DLC check is correct. DLC check shall be made always for the maximum DLC size of the corresponding message, which is 8.
- If a message is not valid all contained signals shall be set to their last valid values (written to Rte) and corresponding DTC shall be set.

~~When CAN message 0x174 (ISS174) is not received, CAN fault monitoring of a CAN channel shall be active if the following conditions are met:~~
CAN fault monitoring (Timeout faults, Message counter faults, checksum faults, CAN unit failure and CAN over run fault) shall be active if the following conditions are met:
3000 ms after startup or reset of the CAN communication shall be elapsed

- 1.) 3000 ms after IGN ON (Battery ON) shall be elapsed
- 2.) Supply voltage shall be above **9V** UBatt for at least 3000 ms.
- 3.) BusOff condition is NOT active.

[Note: Bus-off DTC should not be checked to confirm bus-off condition. Realtime bus-off shall be considered. This means that if a bus-off condition occurs, the DTC shall not be set.)

- 4.) The Node-Id (Left/Right) determination was successfully finished (was established that the sensor is left/ right)

Reset the enable condition if the above mentioned preconditions are not met.

Note for Point 1: As SBL takes around 354ms, this value shall be off-set in the IGN ON mask time during the design/implementation.

Note for Point2: As SBL and Application start-up takes some and after that only voltage can be monitored, so, SBL and Application start-up shall be considered.

Note for Point 3: As we PCAN and VCAN fault monitoring and corresponding faults, VCAN BusOff shall be considered for the CAN communication.

Note for Point 4:As the sensor judgement will be only Left or Right, and unknown judgement is not possible, so condition 4 shall be considered.

When CAN message 0x174 (ISS174) is not received, the CAN monitoring shall be disabled if supply voltage is below **8.340V**.

BackUp Ignition CAN Monitoring

CAN monitoring is depending on the BackUp Ignition feature by using the message ISS174.

The value from signal ISS174_2_5_STATE_VOLT_DROP is used to enable or disable the CAN monitoring, as it is described in the table below.

Valid conditions for enabling CAN communication

The conditions for enabling CAN monitoring using IGN back-up, shall be the following (a) **and** (b) conditions:

- (a) **8.340 [V] ≤** IGN voltage is met during 1 second continuously.
- (b) "State flag of signal ISS174_2_5_STATE_VOLT_DROP" = 0 is met during 1 second continuously, or = 1 is met during 3 seconds continuously.

Valid conditions for disabling CAN communication

Conditions for disabling CAN communication using IGN back-up, shall be met the following (c) **or** (d) immediately:

- (c) IGN voltage < **8.340 [V]**
- (d) "ISS174_2_5_STATE_VOLT_DROP" is changed from 0 to 1.

If CAN message 0x174 (ISS174) is not received, the flag is set 0 without any condition and this unit is identical with unsupervised.

BackUp Ignition workflow

{IMAGE id=2512892 title="1458_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources/1458_Object_Text_0.png}

Correct behaviour for BackUp Ignition handling 1 :

{IMAGE id=2512890 title="1459_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

Correct behaviour for BackUp Ignition handling 2 :

{IMAGE id=2512891 title="1460_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

Correct behaviour for BackUp Ignition handling 3 :

{IMAGE id=2512898 title="1461_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

Correct behaviour for BackUp Ignition handling 4 :

{IMAGE id=2512899 title="1462_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

Correct behaviour for BackUp Ignition handling 5 :

{IMAGE id=2512900 title="1463_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

Signal Related Monitoring

All CAN signals passed to Algo component ~~via RTE~~, shall go through a value range check.

- If data received has a value out of range, the algo interface status shall be set to VDY_IO_STATE_INVALID (1u)
 - if the message is not received (message timeout)/**Checksum failure/Message counter failure** set the Algo interface st
-
- After Init phase (until data is available on CAN), the algo interfaces status shall be VDY_IO_STATE_INIT (15u)

Message CheckSum

The message checksum of the CAN messages shall be monitored for correctness (message checksum doesn't have the

The message checksum of the CAN messages shall be monitored for all input messages, which have the Checksum sign

Message checksum shall be calculated for all the output messages, which have the Checksum signal as defined by custo

The message Checksum shall be made-up from message ID and data bytes except the Checksum byte (byte0 for FHI method). The low byte and the high byte of the message ID shall be summed up. The result of message ID calculation shall be summed up with the data bytes.

E.g

<FHI method>

summed up MessageID 0x228

DLC : 0x08

0byte : Checksum

1byte : 0x66

2byte : 0x7E

3byte : 0x34

4byte : 0xA1

5byte : 0xFF

6byte : 0x52

7byte : 0x77

$0x02+0x28=0x2A$ (. . . ID sum)

$0x2A+0x66=0x90$ (. . . result+1byte)

$0x90+0x7E=0x10E \Rightarrow 0x0E$ (. . . result+2byte)

$0x0E+0x34=0x42$ (. . . result+3byte)

$0x42+0xA1=0xE3$ (. . . result+4byte)

$0xE3+0xFF=0x1E2 \Rightarrow 0xE2$ (. . . result+5byte)

$0xE2+0x52=0x134 \Rightarrow 0x34$ (. . . result+6byte)

$0x34+0x77=0xAB$ (. . . result+7byte)

0Byte data (checksum) is 0xAB

<TMC method>

summed up MessageID 0x228

DLC : 0x08

0byte : 0x66

1byte : 0x7E

2byte : 0x34

3byte : 0xA1

4byte : 0xFF

5byte : 0x52

6byte : 0x77

7byte : Checksum

$0x02+0x28=0x2A$ (. . . ID sum (upper 3 bit +lower **8 bit**))

$0x2A+0x08=0x32$ (. . . result+DLC)

$0x32+0x66=0x98$ (. . . result+0byte)

$0x98+0x7E=0x116 \Rightarrow 0x16$ (. . . result+1byte)

$0x16+0x34=0x4A$ (. . . result+2byte)

$0x4A+0xA1=0xEB$ (. . . result+3byte)

$0xEB+0xFF=0x1EA \Rightarrow 0xEA$ (. . . result+4byte)

$0xEA+0x52=0x13C \Rightarrow 0x3C$ (. . . result+5byte)

$0x3C+0x77=0xB3$ (. . . result+6byte)

7Byte data (checksum) is 0xB3

Checksum error should be treated as a lost message communication (timeout) situation.

CAN Message Overrun Monitoring

In the case of any input message overruns, the event CAN_FULL_CAN_OVERRUN shall be reported.

Message Timeout

~~The CAN message timeout time shall be 40x "CAN msg. cycle time" (+/-10%).~~
This is old requirement. To use L3_LW_1471

The CAN message timeout time shall be 40x "CAN msg. cycle time" (+/-10%) for all input messages

The event "DEM_CAN_TIMEOUT_MSGXY" (with MSGXY is the message name, as defined in the *.dbc file) shall be reported

No DTC disqualification shall be possible if the setting conditions are not met anymore. DTCs shall be set to inactive only

If message TCU048 BEV074 has never been received in the current ignition cycle, the system shouldn't set any timeout (

The following chart shows examples of timeout detection,

{IMAGE id=2512903 title="4509_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

Multiple faults are having common debouncing and COM configuration expects minimum timeout configuration time for ea

Due to this limitation, COM will configure Minimum timeout {2 x cycle time} and DEM will take care of remaining debounci

Example:

1. For Timeout 40 x cycle time: COM configuration timeout {2 x cycle time} and DEM debounce configuration {38 x cycle
2. For Timeout 80 x cycle time: COM configuration timeout {2 x cycle time} and DEM debounce configuration {78 x cycle

Message Counter

The message counter of the CAN messages shall be monitored for correctness (message counter is different than the pre

Message Counter fail should be treated as a lost message communication (timeout) situation.

Unit Failure

if (VDC328_2_1_WARN_ABS_MET_LCD == 1) **or**
(VDC328_2_2_WARN_VDC_MET_LCD == 1)

1. when above condition is satisfied, Data received within CAN message VDC328, VDC138 and VDC139 shall be ignored

SW Signal interfaces:

s_CANData.ui16_SteeringAngle

s_CANData.ui16_YawRate

s_CANData.ui8_reprogramming

s_CANData.ui16_spd_wheel_ave

2. When the above condition is satisfied update the Algo signal state (Refer below signal interface details) of signals from VDC u

Algo signal state interface:

VDC138_4_0_YAW_RATE -> a_MDB_e_CL_VDY_VEH_SIG[0].VehSigMain.State[0]

VDC138_2_0_STEER_ANGLE -> a_MDB_e_CL_VDY_VEH_SIG[0].VehSigMain.State[2]

VDC139_2_0_SPD_WHEEL_AVE -> a_MDB_e_CL_VDY_VEH_SIG[0].VehSigMain.State[12]

~~Vehicle speed should be considered for DTC B2313 (0xA313) setting (see details at ID 645). Please refer Req ID 251526~~

Message Data Length Code

The Data Length Code of the CAN message shall be monitored for correctness.

DLC check shall be made always for the maximum DLC size of the corresponding message, which is also specified in the

Wrong Data Length Code is treated as a lost message communication (timeout) situation.

CAN priority rules for setting related faults

Relationship between communication failure determination priority and DTCs:

{IMAGE id=2512904 title="1486_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_b

Following rules shall apply for the CAN failure determination priority and CAN DTCs:

- Bus off DTC shall be set any time its condition occur, with no dependency for other CAN related DTCs
- If Bus OFF real situation is active, no other CAN related DTCs shall be possible to become active.
- After Bus Off condition are not met anymore the Bus Off DTCs shall stay active until reset/DTC deleted, communication

- Timeout DTCs (which shall be generated by "timeout = Data not delivered", "DLC error", "Checksum error" or "Counter f

- Unit failure DTCs (for TCU BEV, CECU and VDC) shall be set only if the messages which contain the used signals do r

CAN Controller Fault Monitoring

The CAN controller message registers shall be freeze monitored.

The event CAN_RAM_CHECK_FAILURE shall be reported if a freeze condition is detected.

Dimmer Cancel handling via CAN

"Dimmer Cancel" is referring to the control of LED light intensity. This control has 2 steps: night mode and daylight mode.

The values for the light intensity are delivered via the parameter file for variant coding. Usually these values are: 20mA for

Dimmer Cancel handling shall use the combined logic of 3 signals:

- HEAD LAMP SMALL

BIU3AC_7_0_HEADLAMP_SMALL (0 - Turn_OFF, 1 - Turn_ON)

Default value: 0

- Dimmer Cancel

BIU3AC_5_4_DIMMER_CANCEL (0 - NON_ACTIVE, 1 - ACTIVE)

Default value: 0

If this flag value is 1, should be kept LED current 95mA until changing "Dimmer Cancel flag" value 1=>0 in case of lighti

- Bright SW

MET390_6_4_BRIGHT_SW (0 - OFF, 1 - ON)

Default value: 0

If this flag value is 1, should be LED current 95mA.

Note:- Applicable for FM5.

For SRR320SU85, in 5 platforms(CH2 XV, CH2 5D, DA9, RH4K, TL4), the following logic shall be used to enable Night M

{EMBEDDED id=2512905 title="1504_Object_Text_0.docx" uri=https://jazz-1.automotive-wan.com/rm4/resources/WR_b

For SRR320SU85, in other platforms above, the following logic shall be used to enable Night Mode or DayLight Mode:

{EMBEDDED id=2512906 title="3573_Object_Text_0.docx" uri=https://jazz-1.automotive-wan.com/rm4/resources/WR_b

Reprogramming mode entry via CAN

The RDR ECU shall enter into reprogramming mode, when the same pattern signal ("**EGI040_1_7_REPROGRAMING**" =
The RDR ECU shall enter into reprogramming mode, when the same pattern signal ("**TCU048_1_7_REPROGRAMING**" =
The RDR ECU shall enter into reprogramming mode, when the same pattern signal ("**VDC139_1_7_REPROGRAMING**" =
The RDR ECU shall enter normal mode when ~~**EGI040_1_7_REPROGRAMING, TCU048_1_7_REPROGRAMING**~~ **VDC**
When in reprogramming mode, the RDR ECU shall stop CAN Tx messages on Vehicle CAN from left and right side, but
When in reprogramming mode, it is **NOT** necessary to store DTC (B2352) (Linked events: **DEM_REPROGRAMMING_M**
Communication

CAN wiring diagram:

{IMAGE id=2512908 title="1506_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

As shown in the diagram above, SRR630SU17 system consists of 2 ECUs, a Left and a Right.

From CAN point of view this means:

- There are 2 CAN available: CAN1 which is the Vehicle CAN/Public CAN (Channel 0) and is connected to the Left ECU
- Both Left and Right ECUs communicate over Vehicle CAN
- All inputs from Vehicle CAN come over CAN1 to Left and Right ECUs directly

Master sensor shall be positioned on the left side and Slave sensor shall be positioned on the right side.

The software shall contain an implementation for the HwLoopCheck monitor.

The Monitor shall interrupt the HwLoopCheck, if the timer runs longer than 5ms.

Frame priority:

Among two frames with different identifiers, the higher priority shall be assigned to the frame containing the identifier of lo

SREQ 6-8 MSG-TX:

Send each message with the interval of ComTxModeTimeOffset_x at the start of transmission to distribute the bus load. L

{IMAGE id=2512913 title="4534_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

{IMAGE id=2512914 title="4534_Object_Text_1.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Note: After power-on the ECU shall start transmission of CAN-messages within 210 - 500 ms. See also L3_SW_1528.

CAN Initialization

After power-up both sensor modules shall initialize their vehicle CAN bus communication (on the vehicle CAN bus for both

After power-up, until the sensor module detects vehicle CAN OR private CAN messages, the sensor module shall listen (l
That means the sensor module shall listen on the vehicle and private CAN for incoming messages.

The master shall send CAN messages on the private CAN after detecting messages on the vehicle CAN (Timeout time: 2
Until the first reception of a CAN Rx signal after ignition OFF => ON each CAN Rx signal shall be initialized to its default v
Each CAN Tx signal shall be initialized to its default signal value after power-up until the signal controlling software chang
Judgement of Master/ Slave Module

This function, "Judgement of Master / Slave Module", shall be disabled since SW 02.00.00.

Test criteria: To check the function is disabled.

Left side / Right side identification via Pin

Mounting position "left" and "right" shall be detected by pin configuration defined by customer application.

The module with the 9 pin external input connected to ground is left module.

The module with the 9 pin external input not connected anywhere is right module.

The following diagram shows connections of external pins on ECU1(left) and ECU2(right) modules.

{IMAGE id=2512912 title="4252_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_C

and the following table shows pin assignment.

{IMAGE id=2512919 title="4252_Object_Text_1.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_C

Pin Assignment for AD27

{IMAGE id=2530215 title="Pin_Assign_AD27.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_C

CAN0_H/L (1st CAN channel) = Vehicle CAN

CAN1_H/L (2nd CAN channel) = Private CAN

The sensor connected to GND via pin 4 = "ID1" shall be judged as a left module and a module with pin 4 open shall be right module.

Assigned side (LH or RH) shall be retained for the duration of the key cycle and will not change for that key cycle.

After the mounting side has been determined, the system shall setup radar beam parameters for the assigned side.

After the mounting side has been determined, the system shall setup the CAN node ID for the assigned side.

The mount side shall be debounced by reading of the same value for side of detection signal 5 times at periodic message reception.

Vehicle CAN / Public CAN / Channel 0 on Left

The communication on the Public CAN(channel 0) on Left, the interface to the vehicle, shall be implemented with the following parameters.

CAN clock frequency=8MHz±0.5%

Bit time(NBT)= 16

Sample point=81.3%

Synchro jump width(SJW)=2

Frame format shall be 11 bitID standard frame

Number of sending/receiving IDs shall be as specified in the Subaru dbc file.

Compatibility with DIAG shall be as specified by Subaru (Refer to "SSM3 Diagnosis Communication Spec. FHI-CAN" for details).

CAN operating voltage range: DC 9~16V

Communication protocol shall be ISO 15765-2 compliant.

The communication on the Public CAN(channel 0) on Left, the interface to the vehicle, shall be implemented with the following

CAN clock frequency=40MHz±0.5%

Bit time(NBT)= 80 (Arbitration), 20 (Data)

Sample point= 80% (Arbitration), 70% (Data)

Sync_Seg= 1 (Arb), 1 (Data)

Prop_Seg= 47 (Arb), 7 (Data)

Phase_Seg1= 16 (Arb), 6 (Data)

Phase_Seg2= 16 (Arb), 6 (Data)

Synchro jump width(SJW)= 16 (Arbitration), 6 (Data)

Secondary Sample Point = 70%(Data) (Applicable from DV onward)

Frame format shall be 11 bitID standard frame

Number of sending/receiving IDs shall be as specified in the Subaru dbc file.

Compatibility with DIAG shall be as specified by Subaru (Refer to “SSM3 Diagnosis Communication Spec. FHI-CAN” for details)

CAN operating voltage range: DC 9~16V

Communication protocol shall be ISO 15765-2 compliant.

The baud rate of the CAN-bus shall be set to 500 kBaud ±0,15%

The baud rate of the CAN-bus for CAN-FD shall be set to:

500 kBaud (Arbitration)

2000 kBaud (Data)

The communication bit rate in the data field shall be changeable to 500 kbps and to 1 Mbps.

Note: The bit rate doesn't need to be changed dynamically in one piece of software.

After power-on the ECU shall start transmission of CAN-messages within **210 - 500 ms.****

After power-on the ECU shall be able to receive CAN messages within **170 ms.**

Communication shall be possible without problems until a Max. Bus Load of 80%.

The SRVD for SRR630SU17 project consist of the Left and Right modules. Each modules are Master. Communications are as follows.

Each left / right modules transmit/receive the data as below,

- CAN message from vehicle bus: left / right sensor receive
- CAN ID 0x228: transmit from left sensor.
- OOL: object list which are detected by each sensor are transmitted from each sensor.
- DTC: DTCs in each sensor are transmitted from each sensor.

When Advanced driving mode is present, Object Output List shall be transmitted from Left side.

When Advanced driving mode is not present, Object Output List shall not be transmitted.

Regarding Advanced driving mode, refer to L3_SW_2914.

The following flowchart shall be used for judgement of OOL transmission enable/disable when NVM read error happen.

{IMAGE id=2512917 title="4043_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources/4043_Object_Text_0.png" data-bbox="121 767 1000 783"/>

{IMAGE id=2512921 title="4043_Object_Text_1.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources/4043_Object_Text_1.png" data-bbox="121 796 1000 812"/>

Advanced Driving mode shall be always ON and OOL shall be transmitted

Note: Testing is not required for this requirement.

CAN RX/TX signal information and the Signal processing scope for the KD#1, KD#1.5 and KD#1.7 customer releases.

CAN signal information and scope of each signal processing is available in below attached Excel file.

{EMBEDDED id=3123169 title="2884683- 20241107_ Phase-by-phase CAN output check\4.xlsx" uri=https://jazz-1.automotive-wan.com}
Check below details for better understanding of the Excel sheet.

Receive Sheet: Receive signal from Vehicle CAN Bus. (Refer Column 'R' for KD#1 Scope)

Transmit(RDR228) Sheet: RDR228 Transmit signal from Left sensor to VCAN Bus. (Refer Column 'R'- Dummy or Actual)

Transmit(OOL) Sheet: OOL Transmit CAN signal from Left and Right Sensors to VCAN Bus (Refer Column 'R'- Dummy or Actual)

DTC_CAN Signal Mapping Sheet: Transmit CAN signal Mapping for RDR228_2_4_FAIL_RDRSYS (Column 'F'), RDR228_2_4_FAIL_RDRSYS (Column 'F'), RDR228_2_4_FAIL_RDRSYS (Column 'F')

KD#1.5 Applicable messages and signals are listed in below excel sheet:

- All Rx messages are applicable for both Left and Right sensor.
- RDR228 is Tx Message and only applicable for Left sensor.
- OOLs are also Tx messages. CAN ID:0x296~0x29E shall be transmitted from Left sensor and CAN ID: 0x2A6~0x2AF shall be transmitted from Right sensor.

{EMBEDDED id=3225699 title="20250211_フェーズごとのCAN出力確認\6.xlsx" uri=https://jazz-1.automotive-wan.com}

Messages/signals received from Vehicle CAN (CAN Messages)

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

The requirement of signals received from Vehicle CAN describes valid signals for using functions, but other signals are also valid for Checksum calculation. (refer to {LINK id=2513266 title="2513266" uri=https://jazz-1.automotive-wan.com})
The other signals are named “unused signals”. The unused signals shall be received from Vehicle CAN for Checksum calculation.

Message VDC138 (0x138)

Identifier: 0x138

DLC: 8 bytes

Cycle Time: 20 ms

Sender Node: VDC

Signal VDC138_0_0_CHECK_SUM

Description: *This signal indicates the message checksum.*

Position: bit 0
Type: 8 bit unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

CRC formula is detailed at ID 1974.

Signal VDC138_1_0_MSG_COUNTER

Description: *This signal indicates the message counter.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

Signal VDC138_2_0_STEER_ANGLE

Description: *This signal indicates the steering angle.*

Position: bit 0
Type: 16 bit signed integer
Byte order: Intel
Range: -719.9 to 719.9 deg
Interpretation: $(PH) = 0.1 * (HEX) + Offset$
Offset: 0
Init Value: 0 deg

Received Steering Angle value shall be converted, internally, into radian value.

The sign of received value is:

Turning Right: "+", Turning Left: "-"

Converted Steering Angle value shall have following sign for algo:

Right side "-"

Left side "+"

Signal VDC138_4_0_YAW_RATE

Description: *This signal indicates the yaw rate.*

Position: bit 16
Type: 16 bit signed integer
Byte order: Intel
Range: ~~-2.425 to 2.42 rad/s~~ -1.571 to 1.571 rad/s
Interpretation: (PH) = 0.0047358121330724 * (HEX) + Offset
Offset: 0
Init Value: 0 rad/s

The sign of received value is:

Turning Right: "-", Turning Left: "+"

Yaw Rate value shall have following sign for algo:

Right side "-"

Left side "+"

Message VDC139 (0x139)

Identifier: 0x139
DLC: 8 bytes
Cycle Time: 20 ms
Sender Node: VDC

Signal VDC139_0_0_CHECK_SUM

Description: *This signal indicates the message checksum.*

Position: bit 0
Type: 8 bit unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

CRC formula is detailed at ID 1974.

Signal VDC139_1_0_MSG_COUNTER

Description: *This signal indicates the message counter.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal VDC139_1_7_REPROGRAMING

Description: *Signalise if VDC is in programming mode or not.*

Value description: 0x0 - NORMAL

0x1 - STOP COMM, but without DIAG.

Position: bit 15

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal VDC139_2_0_SPD_WHEEL_AVE

Description: *This signal indicates the vehicle speed.*

Position: bit 16

Type: 13 bit unsigned integer

Byte order: Intel

Range: ~~0 to 300 km/h~~ 0 to 299.98125 km/h

Interpretation: $(PH) = 0.05625 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0 km/h

Message VDC328 (0x328)

Identifier: 0x328

DLC: 8 bytes

Cycle Time: 100 ms

Sender Node: VDC

Signal VDC328_0_0_CHECK_SUM

Description: *This signal is the message checksum of this message.*

Position: bit 0

Type: 8 bits unsigned integer

Byte order: Intel

Range: 0 to 255

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

CRC formula is detailed at ID 1974.

Signal VDC328_1_0_MSG_COUNTER

Description: *This signal indicates the message counter of this message.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal VDC328_2_1_WARN_ABS_MET_LCD

Description: Unit failure
Value description: 0x0 - NOT_INDICATE
0x1 - INDICATE

Position: bit 17
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal VDC328_2_2_WARN_VDC_MET_LCD

Description: Unit failure
Value description: 0x0 - NOT_INDICATE
0x1 - INDICATE

Position: bit 18
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Message BIU3AC (0x3AC)

Identifier: 0x3AC
DLC: 8 bytes
Cycle Time: 100 ms
Sender Node: BIU

Signal BIU3AC_0_0_CHECK_SUM

Description: *This signal indicates the message checksum*

Position: bit 0
Type: 8 bit unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

CRC formula is detailed at ID 1974.

Signal BIU3AC_1_0_MSG_COUNTER

Description: *This signal indicates the message counter.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal BIU3AC_5_4_DIMMER_CANCEL

Description: *This signal indicates if the dimmer light intensity shall be for daylight mode or for night mode, as it is described in the specification.*

Value description: 0x0 - NON_REQ
0x1 - ACTIVE

Position: bit 44
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal BIU3AC_6_4_REVERSE_MT

Description: *This signal indicates the Manual Transmission Reverse Switch.*

Value description: 0x0 - OFF
0x1 - REVERSE_ON

Position: bit 52
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal BIU3AC_7_0_HEADLAMP_SMALL

Description: *This signal indicates if the dimmer light intensity shall be for daylight mode or for night mode, as described*

Value description: 0x0 - Turn_OFF
0x1 - Turn_ON

Position: bit 56
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Message CGW660 (0x660)

Identifier: 0x660
DLC: 8 bytes
Cycle Time: 500 ms
Sender Node: BIU

Signal CGW660_3_0_COUNT_TRIP

Description: *This signal indicates the Master Trip counter.*

Value description:

Position: bit 24
Type: 16 bits unsigned integer
Byte order: Motorola
Range: 0 to 65534 trip
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal CGW660_7_0_COUNT_TIME

Description: *This signal indicates the Master Time counter.*

Value description:

Position: bit 56
Type: 24 bits unsigned integer
Byte order: Motorola
Range: 0 to 1677721400 ms
Interpretation: $(PH) = 100 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

{IMAGE id=2512922 title="1595_Object_Text_0.bmp" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WI

Fig 1: Frame format for timestamp.

Message EGI040 (0x040)

Identifier: 0x40
DLC: 8 bytes
Cycle Time: 10 ms
Sender Node: EGI_GAS_DN

Signal EGI040_0_0_CHECK_SUM

Description: *This signal indicates the message checksum*

Position: bit 0
Type: 8 bit unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

CRC formula is detailed at ID 1974.

Signal EGI040_1_0_MSG_COUNTER

Description: *This signal indicates the message counter of this message.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal EGI040_1_7_REPROGRAMING

Description: *Signalise if EGI is in reprogramming mode or not.*

Value description: 0x0 - NORMAL

0x1 - STOP COMM, but without DIAG.

Position: bit 15

Type: 1 bits unsigned integer

Byte order: Intel

Range: 0 to 1 trip

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Message ISS174 (0x174)

Identifier: 0x174

DLC: 8 bytes

Cycle Time: 20 ms

Sender Node: ISS

Signal ISS174_0_0_CHECK_SUM

Description: *This signal is the message checksum of this message.*

Position: bit 0

Type: 8 bits unsigned integer

Byte order: Intel

Range: 0 to 255

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

CRC formula is detailed at ID 1974.

Signal ISS174_1_0_MSG_COUNTER

Description: *This signal indicates the message counter of this message.*

Position: bit 8

Type: 4 bit unsigned integer

Byte order: Intel

Range: 0 to 15

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal ISS174_2_5_STATE_VOLT_DROP

Description: *This signal is used as a mechanism to validate BackUp Ignition feature. See ID: L3_SW_1450.*

Value description: 0x0 - Other Power Voltage Drop
0x1 - Power Voltage Drop

Position: bit 21
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

DTC message Timeout shall not be applicable for ISS message 0x174, which is responsible for BackUp Ignition feature. IN case the message 0x174 does not come until timeout time elapsed, its value shall be considered 0 (zero).

Message EYE321 (0x321)

Identifier: 0x321
DLC: 8 bytes
Cycle Time: 100 ms
Sender Node: EYE

Signal EYE321_0_0_CHECK_SUM

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 0
Type: 8 bit unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

CRC formula is detailed at ID 1974.

Signal EYE321_1_0_MSG_COUNTER

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal EYE321_1_7_AD_DRV_ASS

Description: *This signal indicates whether Advanced Driving Function exist or not.*

Value description:

0x0 - Advanced Driving function not exist

0x1 - Advanced Driving function exist

Position: bit 15

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal EYE321_3_0_CODE_HALT

Description: *This signal indicates whether code halt or not*

Value description:

0x0 - code is not halting

0x1 - code is halting

Position: bit 24

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal EYE321_3_3_ELK_OFF_IND

Description: *This signal indicates whether ELK function exists or not.*

Value description:

0x0 - ELK function not exist

0x1 - ELK function exist

Position: bit 27

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal EYE321_4_2_SRVD_LASTMEM_REQ

Description: *This signal indicates whether last memory available or not.*

Value description:

0x0 - without last memory

0x1 - with last memory

Position: bit 34

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal EYE321_6_0_FAIL_EYESIGHT

Description: *This signal indicates whether EYESIGHT fail or not.*

Value description:

0x0 - EYESIGHT does not fail

0x1 - EYESIGHT fail

Position: bit 48

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Message EYE322 (0x322)

Identifier: 0x322

DLC: 8 bytes

Cycle Time: 100 ms

Sender Node: EYE

Signal EYE322_0_0_CHECK_SUM

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 0

Type: 8 bit unsigned integer

Byte order: Intel

Range: 0 to 255

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

CRC formula is detailed at ID 1974.

Signal EYE322_1_0_MSG_COUNTER

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal EYE322_2_4_INDICATOR_CTRL_REQ

Description: *This signal indicates Indicator control request flag.*

Value description:

0x0 - Standalone indicator control mode
0x1 - External indicator control mode

Position: bit 20
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal EYE322_2_5_INDICATOR_MODE_R

Description: *This signal indicates Indicator control instruction flag for Right Mirror*

Value description:

0x0 - OFF
0x1 - ON
0x2 - Blinking
0x3 - OFF

Position: bit 21
Type: 2 bits unsigned integer
Byte order: Intel
Range: 0 to 3
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal EYE322_6_5_INDICATOR_MODE_L

Description: *This signal indicates Indicator control instruction flag for Left Mirror*

Value description:

0x0 - OFF
0x1 - ON
0x2 - Blinking
0x3 - OFF

Position: bit 53
Type: 2 bits unsigned integer
Byte order: Intel
Range: 0 to 3
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Message MET390 (0x390)

Identifier: 0x390

DLC: 8 bytes

Cycle Time: ~~100ms~~ cyclic 100ms or Event driven (changed by turn signal LH/RH blinking timing, refer to 1555)

Sender Node: BGW

Signal MET390_0_0_CHECK_SUM

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 0
Type: 8 bit unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

CRC formula is detailed at ID 1974.

Signal MET390_1_0_MSG_COUNTER

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal MET390_6_2_TURN_SIG_LEFT

Description: *This signal indicates whether the left blinking flag is set or not.*

Value description: 0x0 - OFF
0x1 - Turn_L_OutPut

Position: bit 50

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

This signal is delivered as input making square-wave shape ON-OFF signal like in picture below:

{IMAGE id=2512920 title="1555_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR}

Although the message cycle time is 100 ms, this message can be sent also "at event" in case Turn Switch signal is updated.

Note: Nominal Turn signal on/off cycle time : 330ms

Maximum(with tolerance) Turn signal on/off cycle time: 360ms

As soon as square-wave shape signal is active, turn switch shall be considered ON. CAN interface for other modules (e.g.

To detect when turn signal is switched OFF, ECU shall wait ~~360ms~~ 530ms (*1) from falling edge of the signal to determine

Note (*1): The wait time will be changed below for CAN output signal tolerance,

Left side: 530ms + 60ms(RDR228 Cycle Time) = 590ms - 600ms

Right side: 530ms + 70ms(delay of communication through private bus) + 60ms(RDR228 Cycle Time) = 660ms - 670ms

Signal MET390_6_3_TURN_SIG_RIGHT

Description: *This signal indicates whether the right side blinking flag is set or not.*

Value description: 0x0 - OFF
0x1 - Turn_R_OutPut

Position: bit 51

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

This signal is delivered as input making square-wave shape ON-OFF signal like in picture below:

{IMAGE id=2512925 title="1560_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR}

Although the message cycle time is 100 ms, this message can be sent also "at event" in case Turn Switch signal is updated.

Note: Nominal Turn signal on/off timing: 330ms

Maximum(with tolerance) Turn signal on/off timing: 360ms

As soon as square-wave shape signal is active, turn switch shall be considered ON. CAN interface for other modules (e.g.

To detect when turn signal is switched OFF, ECU shall wait ~~360ms~~ 530ms(*1) from falling edge of the signal to determine

Note (*1): The wait time will be changed below for CAN output signal tolerance,

Left side: 530ms + 60ms(RDR228 Cycle Time) = 590ms - 600ms

Right side: 530ms + 70ms(delay of communication through private bus) + 60ms(RDR228 Cycle Time) = 660ms - 670ms

Signal MET390_6_4_BRIGHT_SW

Description: *This signal indicates if the dimmer light intensity shall be for daylight mode or for night mode, as it is described below.*

Value description: 0x0 - OFF

0x1 - ON Daylight

Position: bit 10

Type: 1bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

Message TCU048 (0x48)

Identifier: 0x48

DLC: 8 bytes

Cycle Time: 10 ms

Sender Node: TCU_CFT

Signal TCU048_0_0_CHECK_SUM

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 0

Type: 8 bit unsigned integer

Byte order: Intel

Range: 0 to 255

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

CRC formula is detailed at ID 1974.

Signal HA_TCU048_1_0_MSG_COUNTER

Description: *This signal is used as a mechanism to validate data within the message.*

Value description:

Position: bit 8

Type: 4 bit unsigned integer

Byte order: Intel

Range: 0 to 15

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

Signal HA_TCU048_1_6_STATUS_TCM

Description: *This signal is used to determine the status of TCM node.*

Value description: 0x0 - FAIL
0x1 - NORMAL

Position: bit 14

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 1

Signal TCU048_1_7_REPROGRAMING

Description: *Signalise if TCU is in reprogramming mode or not.*

Value description: 0 - Normal mode
1 - Reprogramming mode

Position: bit 15

Type: 1 bits unsigned integer

Byte order: Intel

Range: 0

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal TCU048_3_0_IND_SHIFT_POS

Description: *Automatic gear box position.*

Value description: 0x0 - BLANK

0x1 - D

0x2 - N

0x3 - R

0x4 - P

0x5 - L

0x6 - NON

0x7 - NON

Position: bit 24

Type: 3 bits unsigned integer

Byte order: Intel

Range: 0 to 7

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Message AVN6BB (0x6BB)

Identifier: 0x6BB

DLC: 8 bytes

Cycle Time: 1200 ms

Sender Node: AVN

MessageType: EventPeriodic

Signal AVN6BB_0_0_CHECK_SUM

Description: *This signal is the message check sum.*

Position: 0 bit
Type: 8 bits unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal AVN6BB_1_0_MSG_COUNTER

Description: *This signal is used as a mechanism to validate data within the message.*
Value description:

Position: 8 bit
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal AVN6BB_3_0_SRVD_ON_OFF

Description: *Information of SRVD ON/OFF Switch*
Value description: 0x0 -> SRVD switch OFF
0x1 -> SRVD switch ON

Position: 24 bit
Type: 1 bits unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal AVN6BB_3_1_PRG_RESET_REQ

~~Description: Request of SRVD status forced to ON~~
~~Value description: 0x0 -> No reaction~~
~~0x1 -> Change SRVD status to ON~~

~~Position: 25 bit~~
~~Type: 1 bits unsigned integer~~
~~Byte order: Intel~~
~~Range: 0 to 1~~
~~Interpretation: (PH) = 1 * (HEX) + Offset~~
~~Offset: 0~~
~~Init Value: 0~~

The input signal **AVN6BB_3_1_PRG_RESET_REQ** shall be removed since SW 03.00.00.

Test criteria: The signal deletion shall be confirmed by SW Req Test. The reset function shall not be performed if the signal is not present.

Signal AVN6BB_4_5_SRVD_CSTM_REQ

Description: *Request of SRVD status change*

Value description: 0x0 -> No request

0x01 -> Request

Position: 37 bit

Type: 1 bits unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

Message CECU661 (0x661)

Identifier: 0x661

DLC: 8 bytes

Cycle Time: ~~500 ms~~ 1000ms

Sender Node: CECU

Signal CECU661_2_0_PRESENT_YEAR

Description: *Present Year*

Value description:

Position: 16 bit

Type: 8 bits unsigned integer

Byte order: ~~Intel~~ Motorola(big endian)

Range:

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

Signal CECU661_3_0_PRESENT_MONTH

Description: *Present Month*

Value description:

Position: 24 bit

Type: 8 bits unsigned integer

Byte order: ~~Intel~~ Motorola(big endian)

Range:

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

Signal CECU661_4_0_PRESENT_DAY

Description: *Present Day*
Value description:
Position: 32 bit
Type: 8 bits unsigned integer
Byte order: ~~Intel~~ Motorola(big endian)
Range:
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

Signal CECU661_5_0_PRESENT_TIME_HOUR

Description: *Present Time (Hour)*
Value description:
Position: 40 bit
Type: 8 bits unsigned integer
Byte order: ~~Intel~~ Motorola(big endian)
Range:
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

Signal CECU661_6_0_PRESENT_TIME_MIN

Description: *Present Time (Min)*
Value description:
Position: 48 bit
Type: 8 bits unsigned integer
Byte order: ~~Intel~~ Motorola(big endian)
Range:
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

Signal CECU661_7_0_PRESENT_TIME_SEC

Description: *Present Time (Sec)*
Value description:
Position: 56 bit
Type: 8 bits unsigned integer
Byte order: ~~Intel~~ Motorola(big endian)
Range:
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

Message CECU6EC (0x6EC)

Identifier: 0x6EC
DLC: 8 bytes
Cycle Time: 1000 ms
Sender Node: CECU

Signal CECU6EC_3_0_Data_Condition

Description: *Data condition*
Value description: 0 - Normal
1 - Abnormal

Position: 24 bit
Type: 1 bit unsigned integer
Byte order: ~~Intel~~ Motorola(big endian)
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal CECU6EC_3_1_EYE_EXISTENCE

Description: *Eyesight existence*
Value description: 0 - EYE SIGHT not exist
1 - EYE SIGHT exist

Position: 25 bit
Type: 1 bit unsigned integer
Byte order: ~~Intel~~ Motorola(big endian)
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Message CECU6ED (0x6ED)

Identifier: 0x6ED
DLC: 8 bytes
Cycle Time: 1000 ms
Sender Node: CECU

Signal CECU6ED_4_0_VEHICLE_HEIGHT

Description: *Vehicle height*
Value description:
0x0 - reserved
0x1 - standard
0x2 to 0x6 - SUV
0x7 - reserved

Position: 32 bit
Type: 3 bits unsigned integer
Byte order: ~~Intel~~ Motorola(big endian)
Range: 0 to 7
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Message CECU6EE (0x6EE)

Identifier: 0x6EE
DLC: 8 bytes
Cycle Time: 1000 ms
Sender Node: CECU

Signal CECU6EE_5_4_CAR_VARIANT

Description: *CAR Variant*

Value description:

0x0 - SDN (Sedan)
0x1 - WGN (Waggon)

Position: 44 bit
Type: 1 bit unsigned integer
Byte order: ~~Intel~~ Motorola(big endian)
Range: 0 to 1
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal CECU6EE_6_0_DESTINATION

Description: *Destination*

Value description:

000010b - Japan
000011b - U.S.A
000110b - U.S.A
000100b - Canada
000111b - Canada
000101b - Europe_LH
001001b - Europe_LH
001010b - Europe_LH
001100b - Europe_LH
001101b - Europe_LH
010001b - Europe_LH
011001b - Europe_LH
011101b - Europe_LH
001110b - STANDARD_LH & Latin America
001111b - STANDARD_LH & Latin America
011000b - STANDARD_LH & Latin America
011111b - STANDARD_LH & Latin America
010000b - SaudiArabia (Middle East 中近東)
011110b - SaudiArabia (Middle East 中近東)
001000b - EK
010010b - Thai & Singapore
010011b - Thai & Singapore
010101b - Thai & Singapore
010110b - Thai & Singapore
011011b - Thai & Singapore
011100b - Thai & Singapore
010100b - Australia
001011b - China
011010b - China
100001b - Korea
010111b - South Africa & Other

Position: 48 bit
Type: 6 bits unsigned integer
Byte order: ~~Intel~~ Motorola(big endian)
Range: 0 to 64
Interpretation: (PH) =1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal CECU6EE_7_4_VEHICLE_SERIES

Description: *Vehicle series*

Value description:

0x0 - reserved
0x1 - B series (= NB8 (Legacy))
0x2 - G series (= CH2 (Impreza))
0x3 - S series (= DA9 (Forester))
0x4 - abnormal
0x5 - V series (= RE7 / RH4K (Levorg))
0x6 - W series (= TL4 (Tribeca))
0x7 - reserved

Position: 60 bit

Type: 3 bits unsigned integer

Byte order: ~~Intel~~ Motorola (big endian)

Range: 0 to 7

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

Message Service_Diag_CRO_SSM (0x18DABCE0)

Identifier: 0x18DABCE0

DLC: 8 bytes

Cycle Time: n/a

Sender Node: SSM

This message shall be used by the tester to send DIAG requests to the Left ECU.

Message Service_Diag_CRO_DCM (0x18DABCE1)

Identifier: 0x18DABCE1

DLC: 8 bytes

Cycle Time: n/a

Sender Node: DCM

This message shall be used by the DCM to send DIAG requests to the Left ECU.

Message Service_Diag_Func (0x18DBEFE0)

Identifier: 0x18DBEFE0

DLC: 8 bytes

Cycle Time: n/a

Sender Node: SSM

This message shall be used by the tester to send DIAG requests to both Left and Right ECU.

Deleted messages from SW 02.00.00

Message RDR_Diag_Func (0x7DF)

The message shall be removed since SW 02.00.00 due to message ID change.

Message Remoto_Diag_CRO (0x743)

The message, 0x743, shall be removed on Vehicle bus since SW 02.00.00 because Master / Slave identification function

Deleted messages from SW 04.00.00

Message Service_Diag_CRO (0x742)

The message shall be removed on Vehicle bus since SW 04.00.00 due to message ID change.

This message shall be used by the tester to send DIAG requests to the Master ECU.

Message XCP_CRO (0x5F4)

The message in Vehicle bus shall be removed since SW 04.00.00 due to Cybersecurity relevance.

Message XCP_SLAVE_CRO (0x5F5)

The message in Vehicle bus shall be removed since SW 04.00.00 due to Cybersecurity relevance.

Output messages to Vehicle CAN (CAN messages)

Message RDR228 (0x228)

Identifier: 0x228

DLC: 8 bytes

Cycle Time: 60 ms

Sender Node: RDR

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

Signal RDR228_0_0_CHECK_SUM

Description: This signal is the message check sum.

Position: 0 bit

Type: 8 bits unsigned integer

Byte order: Intel

Range: 0 to 255

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal RDR228_1_0_MSG_COUNTER

Description: This signal is the message rolling counter.

Value description: 0 until 15.

Position: 8 bit

Type: 4 bits unsigned integer

Byte order: Intel

Range: 0 to 15

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

This signal shall represent the message rolling counter. The start/default value shall be 0. Each time the message is transr

Signal RDR228_2_0_OBJ_TRACKING_MODE

Description: This signal indicates object output list tracking mode.

Value description: 0x0 - LCS OOL mode
0x1 - RCTB OOL mode

Position: bit 16
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal RDR228_2_1_EYE_LOCAL_BUS_FAIL

Description: This signal indicates EyeSight local bus failure detection.

Value description: 0x0 - Normal
0x1 - Failure detected (e.g. bus off failure detected)

Position: bit 17
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be fixed to 0x0 always because Eyssight bus is not using in SU85.

Test criteria: The signal deletion shall be confirmed by SW Req Test. The signal bit shall output always 0.

Signal RDR228_2_2_INDICATOR_CTRL_STATE

Description: This signal indicates Indicator Control state.

Value description: 0x0 - Standalone indicator control mode
0x1 - External indicator control mode

Position: bit 18
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be fixed to 0 if SRVD system is in Not Advanced Driving mode. See L3_SW_2921 for condition of t

The signal shall be transmitted to 0 if SRVD system is in Standalone indicator control mode. See L3_SW_2961 for conditi

The signal shall be transmitted to 1 if SRVD system is in External indicator control mode. See L3_SW_2961 for condition

Signal RDR228_2_3_SENSING_RDRSYS

Description: This signal is a flag which sensing is ON or OFF.

Value description: 0x0 -> Sensing ON (Active)
0x1 -> Sensing OFF (Stop)

Position: bit 19

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

The signal value shall be fixed to 0x1 if SRVD system is in Not ELK mode.

Signal RDR228_2_4_FAIL_RDRSYS

Description: This signal is a flag which indicates if the BSD system is in FAIL status or not.

Value description: 0x0 -> Normal
0x1 -> Fail

Position: bit 20

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

The signal value shall be 0x0 if the following conditions exists:

-When none of RDR228_2_4_FAIL_RDRSYS related DTCs are active **and** PCAN Rx signal 'sSMR_SLAVE->sDgM_Safe

Note: Refer attached Excel (Tab: DTC_CAN Signal Mapping(Column 'F')) in LIB_L3_SW_ProductSheet_RM:288688 for I

The signal value shall be 0x1 if the following conditions exists:

-When atleast anyone of RDR228_2_4_FAIL_RDRSYS related DTC is active or PCAN Rx signal 'sSMR_SLAVE->sDgM_

Note: Refer attached Excel (Tab: DTC_CAN Signal Mapping(Column 'F')) in LIB_L3_SW_ProductSheet_RM:288688 for I

Signal RDR228_2_5_STOP_RDRSYS

Description: This signal is a flag which indicates if the BSD system is in Normal or Inactive status.

Value description: 0x0 -> Normal
0x1 -> Inactive

Position: bit 21
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if the following conditions exists:

- When none of RDR228_2_5_STOP_RDRSYS related DTCs are active and PCAN Rx signal 'sSMR_SLAVE-> sDgM_Limit

Note: Refer attached Excel (Tab: DTC_CAN Signal Mapping(Column 'G')) in LIB_L3_SW_ProductSheet_RM:288688 for

The signal value shall be 0x1 if the following conditions exists:

- When atleast anyone of RDR228_2_5_STOP_RDRSYS related DTC is active **or** PCAN Rx signal 'sSMR_SLAVE-> sDgM_

Note: Refer attached Excel (Tab: DTC_CAN Signal Mapping(Column 'G')) in LIB_L3_SW_ProductSheet_RM:288688 for

In the moment when output signal **RDR228_2_4_FAIL_RDRSYS** is 1 (one), the value of output signal **RDR228_2_5_STOP_RDRSYS**

Signal RDR228_2_6_ON_OFF_RDRSYS

Description: This signal is a flag which indicates if the BSD system is activated/de-activated from the Main-Switch.

Value description: 0x0 -> OFF
0x1 -> ON

Position: bit 22
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if the following conditions exists (see also L3_SW_799 from HMI module):

- Main-Switch status transmitted by HMI module is OFF.

The signal value shall be 0x1 if the following conditions exists (see also L3_SW_799 from HMI module):

- Main-Switch status transmitted by HMI module is ON.

In the moment when output signal **RDR228_2_4_FAIL_RDRSYS** is 1 (one), the value of output signal **RDR228_2_6_ON_OFF_RDRSYS**

At start up (power OFF -> power ON) the Main Switch State shall be read from EEPROM and shall continue with that value.

Due to the read from EEPROM for Main Switch State, output message RDR228 shall be delayed at start up (power Off -> power On).

The total time resulted for a "complete delay + CAN driver initialization" shall lead to a first delivery of the output message.

If the Main Switch State will not be valid (On/OFF) after the delay, the default transmitted value for this signal shall be 0x0.

Signal RDR228_2_7_BLOCKAGE_FORMING

Description: This signal is a flag which indicates if the BSD system is in blockage mode or normal.

Value description: 0x0 -> NORMAL

0x1 -> BLOCKAGE

Position: bit 23

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

The signal value shall be 0x0 if the following conditions exists:

- When none of RDR228_2_7_BLOCKAGE_FORMING related DTCs are active and PCAN Rx signal ' sSMR_SLAVE-> sFIN

Note: Refer attached Excel (Tab: DTC_CAN Signal Mapping(Column 'I')) in LIB_L3_SW_ProductSheet_RM:288688 for R

The signal value shall be 0x1 if the following conditions exists:

- When atleast anyone of RDR228_2_7_BLOCKAGE_FORMING related DTC is active OR PCAN Rx signal ' sSMR_SLAVE

Note: Refer attached Excel (Tab: DTC_CAN Signal Mapping(Column 'I')) in LIB_L3_SW_ProductSheet_RM:288688 for R

In the moment when output signal **RDR228_2_4_FAIL_RDRSYS** is 1 (one), the value of output signal **RDR228_2_7_BLOCKAGE_FORMING** (zero).

RDR228_6_5_BLOCKAGE_STS Tx Signal processing

During Initial startup (Approx 3 sec from the IGN ON) till the MDB_e_CL_RPM2_ALGO_COMP_STATE -> eCompState is

Once MDB_e_CL_RPM2_ALGO_COMP_STATE -> eCompState == 4 (Success), then check the MDB_e_CL_RPM2_SE

When MDB_e_CL_RPM2_SENSOR_BLOCKAGE -> blockageState == 255 (Invalid)

Update RDR228_6_5_BLOCKAGE_STS = 5(Invalid)

else RDR228_6_5_BLOCKAGE_STS = MDB_e_CL_RPM2_SENSOR_BLOCKAGE -> blockageState

Signal RDR228_3_0_WARN_BSD_LCA_2ND_RIGHT

Description: This signal is a flag for the warnning level 2 of BSD and LCA for Right Side.

Value description: 0x0 - OFF

0x1 - ON

Positionn bit 24

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

The signal value shall be 0x0 if the following conditions exists (see also L3_SW_832 from HMI module):

- if both BSD and LCA level 2 for Right side are inactive

The signal value shall be 0x1 if the following conditions exists (see also L3_SW_832 from HMI module):

- if BSD level 2 for Right side is active

or

- if LCA level 2 for Right side is active

{EMBEDDED id=2535593 title="_4300.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_hkl5MIC-Ee-GkrmJ

Case 1: Target Overtaking Subject Vehicle (ToS)

{IMAGE id=2512926 title="4294_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Case 2: Target Overtaking Subject Vehicle (ToS)

(Turn Signal Off during BSD/LCA warning)

{IMAGE id=2512929 title="4517_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

*1 LED is blinking until 6 cycle set finished after turn signal Off (max 880ms, depends on Trun Signal Off timing), or until v

*2 The turn signal OFF judgment will be done after the OFF state continues for 530ms. Level 2 warning will continue until

*3 BSD/LCA 2nd Flag is AND of BSD/LCA warning Level 2.

Case 3: Subject Vehicle Overtaking Target (ToS)

{IMAGE id=2512930 title="4295_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Note: The image shows left side case. Test case shall be considered to Right side.

Case 4: LCA Warning after BSD Warning

{IMAGE id=2512934 title="4519_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Note: The image shows left side case. Test case shall be considered to Right side.

Case 5: Target Overtaking Subject Vehicle (ToS)

(Target momentarily slow down)

{IMAGE id=2512936 title="4518_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Case 6: Target Overtaking Subject Vehicle (ToS)
(Left-Right compound)

{IMAGE id=2512939 title="4523_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

*1 The turn signal OFF judgment will be done after the OFF state continues for 530ms(**). Level 2 warning will continue u

*2 LED is blinking until 6 cycle set finished after turn signal Off (max 880ms, depends on Trun Signal Off timing).

*3 LED is blinking until warning condition Off.

*4 BSD/LCA 2nd Flag is AND of BSD/LCA warning Level 2.

Note: Test case shall be considered to both left and right side.

Note(**): The value will be changed below for CAN output signal tolerance,

Left side: 530ms + 60ms(RDR228 Cycle Time) = 590ms - 600ms

Right side: 530ms + 70ms(delay of communication through private bus) + 60ms(RDR228 Cycle Time) = 660ms - 670ms

Case 7: Target Overtaking Subject Vehicle (ToS)
(Put out the blinker first)

{IMAGE id=2512938 title="4522_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Case 8: Subject Vehicle Overtaking Target (SoT)
(Put out the blinker first)

{IMAGE id=2512944 title="4521_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Note: The image shows left side case. Test case shall be considered to Right side.

Case 9: LCA Warning after BSD Warning
(Put out the blinker first)

{IMAGE id=2512943 title="4520_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Note: The image shows left side case. Test case shall be considered to Right side.

Signal RDR228_3_1_WARN_BSD_LCA_2ND_LEFT

Description: This signal is a flag for the warnning level 2 of BSD and LCA for Left Side.

Value description: 0x0 - OFF

0x1 - ON

Positionn bit 25

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: (PH) =1 * (HEX) + Offset

Offset: 0

Init Value: 0

The signal value shall be 0x0 if the following conditions exists (see also L3_SW_832 from HMI module):

- if both BSD and LCA level 2 for Left side are inactive

The signal value shall be 0x1 if the following conditions exists (see also L3_SW_832 from HMI module):

- if BSD level 2 for Left side is active

or

- if LCA level 2 for Left side is active

{EMBEDDED id=2535592 title="_4301.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_fNRlclC-Ee-GkrmJ

Case 1: Target Overtaking Subject Vehicle (ToS)

{IMAGE id=2512945 title="4298_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Note: The image shows Right side case. Test case shall be considered to Left side.

Case 2: Target Overtaking Subject Vehicle (ToS)

(Turn Signal Off during BSD/LCA warning)

{IMAGE id=2512949 title="4299_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

*1 LED is blinking until 6 cycle set finished after turn signal Off (max 880ms, depends on Trun Signal Off timing), or until v

*2 The turn signal OFF judgment will be done after the OFF state continues for 530ms. Level 2 warning will continue until

*3 BSD/LCA 2nd Flag is AND of BSD/LCA warning Level 2.

Note: The image shows Right side case. Test case shall be considered to Left side.

Case 3: Subject Vehicle Overtaking Target (ToS)

{IMAGE id=2512946 title="4524_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Case 4: LCA Warning after BSD Warning

{IMAGE id=2512952 title="4525_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Case 5: Target Overtaking Subject Vehicle (ToS)

(Target momentarily slow down)

{IMAGE id=2512950 title="4526_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Note: The image shows Right side case. Test case shall be considered to Left side.

Case 6: Target Overtaking Subject Vehicle (ToS)
(Left-Right compound)

{IMAGE id=2512957 title="4527_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

*1 The turn signal OFF judgment will be done after the OFF state continues for 530ms(**). Level 2 warning will continue u

*2 LED is blinking until 6 cycle set finished after turn signal Off (max 880ms, depends on Trun Signal Off timing).

*3 LED is blinking until warning condition Off.

*4 BSD/LCA 2nd Flag is AND of BSD/LCA warning Level 2.

Note: Test case shall be considered to both left and right side.

Note(**): The value will be changed below for CAN output signal tolerance,

Left side: 530ms + 60ms(RDR228 Cycle Time) = 590ms - 600ms

Right side: 530ms + 70ms(delay of communication through private bus) + 60ms(RDR228 Cycle Time) = 660ms - 670ms

Case 7: Target Overtaking Subject Vehicle (ToS)
(Put out the blinker first)

{IMAGE id=2512955 title="4528_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Note: The image shows Right side case. Test case shall be considered to Left side.

Case 8: Subject Vehicle Overtaking Target (SoT)
(Put out the blinker first)

{IMAGE id=2512958 title="4529_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Case 9: LCA Warning after BSD Warning
(Put out the blinker first)

{IMAGE id=2512962 title="4530_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

* LED blinking and 2nd warning flag are going to OFF at the timing of BSD/LCA warning OFF.

Signal RDR228_3_5_INDICATOR_STATE_RIGHT

Description: This signal indicates Indicator current state for Right side.

Value description: 0x0 - OFF

0x1 - ON

0x2 - Blinking

0x3 - Reserved

Position: bit 29

Type: 2 bits unsigned integer

Byte order: Intel

Range: 0 to 3

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

The signal value shall be fixed to 0x0 if SRVD system is in Not Advanced Driving mode.

Signal RDR228_3_7_DETECT_RR_TGT

Description: Right side target detection flag

Value description: 0x0 - No target

0x1 - Target ON

Position: bit 31

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

The signal value shall be always 0x0.

The signal value shall be 0x0 if the following conditions exists:

- TBD

The signal value shall be 0x1 if the following conditions exists:

- TBD

Signal RDR228_4_5_INDICATOR_STATE_LEFT

Description: This signal indicates Indicator current state for Left side.

Value description: 0x0 - OFF

0x1 - ON

0x2 - Blinking

0x3 - Reserved

Position: bit 37

Type: 2 bits unsigned integer

Byte order: Intel

Range: 0 to 3

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

The signal value shall be fixed to 0x0 if SRVD system is in Not Advanced Driving mode.

Signal RDR228_4_7_DETECT_RL_TGT

Description: Left side target Detection flag

Value description: 0x0 - No target
0x1 - Target ON

Position: bit 39

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

The signal value shall be always 0x0.

The signal value shall be 0x0 if the following conditions exists:

- TBD

The signal value shall be 0x1 if the following conditions exists:

- TBD

Signal RDR228_6_0_WARN_BSD_R_1ST

Description: This signal is a flag for the warning level 1 BSD for Right Side.

Value description: 0x0 - OFF
0x1 - ON

Position: bit 48

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

The signal value shall be 0x0 if the following conditions exists (see also L3_SW_832 from HMI module):

- if BSD level 1 for Right side is inactive

The signal value shall be 0x1 if the following conditions exists (see also L3_SW_832 from HMI module):

- if BSD level 1 for Right side is active

or

- if BSD level 2 for Right side is active.

Signal RDR228_6_1_WARN_BSD_L_1ST

Description: This signal is a flag for the warning level 1 BSD for Left Side.

Value description: 0x0 - OFF
0x1 - ON

Position: bit 49
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if the following conditions exists (see also L3_SW_832 from HMI module):
- if BSD level 1 for Left side is inactive

The signal value shall be 0x1 if the following conditions exists (see also L3_SW_832 from HMI module):
- if BSD level 1 for Left side is active
or
- if BSD level 2 for Left side is active

Signal RDR228_6_2_WARN_BSD_R_2ND

Description: This signal is a flag for the warning level 2 BSD for Right Side.

Value description: 0x0 - OFF
0x1 - ON

Position: bit 50
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

~~The signal value shall be always 0x0 when vehicle platform is other than G and S series.~~

The L3_SW_3724 requirement shall be removed since SW04.00.00

The signal value shall be 0x0 if the following conditions exists (see also L3_SW_832 from HMI module):
- if BSD level 2 for Right side is inactive

The signal value shall be 0x1 if the following conditions exists (see also L3_SW_832 from HMI module):
- if BSD level 2 for Right side is active.

Signal RDR228_6_3_WARN_BSD_L_2ND

Description: This signal is a flag for the warning level 2 BSD for Left Side. (Master ECU)

Value description: 0x0 - OFF
0x1 - ON

Position: bit 51
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

~~The signal value shall be always 0x0 when vehicle platform is other than G and S series.~~

The L3_SW_3726 requirement shall be removed since SW04.00.00

The signal value shall be 0x0 if the following conditions exists (see also L3_SW_832 from HMI module):

- if BSD level 2 for Left side is inactive

The signal value shall be 0x1 if the following conditions exists (see also L3_SW_832 from HMI module):

- if BSD level 2 for Left side is active.

Signal RDR228_7_0_EYESIGHT_FAILURE_FLAG

Description: This signal is a flag for EYE messages data timeout or error detection.

Value description: 0x0 - Normal
0x1 - EYE message data timeout or error

Position: bit 56
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Condition of U127D is met, the signal shall be set to 1 while next IG-OFF.

The signal value shall be fixed to 0x0 when EyeSight does not exist. (CECU6EC_3_1 == 0x0)

Signal RDR228_7_1_BLOCKAGE_2_FLAG

Description: This signal is a flag which indicates if blockage 2 condition is satisfied.

Value description: 0x0 - Normal
0x1 - Blockage 2 satisfied

Position: bit 57
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The "sensor blockage 2" (refer to B2343(L3_SW_3373)) state shall be indicated on vehicle CAN via CAN bus signal **RDR**

The signal value shall be fixed to 0x0 if SRVD system is Not Advanced Driving mode. (Refer to L3_SW_2920 for Advanced

Signal RDR228_7_2_WARN_LCA_R_1ST

Description: This signal is a flag for the warning level 1 LCA for Right Side.

Value description: 0x0 - OFF
0x1 - ON

Position: bit 58
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if the following conditions exists (see also L3_SW_832 from HMI module):
- if LCA level 1 for Right side is inactive

The signal value shall be 0x1 if the following conditions exists (see also L3_SW_832 from HMI module):
- if LCA level 1 for Right side is active
or
- if LCA level 2 for Right side is active

Signal RDR228_7_3_WARN_LCA_L_1ST

Description: This signal is a flag for the warning level 1 LCA for Left Side.

Value description: 0x0 - OFF
0x1 - ON

Position: bit 59
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if the following conditions exists (see also L3_SW_832 from HMI module):
- if LCA level 1 for Left side is inactive

The signal value shall be 0x1 if the following conditions exists (see also L3_SW_832 from HMI module):
- if LCA level 1 for Left side is active
or
- if LCA level 2 for Left side is active

Signal RDR228_7_4_WARN_LCA_R_2ND

Description: This signal is a flag for the warning level 2 LCA for Right Side.

Value description: 0x0 - OFF
0x1 - ON

Position: bit 60
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

~~The signal value shall be always 0x0 when vehicle platform is other than G and S series.~~

The L3_SW_3728 requirement shall be removed since SW04.00.00

The signal value shall be 0x0 if the following conditions exists (see also L3_SW_832 from HMI module):

- if LCA level 2 for Right side is inactive

The signal value shall be 0x1 if the following conditions exists (see also L3_SW_832 from HMI module):

- if LCA level 2 for Right side is active.

Signal RDR228_7_5_WARN_LCA_L_2ND

Description: This signal is a flag for the warning level 2 LCA for Left Side.

Value description: 0x0 - OFF
0x1 - ON

Position: bit 61
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

~~The signal value shall be always 0x0 when vehicle platform is other than G and S series.~~

The L3_SW_3733 requirement shall be removed since SW04.00.00

The signal value shall be 0x0 if the following conditions exists (see also L3_SW_832 from HMI module):

- if LCA level 2 for Left side is inactive

The signal value shall be 0x1 if the following conditions exists (see also L3_SW_832 from HMI module):

- if LCA level 2 for Left side is active.

Signal RDR228_7_6_WARN_RCTA_R

Description: This signal is a flag for the warning level 1 RCTA for Right Side.

Value description: 0x0 - OFF
0x1 - ON

Position: bit 62
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if the following conditions exists (see also L3_SW_832 from HMI module):
- if RCTA level 1 for Right side is inactive

The signal value shall be 0x1 if the following conditions exists (see also L3_SW_832 from HMI module):
- if RCTA level 1 for Right side is active

Signal RDR228_7_7_WARN_RCTA_L

Description: This signal is a flag for the warning level 1 RCTA for Left Side.

Value description: 0x0 - OFF
0x1 - ON

Position: bit 63
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if the following conditions exists (see also L3_SW_832 from HMI module):
- if RCTA level 1 for Left side is inactive

The signal value shall be 0x1 if the following conditions exists (see also L3_SW_832 from HMI module):
- if RCTA level 1 for Left side is active

Message Service_Diag.DTO_SSM (0x18DAE0BC)

Identifier: 0x18DAE0BC
DLC: 8 bytes
Cycle Time: n/a
Sender Node: RCR_LH

This message shall be used by the Left ECU to send DIAG response to the Tester.

Message Service_Diag.DTO_DCM (0x18DAE1BC)

Identifier: 0x18DAE1BC
DLC: 8 bytes
Cycle Time: n/a
Sender Node: RCR_LH

This message shall be used by the Left ECU to send DIAG response to the DCM.

Message RCR29x (0x296 to 0x29E) - Object Output List for Left side

Identifier: 0x296 to 0x29E (9 messages)

DLC: 8 bytes

Cycle Time: 40 ms

Sender Node: RCR (SRVD)

System shall send object data with valid = 0 (No valid data) and ID = 0 when malfunction condition (see L3_SW_367) is fulfilled.

Signal RCR29x_0_0_CHECK_SUM

Description: This signal is the message check sum.

Position: 0 bit

Type: 8 bits unsigned integer

Byte order: Intel

Range: 0 to 255

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

CHECKSUM formula shall be FHI method described in L3_SW_1974.

Signal RCR29x_1_0_MSG_COUNTER

Description: This signal is the message rolling counter.

Value description: 0 until 15.

Position: 8 bit

Type: 4 bits unsigned integer

Byte order: Intel

Range: 0 to 15

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

In the same transmission cycle, all 9 RCR message rolling counter shall be the same value.

Signal RCR29x_1_4_OBJ_VALID

Description: This signal indicates whether object data is valid or not.

Value description: 0x0 - Invalid

0x1 - Valid

Position: 12 bit

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

When shift position is not equal to Reverse, an I/F variable, **LCS_ObjectData[x].Attributes.bObjectValid**, shall be converted to a Boolean variable.

When shift position is equal to Reverse, an I/F variable, **RCTBCustObjData[i].Attributes.bObjectValid**, shall be converted to a Boolean variable.

Signal RCR29x_1_5_OBJ_DX

Description: This signal indicates Object target relative X distance.

Value description: -

Position: 13 bit
Type: 11 bits signed integer
Byte order: Intel
Range: -102.4 to +102.3
Interpretation: $(PH) = 0.1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

When shift position is not equal to Reverse, an I/F variable, **LCS_ObjectData[x].Kinematics.fDistX**, shall be converted.

When shift position is equal to Reverse, an I/F variable, **RCTBCustObjData[i].Kinematics.fDistX**, shall be converted.

Signal RCR29x_3_0_OBJ_DY

Description: This signal indicates Object target relative Y distance.

Value description: -

Position: 24 bit
Type: 11 bits signed integer
Byte order: Intel
Range: -102.4 to +102.3
Interpretation: $(PH) = 0.1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

When shift position is not equal to Reverse, an I/F variable, **LCS_ObjectData[x].Kinematics.fDistY**, shall be converted.

When shift position is equal to Reverse, an I/F variable, **RCTBCustObjData[i].Kinematics.fDistY**, shall be converted.

Signal RCR29x_4_3_OBJ_VX

Description: This signal indicates Object target relative velocity for X direction.

Value description: -

Position: 35 bit
Type: 10 bits signed integer
Byte order: Intel
Range: -51.2 to +51.1
Interpretation: $(PH) = 0.1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

When shift position is not equal to Reverse, an I/F variable, **LCS_ObjectData[x].Kinematics.fVrelX**, shall be converted.

When shift position is equal to Reverse, an I/F variable, **RCTBCustObjData[i].Kinematics.fVrelX**, shall be converted.

Signal RCR29x_6_0_OBJ_ID

Description: This signal indicates Object identification.

Value description: -

Position: 48 bit

Type: 6 bits unsigned integer

Byte order: Intel

Range: 0 to 8

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

When shift position is not equal to Reverse, each CAN ID shall be output different OBJ_ID if an object is detected. For example, this value shall be 0 in RCR296, 8 in RCR29E.

When shift position is equal to Reverse, an I/F variable, **RCTBCustObjData[i].General.uOutObjID**, shall be converted.

Signal RCR29x_6_6_OBJ_VY

Description: This signal indicates Object target relative velocity for Y direction.

Value description: -

Position: 54 bit

Type: 10 bits signed integer

Byte order: Intel

Range: -51.2 to +51.1

Interpretation: $(PH) = 0.1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

When shift position is not equal to Reverse, an I/F variable, **LCS_ObjectData[x].Kinematics.fVrelY**, shall be converted.

When shift position is equal to Reverse, an I/F variable, **RCTBCustObjData[i].Kinematics.fVrelY**, shall be converted.

Message NS55B (0x55B) - Network Status for Left side

Identifier: 0x55B

DLC: 8 bytes

Cycle Time: 1000 ms

Sender Node: RCR_L

Signal NS55B_0_0_Reserved

Description: *Network Status*

Value description:

The signal value shall be always 0.

Position: 0 bit

Type: 64 bits unsigned integer

Byte order: Motorola (big endian)

Range:

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Deleted messages from SW 04.00.00

Message Service_Diag_DTO (0x74A)

The message shall be removed on Vehicle bus since SW 04.00.00 due to message ID change.

Message Remote_Diag_DTO (0x74B)

The message, 0x74B, shall be removed since SW 02.00.00 because Master / Slave identification function will be changed.

Message XCP_DTO (0x5F6)

The message in Vehicle bus shall be removed since SW 04.00.00 due to Cybersecurity relevance.

Message XCP_SLAVE_DTO (0x5F7)

The message in Vehicle bus shall be removed since SW 04.00.00 due to Cybersecurity relevance.

Private CAN / Channel 1

The communication on the Private CAN(channel 1) on Right and Left, the interface to the vehicle, shall be implemented with

CAN clock frequency=40MHz±0.5%

Bit time(NBT)= 80 (Arbitration), 20 (Data)

Sample point= 80% (Arbitration), 70% (Data)

Sync_Seg= 1 (Arb), 1 (Data)

Prop_Seg= 47 (Arb), 7 (Data)

Phase_Seg1= 16 (Arb), 6 (Data)

Phase_Seg2= 16 (Arb), 6 (Data)

Synchro jump width(SJW)= 16 (Arbitration), 6 (Data)

Frame format shall be 11 bitID standard frame

Number of sending/receiving IDs shall be as specified in the Subaru dbc file.

Compatibility with DIAG shall be as specified by Subaru (Refer to "SSM3 Diagnosis Communication Spec. FHI-CAN" for details)

CAN operating voltage range: DC 9~16V

Communication protocol shall be ISO 15765-2 compliant.

The baud rate of the CAN-bus for CAN-FD shall be set to:

500 kBaud (Arbitration)

2000 kBaud (Data)

This CAN communication is between the Left and the Right ECU.

Depending on the determined node-ID, private CAN communication shall be switched during the sensor startup phase before

The requirement shall be removed since SW 02.00.00 because Master / Slave identification function will be changed.

Test criteria: The function change shall be confirmed by SW Req Test.

TX Messages from Left

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

Message mISC_CTRL (0x10)

Identifier: 0x10

DLC: 8 bytes

Cycle time:

Sender node: RCR_L

This message is used for communication between Master ECU and Slave ECU. It is handled by Base team.

Signal Tx_ISC_TIMESTAMP

Description: Timestamp for the algo

Position: bit 24

Type: 32 bits unsigned integer

Byte order: Motorola

Range: 0 to 4294967296

Interpretation: none

Offset: 0

Init Value: 0

Signal Tx_ISC_DLEN

Description: not used, always return 0.

Position: bit 32

Type: 8 bits unsigned integer

Byte order: Motorola

Range: 0 to 255

Offset: 0

Init Value: 0

Signal Tx_ISC_FIM_BLOCKAGE

Description: Sensor in Blockage mode

Position: bit 42

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0,1

Interpretation: 0-Blockage detected
1-Blockage not detected

Offset: 0

Init Value: 0

Signal Tx_ISC_ALIGNMENT

Description: inihibit function cause of Auto - ALIGNMENT

Position: bit 43

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0, 1

Interpretation: 0 - Alignment error detected
1 - Alignment error not present

Offset: 0

Init Value: 0

Signal Tx_ISC_PROTECTION

Description: inihabit function cause of PROTECTION

Position: bit 44

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0,1

Interpretation: 0- FIM_Protection active
1- FIM_Protection not active

Offset: 0

Init Value: 0

Signal Tx_ISC_MALFUNCTION

Description:

Value description:

Position: bit 45

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0,1

Interpretation: 0- FIM_Malfunction active
1- FIM_Malfunction not active

Offset: 0

Init Value: 0

Signal Tx_ISC_CMD

Description: Synchronism and control for inter sensor communication for the LCA.

Position: bit 46

Type: 2 bits unsigned integer

Byte order: Motorola

Range: 1,2

Interpretation: 1 - Synchronization from Master
2 -Synchronization from Slave

Offset: 0

Init Value: 0

Signal Tx_ISC_SCTL

Description: state of sensor control

Value description:

Position: bit 49

Type: 3 bits unsigned integer

Byte order: Motorola

Range: 0 to 5

Interpretation: 0 -Not yet running
1- Startup
2- Init
3-Normal
4- EOL Alignment
5 -BSD Zone

Offset: 0

Init Value: 0

Signal Tx_ISC_RCTA

Description: Warning information from the FCT

Value description:

Position: bit 52

Type: 2 bits unsigned integer

Byte order: Motorola

Range: 0 to 2

Interpretation: 0 - NO request
1 - Active
2,3 - Not used

Offset: 0

Init Value: 0

Signal Tx_ISC_LCA

Description: Warning information from the FCT

Value description:

Position: bit 54

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0, 1

Interpretation: 0-Not Active
1-Active

Offset: 0

Init Value: 0

Signal Tx_ISC_BSD

Description: Warning information from the FCT

Position: bit 55

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0, 1

Interpretation: 0-Not Active

1-Active

Offset: 0

Init Value: 0

Signal Tx_ISC_HMI

Description: HMI Status - not used

Value description:

Position: bit 56

Type: 8 bits unsigned integer

Byte order: Motorola

Range: 0 to 255

Interpretation: none

Offset: 0

Init Value: 0

Message mISC_DATA (0x12)

Identifier: 0x12

DLC: 8 bytes

Cycle time: -

Sender node: RCR_L

This message is used for communication between Slave ECU and Master ECU. The values of this data shall be different

Signals: mISC_D0, mISC_D1, mISC_D2, mISC_D3, mISC_D4, mISC_D5, mISC_D6, mISC_D7

Message mSMR_MASTER (0x332)

Identifier: 0x332

DLC: 4

Cycle time: 40

Sender node: RCR_L

Signal mMAIN_SWITCH

Description: Main switch

Value description: 0x0 -> Not Valid

0x1 -> ON

0x2 -> OFF

0x3 - value not used

Position: bit 2

Type: 2 bits unsigned integer

Byte order: Motorola

Range: 0 to 3

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

Signal mLCA_REQ

Description: This signal indicates LCA warning.

Value description: 0x0 -> OFF
0x1 -> ON
0x2,0x3 ->NotUsed

Position: bit 20

Type: 2 bit unsigned integer

Byte order: Motorola

Range: 0 to 3

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

The signal value shall be 0x0 if no LCA warning is active.

The signal value shall be 0x1 if LCA warning level 1 or level 2 is active.

Signal mRTCA_REQ

Description: This signal indicates RTCA warning.

Value description: 0x0 -> OFF
0x1 -> ON
0x2,0x3 ->NotUsed

Position: bit 18

Type: 2 bit unsigned integer

Byte order: Motorola

Range: 0 to 3

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

The signal value shall be 0x0 if no RTCA warning is active.

The signal value shall be 0x1 if RTCA warning level 1 is active.

Signal mBSD_REQ

Description: This signal indicates if there is a BSD warning active.

Value description: 0x0 -> OFF
0x1 -> ON
0x2,0x3 ->NotUsed

Position: bit 22

Type: 2 bit unsigned integer

Byte order: Motorola

Range: 0 to 3

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

The signal value shall be 0x0 if no BSD warning active.

The signal value shall be 0x1 if BSD warning level 1 or level 2 is active.

Message XCP_LEFT.DTO (0x5F6)

Identifier: 0x5F6

DLC: 8 bytes

Cycle Time: n/a

Sender Node: RCR_L

This message shall be used by the Left ECU to send XCP response to the Tester.

Message UDS_LEFT.DTO (0x5FE)

Identifier: 0x5FE

DLC: 8 bytes

Cycle Time: n/a

Sender Node: RCR_L

This message shall be used by the Left ECU to send UDS DIAG response to the Tester.

Deleted messages from SW 02.00.00

Message VDC138 (0x138)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message VDC139 (0x139)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message VDC328 (0x328)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message BIU3AC (0x3AC)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message CGW660 (0x660)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message EGI040 (0x040)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message ISS174 (0x174)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message EYE321 (0x321)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message EYE322 (0x322)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message MET390 (0x390)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message TCU048 (0x48)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message AVN6BB (0x6BB)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message RCR23x (0x230 to 0x238) - Object output list for Left side

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message mRemote_Diag_CRO (0x743)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

Message mRDR_Diag_Func (0x7DF)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer

RX messages by Left

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

Message sISC_CTRL (0x11)

Identifier: 0x11

DLC: 8 bytes

Cycle time:

Sender node: RCR_R

This message is used for communication between Master ECU and Slave ECU. It is handled by Base team.

Signal Tx_sISC_TIMESTAMP

Description: Timestamp for the algo

Position: bit 24

Type: 32 bits unsigned integer

Byte order: Motorola

Range: 0 to 4294967296

Interpretation: none

Offset: 0

Init Value: 0

Signal Tx_sISC_DLEN

Description: not used, always return 0.

Position: bit 32

Type: 8 bits unsigned integer

Byte order: Motorola

Range: 0 to 255

Offset: 0

Init Value: 0

Signal Tx_sISC_FIM_BLOCKAGE

Description: Sensor in Blockage mode

Position: bit 42

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0,1

Interpretation: 0-Blockage detected
1-Blockage not detected

Offset: 0

Init Value: 0

Signal Tx_sISC_ALIGNMENT

Description: inhibit function cause of Auto - ALIGNMENT

Position: bit 43

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0, 1

Interpretation: 0 - Alignment error detected
1 - Alignment error not present

Offset: 0

Init Value: 0

Signal Tx_sISC_PROTECTION

Description: inhibit function cause of PROTECTION

Position: bit 44

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0,1

Interpretation: 0- FIM_Protection active
1- FIM_Protection not active

Offset: 0

Init Value: 0

Signal Tx_sISC_MALFUNCTION

Description:

Value description:

Position: bit 45

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0,1

Interpretation: 0- FIM_Malfunction active
1- FIM_Malfunction not active

Offset: 0

Init Value: 0

Signal Tx_sISC_CMD

Description: Synchronization and control for inter sensor communication for the LCA.

Position: bit 46

Type: 2 bits unsigned integer

Byte order: Motorola

Range: 1,2

Interpretation: 1 - Synchronization from Master
2 -Synchronization from Slave

Offset: 0

Init Value: 0

Signal Tx_sISC_SCTL

Description: state of sensor control

Value description:

Position: bit 49

Type: 3 bits unsigned integer

Byte order: Motorola

Range: 0 to 5

Interpretation: 0 -Not yet running

1- Startup

2- Init

3-Normal

4- EOL Alignment

5 -BSD Zone

Offset: 0

Init Value: 0

Signal Tx_sISC_RCTA

Description: Warning information from the FCT

Value description:

Position: bit 52

Type: 2 bits unsigned integer

Byte order: Motorola

Range: 0 to 2

Interpretation: 0 - NO request

1 - Active request

2 - not used

3 - not used

Offset: 0

Init Value: 0

Signal Tx_sISC_LCA

Description: Warning information from the FCT

Value description:

Position: bit 54

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0, 1

Interpretation: 0-Not Active

1-Active

Offset: 0

Init Value: 0

Signal Tx_sISC_BSD

Description: Warning information from the FCT

Position: bit 55

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0, 1

Interpretation: 0-Not Active

1-Active

Offset: 0

Init Value: 0

Signal Tx_sISC_HMI

Description: HMI Status - not used

Value description:

Position: bit 56

Type: 8 bits unsigned integer

Byte order: Motorola

Range: 0 to 255

Interpretation: none

Offset: 0

Init Value: 0

Message sISC_DATA (0x13)

Identifier: 0x13

DLC: 8 bytes

Cycle time: -

Sender node: RCR_R

This message is used for communication between Slave ECU and Master ECU. The values of this data shall be different

Signals: sISC_D0, sISC_D1, sISC_D2, sISC_D3, sISC_D4, sISC_D5, sISC_D6, sISC_D7

Message sSMR_SLAVE (0x333)

Identifier: 0x333

DLC: 4

Cycle time: 40

Sender node: RCR_R

Signal sBLOCKAGE_Lvl2

Description: This signal indicates sensor detects blockage level 2.

Value description: 0x0 - Normal

0x1 - Blockage level 2 detect

Position: bit 0

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0 to 1

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

Signal sEyeSightBusOff_Failure

The signal value shall be fixed to 0x0 always because Eyssight bus is not using in SU85.

Signal sSYSTEM_FAILURE

Description: This signal is a flag which indicates if the radar system is in Normal or Fail state.

Value description: 0x0 -> Normal
0x1 -> Halt

Position: bit 9
Type: 1 bit unsigned integer
Byte order: Motorola
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if no error is active

The signal value shall be 0x1 if at least one error is active

Signal sCANCEL_CODE

Description: This signal is a flag which indicates if the radar system is in Normal or Halt status.

Value description: 0x0 -> Normal
0x1 -> Halt

Position: bit 10
Type: 1 bit unsigned integer
Byte order: Motorola
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if no temporary type DTC is active (Cancel code)

The signal value shall be 0x1 if any temporary type DTC is active (Cancel code)

Signal sRTCA_REQ

Description: This signal indicates RTCA warning.

Value description: 0x0 -> OFF
0x1 -> ON
0x2,0x3 -> NotUsed

Position: bit 18
Type: 2 bit unsigned integer
Byte order: Motorola
Range: 0 to 3
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if no RTCA warning is active.

The signal value shall be 0x1 if RTCA warning level 1 is active.

Signal sLCA_REQ

Description: This signal indicates LCA warning.

Value description: 0x0 -> OFF

0x1 -> warning level 1 active

0x2 -> warning level 2 active

0x3 -> NotUsed

Position: bit 20

Type: 2 bit unsigned integer

Byte order: Motorola

Range: 0 to 3

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

The signal value shall be 0x0 if no LCA warning is active.

The signal value shall be 0x1 if LCA warning level 1 is active.

The signal value shall be 0x2 if LCA warning level 2 is active.

Signal sBSD_REQ

Description: This signal indicates if there is a BSD warning active.

Value description: 0x0 -> OFF

0x1 -> warning level 1 active

0x2 -> warning level 2 active

0x3 -> NotUsed

Position: bit 22

Type: 2 bit unsigned integer

Byte order: Motorola

Range: 0 to 3

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

The signal value shall be 0x0 if no BSD warning active.

The signal value shall be 0x1 if BSD warning level 1 is active.

The signal value shall be 0x2 if BSD warning level 2 is active.

Signal sHMI_INDI_STAT

Description: This signal indicates if indicator current state for Right Mirror when External indicator control mode.

Value description: 0x0 -> OFF
0x1 -> ON
0x2 -> blinking
0x3 -> Reserved

Position: bit 24
Type: 2 bit unsigned integer
Byte order: Motorola
Range: 0 to 3
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if indicator current state is OFF.

The signal value shall be 0x1 if indicator current state is ON.

The signal value shall be 0x2 if indicator current state is blinking.

Message XCP_LEFT_CRO (0x5F4)

Identifier: 0x5F4
DLC: 8 bytes
Cycle Time: n/a
Sender Node: XCP Tester

This message shall be used by the tester to send XCP requests to the Left ECU.

Message UDS_LEFT_CRO (0x5FC)

Identifier: 0x5FC
DLC: 8 bytes
Cycle Time: n/a
Sender Node: XCP Tester

This message shall be used by the tester to send UDS Diag requests to the Left ECU.

TX messages from Right

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

Message sISC_CTRL (0x11)

Identifier: 0x11
DLC: 8 bytes
Cycle time:
Sender node: RCR_R

This message is used for communication between Master ECU and Slave ECU. It is handled by Base team.

Signal Tx_sISC_TIMESTAMP

Description: Timestamp for the algo
Position: bit 24
Type: 32 bits unsigned integer
Byte order: Motorola
Range: 0 to 4294967296
Interpretation: none
Offset: 0
Init Value: 0

Signal Tx_sISC_DLEN

Description: not used, always return 0.

Position: bit 32

Type: 8 bits unsigned integer

Byte order: Motorola

Range: 0 to 255

Offset: 0

Init Value: 0

Signal Tx_sISC_FIM_BLOCKAGE

Description: Sensor in Blockage mode

Position: bit 42

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0,1

Interpretation: 0-Blockage detected
1-Blockage not detected

Offset: 0

Init Value: 0

Signal Tx_sISC_ALIGNMENT

Description: inihabit function cause of Auto - ALIGNMENT

Position: bit 43

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0, 1

Interpretation: 0 - Alignment error detected
1 - Alignment error not present

Offset: 0

Init Value: 0

Signal Tx_sISC_PROTECTION

Description: inihabit function cause of PROTECTION

Position: bit 44

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0,1

Interpretation: 0- FIM_Protection active
1- FIM_Protection not active

Offset: 0

Init Value: 0

Signal Tx_sISC_MALFUNCTION

Description:

Value description:

Position: bit 45

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0,1

Interpretation: 0- FIM_Malfunction active
1- FIM_Malfunction not active

Offset: 0

Init Value: 0

Signal Tx_sISC_CMD

Description: Synchronism and control for inter sensor communication for the LCA.

Position: bit 46

Type: 2 bits unsigned integer

Byte order: Motorola

Range: 1,2

Interpretation: 1 - Synchronization from Master
2 -Synchronization from Slave

Offset: 0

Init Value: 0

Signal Tx_sISC_SCTL

Description: state of sensor control

Value description:

Position: bit 49

Type: 3 bits unsigned integer

Byte order: Motorola

Range: 0 to 5

Interpretation: 0 -Not yet running
1- Startup
2- Init
3-Normal
4- EOL Alignment
5 -BSD Zone

Offset: 0

Init Value: 0

Signal Tx_sISC_RCTA

Description: Warning information from the FCT

Value description:

Position: bit 52

Type: 2 bits unsigned integer

Byte order: Motorola

Range: 0 to 2

Interpretation: 0 - NO request
1 - Active request
2 - not used
3 - not used

Offset: 0

Init Value: 0

Signal Tx_sISC_LCA

Description: Warning information from the FCT

Value description:

Position: bit 54

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0, 1

Interpretation: 0-Not Active
1-Active

Offset: 0

Init Value: 0

Signal Tx_sISC_BSD

Description: Warning information from the FCT

Position: bit 55

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0, 1

Interpretation: 0-Not Active
1-Active

Offset: 0

Init Value: 0

Signal Tx_sISC_HMI

Description: HMI Status - not used

Value description:

Position: bit 56

Type: 8 bits unsigned integer

Byte order: Motorola

Range: 0 to 255

Interpretation: none

Offset: 0

Init Value: 0

Message sISC_DATA (0x13)

Identifier: 0x13
DLC: 8 bytes
Cycle time: -
Sender node: RCR_R

This message is used for communication between Slave ECU and Master ECU. The values of this data shall be different
Signals: sISC_D0, sISC_D1, sISC_D2, sISC_D3, sISC_D4, sISC_D5, sISC_D6, sISC_D7

Message sSMR_SLAVE (0x333)

Identifier: 0x333
DLC: 4
Cycle time: 40
Sender node: RCR_R

Signal sBLOCKAGE_Lvl2

Description: This signal indicates sensor detects blockage level 2.

Value description: 0x0 - Normal
0x1 - Blockage level 2 detect

Position: bit 0
Type: 1 bit unsigned integer
Byte order: Motorola
Range: 0 to 1
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal sEyeSightBusOff_Failure

The signal value shall be fixed to 0x0 always because Eyssight bus is not using in SU85.

Signal sSYSTEM_FAILURE

Description: This signal is a flag which indicates if the radar system is in Normal or Fail state.

Value description: 0x0 -> Normal
0x1 -> Halt

Position: bit 9
Type: 1 bit unsigned integer
Byte order: Motorola
Range: 0 to 1
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

The signal value shall be 0x0 if no error is active

The signal value shall be 0x1 if at least one error is active

Signal sCANCEL_CODE

Description: This signal is a flag which indicates if the radar system is in Normal or Halt status.

Value description: 0x0 -> Normal
0x1 -> Halt

Position: bit 10
Type: 1 bit unsigned integer
Byte order: Motorola
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if no temporary type DTC is active (Cancel code)

The signal value shall be 0x1 if any temporary type DTC is active (Cancel code)

Signal sRTCA_REQ

Description: This signal indicates RTCA warning.

Value description: 0x0 -> OFF
0x1 -> ON
0x2,0x3 -> NotUsed

Position: bit 18
Type: 2 bit unsigned integer
Byte order: Motorola
Range: 0 to 3
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if no RTCA warning is active.

The signal value shall be 0x1 if RTCA warning level 1 is active.

Signal sLCA_REQ

Description: This signal indicates LCA warning.

Value description: 0x0 -> OFF
0x1 -> warning level 1 active
0x2 -> warning level 2 active
0x3 -> NotUsed

Position: bit 20
Type: 2 bit unsigned integer
Byte order: Motorola
Range: 0 to 3
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

The signal value shall be 0x0 if no LCA warning is active.

The signal value shall be 0x1 if LCA warning level 1 is active.

The signal value shall be 0x2 if LCA warning level 2 is active.

Signal sBSD_REQ

Description: This signal indicates if there is a BSD warning active.

Value description: 0x0 -> OFF

0x1 -> warning level 1 active

0x2 -> warning level 2 active

0x3 -> NotUsed

Position: bit 22

Type: 2 bit unsigned integer

Byte order: Motorola

Range: 0 to 3

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

The signal value shall be 0x0 if no BSD warning active.

The signal value shall be 0x1 if BSD warning level 1 is active.

The signal value shall be 0x2 if BSD warning level 2 is active.

Signal sHMI_INDI_STAT

Description: This signal indicates if indicator current state for Right Mirror when External indicator control mode.

Value description: 0x0 -> OFF

0x1 -> ON

0x2 -> blinking

0x3 -> Reserved

Position: bit 24

Type: 2 bit unsigned integer

Byte order: Motorola

Range: 0 to 3

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

The signal value shall be 0x0 if indicator current state is OFF.

The signal value shall be 0x1 if indicator current state is ON.

The signal value shall be 0x2 if indicator current state is blinking.

Message XCP_RIGHT.DTO (0x5F7)

Identifier: 0x5F7

DLC: 8 bytes

Cycle time: n/a

Sender node: RCR_R

This message shall be used by the Right ECU to send XCP response to the Tester.

Message UDS_RIGHT.DTO (0x5FF)

Identifier: 0x5FF

DLC: 8 bytes

Cycle Time: n/a

Sender Node: RCR_R

This message shall be used by the Right ECU to send UDS DIAG response to the Tester.

Deleted messages from SW 02.00.00

Message sRemote_Diag_DTO (0x74B)

The message shall be removed since SW 02.00.00 because Master / Slave identification function will be changed. (Refer RX messages by Right

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

Message mISC_CTRL (0x10)

Identifier: 0x10
DLC: 8 bytes
Cycle time:
Sender node: RCR_L

This message is used for communication between Master ECU and Slave ECU. It is handled by Base team.

Signal Tx_ISC_TIMESTAMP

Description: Timestamp for the algo
Position: bit 24
Type: 32 bits unsigned integer
Byte order: Motorola
Range: 0 to 4294967296
Interpretation: none
Offset: 0
Init Value: 0

Signal Tx_ISC_DLEN

Description: not used, always return 0.
Position: bit 32
Type: 8 bits unsigned integer
Byte order: Motorola
Range: 0 to 255
Offset: 0
Init Value: 0

Signal Tx_ISC_FIM_BLOCKAGE

Description: Sensor in Blockage mode
Position: bit 42
Type: 1 bit unsigned integer
Byte order: Motorola
Range: 0,1
Interpretation: 0-Blockage detected
1-Blockage not detected
Offset: 0
Init Value: 0

Signal Tx_ISC_ALIGNMENT

Description: inhibit function cause of Auto - ALIGNMENT

Position: bit 43

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0, 1

Interpretation: 0 - Alignment error detected
1 - Alignment error not present

Offset: 0

Init Value: 0

Signal Tx_ISC_PROTECTION

Description: inhibit function cause of PROTECTION

Position: bit 44

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0,1

Interpretation: 0- FIM_Protection active
1- FIM_Protection not active

Offset: 0

Init Value: 0

Signal Tx_ISC_MALFUNCTION

Description:

Value description:

Position: bit 45

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0,1

Interpretation: 0- FIM_Malfunction active
1- FIM_Malfunction not active

Offset: 0

Init Value: 0

Signal Tx_ISC_CMD

Description: Synchronization and control for inter sensor communication for the LCA.

Position: bit 46

Type: 2 bits unsigned integer

Byte order: Motorola

Range: 1,2

Interpretation: 1 - Synchronization from Master
2 -Synchronization from Slave

Offset: 0

Init Value: 0

Signal Tx_ISC_SCTL

Description: state of sensor control

Value description:

Position: bit 49

Type: 3 bits unsigned integer

Byte order: Motorola

Range: 0 to 5

Interpretation: 0 -Not yet running
1- Startup
2- Init
3-Normal
4- EOL Alignment
5 -BSD Zone

Offset: 0

Init Value: 0

Signal Tx_ISC_RCTA

Description: Warning information from the FCT

Value description:

Position: bit 52

Type: 2 bits unsigned integer

Byte order: Motorola

Range: 0 to 2

Interpretation: 0 - NO request
1 - Active
2,3 - Not used

Offset: 0

Init Value: 0

Signal Tx_ISC_LCA

Description: Warning information from the FCT

Value description:

Position: bit 54

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0, 1

Interpretation: 0-Not Active
1-Active

Offset: 0

Init Value: 0

Signal Tx_ISC_BSD

Description: Warning information from the FCT

Position: bit 55

Type: 1 bit unsigned integer

Byte order: Motorola

Range: 0, 1

Interpretation: 0-Not Active

1-Active

Offset: 0

Init Value: 0

Signal Tx_ISC_HMI

Description: HMI Status - not used

Value description:

Position: bit 56

Type: 8 bits unsigned integer

Byte order: Motorola

Range: 0 to 255

Interpretation: none

Offset: 0

Init Value: 0

Message mISC_DATA (0x12)

Identifier: 0x12

DLC: 8 bytes

Cycle time: -

Sender node: RCR_L

This message is used for communication between Slave ECU and Master ECU. The values of this data shall be different

Signals: mISC_D0, mISC_D1, mISC_D2, mISC_D3, mISC_D4, mISC_D5, mISC_D6, mISC_D7

Message mSMR_MASTER (0x332)

Identifier: 0x332

DLC: 4

Cycle time: 40

Sender node: RCR_L

Signal mMAIN_SWITCH

Description: Main switch

Value description: 0x0 -> Not Valid

0x1 -> ON

0x2 -> OFF

0x3 - value not used

Position: bit 2

Type: 2 bits unsigned integer

Byte order: Motorola

Range: 0 to 3

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

Signal mLCA_REQ

Description: This signal indicates LCA warning.

Value description: 0x0 -> OFF
0x1 -> ON
0x2,0x3 ->NotUsed

Position: bit 20

Type: 2 bit unsigned integer

Byte order: Motorola

Range: 0 to 3

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

The signal value shall be 0x0 if no LCA warning is active.

The signal value shall be 0x1 if LCA warning level 1 or level 2 is active.

Signal mRTCA_REQ

Description: This signal indicates RTCA warning.

Value description: 0x0 -> OFF
0x1 -> ON
0x2,0x3 ->NotUsed

Position: bit 18

Type: 2 bit unsigned integer

Byte order: Motorola

Range: 0 to 3

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

The signal value shall be 0x0 if no RTCA warning is active.

The signal value shall be 0x1 if RTCA warning level 1 is active.

Signal mBSD_REQ

Description: This signal indicates if there is a BSD warning active.

Value description: 0x0 -> OFF
0x1 -> ON
0x2,0x3 ->NotUsed

Position: bit 22

Type: 2 bit unsigned integer

Byte order: Motorola

Range: 0 to 3

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

The signal value shall be 0x0 if no BSD warning active.

The signal value shall be 0x1 if BSD warning level 1 or level 2 is active.

Message XCP_RIGHT_CRO (0x5F5)

Identifier: 0x5F5

DLC: 8 bytes

Cycle Time: n/a

Sender Node: XCP Tester

This message shall be used by the tester to send XCP requests to the Right ECU.

Message UDS_RIGHT_CRO (0x5FD)

Identifier: 0x5FD

DLC: 8 bytes

Cycle Time: n/a

Sender Node: XCP Tester

This message shall be used by the tester to send UDS Diag requests to the Right ECU.

Vehicle CAN / Public CAN / Channel 0 on Right

The communication on the Public CAN(channel 0) on Right, the interface to the vehicle, shall be implemented with the following parameters:
CAN clock frequency=8MHz±0.5%

Bit time(NBT)= 16

Sample point=81.3%

Synchro jump width(SJW)=2

Frame format shall be 11 bitID standard frame

Number of sending/receiving IDs shall be as specified in the Subaru dbc file.

Compatibility with DIAG shall be as specified by Subaru (Refer to “SSM3 Diagnosis Communication Spec. FHI-CAN” for details)

CAN operating voltage range: DC 9~16V

Communication protocol shall be ISO 15765-2 compliant.

The communication on the Public CAN(channel 0) on Right, the interface to the vehicle, shall be implemented with the following parameters:
CAN clock frequency=40MHz±0.5%
Bit time(NBT)= 80 (Arbitration), 20 (Data)
Sample point= 80% (Arbitration), 70% (Data)
Sync_Seg= 1 (Arb), 1 (Data)
Prop_Seg= 47 (Arb), 7 (Data)
Phase_Seg1= 16 (Arb), 6 (Data)
Phase_Seg2= 16 (Arb), 6 (Data)
Synchro jump width(SJW)= 16 (Arbitration), 6 (Data)
Frame format shall be 11 bitID standard frame
Number of sending/receiving IDs shall be as specified in the Subaru dbc file.
Compatibility with DIAG shall be as specified by Subaru (Refer to “SSM3 Diagnosis Communication Spec. FHI-CAN” for details)
CAN operating voltage range: DC 9~16V

Communication protocol shall be ISO 15765-2 compliant.

The baud rate of the CAN-bus shall be set to 500 kBaud ±0,15%

The baud rate of the CAN-bus for CAN-FD shall be set to:

500 kBaud (Arbitration)

2000 kBaud (Data)

The communication bit rate in the data field shall be changeable to 500 kbps and to 1 Mbps.

Note: The bit rate doesn't need to be changed dynamically in one piece of software.

After power-on the ECU shall start transmission of CAN-messages within **210 - 500** ms.

After power-on the ECU shall be able to receive CAN messages within **170** ms.

Communication shall be possible without problems until a Max. Bus Load of 80%.

The SRVD for SRR630SU17 project consist of the Left and Right modules. Each modules are Master. Communications are bidirectional.

Each left / right modules transmit/receive the data as below,

- CAN message from vehicle bus: left / right sensor receive
- OOL: object list which are detected by each sensor are transmitted from each sensor.
- DTC: DTCs in each sensor are transmitted from each sensor.

When Advanced driving mode is present, Object Output List shall be transmitted from slave-side (EyeSight local bus1) Right module.

When Advanced driving mode is not present, Object Output List shall not be transmitted.

Regarding Advanced driving mode, refer to L3_SW_2914.

Advanced Driving mode shall be always ON and OOL shall be transmitted

The following flowchart shall be used for judgement of OOL transmission enable/disable when NVM read error happen.

{IMAGE id=2512960 title="3756_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources/3756_Object_Text_0.png}

{IMAGE id=2512965 title="3756_Object_Text_1.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources/3756_Object_Text_1.png}

Messages/signals received from Vehicle CAN (CAN Messages)

The requirement of signals received from Vehicle CAN describes valid signals for using functions, but other signals are also valid for Checksum calculation. (refer to {LINK id=2513266 title="2513266" uri=https://jazz-1.au The other signals are named "unused signals". The unused signals shall be received from Vehicle CAN for Checksum calculation.

Message VDC138 (0x138)

Identifier: 0x138

DLC: 8 bytes

Cycle Time: 20 ms

Sender Node: VDC

Signal VDC138_0_0_CHECK_SUM

Description: *This signal indicates the message checksum.*

Position: bit 0

Type: 8 bit unsigned integer

Byte order: Intel

Range: 0 to 255

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

Checksum formula is detailed at ID 1974

Signal VDC138_1_0_MSG_COUNTER

Description: *This signal indicates the message counter.*

Position: bit 8

Type: 4 bit unsigned integer

Byte order: Intel

Range: 0 to 15

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

Signal VDC138_2_0_STEER_ANGLE

Description: *This signal indicates the steering angle.*

Position: bit 0
Type: 16 bit signed integer
Byte order: Intel
Range: -719.9 to 719.9 deg
Interpretation: $(PH) = 0.1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0 deg

Received Steering Angle value shall be converted, internally, into radian value.

The sign of received value is:

Turning Right: "+", Turning Left: "-"

Converted Steering Angle value shall have following sign for algo:

Right side "-"

Left side "+"

Signal VDC138_4_0_YAW_RATE

Description: *This signal indicates the yaw rate.*

Position: bit 16
Type: 16 bit signed integer
Byte order: Intel
Range: ~~-2.425 to 2.42 rad/s~~ -1.571 to 1.571 rad/s
Interpretation: $(PH) = 0.0047358121330724 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0 rad/s

The sign of received value is:

Turning Right: "-", Turning Left: "+"

Yaw Rate value shall have following sign for algo:

Right side "-"

Left side "+"

Signal Dummy_Signal1_VDC138

Description: Dummy Signal assigned for the unused bits
Value description: NA

Position: 15 bit
Type: 1 bits unsigned integer
Byte order: Intel Motorola (little endian)
Range: NA
Interpretation: NA
Offset: 0
Init Value: 0

All the signals which is not applicable for RDR (ECU) should also be considered for checksum calculation with the used a

Bit Mapping of VDC138:{IMAGE id=2512967 title="4627_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4

Message VDC139 (0x139)

Identifier: 0x139

DLC: 8 bytes

Cycle Time: 20 ms

Sender Node: VDC

Signal VDC139_0_0_CHECK_SUM

Description: *This signal indicates the message checksum.*

Position: bit 0

Type: 8 bit unsigned integer

Byte order: Intel

Range: 0 to 255

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

CRC formula is detailed at ID 1974.

Signal VDC139_1_0_MSG_COUNTER

Description: *This signal indicates the message counter.*

Position: bit 8

Type: 4 bit unsigned integer

Byte order: Intel

Range: 0 to 15

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

Signal VDC139_1_7_REPROGRAMING

Description: *Signalise if VDC is in programming mode or not.*

Value description: 0x0 - NORMAL

0x1 - STOP COMM, but without DIAG.

Position: bit 15

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

Signal VDC139_2_0_SPD_WHEEL_AVE

Description: *This signal indicates the vehicle speed.*

Position: bit 16
Type: 13 bit unsigned integer
Byte order: Intel
Range: ~~0 to 300 km/h~~ 0 to 299.98125 km/h
Interpretation: (PH) = 0.05625 * (HEX) + Offset
Offset: 0
Init Value: 0 km/h

Message VDC328 (0x328)

Identifier: 0x328
DLC: 8 bytes
Cycle Time: 100 ms
Sender Node: VDC

Signal VDC328_0_0_CHECK_SUM

Description: *This signal is the message checksum of this message.*

Position: bit 0
Type: 8 bits unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

CRC formula is detailed at ID 1974.

Signal VDC328_1_0_MSG_COUNTER

Description: *This signal indicates the message counter of this message.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal VDC328_2_1_WARN_ABS_MET_LCD

Description: Unit failure

Value description: 0x0 - NOT_INDICATE
0x1 - INDICATE

Position: bit 17

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal VDC328_2_2_WARN_VDC_MET_LCD

Description: Unit failure

Value description: 0x0 - NOT_INDICATE
0x1 - INDICATE

Position: bit 18

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal Dummy_Signal1_VDC328

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 12 bit

Type: 4 bits unsigned integer

Byte order: Intel Motorola (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal2_VDC328

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 20 bit

Type: 4 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal3_VDC328

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 37 bit

Type: 26 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

All the signals which is not applicable for RDR (ECU) should also be considered for checksum calculation with the used a

Bit mapping of VDC328:

{IMAGE id=2512968 title="4629_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Message BIU3AC (0x3AC)

Identifier: 0x3AC

DLC: 8 bytes

Cycle Time: 100 ms

Sender Node: BIUs

Signal BIU3AC_0_0_CHECK_SUM

Description: *This signal indicates the message checksum*

Position: bit 0
Type: 8 bit unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

CRC formula is detailed at ID 1974.

Signal BIU3AC_1_0_MSG_COUNTER

Description: *This signal indicates the message counter.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal BIU3AC_5_4_DIMMER_CANCEL

Description: *This signal indicates if the dimmer light intensity shall be for daylight mode or for night mode, as it is described in the specification.*

Value description: 0x0 - NON_REQ
0x1 - ACTIVE

Position: bit 44
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal BIU3AC_6_4_REVERSE_MT

Description: *This signal indicates the Manual Transmission Reverse Switch.*

Value description: 0x0 - OFF
0x1 - REVERSE_ON

Position: bit 52
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal BIU3AC_7_0_HEADLAMP_SMALL

Description: *This signal indicates if the dimmer light intensity shall be for daylight mode or for night mode, as described*

Value description: 0x0 - Turn_OFF
0x1 - Turn_ON

Position: bit 56
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal Dummy_Signal1_BIU3AC

Description: Dummy Signal assigned for the unused bits
Value description: NA

Position: 14 bit
Type: 2 bits unsigned integer
Byte order: Intel Motorola (little endian)
Range: NA
Interpretation: NA
Offset: 0
Init Value: 0

Signal Dummy_Signal2_BIU3AC

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 49 bit

Type: 1 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal3_BIU3AC

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 20 bit

Type: 4 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal4_BIU3AC

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 38 bit

Type: 2 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal5_BIU3AC

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 46 bit

Type: 2 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

All the signals which is not applicable for RDR (ECU) should also be considered for checksum calculation with the used a

Bit mapping for BIU3AC:

{IMAGE id=2512971 title="4630_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

Message CGW660 (0x660)

Identifier: 0x660

DLC: 8 bytes

Cycle Time: 500 ms

Sender Node: BIU

Signal CGW660_3_0_COUNT_TRIP

Description: *This signal indicates the Master Trip counter.*

Value description:

Position: bit 24

Type: 16 bits unsigned integer

Byte order: Motorola

Range: 0 to 65534 trip

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

Signal CGW660_7_0_COUNT_TIME

Description: *This signal indicates the Master Time counter.*

Value description:

Position: bit 56
Type: 24 bits unsigned integer
Byte order: Motorola
Range: 0 to 1677721400 ms
Interpretation: $(PH) = 100 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

{IMAGE id=2512974 title="3915_Object_Text_0.bmp" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WI

Fig 1: Frame format for timestamp.

Message EGI040 (0x040)

Identifier: 0x40
DLC: 8 bytes
Cycle Time: 10 ms
Sender Node: EGI_GAS_DN

Signal EGI040_0_0_CHECK_SUM

Description: *This signal indicates the message checksum*

Position: bit 0
Type: 8 bit unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

CRC formula is detailed at ID 1974.

Signal EGI040_1_0_MSG_COUNTER

Description: *This signal indicates the message counter of this message.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal EGI040_1_7_REPROGRAMING

Description: *Signalise if EGI is in reprogramming mode or not.*

Value description: 0x0 - NORMAL

0x1 - STOP COMM, but without DIAG.

Position: bit 15

Type: 1 bits unsigned integer

Byte order: Intel

Range: 0 to 1 trip

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal Dummy_Signal1_EGI040

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 12 bit

Type: 3 bits unsigned integer

Byte order: Intel ~~Motorola~~-(little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

All the signals which is not applicable for RDR (ECU) should also be considered for checksum calculation with the used a
Bit mapping for EGI040:

{IMAGE id=2512973 title="4632_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Message ISS174 (0x174)

Identifier: 0x174

DLC: 8 bytes

Cycle Time: 20 ms

Sender Node: ISS

Signal ISS174_0_0_CHECK_SUM

Description: *This signal is the message checksum of this message.*

Position: bit 0
Type: 8 bits unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

CRC formula is detailed at ID 1974.

Signal ISS174_1_0_MSG_COUNTER

Description: *This signal indicates the message counter of this message.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

Signal ISS174_2_5_STATE_VOLT_DROP

Description: *This signal is used as a mechanism to validate BackUp Ignition feature. See ID: L3_SW_1450.*

Value description: 0x0 - Other Power Voltage Drop
0x1 - Power Voltage Drop

Position: bit 21
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

DTC message Timeout shall not be applicable for ISS message 0x174, which is responsible for BackUp Ignition feature. IN case the message 0x174 does not come until timeout time elapsed, its value shall be considered 0 (zero).

Signal Dummy_Signal1_ISS174

Description: Dummy Signal assigned for the unused bits
Value description: NA

Position: 12 bit
Type: 3 bits unsigned integer
Byte order: Intel ~~Motorola~~-(little endian)
Range: NA
Interpretation: NA
Offset: 0
Init Value: 0

Signal Dummy_Signal2_ISS174

Description: Dummy Signal assigned for the unused bits
Value description: NA

Position: 48 bit
Type: 15 bits unsigned integer
Byte order: Intel ~~Motorola~~-(little endian)
Range: NA
Interpretation: NA
Offset: 0
Init Value: 0

Signal Dummy_Signal3_ISS174

Description: Dummy Signal assigned for the unused bits
Value description: NA

Position: 26 bit
Type: 2 bits unsigned integer
Byte order: Intel ~~Motorola~~-(little endian)
Range: NA
Interpretation: NA
Offset: 0
Init Value: 0

All the signals which is not applicable for RDR (ECU) should also be considered for checksum calculation with the used a
Bit mapping for ISS174:

{IMAGE id=2512978 title="4633_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Message EYE321 (0x321)

Identifier: 0x321
DLC: 8 bytes
Cycle Time: 100 ms
Sender Node: EYE

Signal EYE321_0_0_CHECK_SUM

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 0
Type: 8 bit unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

CRC formula is detailed at ID 1974.

Signal EYE321_1_0_MSG_COUNER

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

Signal EYE321_1_7_AD_DRV_ASS

Description: *This signal indicates whether Advanced Driving Function exist or not.*

Value description:

0x0 - Advanced Driving function not exist
0x1 - Advanced Driving function exist

Position: bit 15
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

Signal EYE321_3_0_CODE_HALT

Description: *This signal indicates whether code halt or not*

Value description:

0x0 - code is not halting

0x1 - code is halting

Position: bit 24

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal EYE321_3_3_ELK_OFF_IND

Description: *This signal indicates whether ELK function exists or not.*

Value description:

0x0 - ELK function not exist

0x1 - ELK function exist

Position: bit 27

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal EYE321_4_2_SRVD_LASTMEM_REQ

Description: *This signal indicates whether last memory available or not.*

Value description:

0x0 - without last memory

0x1 - with last memory

Position: bit 34

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal EYE321_6_0_FAIL_EYESIGHT

Description: *This signal indicates whether EYESIGHT fail or not.*

Value description:

0x0 - EYESIGHT does not fail

0x1 - EYESIGHT fail

Position: bit 48

Type: 1 bit unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal Dummy_Signal1_EYE321

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 12 bit

Type: 3 bits unsigned integer

Byte order: Intel Motorola (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal2_EYE321

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 19 bit

Type: 5 bits unsigned integer

Byte order: Intel Motorola (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal3_EYE321

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 53 bit

Type: 3 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal4_EYE321

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 25 bit

Type: 2 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

All the signals which is not applicable for RDR (ECU) should also be considered for checksum calculation with the used a
Bit mapping for EYE321:

{IMAGE id=2512977 title="4634_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Message EYE322 (0x322)

Identifier: 0x322

DLC: 8 bytes

Cycle Time: 100 ms

Sender Node: EYE

Signal EYE322_0_0_CHECK_SUM

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 0
Type: 8 bit unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

CRC formula is detailed at ID 1974.

Signal EYE322_1_0_MSG_COUNTER

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal EYE322_2_4_INDICATOR_CTRL_REQ

Description: *This signal indicates Indicator control request flag.*

Value description:

0x0 - Standalone indicator control mode
0x1 - External indicator control mode

Position: bit 20
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal EYE322_2_5_INDICATOR_MODE_R

Description: *This signal indicates Indicator control instruction flag for Right Mirror*

Value description:

0x0 - OFF
0x1 - ON
0x2 - Blinking
0x3 - OFF

Position: bit 21
Type: 2 bits unsigned integer
Byte order: Intel
Range: 0 to 3
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal EYE322_6_5_INDICATOR_MODE_L

Description: *This signal indicates Indicator control instruction flag for Left Mirror*

Value description:

0x0 - OFF
0x1 - ON
0x2 - Blinking
0x3 - OFF

Position: bit 53
Type: 2 bits unsigned integer
Byte order: Intel
Range: 0 to 3
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal Dummy_Signal1_EYE322

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 23 bit
Type: 1 bits unsigned integer
Byte order: Intel Motorola (little endian)
Range: NA
Interpretation: NA
Offset: 0
Init Value: 0

Signal Dummy_Signal2_EYE322

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 12 bit

Type: 4 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal3_EYE322

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 36 bit

Type: 12 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal4_EYE322

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 56 bit

Type: 7 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal5_EYE322

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 55 bit

Type: 1 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

All the signals which is not applicable for RDR (ECU) should also be considered for checksum calculation with the used a
Bit mapping for EYE322:

{IMAGE id=2512981 title="4635_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Message MET390 (0x390)

Identifier: 0x390

DLC: 8 bytes

Cycle Time: ~~100 ms~~ cyclic 100ms or Event driven (changed by turn signal LH/RH blinking timing, refer to 3961

Sender Node: BGW

Signal MET390_0_0_CHECK_SUM

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 0

Type: 8 bit unsigned integer

Byte order: Intel

Range: 0 to 255

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

CRC formula is detailed at ID 1974.

Signal MET390_1_0_MSG_COUNTER

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 8

Type: 4 bit unsigned integer

Byte order: Intel

Range: 0 to 15

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal MET390_6_2_TURN_SIG_LEFT

Description: *This signal indicates whether the left blinking flag is set or not.*

Value description: 0x0 - OFF
0x1 - Turn_L_OutPut

Position: bit 50
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

This signal is delivered as input making square-wave shape ON-OFF signal like in picture below:

{IMAGE id=2512984 title="3961_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Although the message cycle time is 100 ms, this message can be sent also "at event" in case Turn Switch signal is updated.

Note: Nominal Turn signal on/off timing : 330ms

Maximum(with tolerance) Turn signal on/off timing: 360ms

As soon as square-wave shape signal is active, turn switch shall be considered ON. CAN interface for other modules (e.g.

To detect when turn signal is switched OFF, ECU shall wait ~~360ms~~ 530ms from falling edge of the signal to determinate the

Signal MET390_6_3_TURN_SIG_RIGHT

Description: *This signal indicates whether the right side blinking flag is set or not.*

Value description: 0x0 - OFF
0x1 - Turn_R_OutPut

Position: bit 51
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

This signal is delivered as input making square-wave shape ON-OFF signal like in picture below:

{IMAGE id=2512983 title="3966_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Although the message cycle time is 100 ms, this message can be sent also "at event" in case Turn Switch signal is updated.

Note: Nominal Turn signal on/off timing: 330ms

Maximum(with tolerance) Turn signal on/off timing: 360ms

As soon as square-wave shape signal is active, turn switch shall be considered ON. CAN interface for other modules (e.g.

To detect when turn signal is switched OFF, ECU shall wait ~~360ms~~ 530ms from falling edge of the signal to determinate the

Signal MET390_6_4_BRIGHT_SW

Description: *This signal indicates if the dimmer light intensity shall be for daylight mode or for night mode, as it is described in the specification.*
Value description: 0x0 - OFF
0x1 - ON Daylight

Position: bit 10
Type: 1bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: (PH) =1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal Dummy_Signal1_MET390

Description: Dummy Signal assigned for the unused bits
Value description: NA

Position: 14 bit
Type: 1 bits unsigned integer
Byte order: Intel Motorola (little endian)
Range: NA
Interpretation: NA
Offset: 0
Init Value: 0

Signal Dummy_Signal2_MET390

Description: Dummy Signal assigned for the unused bits
Value description: NA

Position: 30 bit
Type: 2 bits unsigned integer
Byte order: Intel Motorola (little endian)
Range: NA
Interpretation: NA
Offset: 0
Init Value: 0

Signal Dummy_Signal3_MET390

Description: Dummy Signal assigned for the unused bits
Value description: NA

Position: 23 bit
Type: 1 bits unsigned integer
Byte order: Intel ~~Motorola~~ (little endian)
Range: NA
Interpretation: NA
Offset: 0
Init Value: 0

Signal Dummy_Signal4_MET390

Description: Dummy Signal assigned for the unused bits
Value description: NA

Position: 56 bit
Type: 7 bits unsigned integer
Byte order: Intel ~~Motorola~~ (big endian)
Range: NA
Interpretation: NA
Offset: 0
Init Value: 0

Signal Dummy_Signal5_MET390

Description: Dummy Signal assigned for the unused bits
Value description: NA

Position: 55 bit
Type: 1 bits unsigned integer
Byte order: Intel ~~Motorola~~ (little endian)
Range: NA
Interpretation: NA
Offset: 0
Init Value: 0

All the signals which is not applicable for RDR (ECU) should also be considered for checksum calculation with the used a
Bit mapping for MET390:

{IMAGE id=2512987 title="4636_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Message TCU048 (0x48)

Identifier: 0x48
DLC: 8 bytes
Cycle Time: 10 ms
Sender Node: TCU_CFT

Signal TCU048_0_0_CHECK_SUM

Description: *This signal is used as a mechanism to validate data within the message.*

Position: bit 0
Type: 8 bit unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

CRC formula is detailed at ID 1974.

Signal HA_TCU048_1_0_MSG_COUNTER

Description: *This signal is used as a mechanism to validate data within the message.*

Value description:

Position: bit 8
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Signal HA_TCU048_1_6_STATUS_TCM

Description: *This signal is used to determine the status of TCM node.*

Value description: 0x0 - FAIL
0x1 - NORMAL

Position: bit 14
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 1.

Signal TCU048_1_7_REPROGRAMING

Description: *Signalise if TCU is in reprogramming mode or not.*

Value description: 0 - Normal mode

1 - Reprogramming mode

Position: bit 15

Type: 1 bits unsigned integer

Byte order: Intel

Range: 0

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

Signal TCU048_3_0_IND_SHIFT_POS

Description: *Automatic gear box position.*

Value description: 0x0 - BLANK

0x1 - D

0x2 - N

0x3 - R

0x4 - P

0x5 - L

0x6 - NON

0x7 - NON

Position: bit 24

Type: 3 bits unsigned integer

Byte order: Intel

Range: 0 to 7

Interpretation: $(PH) = 1 * (HEX) + Offset$

Offset: 0

Init Value: 0

Signal Dummy_Signal1_TCU048

Description: Dummy Signal for unused bits

Value description: NA

Position: bit 12

Type: 2 bits unsigned integer

Byte order: Intel

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal2_TCU048

Description : Dummy Signal for unused bits

Value description: NA

Position: bit 33

Type: 1 bits unsigned integer

Byte order: Intel

Range: NA

InterpretION : NA

Offset: 0

Init Value: 0

Signal Dummy_Signal3_TCU048

Description : Dummy Signal for unused bits

Value description: NA

Position: bit 54

Type: 1 bits unsigned integer

Byte order: Intel

Range: NA

InterpretION : NA

Offset: 0

Init Value: 0

All the signals which is not applicable for RDR (ECU) should also be considered for checksum calculation with the used a

Bit mapping for TCU048:

{IMAGE id=2512985 title="4637_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

Message AVN6BB (0x6BB)

Identifier: 0x6BB

DLC: 8 bytes

Cycle Time: 1200 ms

Sender Node: AVN

MessageType: EventPeriodic

Signal AVN6BB_0_0_CHECK_SUM

Description: *This signal is the message check sum.*

Position: 0 bit
Type: 8 bits unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal AVN6BB_1_0_MSG_COUNTER

Description: *This signal is used as a mechanism to validate data within the message.*
Value description:

Position: 8 bit
Type: 4 bit unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal AVN6BB_3_0_SRVD_ON_OFF

Description: *Information of SRVD ON/OFF Switch*
Value description: 0x0 -> SRVD switch OFF
0x1 -> SRVD switch ON

Position: 24 bit
Type: 1 bits unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal AVN6BB_3_1_PRG_RESET_REQ

~~Description: Request of SRVD status forced to ON~~
~~Value description: 0x0 -> No reaction~~
~~0x1 -> Change SRVD status to ON~~

~~Position: 25 bit~~
~~Type: 1 bits unsigned integer~~
~~Byte order: Intel~~
~~Range: 0 to 1~~
~~Interpretation: (PH) = 1 * (HEX) + Offset~~
~~Offset: 0~~
~~Init Value: 0~~

The input signal **AVN6BB_3_1_PRG_RESET_REQ** shall be removed since SW 03.00.00.

Test criteria: The signal deletion shall be confirmed by SW Req Test. The reset function shall not be performed if the signal is present.

Signal AVN6BB_4_5_SRVD_CSTM_REQ

Description: *Request of SRVD status change*

Value description: 0x0 -> No request

0x01 -> Request

Position: 37 bit

Type: 1 bits unsigned integer

Byte order: Intel

Range: 0 to 1

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Signal Dummy_Signal1_AVN6BB

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 16 bit

Type: 8 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal2_AVN6BB

Description: Dummy Signal assigned for the unused bits

Value description: NA

Position: 26 bit

Type: 11 bits unsigned integer

Byte order: Intel ~~Motorola~~ (little endian)

Range: NA

Interpretation: NA

Offset: 0

Init Value: 0

Signal Dummy_Signal3_AVN6BB

Description: Dummy Signal assigned for the unused bits
Value description: NA

Position: 38 bit
Type: 10 bits unsigned integer
Byte order: Intel ~~Motorola~~ (little endian)
Range: NA
Interpretation: NA
Offset: 0
Init Value: 0

Signal Dummy_Signal4_AVN6BB

Description: Dummy Signal assigned for the unused bits
Value description: NA

Position: 49 bit
Type: 15 bits unsigned integer
Byte order: Intel ~~Motorola~~ (little endian)
Range: NA
Interpretation: NA
Offset: 0
Init Value: 0

All the signals which is not applicable for RDR (ECU) should also be considered for checksum calculation with the used a
Bit mapping for AVN6BB:

{IMAGE id=2512994 title="4638_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Message CECU661 (0x661)

Identifier: 0x661

DLC: 8 bytes

Cycle Time: ~~500 ms~~ 1000ms

Sender Node: CECU

Signal CECU661_2_0_PRESENT_YEAR

Description: *Present Year*
Value description:
Position: 16 bit
Type: 8 bits unsigned integer
Byte order: Intel ~~Motorola~~ (big endian)
Range:
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal CECU661_3_0_PRESENT_MONTH

Description: *Present Month*
Value description:
Position: 24 bit
Type: 8 bits unsigned integer
Byte order: ~~Intel~~ Motorola (big endian)
Range:
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

Signal CECU661_4_0_PRESENT_DAY

Description: *Present Day*
Value description:
Position: 32 bit
Type: 8 bits unsigned integer
Byte order: ~~Intel~~ Motorola (big endian)
Range:
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

Signal CECU661_5_0_PRESENT_TIME_HOUR

Description: *Present Time (Hour)*
Value description:
Position: 40 bit
Type: 8 bits unsigned integer
Byte order: ~~Intel~~ Motorola (big endian)
Range:
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

Signal CECU661_6_0_PRESENT_TIME_MIN

Description: *Present Time (Min)*
Value description:
Position: 48 bit
Type: 8 bits unsigned integer
Byte order: ~~Intel~~ Motorola (big endian)
Range:
Interpretation: $(PH) = 1 * (HEX) + Offset$
Offset: 0
Init Value: 0

Signal CECU661_7_0_PRESENT_TIME_SEC

Description: *Present Time (Sec)*
Value description:
Position: 56 bit
Type: 8 bits unsigned integer
Byte order: ~~Intel~~ Motorola (big endian)
Range:
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Message CECU6EC (0x6EC)

Identifier: 0x6EC
DLC: 8 bytes
Cycle Time: 1000 ms
Sender Node: CECU

Signal CECU6EC_3_0_Data_Condition

Description: *Data condition*
Value description: 0 - Normal
1 - Abnormal

Position: 24 bit
Type: 1 bit unsigned integer
Byte order: ~~Intel~~ Motorola (big endian)
Range: 0 to 1
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal CECU6EC_3_1_EYE_EXISTENCE

Description: *Eyesight existence*
Value description: 0 - EYE SIGHT not exist
1 - EYE SIGHT exist

Position: 25 bit
Type: 1 bit unsigned integer
Byte order: ~~Intel~~ Motorola (big endian)
Range: 0 to 1
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Message CECU6ED (0x6ED)

Identifier: 0x6ED
DLC: 8 bytes
Cycle Time: 1000 ms
Sender Node: CECU

Signal CECU6ED_4_0_VEHICLE_HEIGHT

Description: *Vehicle height*

Value description:

0x0 - reserved
0x1 - standard
0x2 to 0x6 - SUV
0x7 - reserved

Position: 32 bit
Type: 3 bits unsigned integer
Byte order: ~~Intel~~ Motorola (big endian)
Range: 0 to 7
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Message CECU6EE (0x6EE)

Identifier: 0x6EE

DLC: 8 bytes

Cycle Time: 1000 ms

Sender Node: CECU

Signal CECU6EE_5_4_CAR_VARIANT

Description: *CAR Variant*

Value description:

0x0 - SDN (Sedan)
0x1 - WGN (Waggon)

Position: 44 bit
Type: 1 bit unsigned integer
Byte order: ~~Intel~~ Motorola (big endian)
Range: 0 to 1
Interpretation: (PH) = 1 * (HEX) + Offset
Offset: 0
Init Value: 0

Signal CECU6EE_6_0_DESTINATION

Description: *Destination*

Value description:

000010b - Japan
000011b - U.S.A
000110b - U.S.A
000100b - Canada
000111b - Canada
000101b - Europe_LH
001001b - Europe_LH
001010b - Europe_LH
001100b - Europe_LH
001101b - Europe_LH
010001b - Europe_LH
011001b - Europe_LH
011101b - Europe_LH
001110b - STANDARD_LH & Latin America
001111b - STANDARD_LH & Latin America
011000b - STANDARD_LH & Latin America
011111b - STANDARD_LH & Latin America
010000b - SaudiArabia (Middle East 中近東)
011110b - SaudiArabia (Middle East 中近東)
001000b - EK
010010b - Thai & Singapore
010011b - Thai & Singapore
010101b - Thai & Singapore
010110b - Thai & Singapore
011011b - Thai & Singapore
011100b - Thai & Singapore
010100b - Australia
001011b - China
011010b - China
100001b - Korea
010111b - South Africa & Other

Position: 48 bit

Type: 6 bits unsigned integer

Byte order: ~~Intel~~ Motorola (big endian)

Range: 0 to 64

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

Signal CECU6EE_7_4_VEHICLE_SERIES

Description: *Vehicle series*

Value description:

0x0 - reserved
0x1 - B series (= NB8 (Legacy))
0x2 - G series (= CH2 (Impreza))
0x3 - S series (= DA9 (Forester))
0x4 - abnormal
0x5 - V series (= RE7 / RH4K (Levorg))
0x6 - W series (= TL4 (Tribeca))
0x7 - reserved

Position: 60 bit

Type: 3 bits unsigned integer

Byte order: ~~Intel~~ Motorola (big endian)

Range: 0 to 7

Interpretation: (PH) = 1 * (HEX) + Offset

Offset: 0

Init Value: 0

Message Service_Diag_CRO_SSM (0x18DABDE0)

Identifier: 0x18DABDE0

DLC: 8 bytes

Cycle Time: n/a

Sender Node: SSM

This message shall be used by the tester to send DIAG requests to the Right ECU.

Message Service_Diag_DCM (0x18DABDE1)

Identifier: 0x18DABDE1

DLC: 8 bytes

Cycle Time: n/a

Sender Node: DCM

This message shall be used by the DCM to send DIAG requests to the Right ECU.

Message Service_Diag_Func (0x18DBEFE0)

Identifier: 0x18DBEFE0

DLC: 8 bytes

Cycle Time: n/a

Sender Node: SSM

This message shall be used by the tester to send DIAG requests to both Left and Right ECU.

Deleted messages from SW 04.00.00

Message Remoto_Diag_CRO (0x743)

The message shall be removed on Vehicle bus since SW 04.00.00 due to message ID change.

Output messages to Vehicle CAN (CAN messages)

Message Remote_Diag.DTO_SSM (0x18DAE0BD)

Identifier: 0x18DAE0BD

DLC: 8 bytes

Cycle Time: n/a

Sender Node: RCR_RH

This message shall be used by the Right ECU to send DIAG response to the Tester.

Message Remote_Diag.DTO_DCM (0x18DAE1BD)

Identifier: 0x18DAE1BD
DLC: 8 bytes
Cycle Time: n/a
Sender Node: RCR_RH

This message shall be used by the Right ECU to send DIAG response to the DCM.

Message RCR2Ax (0x2A6 to 0x2AE) - Object Output List for Right side

Identifier: 0x2A6 to 0x2AE (9 messages)
DLC: 8 bytes
Cycle Time: 40 ms
Sender Node: RCR (SRVD)

System shall send object data with valid = 0 (No valid data) and ID = 0 when malfunction condition (see L3_SW_367) is fulfilled.

Signal RCR2Ax_0_0_CHECK_SUM

Description: This signal is the message check sum.

Position: 0 bit
Type: 8 bits unsigned integer
Byte order: Intel
Range: 0 to 255
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

Checksum formula shall be FHI method described in L3_SW_1974.

Signal RCR2Ax_1_0_MSG_COUNTER

Description: This signal is the message rolling counter.
Value description: 0 until 15.

Position: 8 bit
Type: 4 bits unsigned integer
Byte order: Intel
Range: 0 to 15
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

In the same transmission cycle, all 9 RCR message rolling counter shall be the same value.

Signal RCR2Ax_1_4_OBJ_VALID

Description: This signal indicates whether object data is valid or not.
Value description: 0x0 - Invalid
0x1 - Valid

Position: 12 bit
Type: 1 bit unsigned integer
Byte order: Intel
Range: 0 to 1
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

When shift position is not equal to Reverse, an I/F variable, **LCS_ObjectData[x].Attributes.bObjectValid**, shall be converted.
When shift position is equal to Reverse, an I/F variable, **RCTBCustObjData[i].Attributes.bObjectValid**, shall be converted.

Signal RCR2Ax_1_5_OBJ_DX

Description: This signal indicates Object target relative X distance.
Value description: -

Position: 13 bit
Type: 11 bits signed integer
Byte order: Intel
Range: -102.4 to +102.3
Interpretation: $(PH) = 0.1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

When shift position is not equal to Reverse, an I/F variable, **LCS_ObjectData[x].Kinematics.fDistX**, shall be converted.
When shift position is equal to Reverse, an I/F variable, **RCTBCustObjData[i].Kinematics.fDistX**, shall be converted.

Signal RCR2Ax_3_0_OBJ_DY

Description: This signal indicates Object target relative Y distance.
Value description: -

Position: 24 bit
Type: 11 bits signed integer
Byte order: Intel
Range: -102.4 to +102.3
Interpretation: $(PH) = 0.1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

When shift position is not equal to Reverse, an I/F variable, **LCS_ObjectData[x].Kinematics.fDistY**, shall be converted.
When shift position is equal to Reverse, an I/F variable, **RCTBCustObjData[i].Kinematics.fDistY**, shall be converted.

Signal RCR2Ax_4_3_OBJ_VX

Description: This signal indicates Object target relative velocity for X direction.
Value description: -

Position: 35 bit
Type: 10 bits signed integer
Byte order: Intel
Range: -51.2 to +51.1
Interpretation: $(PH) = 0.1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

When shift position is not equal to Reverse, an I/F variable, **LCS_ObjectData[x].Kinematics.fVrelX**, shall be converted.
When shift position is equal to Reverse, an I/F variable, **RCTBCustObjData[i].Kinematics.fVrelX**, shall be converted.

Signal RCR2Ax_6_0_OBJ_ID

Description: This signal indicates Object identification.

Value description: -

Position: 48 bit

Type: 6 bits unsigned integer

Byte order: Intel

Range: ~~0 to 8~~ 18 to 26

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0 18

Init Value: 0

When shift position is not equal to Reverse, each CAN ID shall be output different OBJ_ID if an object is detected. For example, this value shall be 18 in RCR2A6, 26 in RCR2AE.

When shift position is equal to Reverse, an I/F variable, **RCTBCustObjData[i].General.uOutObjID**, shall be converted.

Signal RCR2Ax_6_6_OBJ_VY

Description: This signal indicates Object target relative velocity for Y direction.

Value description: -

Position: 54 bit

Type: 10 bits signed integer

Byte order: Intel

Range: -51.2 to +51.1

Interpretation: $(PH) = 0.1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

When shift position is not equal to Reverse, an I/F variable, **LCS_ObjectData[x].Kinematics.fVrelY**, shall be converted.

When shift position is equal to Reverse, an I/F variable, **RCTBCustObjData[i].Kinematics.fVrelY**, shall be converted.

Message NS55C (0x55C) - Network Status for Right side

Identifier: 0x55C

DLC: 8 bytes

Cycle Time: 1000 ms

Sender Node: RCR_R

Signal NS55C_0_0_Reserved

Description: *Network Status*

Value description:

The signal value shall be always 0.

Position: 0 bit

Type: 64 bits unsigned integer

Byte order: Motorola (big endian)

Range:

Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$

Offset: 0

Init Value: 0

Deleted messages from SW 02.00.00

Message RCR23x (0x230 to 0x238) - Object output list for Left side

The message shall be removed since SW 02.00.00 because Master / Slave identification function is changed (Refer to L3_

Message RCR25x (0x250 to 0x258) - Object output list for Right side

The message shall be removed since SW 02.00.00 because Master / Slave identification function is changed (Refer to L3_

Deleted messages from SW 04.00.00

Message Remote_Diag_DTO (0x74B)

The message shall be removed on Vehicle bus since SW 04.00.00 due to message ID change.

InterSensor Communication

Bus off

A BusOff shall be detected if CANH and CANL wires are shorted.

When the CAN controller enters the bus-off state the controller shall be re-initialized immediately and the CAN transmission

When the CAN controller enters the bus-off state, for the next period of ~~500ms~~ $10 \times 100 = 1000\text{ms}$ (= TA) "Accelerated Bus-

During this period CAN transmission shall be resumed after a pause of 100ms (10 times).

After the period of TA "Accelerated Bus-Off Repair", "Normal Bus-Off Repair" shall be tried (Phase B).

In this phase the CAN transmission shall be resumed after a pause of TBcycle=1000ms, repeating the retry action.

If the Bus-Off repair does not succeed within the first ~~500ms~~ $10 \times 100 = 1000\text{ms}$ the ECU shall report the BusOff event from

In both Phase A and Phase B, once the bus off is recovered, the bus off counters shall be cleared after T_NBusoff time (5

Refer ID:2982558 information for any clarification of this requirement.

This information is for the SU17 bus off strategy for SRR630SU17for chapter ID:2514136.

{IMAGE id=3103105 title="img-01231540.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_P-DJ

The DEM event shall NOT be reported as inactive when the Bus-Off state is left (when Bus off is repaired).

No DTC disqualification shall be possible if the setting conditions are not met anymore. DTCs shall be set to inactive only

Phase B shall be active until either a successful transmission or the end of the current ignition cycle.

CAN communication and monitoring for public and private channel are disabled during Bus OFF respectively.

All requirements from this Bus off chapter shall be fulfilled by both, the left and right ECU for the Public CAN, and shall be

FREQ 4-11

When power supply voltage invalid condition(*1) is satisfied, the bus-off continuous detection counter should be reset to 0

Note *1:

If the supply voltage is <9V, the supply voltage will be invalid and will remain invalid until the supply voltage is above 9V f

Test criteria: Bus-off DTC shall be checked due to it's difficult to check counter.

FREQ 4-13

If the operating mode of the unit is reprogramming mode, the transmission of the monitored message may have stopped.

Don't memorize U-codes including bus off in reprogramming mode.

(The U code is stored only when the operating mode of the unit is in normal operation mode.)

Note: For list of U codes, refer to L3_SW_4070.

Note: For reprogramming mode, refer to L3_SW_3033.

Debouncing of 50 counts is introduced to ErrorHook function of OS to avoid software resets with multiple BusOffs.

This decision is taken as per other projects to avoid direct software reset incase of ErrorHook call.

{LINK title="Transmit lock detection function" uri=https://jazz-1.automotive-wan.com/rm4/resources/BI_Gp4mOznpEe-sxr

If a message is not sent to the bus during T_SendLock(500ms, tolerance10ms) after a request to send a message then the channel is determined to be send-lock, clear the message buffers and the stuck messages in the message box.
Note: This requirement is applicable for all the messages.

COM states during State Machine

During 'SafeSilent' mode both VCAN and PCAN shall be in 'No Communication Mode'.
In all other mode COM shall work as 'Full Communication'.

{IMAGE id=3464685 title="img-07011825.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_q156}
Variant Coding

A number of 5 Vehicle Platforms, each having Waggon or Sedan as CAR Types, have to be included in same Software Version.
For each Platform and for each car type, a number of parameters are different compared to other platforms/car types. The

Following schematic shall be used for Variant Coding Strategy:

{IMAGE id=2512992 title="1945_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_q156}

Variant Coding Index, based on CAN inputs

Information regarding Vehicle Platform shall be received over CAN message **CECU6EE** via signal **CECU6EE_7_4_VEHICLE_PLATFORM**

Vehicle Platforms which shall be considered in same SW version, are:

- 0x0 - reserved
- 0x1 - B series (= NB8 (Legacy))
- 0x2 - G series (= CH2 (Impreza))
- 0x3 - S series (= DA9 (Forester))
- 0x4 - abnormal
- 0x5 - V series (= RE7 / RH4K (Levorg))
- 0x6 - W series (= TL4 (Tribeca))
- 0x7 - reserved

Information regarding Destinations shall be received over CAN message **CECU6EE** via signal **CECU6EE_6_0_DESTINATION**

Destinations which shall be considered in same SW version, are:

- 000010b - Japan
- 000011b - U.S.A (default)
- 000110b - U.S.A
- 000100b - Canada
- 000111b - Canada
- 000101b - Europe_LH
- 001001b - Europe_LH
- 001010b - Europe_LH
- 001100b - Europe_LH
- 001101b - Europe_LH
- 010001b - Europe_LH
- 011001b - Europe_LH
- 011101b - Europe_LH
- 001110b - STANDARD_LH & Latin America
- 001111b - STANDARD_LH & Latin America
- 011000b - STANDARD_LH & Latin America
- 011111b - STANDARD_LH & Latin America
- 010000b - SaudiArabia (Middle East 中近東)
- 011110b - SaudiArabia (Middle East 中近東)
- 001000b - EK
- 010010b - Thai & Singapore
- 010011b - Thai & Singapore
- 010101b - Thai & Singapore
- 010110b - Thai & Singapore
- 011011b - Thai & Singapore
- 011100b - Thai & Singapore
- 010100b - Australia
- 001011b - China
- 011010b - China
- 100001b - Korea
- 010111b - South Africa & Other
- other - use default

Information regarding Vehicle Variant shall be received over CAN message **CECU6EE** via signal **CECU6EE_5_4_CAR_**

Vehicle Variants which shall be considered in same SW version, are: SEDAN, WAGGON and SUV.

{EMBEDDED id=2535619 title="_4059.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_syVaglC_Ee-Gkrm

{EMBEDDED id=2535565 title="_4501.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_aLfGEFC9Ee-Gkrm

The Vehicle Platform, Destination and Vehicle Variant shall be stored in EEPROM.

If DTC B2344(Vehicle Code Abnormal) is stored, Vehicle Platform, Destination and Vehicle Variant in EEPROM shall be n

At Start Up, a delay shall be applicable before to store/overwritten the information from CAN regarding Vehicle Platform, D

This delay shall be until "old" Vehicle Platform, Destination and Vehicle Variant are read from EEPROM (to be used in cur

Every time when Vehicle Platform, Destination or Vehicle Variant comes valid but with different value compared to the val

This update in EEPROM shall be done every time when the following conditions are fulfilled,

Condition:

1. CECU6EC_3_0 is received to 0 (Normal).
- AND
2. All of three messages, CECU6EC, CECU6ED and CECU6EE, are received.

Affected signals:

1. CECU6ED_4_0_VEHICLE_HEIGHT
2. CECU6EE_5_4_CAR_VARIANT
3. CECU6EE_6_0_DESTINATION
4. CECU6EE_7_4_VEHICLE_SERIES

The EEPROM shall be kept to previous value when it is in abnormal condition.

Test criteria:

1. It shall be tested in both "Normal" and "Abnormal" conditions.

Note: If one of the following condition is met, it will be abnormal.

- a. CECU6EC_3_0 is received to 1 (Abnormal).
- OR
- b. one of message is not received once: CECU6EC, CECU6ED or CECU6EE.

2. The update in EEPROM can be checked by reading DIDs (1036, 1038 and 103A), but the DID will be updated after IC

Variant Coding Design change for U0162 field issue.

Issue description:

DTC U0162 [TIMEOUT_AVN6BB] happens in Vehicle PF ES1 and HR3.

For more details of analysis and root cause, refer to Root Cause report in IMS#1588529.

Countermeasure:

1. To change order of calling CheckVDC139Data and CheckVDC328Data functions.
2. To add validity check of VDC328 before writing NVM.

{IMAGE id=2512990 title="3749_Object_Text_0.png" uri="https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Judgement of ELK mode

Information regarding Presence of EYE SIGHT shall be received over CAN message **CECU6EC** via signal **CECU6EC_3_0**

Presence of EYE SIGHT which shall be considered in same SW version, is:

- 0x0 - EYE SIGHT not exist
- 0x1 - EYE SIGHT exist

Information regarding Presence of ELK function shall be received over CAN message **EYE321** via signal **EYE321_3_3_1**

Presence of ELK which shall be considered in same SW version, is:

- 0x0 - ELK function not exist
- 0x1 - ELK function exist

The Presence of EYE SIGHT and Presence of ELK shall be stored in EEPROM.

At Start Up, a delay shall be applicable before to store/overwritten the information from CAN regarding Presence of EYE SIGHT

This delay shall be until "old" Presence of EYE SIGHT and Presence of ELK are read from EEPROM (to be used in current

Every time when Presence of EYE SIGHT and Presence of ELK comes valid but with different value compared to the value stored in EEPROM

This update in EEPROM for presence of ELK shall be done every time the conditions are met, even if a timeout DTC for

This update in EEPROM for presence of EYE SIGHT shall be done every time when the conditions are fulfilled,

Condition:

1. CECU6EC_3_0 is received to 0 (Normal).
- AND
2. All of three messages, CECU6EC, CECU6ED and CECU6EE, are received.

Affected signal:

1. CECU6EC_3_1_EYE_EXISTENCE

The EEPROM shall be kept to previous value when it is in abnormal condition.

Test criteria:

1. It shall be tested in both "Normal" and "Abnormal" conditions.

Note: If one of the following condition is met, it will be abnormal.

- a. CECU6EC_3_0 is received to 1 (Abnormal).

OR

- b. one of message is not received once: CECU6EC, CECU6ED or CECU6EE.

2. The update in EEPROM can be checked by ELK mode or not, but the mode will be updated after IG OFF -> ON twice.

For more details of ELK mode configuration, refer to L3_SW_4062 and L3_SW_2923.

When the following condition is satisfied, SRVD system recognizes as ELK mode.

AND \neg CECU6EC_3_1 == 1 (means EYE SIGHT exist)

└ EYE321_3_3 == 1 (means ELK function exist)

Otherwise, SRVD system recognizes as Not ELK mode.

Result of the judgement of ELK mode is related to conditions of:

- Main switch control (3state with ELK, 2state with ELK and 2state without ELK)
- Output value of 228_2_3

Judgement of Advanced Driving mode

Information regarding Presence of Advanced Driving function shall be received over CAN message **EYE321** via signal **E**

Presence of Advanced Driving function which shall be considered in same SW version, is:

0x0 - Advanced Driving function not exist

0x1 - Advanced Driving function exist

The Presence of Advanced Driving function shall be stored in EEPROM.

At Start Up, a delay shall be applicable before to store/overwrite the information from CAN regarding Presence of Advanced Driving function.

This delay shall be until "old" Presence of Advanced Driving function is read from EEPROM (to be used in current IGN cycle).

Every time when Presence of Advanced Driving function comes valid but with different value compared to the value stored in EEPROM.

This update in EEPROM shall be done every time the conditions are met, even if a timeout DTC for CAN IDs 0x321 was set.

When the following condition is satisfied, SRVD system recognizes as Advanced Driving mode.

AND \neg CECU6EC_3_1 == 1 (means EYE SIGHT exist)

└ EYE321_1_7 == 1 (means Advanced Driving function exist)

Otherwise, SRVD system recognizes as Not Advanced Driving mode.

At the time of shipment from factory (default setting), it shall be judged as Advanced driving mode is present.

Result of the judgement of Advanced Driving mode is related to conditions of:

- Mirror Indicator control (Standalone or External control mode)
- ~~Failure detection (U1075)~~
- Output value of 228_2_1, 228_2_2, 228_3_5 and 228_4_5

{EMBEDDED id=2535617 title="_4064.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_qj7CMFC_Ee-Gkrm}

Judgement of EyeSight exist

Judgement of Last Memory

Information regarding Switch Last Memory functionality shall be received over CAN message **EYE321** via signal **EYE321**.

Presence of Switch Last Memory which shall be considered in same SW version, is:

0x0 - without Last Memory functionality

0x1 - with Last Memory functionality

The Switch Last Memory shall be stored in EEPROM.

Variant Coding Parameters handling

All sets of parameter shall be stored in non volatile memory.

The default parameters shall be stored in EEPROM and the Variant Coding Sets shall be stored in Flash.

Parameter set dedicated to vehicle type "Legacy (NB8) SUV" and Destination "U.S.A" shall be considered as default para

At each Start Up, the parameters structures from EEPROM shall be copied to the RAM copy which will be delivered to oth

Vehicle Platform, Destination and Vehicle Variant from EEPROM shall be used to calculate the proper Index for Variant C

Tables to calculate Variant Coding Index and to determine Variant Coding Parameters:

Regarding Table1, the following parameters are changed from L0 due to the following reason:

1. LCA TTC - In L0 the value is "4.0s" and in L3 parameter file its "4.5s"

Implementation : "0.5s" is added as a tolerance value for Algo internal processing.

2. RCTA TTC - In L0 the this value is "3.5s" and in L3 parameter file its "2.5s"

Implementation : "FTTCThresholdMargin - 1s" will be added by Algo.

History : Earlier when the customer spec is set as 2.5s, algo adds 1s tolerance to it. But now customer spec is changed

So RCTA TTC in customer spec (3.5s) = RCTA TTC Algo Spec(2.5s) + RCTA TTC Margin Algo Spec(1s)

SU85; Table1, System warning specification:

{IMAGE id=2512999 title="4066_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Note: To apply this value for BSD and LCA width.

Note: Regarding LED current requirements, the requirements from L3_SW_4081 to L3_SW_4086 in section 9.11.2 are hi

The LED current requirement shall be followed to L3_SW_4059 strictly.

{EMBEDDED id=2535616 title="_4067.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_objnhVC_Ee-Gkrm}

{EMBEDDED id=2535566 title="_4500.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_cQ7voFC9Ee-Gkrm}

In any situation when the "Platform" input, points to a "Not supported" mounting position, then the parameters for the "Def

Based on Variant Coding Index and using tables from above (ID: L3_SW_1961) default values from RAM shall be overw

Once the RAM copy of the parameters is completed, it shall remain the same for entire IGN cycle. No parameter change i

Vehicle parameters

{EMBEDDED id=2535614 title="_4069.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_I3ZouFC_Ee-Gkrm}

Algo parameters

{LINK title="http://ims-adas:7001/si/viewrevision?projectName=%23p%3D/nfs/projekte1/PROJECTS/PROJECTS.pj%23SRR300/06_Algorithmm"

Internal

* DCM通信に関して

実装は行うが、非Active状態とする。

Activeにする場合、乗数変更でActiveに変更できること。

* Regarding DCM communication

Implemented, but in non-Active state.

When making it Active, it can be changed to Active by changing the multiplier.

{EMBEDDED id=2535612 title="_4097.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_hnLJoVC_Ee-Gkrm}

{EMBEDDED id=2535594 title="_4289.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_IQwU4IC-Ee-Gkrm}

Diagnostic Routing Function

Application Services

Supported services in Default session (0x01) shall be: \$10, \$14, \$19, \$22 \$31 and \$3E.

Supported services in Default session (0x01) of bootloader shall be: \$10, \$22 \$31 and \$3E.

Supported services in Programming session (0x02) shall be: \$10, \$22, \$27, \$2E, \$34, \$36, \$37 and \$3E.

Supported services in Extended session (0x03) shall be: \$10, \$14, \$19, \$22, \$28, \$2E, \$31, \$3E and \$85

Supported services in Extended session (0x03) of bootloader shall be: \$10, \$22, \$28, \$2E, \$31, \$3E and \$85

All requests which are using a not supported service shall be responded with negative response code: 0x11 -> Service not supported

All DIAG services/subservice shall be available in default session and shall not require a security access permission.

All DIAG services/subservice shall be available in default, programming and extended sessions.

All DIAG shall be unresponsive when requested for an unsupported service ID at the functional address.

Some DIAG services/subservice in programming session shall require a security access permission.

{EMBEDDED id=2535675 title="_3139.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_CZEAdFDCEe-Gkrm}

SID 0x10 Diagnostic Session Control

The service is mandatory and shall be implemented .

This service should do the switch between different DIAG modes but because only defaultSession was requested, no switch is needed.

This service should do the switch between different DIAG modes but because only defaultSession was requested, no switch is needed.

This service shall be allowed during Default Session (0x01) and Extended Diagnostic Session (0x03).

This service will be allowed during Programming Session (0x02).

Figure 1 provides an overview about the diagnostic session transition and what the sensor shall do when it transitions to a new session.

Figure 1 - Sensor diagnostic session state diagram

{IMAGE id=2512997 title="3072_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources_0.png}

Diagnostic session transition description:

1) Default session to Default session:

a. The sensor shall re-initialize the default session completely.

2) Default session to Extended session:

a. Nothing.

3) Extended session to Programming session:

a. The state of the SID 0x28 Communication Control and SID 0x85 Control DTC Setting services shall not be affected, e.g. normal communication shall remain disabled.

4) Programming session to Default session:

a. Security shall be locked again.

b. BL triggeres reset after exiting Programming session.

Request message format: 10 01

{EMBEDDED id=2535660 title="_3253.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_Cmq0EIDBEe-Gkrm}

{EMBEDDED id=2535684 title="_3079.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_X-KgoIDCEe-Gkrm

Positive response message format: 50 01 00 32 01 F4

{EMBEDDED id=2535659 title="_3254.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX__30BIFDAEe-Gkrm

{EMBEDDED id=2535683 title="_3080.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_Vn1icVDCEe-Gkrm

Negative response message format: 7F 10 <NRC>

Supported negative response codes: 0x12, 0x13, 0x7E and 0x78.

{EMBEDDED id=2535558 title="_985.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_KEZGvIC9Ee-Gkrm

With a request to transition to the same mode as the current one, a positive response is returned. No other transition pro

With IG OFF→IG ON, or power ON, the ECU shall start from a default session.

When a sensor receives a request for switching to programming session via functional address (0x18DBEFE0), the senso

Physical CANID Conditional check is added in Application while updating BAI structure, to identify whether request is from

SID 0x14 ClearDiagnosticInformation

The service is mandatory and shall be implemented

This service shall be allowed during Default Session (0x01) and Extended Session (0x03).

This request shall erase both Diagnostics codes and Cancel Codes, which are stored in NVM memory, active or inactive a

The request shall erase also all DEM Events, active or inactive.

The request shall delete all DEM Events.

Request message format: 14 FF FF FF

Positive response message format: 54

Negative response message format: 7F 14 <NRC>

Supported negative response codes: 0x13, 0x22, 0x31, 0x78.

{EMBEDDED id=2535556 title="_1325.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_FzLJJFC9Ee-Gkrm

Positive response shall be send only after erase has been completed. If needed, response pending shall be send until era

SID 0x19 ReadDTCInformation

The service is mandatory and shall be implemented.

This service read out DTCs and their freeze frame data.

This service shall be allowed during Default Session (0x01) and Extended Session (0x03).

Subfunction definition

Sub function supported shall be 0x02 and 0x05.

If other sub function (01, 03 and 04) is requested, Negative Response with NRC12 (If the sub-function parameter is not s

reportNumberOfDTCByStatusMask (0x01)

This sub functions shall not be supported since UDS 2nd Edition.

reportDTCByStatusMask (0x02)

This parameter specifies that the server shall transmit to the client a list of DTCs and corresponding statuses matching a client-defined status mask.

Request message format: 19 02 DTCSM

DTCSM - DTC status mask shall be set from 0x00 to 0xFF.

In case DTCSM is 0x02, the response shall contain only DTCs and Cancel Code from Level 1.

Positive response message format: 59 02 DTCSAM DTCHB1 DTCMB1 DTCLB1 SoDTC1DTCSAMn DTCHBn DTC

DTCSAM - DTC status availability mask, shall be always 0x2E.
 DTCHB1 - DTC high byte of first DTC, shall be in the format as described at L3_SW_368.
 DTCMB1 - DTC medium byte of first DTC, shall be in the format as described at L3_SW_368.
 DTCLB1 - DTC low byte, shall be always 0x00 in the response.
 SoDTC1 - Status of 1st DTC

⋮
 ⋮

DTCHBn - DTC high byte of ...n DTC, shall be in the format as described at L3_SW_368.
 DTCMBn - DTC medium byte of ...n DTC, shall be in the format as described at L3_SW_368.
 DTCLBn - DTC low byte...of n DTC, shall be always 0x00 in the response.
 SoDTCn - Status of ...n DTCf

After 2nd edition of ISO14229-1, 2byte DTC shall be left-aligned and Low Byte shall be 0x00.

{EMBEDDED id=2535661 title="_3179.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_EsOLUFDBEe-Gkr

{EMBEDDED id=2535563 title="_4652.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_VLvOkFC9Ee-Gkr

For a request message with a SubFunction parameter reportDTCByStatusMask, the size of the server's response message

Negative response message format: 7F 19 <NRC>

Supported negative response codes: 0x12 and 0x13.

Supported negative response codes: 0x12, 0x13, 0x7F

{EMBEDDED id=2535555 title="_1348.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_Dqgzg1C9Ee-Gkr

If there is no matching with the DTCSM, the positive response shall be:

{IMAGE id=2513003 title="1349_Object_Text_0.bmp" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/W

reportDTCStoredDataByRecordNumber (0x05)

This parameter specifies that the server shall transmit to the client the
 DTCSnapshot record(s) associated with a client-defined DTCSnapshot record
 number (FF hex for all records).

Subaru way to get the response of this request is a bit different and the Snapshot Record Number will return actually the

Request message format: 19 05 FF

Snapshot Record Number is always 0xFF in the request, which means All supported snapshot record numbers.

Positive response message format: 59 05 **DTCAO** DTCHB DTCMB DTCLB SoDTC NoID **10 14 <6 bytes of ATI>** 10 1E

Positive response message format in case of multiple DTCs: 59 05 DTCAO1 DTCHB1 DTCMB1 DTCLB1 SoDTC1 NoR

⋮
 ⋮

DTCAOx DTCHBx DTCMBx DTCLBx SoDTCx NoRDTCx 10 14 <6 bytes of ATI> 10 1E <6 bytes of time stamp>

Where x is the number of matching DTCs.

DTC AO - DTC Age Order: is basically counter for the DTCs. The oldest(first) DTC shall have value 1, second oldest

DTCHB - DTC high byte, shall be in the format as described at L3_SW_4047.

DTCMB - DTC medium byte, shall be in the format as described at L3_SW_4047.

DTCLB - DTC low byte, shall be always 0x00 in the response.

SoDTC - Status of DTC at: L3_SW_3179

NoID - Number of DIDs which follow, in this project it shall be always 0x02h.

10 14 - This is the ID used in the snapshot information

6 bytes of ATI - these shall be as it is described in the requirements from DID 0x1014, at: L3_SW_4149

10 1E - This is the ID used in the snapshot information

6 bytes of time stamp - these shall be as it is described in the requirements from DID 0x101E, at: L3_SW_1156.

After 2nd edition of ISO14229-1, 2byte DTC shall be left-aligned and Low Byte shall be 0x00.

Usage example for DTC AO in a response:

{IMAGE id=2513002 title="1357_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_CWB

{IMAGE id=2513004 title="1357_Object_Text_1.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_CWB

Negative response message format: 7F 19 <NRC>

Supported negative response codes: 0x12, 0x13, 0x31.

{EMBEDDED id=2535553 title="_1360.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_6qbTEFC8Ee-Gkrm

{EMBEDDED id=2535551 title="_1361.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_C_lcqFC8Ee-Gkrm

The server shall send a positive response message containing only the DTCStoredDataRecordNumber (the same value as

When the server clears the memory or erases the confirmed DTC (0x14 Service),

Also clear DTCStoredData.

The server shall renumber the DTCStoredDataRecordNumber if DTCStoredData is cleared.

Following Service shall be used to read/clear the DTC/UDMDTC status for the KD#1 Release,

{TABLE id=_1736170171273}

Note: UDMDTC status will not be cleared through 14 FF FF FF. This is not supported.

Example for KD#1 Release:

{IMAGE id=3011900 title="img-01061919.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_CWB

SID 0x22 ReadDataByIdentifier

All requests with single DID from service \$22 will have the same format for requests, responses and same possible negative

This service shall be allowed during Default Session (0x01) and Extended Session (0x03).

The following three DIDs shall be read out during Default Session (0x01), Extended Session (0x03) and Programming ses

0x0250, 0x0251, 0xF186

0xF100(SSMID), 0xF182(ROMID), 0xF101(SWID)

Request message format: 22 <DID>

Positive response message format: 62 <DID> <data>

Negative response message format: 7F 22 <NRC>

Supported negative response codes: 0x13 and 0x31.

Supported negative response codes: 0x13, 0x31 and 0x7F.

0x13 - if the length of the requested message is not correct.

0x31 - if a not supported DID is requested, or if the maximum DID value is abnormal, or if the response message length is

{EMBEDDED id=2535658 title="_3263.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_9eHI4IDAEe-Gkrm.

<DID> shall be considered a 2 bytes Diag Data Identifier as they are described for each DID in "DID list" chapter (see L3_

<data> shall be considered the number of data bytes, as they are described for each DID in "DID list" chapter (see L3_SV

Service \$22 shall permit the request of more DIDs in the same request message.

Maximum number of DIDs which can be requested in the same DIAG message, shall be 12.

If more than 1 DataIdentifier is requested, the format shall be:

{IMAGE id=2513008 title="1007_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

In case of multiple DID requests, the positive response format shall be:

{IMAGE id=2513007 title="1008_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

dataIdentifier (#1 to #m)

This parameter is an echo of the data parameter dataIdentifier from the request message.

dataRecord (#1 to #k/o)

This parameter is used by the ReadDataByIdentifier positive response message to provide the requested data record value

If more than 1 DataIdentifier is requested, the Supported negative response codes: 0x13 and 0x22.

If more than 1 DataIdentifier is requested and 1 or more of them are not supported, but at least 1 DID is supported, then the

If more than 1 DataIdentifier is requested and 1 or more of them are supported but shall respond with NRC, then entire re

If more than 1 DataIdentifier is requested and DataIdentifiers are duplicated, they are handled as valid requests.

If multi-frame response is required, all DataIdentifier content must be consistent

This service 0x22 (ReadDataByIdentifier) function and read data doesn't include privacy data (Key information, password

DID list

DID 0x0000 - Supported DIDs in range 0x0001 - 0x0020

This DID shall return 4 bytes. Each bit of the response is corresponding to one DID in range 0x0001 - 0x0020, the correspo

- 1 if DID is supported,

- 0 if DID is not supported.

DID response shall be:

{IMAGE id=2513009 title="1017_Picture3.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_qf-m

DID format is on 2 bytes: 0x00 0x00

<data> length is 4 byte.

DID is not supported in programming session (0x2)

DID 0x0100 - Supported DIDs in range 0x0101 - 0x0120

This DID shall return 4 bytes. Each bit of the response is corresponding to one DID in range 0x0101 - 0x0120, the corresponding bit is:
- 1 if DID is supported,
- 0 if DID is not supported.

DID response shall be:

{IMAGE id=2513013 title="1022_Picture4.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_rHkK

DID format is on 2 bytes: 0x01 0x00

<data> length is 4 byte.

~~DID is supported in programming session (0x2). During reprogramming session, no DID in this range is supported. All DA~~

DID 0x0111 - Supported service \$14

This DID shall return 0x01 if Diag Service \$14 is supported in this ECU, or shall return 0x00 if the service is not supported.

Note: Because the service is supported, the response shall always be 0x01.

DID format is on 2 bytes: 0x01 0x11

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x0112 - Supported service \$19

This DID shall return 0x01 if Diag Service \$19 is supported in this ECU, or shall return 0x00 if the service is not supported.

Note: Because the service is supported, the response shall always be 0x01.

DID format is on 2 bytes: 0x01 0x12

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x0113 - Supported service \$22

This DID shall return 0x01 if Diag Service \$22 is supported in this ECU, or shall return 0x00 if the service is not supported.

Note: Because the service is supported, the response shall always be 0x01.

DID format is on 2 bytes: 0x01 0x13

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x011A - Supported service \$31

This DID shall return 0x01 if Diag Service \$31 is supported in this ECU, or shall return 0x00 if the service is not supported.

Note: Because the service is supported, the response shall always be 0x01.

DID format is on 2 bytes: 0x01 0x1A

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x011C - Supported service \$7F

This DID shall return 0x01 if the Negative Response (0x7F) is supported in this ECU, or shall return 0x00 if the Negative Response is not supported.

Note: Because the NRC is supported, the response shall always be 0x01.

DID format is on 2 bytes: 0x01 0x1C

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x0200 - Supported DIDs in range 0x0201 - 0x0220

This DID shall return 4 bytes. Each bit of the response is corresponding to one DID in range 0x0201 - 0x0220, the corresponding bit is:

- 1 if DID is supported,
- 0 if DID is not supported.

DID response shall be:

{IMAGE id=2513014 title="1047_Picture5.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_rLvq

DID format is on 2 bytes: 0x02 0x00

<data> length is 4 byte.

~~DID is supported in programming session (0x2). During reprogramming session, only 0x0220 in this range is supported. E~~

Info applicable for DIDs below:

{IMAGE id=2513010 title="1050_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

DID 0x0201 - Radar configuration DID for SSM menu table content

This DID acts as a configuration flag for SSM and shall always return 0x00.

DID format is on 2 bytes: 0x02 0x01

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x0202 - Radar configuration DID for SSM menu table content

This DID acts as a configuration flag for SSM and shall always return 0x00.

DID format is on 2 bytes: 0x02 0x02

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x0204 - Radar configuration DID for SSM menu table content

This DID acts as a configuration flag for SSM and shall always return 0x20.

DID format is on 2 bytes: 0x02 0x04

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x0205 - Radar configuration DID for SSM menu table content

This DID acts as a configuration flag for SSM and shall always return 0x40.

DID format is on 2 bytes: 0x02 0x05

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x0206 - Radar configuration DID for SSM menu table content

This DID acts as a configuration flag for SSM and shall always return 0x80.

DID format is on 2 bytes: 0x02 0x06

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x0207 - Radar configuration DID for SSM menu table content

This DID acts as a configuration flag for SSM and shall always return 0x80.

DID format is on 2 bytes: 0x02 0x07

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x0208 - Radar configuration DID for SSM menu table content

This DID acts as a configuration flag for SSM and shall always return 0xE0.

DID format is on 2 bytes: 0x02 0x08

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x0220 - Supported DIDs in range 0x0221 - 0x0240

This DID shall return 4 bytes. Each bit of the response is corresponding to one DID in range 0x0221 - 0x0240, the corresponding

- 1 if DID is supported,
- 0 if DID is not supported.

{EMBEDDED id=2535654 title="_3355.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_1ABYMFDAEe-Gkr

DID format is on 2 bytes: 0x02 0x20

<data> length is 4 byte.

~~DID is supported in programming session (0x2). During reprogramming session, no DID in this range is supported. All byt~~

DID 0x0221 - Radar configuration DID for SSM menu table content

This DID acts as a configuration flag for SSM and shall always return 0xE0.

DID format is on 2 bytes: 0x02 0x21

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x0222 - Radar configuration DID for SSM menu table content

This DID acts as a configuration flag for SSM and shall always return 0xC0.

DID format is on 2 bytes: 0x02 0x22

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x0240 - Supported DIDs in range 0x0241 - 0x0260

This DID shall return 4 bytes. Each bit of the response is corresponding to one DID in range 0x0241 - 0x0260, the corresponding

- 1 if DID is supported,
- 0 if DID is not supported.

{EMBEDDED id=2535653 title="_3358.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_y236Y1DAEe-Gkr

DID format is on 2 bytes: 0x02 0x40

<data> length is 4 byte.

DID is not supported in programming session (0x2)

DID 0x0250 - Security Access Method

This DID acts as a configuration flag for SSM and shall always return 0x80.

DID format is on 2 bytes: 0x02 0x50

<data> length is 1 byte.

DID shall be supported in programming session (0x2).

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x0251 - Security Key Version

This DID acts as a configuration flag for SSM and shall always return 0x01

DID format is on 2 bytes: 0x02 0x51

<data> length is 1 byte.

DID shall be supported in programming session (0x2).

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1000 - Supported DIDs in range 0x1001 - 0x1020

This DID shall return 4 bytes. Each bit of the response is corresponding to one DID in range 0x1001 - 0x1020, the corresponding bit is:
- 1 if DID is supported,
- 0 if DID is not supported.

DID response shall be:

{IMAGE id=2513012 title="1103_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources/1103_Object_Text_0.png" data-bbox="121 154 1000 170"/>

{EMBEDDED id=2535607 title="_4148.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_FgXP-VC_Ee-Gkrm4148.rtf" data-bbox="121 223 1000 255"/>
DID format is on 2 bytes: 0x10 0x00

<data> length is 4 byte.

~~DID is supported in programming session (0x2). During reprogramming session, 0x1020 is supported. DATA 1-3 shall return 0x00 0x00.~~

DID 0x1001 - Message spec. information 1 DID

This DID returns a constant, answer shall be 0x00 0x00.

DID format is on 2 bytes: 0x10 0x01

<data> length is 2 bytes.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1002 - Message spec. information 2 DID

This DID returns a constant, answer shall be 0x00 0x00.

DID format is on 2 bytes: 0x10 0x02

<data> length is 2 bytes.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1003 - Message spec. information 3 DID

This DID returns a constant, answer shall be 0x00 0x00.

DID format is on 2 bytes: 0x10 0x03

<data> length is 2 bytes.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1004 - Message spec. information 4 DID

This DID returns a constant, answer shall be 0x00 0x00.

DID format is on 2 bytes: 0x10 0x04

<data> length is 2 bytes.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1005 - Message spec. information 5 DID

This DID returns a constant, answer shall be 0x00 0x00.

DID format is on 2 bytes: 0x10 0x05

<data> length is 2 bytes.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1006 - Message spec. information 6 DID

This DID returns a constant, answer shall be 0x00 0x0C.

DID format is on 2 bytes: 0x10 0x06

<data> length is 2 bytes.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1007 - Message spec. information 7 DID

This DID returns a constant, answer shall be 0x00 0x90.

DID format is on 2 bytes: 0x10 0x07

<data> length is 2 bytes.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1008 - Message spec. information 8 DID

This DID returns a constant, answer shall be 0x00 0x00.

DID format is on 2 bytes: 0x10 0x08

<data> length is 2 bytes.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1009 - Message spec. information 9 DID

This DID returns a constant, answer shall be 0x00 0x0C.

DID format is on 2 bytes: 0x10 0x09

<data> length is 2 bytes.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x100A - Message spec. information 10 DID

This DID returns a constant, answer shall be 0x00 0x00.

DID format is on 2 bytes: 0x10 0x0A

<data> length is 2 bytes.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1014 - Absolute time information counter

This DID shall return absolute time containing:

- present year;
- present month;
- present day;
- present time (hour);
- present time (min);
- present time (sec).

{EMBEDDED id=2535606 title="_4153.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_DF28YFC_Ee-Gkr

DID format is on 2 bytes: 0x10 0x14

<data> length is 6 bytes.

DID is not supported in programming session (0x2)

DID 0x101A - Vehicle Speed DID

This DID returns vehicle speed information received from VDC139_2_0_SPD_WHEEL_AVE.

DID format is on 2 bytes: 0x10 0x1A

<data> length is 1 byte.

<data> shall be the following format:

Type: 8 bit unsigned integer
Byte order: Motorola
Range: 0 to 255 km/h
Interpretation: $(PH) = 1 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x101B - Supply Voltage DID

This DID returns supply voltage information.

DID format is on 2 bytes: 0x10 0x1B

<data> length is 2 bytes.

<data> shall be the following format:

Type: 16 bit unsigned integer
Byte order: Motorola
Range: 0 to 65.535 V
Interpretation: $(PH) = 0.001 * (HEX) + \text{Offset}$
Offset: 0
Init Value: 0

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x101C - Programming Authorization DID

This DID returns programming authorization information.

DID format is on 2 bytes: 0x10 0x1C

<data> length is 1 byte.

{EMBEDDED id=2535682 title="_3120.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_TUQWQ1DCEe-Gl

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x101E - Time stamp information DID

This DID returns timestamp information containing:

- trip counter;
- time counter.

The return shall be as follows:

{IMAGE id=2513015 title="1158_Picture1.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_rwFjl

DID format is on 2 bytes: 0x10 0x1E

<data> length is 6 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1020 - Supported DIDs in range 0x1021 - 0x1040

This DID shall return 4 bytes. Each bit of the response is corresponding to one DID in range 0x1021 - 0x1040, the correspo

- 1 if DID is supported,
- 0 if DID is not supported.

{EMBEDDED id=2535652 title="_3362.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_wxCpq1DAEe-Gkr

{EMBEDDED id=2535608 title="_4147.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_Xo2fUIC_Ee-Gkrm

DID format is on 2 bytes: 0x10 0x20

<data> length is 4 byte.

~~DID is supported in programming session (0x2). During reprogramming session, only 0x1040 in this range is supported. D~~

DID 0x1021 - RADAR ASSY B&S Fail flag DID

This DID shall return 0xFF if radar in fail mode, DID shall return 0x00 if radar in normal state.

DID format is on 2 bytes: 0x10 0x21

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1022 - RADAR ASSY B&S Halt flag DID

This DID shall return 0xFF if radar in Stop mode, DID shall return 0x00 if radar in normal state.

DID format is on 2 bytes: 0x10 0x22

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1023 - RADAR ASSY B&S On-Off flag DID

This DID shall return 0xFF if radar system is ON and 0x00 if radar system is OFF.

DID format is on 2 bytes: 0x10 0x23

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1027 - Right side BSD lvl 1 warning flag DID

This DID shall return 0xFF if BSD warning level 1 is active.

DID shall return 0x00 if BSD warning level 1 is not active.

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **left** sensor.

DID format is on 2 bytes: 0x10 0x27

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x1028 - Left side BSD lvl 1 warning flag DID

This DID shall return 0xFF if BSD warning level 1 is active.

DID shall return 0x00 if BSD warning level 1 is not active.

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **right** sensor.

DID format is on 2 bytes: 0x10 0x28

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x1029 - Right side BSD lvl 2 warning flag DID

This DID shall return 0xFF if BSD warning level 2 is active.

DID shall return 0x00 if BSD warning level 2 is not active.

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **left** sensor.

DID format is on 2 bytes: 0x10 0x29

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x102A - Left side BSD lvl 2 warning flag DID

This DID shall return 0xFF if BSD warning level 2 is active.
DID shall return 0x00 if BSD warning level 2 is not active.
Negative Response 0x22 (conditions not correct) shall be returned if request is made on **right** sensor.
DID format is on 2 bytes: 0x10 0x2A

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x102B - Right side LCA lvl 1 warning flag DID

This DID shall return 0xFF if LCA warning level 1 is active.

DID shall return 0x00 if LCA warning level 1 is not active.

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **left** sensor.

DID format is on 2 bytes: 0x10 0x2B

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x102C - Left side LCA lvl 1 warning flag DID

This DID shall return 0xFF if LCA warning level 1 is active.

DID shall return 0x00 if LCA warning level 1 is not active.

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **right** sensor.

DID format is on 2 bytes: 0x10 0x2C

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x102D - Right side LCA lvl 2 warning flag DID

This DID shall return 0xFF if LCA warning level 2 is active.

DID shall return 0x00 if LCA warning level 2 is not active.

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **left** sensor.

DID format is on 2 bytes: 0x10 0x2D

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x102E - Left side LCA lvl 2 warning flag DID

This DID shall return 0xFF if LCA warning level 2 is active.

DID shall return 0x00 if LCA warning level 2 is not active.

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **right** sensor.

DID format is on 2 bytes: 0x10 0x2E

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x102F - Right side RCTA warning flag DID

This DID shall return 0xFF if RCTA warning is active.

DID shall return 0x00 if RCTA warning is not active.

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **left** sensor.

DID format is on 2 bytes: 0x10 0x2F

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x1030 - Left side RCTA warning flag DID

This DID shall return 0xFF if RCTA warning is active.

DID shall return 0x00 if RCTA warning is not active.

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **right** sensor.

DID format is on 2 bytes: 0x10 0x30

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x1031 - Right side RADAR internal voltage DID

This DID shall return radar internal voltage.

Range: 0 - 25.5V.

Scaling: 0.1V/bit.

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **left** sensor.

DID format is on 2 bytes: 0x10 0x31

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x1032 - Left side RADAR internal voltage DID

This DID shall return radar internal voltage.

Range: 0 - 25.5V.

Scaling: 0.1V/bit.

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **right** sensor.

DID format is on 2 bytes: 0x10 0x32

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x1033 - Right side RADAR temperature DID

This DID shall return radar temperature.

Range: -128 to 127.

Scaling: 1°C / bit.

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **left** sensor.

DID format is on 2 bytes: 0x10 0x33

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x1034 - Left side RADAR temperature DID

This DID shall return radar temperature.

Range: -128 to 127.

Scaling: 1°C / bit.

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **right** sensor.

DID format is on 2 bytes: 0x10 0x34

<data> length is 1 byte.

DID is not supported in programming session (0x2)

DID 0x1036 - Active Vehicle Series

This DID shall return the Vehicle Series which is active in that moment.

DID format is on 2 bytes: 0x10 0x36

<data> length is 1 byte.

Data details:

<data> length shall be 1 byte, as described below. The DID shall return values based on the stored Vehicle Platform in V

0x01: G series (Impreza)
0x02: S series (Forester)
0x03: -
0x04: B series (Legacy)
0x05: V series (WRX)
0x06: W series (Ascent)
0x07: ~~Z series (86/BRZ)~~ Reserved
0x08-0xFF: Reserved

Default: NB8 (= B series (Legacy) SUV). When the stored Vehicle Platform is "reserved(0x0 or 0x7)" or "abnormal(0x4)", t

The DID 0x1036 shall return value on both **left** and **right** sensors.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1038 - Active Body Type

This DID shall return the Body type which is active in that moment.

DID format is on 2 bytes: 0x10 0x38

<data> length is 1 byte.

Data details:

<data> length shall be 1 byte, as described below:

0x01: Sedan
0x02: Wagon
0x03: XUV/OBK

DID is not supported in programming session (0x2)

The DID 0x1038 shall return value on both **left** and **right** sensors.

DID 0x1039 - SRVD Indicator Illumination

This DID shall return the Dimmer Cancel Mode which is active in that moment.

DID format is on 2 bytes: 0x10 0x39

<data> length is 1 byte.

Data details:

<data> length shall be 1 byte, as described below:

0x01: Day Mode
0x02: Night Mode

DID is not supported in programming session (0x2)

The DID 0x1039 shall return value on both **left** and **right** sensors.

DID 0x103A - Active Destination Code

This DID shall return the Destination which is active in that moment.

DID format is on 2 bytes: 0x10 0x3A

<data> length is 1 byte.

{EMBEDDED id=2535610 title="_4141.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_fQ2ygFC_Ee-Gkrm

DID is not supported in programming session (0x2)

The DID 0x103A shall return value on both **left** and **right** sensors.

DID 0x103B - Left side alignment angles

This DID shall return alignment angle of auto-alignmnet and EOL/Dealer alignment, at any time it is requested, independe

DID format is on 2 bytes: 0x10 0x3B

<data> length is 4 bytes.

Data details:

<data> length shall be 4 bytes, as described below:

- data1 and data2 bytes shall output the stored Auto-alignment Angle value (word type). Similar with Angle response from
- data3 and data4 bytes shall output the stored Dealer (EOL) Angle value (word type). Actually is the last Angle from Dea

DID is not supported in programming session (0x2)

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **right** sensor.

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x103C - Right side alignment angles

This DID shall return alignment angle of auto-alignmnet and EOL/Dealer alignment, at any time it is requested, independe

DID format is on 2 bytes: 0x10 0x3C

<data> length is 4 byte.

Data details:

<data> length shall be 4 bytes, as described below:

- data1 and data2 bytes shall output the stored Auto-alignment Angle value (word type). Similar with Angle response from
- data3 and data4 bytes shall output the stored Dealer (EOL) Angle value (word type). Actually is the last Angle from Dea

DID is not supported in programming session (0x2)

Negative Response 0x22 (conditions not correct) shall be returned if request is made on **left** sensor.

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x103D - ELK equipped

This DID shall return 0x01 if ELK is equipped (Signal EYE321_3_3_ELK_OFF_IND is 0x1)

and 0x02 if ELK is not equipped (Signal EYE321_3_3_ELK_OFF_IND is 0x0).

See also L3_SW_2582.

DID format is on 2 bytes: 0x10 0x3D

<data> length is 1 byte.

DID is not supported in programming session (0x2)

The DID 0x103D shall return value on both **left** and **right** sensors.

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x103E - EyeSight equipped

This DID shall return 0x01 if EyeSight is equipped (Signal CECU6EC_3_1_EYE_EXISTENCE is 0x1)

and 0x02 if EyeSight is not equipped (Signal CECU6EC_3_1_EYE_EXISTENCE is 0x0).

See also L3_SW_4061.

DID format is on 2 bytes: 0x10 0x3E

<data> length is 1 byte.

DID is not supported in programming session (0x2)

The DID 0x103E shall return value on both **left** and **right** sensors.

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1040 - Supported DIDs in range 0x1041 - 0x1060

This DID shall return 4 bytes. Each bit of the response is corresponding to one DID in range 0x1041 - 0x1060, the corres

- 1 if DID is supported,
- 0 if DID is not supported.

{EMBEDDED id=2535657 title="_3330.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_7RPeolDAEe-Gkrm

DID format is on 2 bytes: 0x10 0x40

<data> length is 4 byte.

~~DID is supported in programming session (0x2). During reprogramming session, 0x1060 is supported. DATA 1-3 shall ret~~

DID 0x1060 - Supported DIDs in range 0x1061 - 0x1080

This DID shall return 4 bytes. Each bit of the response is corresponding to one DID in range 0x1061 - 0x1080, the corres

- 1 if DID is supported,
- 0 if DID is not supported.

{EMBEDDED id=2535609 title="_4146.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_cLeV9VC_Ee-Gkrm

DID format is on 2 bytes: 0x10 0x60

<data> length is 4 byte.

~~DID is supported in programming session (0x2). During reprogramming session, no DID in this range is supported. All byt~~

DID 0x1061 - Advanced Driving mode

This DID shall return 0x01 if SRVD system is in Advanced Driving mode.

This DID shall return 0x00 if system is not in Advanced Driving mode.

Refer to L3_SW_2914 for judgement of Advanced Driving mode.

DID format is on 2 bytes: 0x10 0x61

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1062 - Door mirror indicator external control setting

This DID shall return 0x01 if SRVD system is in External indicator control mode.

This DID shall return 0x00 if system is not in External indicator control mode.

Refer to L3_SW_4170 for judgement of External indicator control mode.

DID format is on 2 bytes: 0x10 0x62

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x1063 - Door mirror indicator external control status

This DID shall return the following values for each mirror LED conditions:

value - condition

0x00 - OFF

0x01 - ON

0x02 - Blinking

others - reserved

DID format is on 2 bytes: 0x10 0x63

<data> length is 1 byte.

DID is not supported in programming session (0x2)

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0x2000 - Supported DIDs in range 0x2001 - 0x2020

This DID shall return 4 bytes. Each bit of the response is corresponding to one DID in range 0x2001 - 0x2020, the corresponding bit is:

- 1 if DID is supported,
- 0 if DID is not supported.

DID response shall be:

{IMAGE id=2513016 title="1279_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources/1279_Object_Text_0.png" data-bbox="121 155 1000 171"/>

DID format is on 2 bytes: 0x20 0x00

<data> length is 4 byte.

~~DID is supported in programming session (0x2). During reprogramming session, no DID in this range is supported. All DA~~

DID 0x3000 - Supported DIDs in range 0x3001 - 0x3020

This DID shall return 4 bytes. Each bit of the response is corresponding to one DID in range 0x3001 - 0x3020, the corresponding bit is:

- 1 if DID is supported,
- 0 if DID is not supported.

DID response shall be:

{IMAGE id=2513019 title="1284_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources/1284_Object_Text_0.png" data-bbox="121 354 1000 370"/>

DID format is on 2 bytes: 0x30 0x00

<data> length is 4 byte.

~~DID is supported in programming session (0x2). During reprogramming session, no DID in this range is supported. All DA~~

DID 0xF100 - Identification option vehicle manufacturer specific DID (SSM ID)

This DID shall return:

- 0x85 0x00 0x00 if left sensor.
 - 0x85 0x10 0x00 if right sensor
-
- 0x85 0x00 0x00 if request by physical address 0x18DABCE0;
 - 0x85 0x10 0x00 if request by physical address 0x18DABDE0.

DID format is on 2 bytes: 0xF1 0x00

<data> length is 3 bytes.

DID is supported in programming session (0x2).

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0xF101 - SW DID

This DID shall return ROM ID (same contents as F182) in ASCII codes:

- 85 00 00 if left sensor;
- 85 00 00 if right sensor.

For example of 85 00 00, the return value shall be 0x38 0x35 0x30 0x30 0x30 0x30.

DID format is on 2 bytes: 0xF1 0x01

<data> length is 6 bytes.

DID is supported in programming session (0x2).

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0xF102 - HW DID

This DID shall return SBR parts number.

Parts number is "**877C2A1R00**" in ASCII codes **if it is produced in SBR (CAL)**.

for example, 0x38 0x37 0x37 0x43 0x32 0x41 0x31 0x52 0x30 0x30

This DID shall return SBR parts number for K3 (since SW04)

Part number is "**877C2AR000**" in ASCII codes **if it is produced in SBR (CAL)**.

for example, 0x38 0x37 0x37 0x43 0x32 0x41 0x52 0x30 0x30 0x30

The content of parts number shall be stored in PPAR due to it cannot be changed by Customer reprogramming.

The address of parts number (PPAR_OemSwBlock) is started from 0xf9d3b8 and end to 0xf9d3c1.

DID format is on 2 bytes: 0xF1 0x02

<data> length is 10 bytes.

DID is not supported in programming session (0x2).

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0xF103 - Serial number

This DID shall return serial number with 26 bytes in ASCII codes.

The serial number shall be gotten from PPAR.

Reference: Contents of the serial number

Byte1:13 SAP material no

Byte14:15 Revision

Byte16 Plant code

Byte17:18 Year

Byte19 Month(Hex)

Byte20:21 Day

Byte22:26 Day counter(Hex)

DID format is on 2 bytes: 0xF1 0x03

<data> length is 26 bytes.

DID is not supported in programming session (0x2).

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0xF182 - Application data identification DID (ROM ID)

This DID shall return:

- 0x85 0x00 0x00 if left and right sensor.

- 0x85 0x00 0x00 if request by physical address 0x18DABCE0;

- 0x85 0x00 0x00 if request by physical address 0x18DABDE0.

DID format is on 2 bytes: 0xF1 0x82

<data> length is 3 bytes.

DID is supported in programming session (0x2).

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0xF186 - Active Session DID

This DID shall return active session.

DID format is on 2 bytes: 0xF1 0x86

<data> length is 1 byte.

{EMBEDDED id=2535681 title="_3126.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_RFA3iFDCEe-Gkr

DID is supported in programming session (0x2).

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0xF189 - Vehicle manufacturer ECU software version number DID

This DID shall return the SW version.

For example for SW 01.00.00 the return value shall be 0x30 0x31 0x30 0x30 0x30 0x30 0x00 0x00 0x00 0x00.

DID format is on 2 bytes: 0xF1 0x89

<data> length is 10 bytes.

DID is not supported in programming session (0x2).

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0xF18E - Vehicle manufacturer kit assembly part number DID

This DID shall return SBR part number.

Parts number is "877C2A1R00" in ASCII codes **if it is produced in SBR (CAL).**

for example, 0x38 0x37 0x37 0x43 0x32 0x41 0x31 0x52 0x30 0x30

This DID shall return SBR part number for K3(since SW04).

Part number is "877C2AR000" in ASCII codes **if it is produced in SBR (CAL).**

for example, 0x38 0x37 0x37 0x43 0x32 0x41 0x52 0x30 0x30 0x30

The content of parts number shall be stored in PPAR due to it cannot be changed by Customer reprogramming.

The address of parts number (PPAR_OemSwBlock) is started from 0xf9d3b8 and end to 0xf9d3c1.

DID format is on 2 bytes: 0xF1 0x8E

<data> length is 10 bytes.

~~DID is supported in programming session (0x2).~~

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0xF197 - System name or engine type DID

This DID shall return in ASCII:

- "RADAR RCR LH" if left sensor, remaining bytes shall be set to 0x20;
- "RADAR RCR RH" if right sensor, remaining bytes shall be set to 0x20.

DID format is on 2 bytes: 0xF1 0x97

<data> length is 32 bytes.

~~DID is supported in programming session (0x2).~~

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0xF198 - Fingerprint

This DID shall return Fingerprint for reprogramming.

DID format is on 2 bytes: 0xF1 0x98

<data> length is 4 bytes.

DID is not supported in programming session (0x2).

DID 0xFF00 - UDS Version

This DID shall return UDS Version.

DID format is on 2 bytes: 0xFF 0x00

<data> length is 4 bytes.

The returned <data> shall be below value when both left and right sensors.

- 0x03 0x00 0x00 0x00

DID is not supported in programming session (0x2).

Other Negative Response Codes besides those applicable for service \$22, are not supported.

DID 0xFF01 - Supported CAN classic / CAN FD Information

This DID shall return supported CAN information.

DID format is on 2 bytes: 0xFF 0x01

<data> length is 1 byte.

The returned <data> shall be below value when both left and right sensors.

- 0x00

DID is not supported in programming session (0x2).

SID 0x27 Security Access

The purpose of this service is to provide a means to access data and/or diagnostic services, which have restricted access

The service is mandatory and shall be implemented

This service shall be allowed during Programming Session (0x02).

Sub function supported shall be 0x01 and 0x02.

{IMAGE id=2513021 title="3539_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

{EMBEDDED id=2535649 title="_3462.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_pwwDYFDAEe-Gkr

{EMBEDDED id=2535648 title="_3463.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_nNjt4IDAEe-Gkr

{EMBEDDED id=2535638 title="_3507.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_FoKEkIDAEe-Gkr

{EMBEDDED id=2535637 title="_3508.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_DobohVDAEe-Gkr

{EMBEDDED id=2535647 title="_3464.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_IBF2VVDAEe-Gkr

Supported Negative Response Code

NRC 0x12 sub-functionNotSupported shall be supported

If the sub-function parameter is not supported.

NRC 0x13 incorrectMessageLengthOrInvalidFormat shall be supported

If the length of the message is wrong.

NRC 0x31 requestOutOfRange shall be supported

If unsupported "communication Type" is received.

NRC 0x7F serviceNotSupportedInActiveSession shall be supported.

If the service is requested when the service is not supported in current session.

SID 0x28 Communication Control

The purpose of this service is to switch on/off the transmission and/or the reception of certain messages of sensor.

This service is mandatory and shall be implemented

This service shall be allowed during Extended Diagnostic Session (0x03).

This service shall control communication on Vehicle bus and private bus.

{EMBEDDED id=2535680 title="_3129.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_OOhLhIDCEe-Gkr

{EMBEDDED id=2535679 title="_3131.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_Luk-UVDCEe-Gkr

{EMBEDDED id=2535678 title="_3132.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_JSNCiVDCEe-Gkr

{EMBEDDED id=2535677 title="_3133.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_HKPQd1DCEe-Gkr

Negative response message format: 7F 28 <NRC>

Supported negative response codes: 0x12, 0x13, 0x31 and 0x7F

{EMBEDDED id=2535676 title="_3136.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_FRSKwVDCEe-Gkr

SID 0x2E Write Data By Identifier

The Write Data By Identifier service allows the SSM Tool to write information into the sensor at an internal location specified

This service is mandatory and shall be implemented

This service shall be allowed during Extended Diagnostic Session (0x03).

This service will be allowed during Programming Session (0x02).

This service 0x2E (WriteDataByIdentifier) function and write data doesn't include privacy data (Key information, password)
{EMBEDDED id=2535674 title="_3142.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX__cx1hIDBEe-Gkrm
{EMBEDDED id=2535673 title="_3143.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_9YIJFDBEe-Gkrm
<DID> shall be considered a 2 bytes Diag Data Identifier as they are described for each DID in "DID list" chapter (see L3_SV
<data> shall be considered the number of data bytes, as they are described for each DID in "DID list" chapter (see L3_SV
{EMBEDDED id=2535672 title="_3144.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_7IMa5FDBEe-Gkrm
{EMBEDDED id=2535671 title="_3145.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_4hEAIVDBEe-Gkrm
Negative response message format: 7F 2E <NRC>
Supported negative response codes: 0x13, 0x22, 0x31 and 0x7F
{EMBEDDED id=2535670 title="_3148.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_2yhbIVDBEe-Gkrm

DID list

DID 0xF198 - Fingerprint

This DID shall store Fingerprint for reprogramming.

DID format is on 2 bytes: 0xF1 0x98

<data> length is 4 bytes.

SID 0x31 RoutineControl

Definition: Implementations of the service RoutineControl where the execution finishes before the response message to

This service is mandatory and shall be implemented

This Routine ID, 0x0141 and 0x0142, shall be allowed during Extended Session (0x03).

This Routine ID, 0xFF00 and 0xFF01, shall be allowed during Programming Session (0x02).

Asynchronous routines shall store the response data and shall provide the same response for sub function requestRoutine

A terminated/completed asynchronous routine shall respond to requestRoutineResults independently of the execution of r

The result shall be available as long as the ECU remains in the diagnostic session and IGN cycle in which the routine was

Asynchronous routines that have finished execution (automatically or forced using sub function stopRoutine) shall provide

Subfunction definition

EOL alignment routine (Routine ID 0x0141)

Start routine (0x01)

This request will start the radar alignment routine.

After the request is received, the ECU will analyze if the routine can be started. When the results is received, positive resp

Additional conditions: Vehicle speed shall be below 0.5 kph. This means the vehicle shall be in standstill.

Supported Session: 0x03 - Extended Diagnostic Session

Supported Security Level: Not supported

Request message format: 31 01 01 41

Positive response message format: 71 01 01 41

Negative response message format: 7F 31 <NRC>

Supported negative response codes during Extended session: 0x13, 0x22, 0x31, 0x78

Negative response codes during default session and programming session: 0x7F

If the start of the routine is successfully a positive response will be given. If the routine cannot start for any reason a corre

Supported negative response codes:

~~0x12 - Subfunction not supported~~

0x13 - Incorrect message length

~~0x21 - Busy, repeat request~~

0x22 - Condition not correct (i.e. Vehicle Speed not in standstill)

0x31 - Routine ID not supported

0x78 - Response pending.

{EMBEDDED id=2535651 title="_3366.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_uprhMFDAEe-Gkrm

Stop Routine (0x02)

The Stop routine sub-function is not supported. Negative response code 0x12 shall be returned.

Request Routine Results (0x03)

This request will return the status of the routine and the results after the routine is completed.

Additional conditions: Vehicle speed shall be below 0.5 kph. This means the vehicle shall be in standstill.

Supported Session: 0x03 - Extended Diagnostic Session

Supported Security Level: Not supported

Request message format: 31 03 01 41

Positive response message format: 71 03 01 41 <data>

Negative response message format: 7F 31 <NRC>

Supported negative response codes during Extension session: 0x13, 0x22, 0x24, 0x31.

Negative response codes during default session and programming session: 0x7F

Supported negative response codes:

0x11 - If the service is not supported

0x13 - Incorrect message length

0x22 - Condition not correct (i.e. Vehicle Speed not in standstill)

0x24 - Request sequence error -> can appear if the start of EOL alignment was not requested prior to the request for routine results

0x31 - Routine ID not supported

0x7F - If the service is requested when the service is not supported in current session.

<data> length shall be 6 bytes, as described below:

- data1 byte shall be the status byte. Status of the routine shall be:

- 0x00 if the routine was successfully.
- 0x09 if the routine ended unsuccessfully
- 0x0C if the sensor looks too left
- 0x0D if the sensor looks too right

- data2 byte shall output the SNR value with a range between -(minus)128dB until +(plus)127 dB.

- data4 (LSB) and data3 (MSB) bytes shall output the measured Angle value (word type) with a range between -(minus)32.768° until +(plus)32.768°.

- data6 (LSB) and data5 (MSB) bytes shall output always 0x0000. ~~the measured Range value (unsigned word type) with a range between 0.5 meter until 1.5 meter.~~

In case the status of the routine is 0x09 the Angle value shall be 0xFFFF.

In case the routine was not successfully (0x09), it means the deviation was much too big, for example if the mounting position is not correct.

{IMAGE id=2513022 title="1391_Object_Text_0.bmp" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources/1391_Object_Text_0.bmp" data-bbox="121 770 1000 787" style="display: block; margin-bottom: 5px;"/>Range is the distance from radar to the reflector and shall be always 1.5 meter.

LED lighting routine (Routine ID 0x0142)

Start routine (0x01)

This request will start the LED lighting routine.

After the request is received, the ECU will analyze if the routine can be started. When the routine is finished, positive response code 0x00 shall be returned.

This routine shall activate the corresponding mirror LED for 3 times, following the pattern bellow:

- 3 seconds LED On, after this 1 second LED Off.

{IMAGE id=2513024 title="1397_Object_Text_0.bmp" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WV

Additional conditions: Vehicle speed shall be below 0.5 kph. This means the vehicle shall be in standstill.

Supported Session: 0x03 - Extended Diagnostic Session

Supported Security Level: Not supported

Request message format: 31 01 01 42

Positive response message format: 71 01 01 42

Negative response message format: 7F 31 <NRC>

Supported negative response codes during Extended session: 0x13, 0x22, 0x31

Negative response codes during default session and programming session: 0x7F

If the routine cannot start for any reason a corresponding negative response will be send. If the request was well received

Supported negative response codes:

~~0x12 - Subfunction not supported~~

0x13 - Incorrect message length

0x22 - Condition not correct (i.e. Vehicle Speed not in standstill)

0x31 - Routine ID not supported

0x78 - Response pending.

{EMBEDDED id=2535650 title="_3368.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_r4snUIDAEe-GkrmJ

Stop Routine (0x02)

The Stop routine sub-function is not supported. Negative response code 0x12 shall be returned.

Request Routine Results (0x03)

The Request routine results sub-function is not supported. Negative response code 0x12 shall be returned.

Erase memory (Routine ID 0xFF00)

{IMAGE id=2513026 title="3537_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WV

{IMAGE id=2513028 title="4660_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WV

{EMBEDDED id=2535560 title="_4659.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_Oj70IIC9Ee-GkrmJ

Start Routine (0x01)

Request message format: 31 01 FF 00

Positive response message format: 71 01 FF 00

Negative response message format: 7F 31 <NRC>

Supported negative response codes: ~~0x12~~, 0x13, 0x22, 0x31, 0x78, 0x7F

If the routine cannot start for any reason a corresponding negative response will be send. If the request was well received

Supported negative response codes:

0x12 - Subfunction not supported

0x13 - Incorrect message length

0x22 - Condition not correct (i.e. Vehicle Speed not in standstill)

0x31 - Routine ID not supported

0x78 - Response pending.

Stop Routine (0x02)

The Stop routine sub-function is not supported. Negative response code 0x12 shall be returned.

Request Routine Results (0x03)

The Request routine results sub-function is not supported. Negative response code 0x12 shall be returned.

Sum Check (Routine ID 0xFF01)

{IMAGE id=2513029 title="3538_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WV

{EMBEDDED id=2535562 title="_4657.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_SyYxkFC9Ee-GkrmJ

{EMBEDDED id=2535561 title="_4658.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_QnKQIIC9Ee-GkrmJ

Start Routine (0x01)

Request message format: 31 01 FF 01

Positive response message format: 71 01 FF 01

Negative response message format: 7F 31 <NRC>

Supported negative response codes: 0x12, 0x13, 0x22, 0x31, 0x78, 0x7F

If the routine cannot start for any reason a corresponding negative response will be send. If the request was well received

Supported negative response codes:

0x12 - Subfunction not supported

0x13 - Incorrect message length

0x22 - Condition not correct (i.e. Vehicle Speed not in standstill)

0x31 - Routine ID not supported

0x78 - Response pending.

Stop Routine (0x02)

The Stop routine sub-function is not supported. Negative response code 0x12 shall be returned.

Request Routine Results (0x03)

The Request routine results sub-function is not supported. Negative response code 0x12 shall be returned.

SID 0x34 Request Download

The request Download service is used by the SSM tool to initiate a data transfer from the SSM tool to the sensor (download)

The service is mandatory and shall be implemented

This service shall be allowed during Programming Session (0x02).

Request Message Format

{IMAGE id=2513031 title="3540_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

{EMBEDDED id=2535646 title="_3474.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_jHkI4VDAEe-Gkrm

{EMBEDDED id=2535645 title="_3475.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_WjiAkFDAEe-Gkrm

{EMBEDDED id=2535643 title="_3477.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_SQ5twVDAEe-Gkrm

{EMBEDDED id=2535644 title="_3476.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_UQLd51DAEe-Gkrm

Supported Negative Response Code

NRC 0x13 incorrectMessageLengthOrInvalidFormat shall be supported

If the length of the message is wrong.

NRC 0x22 conditionsNotCorrect shall be supported.

This NRC shall be returned if a server receives a request for this service while in the process of receiving a download of a

NRC 0x31 requestOutOfRange shall be supported

If unsupported "communication Type" is received.

NRC 0x33 securityAccessDenied shall be supported

If the sensor is secure when a request for this service has been received.

NRC 0x70 uploadDownloadNotAccepted shall be supported

If an attempt to download to a sensor's memory cannot be accomplished due to some fault

NRC 0x7F serviceNotSupportedInActiveSession shall be supported.

If the service is requested when the service is not supported in current session.

SID 0x36 Transfer Data

The Transfer Data service is used by the SSM tool to transfer data either from the SSM tool to the sensor (download).

The service is mandatory and shall be implemented

This service shall be allowed during Programming Session (0x02).

Request Message Format

{IMAGE id=2513033 title="3541_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

{EMBEDDED id=2535642 title="_3488.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_PsOxIIDAEE-Gkrm

{EMBEDDED id=2535641 title="_3489.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_NMYD81DAEE-Gkrm

Supported Negative Response Code

NRC 0x11 serviceNotSupported shall be supported

NRC 0x13 incorrectMessageLengthOrInvalidFormat shall be supported
If the length of the message is wrong.

NRC 0x21 busyRepeatRequest shall be supported

NRC 0x22 conditionsNotCorrect shall be supported

NRC 0x24 requestSequenceError shall be supported

NRC 0x31 requestOutOfRange shall be supported

NRC 0x71 TransferDataSuspended shall be supported

NRC 0x72 generalProgrammingFailure shall be supported

NRC 0x73 wrongBlockSequenceCounter shall be supported

NRC 0x78 ResponsePending shall be supported

NRC 0x7F serviceNotSupportedInActiveSession shall be supported.

If the service is requested when the service is not supported in current session.

Padding Information : During the final block of data transfer if the remaining data is less than the block size, then SU85 will

SID 0x37 Request Transfer Exit

This service is used by the client to terminate a data transfer between SSM tool and sensor (upload or download).

The service is mandatory and shall be implemented

This service shall be allowed during Programming Session (0x02).

Request Message Format

{IMAGE id=2513035 title="3542_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

{EMBEDDED id=2535640 title="_3502.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_K-6t5FDAEe-Gkrm

{EMBEDDED id=2535639 title="_3503.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_lp0ewFDAEe-Gkrm

Supported Negative Response Code

NRC 0x13 incorrectMessageLengthOrInvalidFormat shall be supported

If the length of the message is wrong.

NRC 0x7F serviceNotSupportedInActiveSession shall be supported.

If the service is requested when the service is not supported in current session.

SID 0x3E TesterPresent

The service is mandatory and shall be implemented

This service shall be allowed during Default Session (0x01) and Extended Diagnostic Session (0x03).

This service will be allowed during Programming Session (0x02).

This service does maintain the active communication state according to tool requests.

Request message format: 3E 00 or 3E 80

Positive response message format: 7E 00

Negative response message format: 7F 3E <NRC>

Supported negative response codes: 0x12 and 0x13.

NRC	Description	Support
-----	-------------	---------

t		
---	--	--

0x11	If the service is not supported	n/a
------	---------------------------------	-----

a		
---	--	--

0x12	If the sub-function parameter is not supported.	X
------	---	---

X		
---	--	--

0x13	If the length of the message is wrong.	X
------	--	---

X		
---	--	--

0x21	If the service is not conducted due to high-load MCU	
------	--	--

0x22	If the criteria for the request are not met. (i.e. Vehicle speed, Voltage)	
------	--	--

0x78	If response is pending	
------	------------------------	--

0x7E	If unsupported sub-function is requested in current session.	
------	--	--

0x7F	If the service is requested when the service is not supported in current session.	
------	---	--

SID 0x85 Control DTC Setting

The Control DTC Setting service shall be used by the SSM tool to stop or resume the updating of DTC status bits in the s
The service is mandatory and shall be implemented.

This service shall be allowed during Extended Diagnostic Session (0x03).

{EMBEDDED id=2535669 title="_3157.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_0rD_Y1DBEe-Gkrn

{EMBEDDED id=2535666 title="_3158.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_NaKL0FDBEe-Gkrn

{EMBEDDED id=2535567 title="_4485.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_eQyHgFC9Ee-Gkrn

If the server receives a request message with 0x02 specified in the SubFunction data parameter and stops updating the D

- 1) A request message with 0x01 specified as the SubFunction data parameter is received.
- 2) IG-OFF has occurred (resume update on IG-ON next time)

Note that updates should not be resumed when migrating sessions.

{EMBEDDED id=2535664 title="_3159.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_LNMIA1DBEe-Gk
{EMBEDDED id=2535663 title="_3160.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_JFyMkFDBEe-Gkrr

Negative response message format: 7F 85 <NRC>

Supported negative response codes: 0x12, 0x13 and 0x7F

{EMBEDDED id=2535662 title="_3163.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_Gxt4MFDBEe-Gkrr

SID 0xBA Conti Internal Requirement

This Service shall be only supported for the DV Releases.

For the Customer release this service shall not be supported and shall provide NRC11{Service not supported}

LED Driver Control Options

IO DID 0xFE00 shall be used to control the LED Driver control options

LED ON/Blinking/OFF Control

LED Driver Current Change

Supported diagnostic session: Conti Session{0x10 0x60} under service 0xBA as it will be specific to Conti

LED Driver Control Options - IO DID

Request

{TABLE id=_1733911305161}

Parameter Definitions

{TABLE id=_1733911577524}

Note:

1. Short Term Adjustment shall control the LED with requested control options
2. Return to ECU shall return the LED control to Normal Sensor operations
3. After requesting LED ON, It shall continue to ON un-till LED OFF/Toggling is requested
4. LED Toggling pattern shall be as per the SU RID pattern{Req ID: 2514952: LED lighting routine (Routine ID 0x0142
5. Due to limitation from HW, Max Current level is 100mA. If input current level is more than 100mA, SW will consider it
6. When LED Toggling is selected for short term adjustment, when LED toggling completes after 12sec, Read status w

Positive Response

{TABLE id=_17339113051611513325098361032}

Parameter Definitions

{TABLE id=_17339115775241513325098477874}

Negative Response

{TABLE id=_17339113051611513325224807853}

Read LED Driver Control Status - Read DID Request

{TABLE id=_17339113051611513325263630598}

Positive Response

{TABLE id=_17339113051611513325669804760}

Parameter Definitions

{TABLE id=_17339115775241513325669920722}

Negative Response

{TABLE id=_17339113051611513325802071985}

UDS for XCP lock/unlock

Following standards shall be applied:

DPSBT-22-S00240	Diagnostic Communication CAN / CAN FD Specification
DPSBT-22-S00340	Diagnostic Communication UDS session Layer Specification
DPSBT-22-S00441	Diagnostic Communication UDS Application Layer Specification
DPSBT-22-S00541	Diagnostic Communication Service Requirement Specification

References:

ISO 15765-2:2016 : Road vehicles — Diagnostic communication over Controller Area Network (DoCAN)—
ISO 14229-1:2020 : Road vehicles — Unified diagnostic services (UDS) —
ISO 14229-2:2021 : Road vehicles — Unified diagnostic services (UDS) —

Protocol

{EMBEDDED id=2535591 title="_4305.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_cyWINFC-Ee-Gkrm}

The CAN IDs used for XCP lock/unlock shall be assigned on private bus.

Application Services

Supported services shall be: \$10, \$27, \$28 and \$BE.

SID 0x10 Diagnostic Session Control

The service is mandatory and shall be implemented

This service shall be allowed during Default Session, Extended Session and Programming session.

Figure 1 provides an overview about the diagnostic session transition and what the sensor shall do when it transitions to a

Figure 1 - Sensor diagnostic session state diagram

{EMBEDDED id=2513037 title="4313_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Diagnostic session transition description:

- 1) Default session to Default session:
 - a. The sensor shall re-initialize the default session completely.
- 2) Default session to Non-default session:
 - a. Nothing.
- 3) Non-default session to Same session:
 - a. The state of the SID 0x28 Communication Control and SID 0x85 Control DTC Setting services shall not be affected, e.g. normal communication shall remain disabled.
- 4) Non-default session to Default session:
 - a. Security shall be locked again.

{EMBEDDED id=2535590 title="_4319.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_anTC4FC-Ee-Gkrm

{EMBEDDED id=2535589 title="_4320.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_YNbBc1C-Ee-Gkrm

{EMBEDDED id=2535588 title="_4321.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_WGvBx1C-Ee-Gkrm

{EMBEDDED id=2535587 title="_4322.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_TWIOUVC-Ee-Gkrm

Negative response message format: 7F 10 <NRC>

Supported negative response codes: 0x12, 0x13 and 0x78.

{EMBEDDED id=2535586 title="_4325.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_QrAY4IC-Ee-Gkrm

SID 0x27 Security Access

The purpose of this service is to provide a means to access data and/or diagnostic services, which have restricted access

The service is mandatory and shall be implemented

This service shall be allowed during Programming Session (0x02).

Sub function supported shall be 0x01 and 0x02.

{IMAGE id=2513038 title="4331_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

{EMBEDDED id=2535587 title="_4322.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_TWIOUVC-Ee-Gkrm

{EMBEDDED id=2535580 title="_4333.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_LGxUQIC-Ee-Gkrm

{EMBEDDED id=2535579 title="_4334.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_lxNyl1C-Ee-GkrmJ

{EMBEDDED id=2535578 title="_4335.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_E2__UFC-Ee-Gkrm

{EMBEDDED id=2535577 title="_4336.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_CmU9NIC-Ee-Gkrm

Supported Negative Response Code

NRC 0x12 sub-functionNotSupported shall be supported

If the sub-function parameter is not supported.

NRC 0x13 incorrectMessageLengthOrInvalidFormat shall be supported

If the length of the message is wrong.

NRC 0x31 requestOutOfRange shall be supported

If unsupported "communication Type" is received.

NRC 0x7F serviceNotSupportedInActiveSession shall be supported.

If the service is requested when the service is not supported in current session.

Security Access encryption key for Tool qualification

XCP unlock key is specified in the following document,

SRR320SU85 XCP_unlock_Key from OTC.docx

{LINK title="https://jazz.conti.de/ccm4/web/projects/Radar_SRR320SU85_DM#action=com.ibm.team.scm.browseElement&workSpaceItemId=_u
wan.com/ccm4/web/projects/Radar_SRR320SU85_DM#action=com.ibm.team.scm.browseElement&workSpaceItemId=_u

SID 0x28 Communication Control

The purpose of this service is to switch on/off the transmission and/or the reception of certain messages of sensor.

This service is mandatory and shall be implemented

This service shall be allowed during Extended Diagnostic Session (0x03).

This service shall control communication on Vehicle bus and Private bus.

{EMBEDDED id=2535576 title="_4346.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_pvVOcFC9Ee-Gkrm

{EMBEDDED id=2535575 title="_4347.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_m-Z-9FC9Ee-Gkrm

{EMBEDDED id=2535574 title="_4348.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_k0Aj9VC9Ee-Gkrm

{EMBEDDED id=2535573 title="_4349.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_iZ4D01C9Ee-Gkrm

Negative response message format: 7F 28 <NRC>

Supported negative response codes: 0x12, 0x13, 0x31 and 0x7F

{EMBEDDED id=2535568 title="_4352.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_gKFLc1C9Ee-Gkrm

SID 0xBE ECUShippingInspection

The service is mandatory and shall be implemented.

This service shall be allowed during Programming Session (0x02).

{EMBEDDED id=2535605 title="_4200.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_AoxO4VC_Ee-Gkrm

{EMBEDDED id=2535604 title="_4201.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_886BI1C-Ee-Gkrm

{EMBEDDED id=2535603 title="_4202.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_6rTx8FC-Ee-Gkrm

Supported Negative Response Codes (NRC)

{EMBEDDED id=2535600 title="_4206.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_0GeL8IC-Ee-Gkrm

{EMBEDDED id=2535599 title="_4251.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_x26kJFC-Ee-Gkrm

{EMBEDDED id=2535601 title="_4205.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_2xu4VFC-Ee-Gkrm

{EMBEDDED id=2535602 title="_4204.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_4sqT9VC-Ee-Gkrm

{EMBEDDED id=2535595 title="_4283.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_oARPJIC-Ee-Gkrm

XCP

SID 0xBE is used to enable and disable the XCP access.

The ECUs shall use the following CAN IDs on Private bus:

* Left Rx/Tx 0x5F4/0x5F6

* Right Rx/Tx 0x5F5/0x5F7

If the sensor has a global CAN interface, all received XCP commands shall be ignored/discarded on this interface.

Note: In this case, it does not matter if XCP is unlocked or not, in either case the XCP commands shall be ignored/discarded

The XCP command interface shall only be available on the private/local CAN.

In SW Default value of the XCP ON/OFF NVM flag should "OFF" in in below cases

1. NVM Reset(NVM is erased).
2. When the NVM corruption in feild.
3. Also in the SW which will be deliver to production.

To Enable XCP 0xDCBA value should be checked in the SW.

Note for verification:

Flash NVM mot file with XCP ON/OFF NVM flag value other than 0x00 and 0xDCBA.

If the XCP is disabled and the Application is not present then XCP should be disabled in bootloader.

If the XCP communication is enabled(=unlocked), both the bootloader and the application XCP command interface shall b

Error Handling

The SW shall be able to check the SW faults continuously and if any SW fault is detected, it shall be indicated by the outp

The SW shall be able to record the necessary environmental error data to be able to analyze when and why the trouble o

Supported events

DEM list (t.b.d)

Error Codes

Table below contains all DTCs required:

DTCs details

{EMBEDDED id=2535613 title="_4070.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_j6HcoVC_Ee-Gkrm

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

Every DTC shall have an internal code on 2 bytes, as shown in the table above. (L3_SW_4070)

The internal code shall be computed using following method:

{IMAGE id=2513041 title="504_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_

Because the first byte in the computing method is always 0(zero), the Error Handling module shall not take care about this

DTC related to CAN communication shall not be stored in programming session.

Note: About programming session entry, refer to SID 10 service

Note: Refer to FREQ 4-13 in DPSB-19-S08241 CAN Fail Diag Specification

An example on how to compute the internal code for customer DTC B2300:

{IMAGE id=2513045 title="506_Object_Text_0.bmp" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_

There are two different DTC debounce logic implemented.

1. Event triggered (default logic):

The counter has a maximum value of 127 and a minimum value of 0. If the pre-debouncing has been finished then the Fault is reported. According to the Fault Detection definition, the counter increments/decrements according to the configured increment/decrement.

Since the range of 0 to +127 is fixed, different limits for FAILED and PASSED can be implemented via different step sizes.

2. Time triggered:

When the event is reported, a timer is started. The timer is incremented each 10 ms until a value of 30000 is reached, so the fault is reported.

Test Stimuli Information:

1. Battery Voltage

The test stimuli variable/structure to be used is **myIOHWAB_ADC_UBATT**.

Structure member **s_SignalValue** reads the actual voltage value (Unit = Voltage * 100)

Structure member **s_SignalValueShadow** should be updated with required voltage value

Set the Structure member **u_Locked** to "1" to set the voltage mentioned in the step above

2. Temperature

The test stimuli variable/structure to be used are **myIOHWAB_ADC_ROC_DIG_TEMP_HWA**, **myIOHWAB_ADC_ROC_DIG_TEMP_HWB**.

Structure member **s_SignalValueShadow** should be updated with required voltage value

Set the Structure member **u_Locked** to "1" to set the voltage mentioned in the step above

3. LED Voltage and Current

TODO

4. DEM injection technique using DgM

Dgm_a_EventInjectionQueue[] is an array, Set any of the indexes to the required DEM event ID. (Maximum 5 indexes)

Dgm_a_EventInjectionStatus[] is an array, Set the value of the corresponding event ID (index) to 1. (Maximum number of 5)

Set the variable **Dgm_b_EventInjectionTrigger** to 1.

Check the status of the corresponding DEM using the variable **Dem_Cfg_StatusData.EventStatus[EventId]**.

Note: For DEM testing using DgM injection method - when DEM failed is reported through DgM injection, that fault is reported only if the enable condition is satisfied, then also DEM will not be logged as DgM will not report the fault by itself.

Enable Conditions and their Init values shall be as per the bellow table
{TABLE id=_1741159618564}

DEM_EC_SRVD_SWITCH_ON - Enable condition shall be set to 1 if the SRVD switch is ON, else Enable condition shall be
DEM_EC_TOWING_OFF - Enable condition shall be set to 1 if the Towing is OFF, else Enable condition shall be reset to 0.

B2B0011 <- ~~B2300~~ - short to ground

Description: This DTC will be set if the circuit of the mirror LED has short to ground. This DTC is the same for both ECU

Subaru Failure code: B2B0011 <- ~~B2300~~

Internal Failure code: 0xAB0011 <- ~~0xA300~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event for short to ground is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are not met)

Event setting conditions:

When the following conditions are met MON_SHORT2GND_MIRRORLED event shall be set to ON.

AND \neg Power supply voltage more than 9V (Because this condition has to be valid also at extreme temperatures (+85 de

- Mirror LED ON (supposed to be OFF)
- $3\text{ mA} < \text{Mirror LED current}$
- Mirror LED voltage $< 1.0\text{V}$ for 480 ms
- Without request to clear present diagnostic information

When the following conditions is met event(s) shall be set to OFF.

- OR \neg IG OFF (CPU reset)
- With request to clear present diagnostic information

Event Set/Fail Conditions:

Pre-condition: Power Supply voltage ≥ 8 and Power Supply voltage $\leq 17\text{V}$

When the following conditions are met continuously for 480ms, **LED_SHORT2GND** event shall be set to ON.

- OR \neg AND \neg Driver State: ON (HSD_EN = H)
- Current Setpoint $\geq 10\text{mA}$ (HSD_LED_DIMMING Duty cycle $\geq 10\%$)
 - $\text{ADC_LED_STATUS} \leq \text{ADC_LED_STATUS_th_3}$
- L AND \neg Driver State: ON (HSD_EN = H)
- Current Setpoint $\geq 10\text{mA}$ (HSD_LED_DIMMING Duty cycle $\geq 10\%$)
 - $\text{ADC_HSD_OUT_VOLTAGE} \leq \text{LED_out_stg_th_V}$
 - $\text{ADC_HSD_OUT_CURRENT_FB_MOUNT_ID2} \geq \text{LED_out_stg_th_I}$
- {ADC_LED_STATUS_th_3 = 840mV, LED_out_stg_th_V = 1V, LED_out_stg_th_I = 3mA}

Event Reset/Pass Conditions:

When the following conditions is met event(s) shall be set to OFF.

- OR \neg IG OFF (CPU reset)
- With request to clear present diagnostic information
 - AND \neg LED_SHORT2GND DEM is not active/Failed
 - ADC_LED_STATUS voltage is Normal Range 3650mV-5630mV(maximum valid value)

Note: Limitation will be to verify the LED voltage and current values by software validation team. Testing shall be done with

LED Fault Monitoring conditions shall be implemented from LED Driver Component

Debouncing of 480ms and Enable condition(Power Supply voltage range check) shall be handled from EH component

Linked events: ~~OMI_SHORT2GND~~

LED_SHORT2GND

FIM reaction: malfunction

Degradation Mapping:

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

Fault detection counter decrement step: 2

Fault detection counter increment step: 2

B2B0015 <- ~~B2304~~ - open or short to supply voltage

Description: This DTC will be set if the circuit of the mirror LED has an open or a short to supply voltage situation. This D

Subaru Failure code: B2B0015 <- ~~B2304~~

Internal Failure code: 0xAB0015 <- ~~0xA304~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event for short to ground is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are no

Events setting conditions:

When the following conditions are met MON_SHORT2BAT_MIRRORLED event shall be set to ON:

AND \top Power supply voltage more than 9V (Because this condition has to be valid also at extreme temperatures (+85 de
└ Mirror LED OFF (supposed to be OFF)
└ Mirror LED voltage > 5,2V for 480ms
└ Without request to clear present diagnostic information

When the following conditions are met MON_OPENCONN_MIRRORLED event shall be set to ON:

AND \top Power supply voltage more than 9V (Because this condition has to be valid also at extreme temperatures (+85 d
└ Without request to clear present diagnostic information
└ Mirror LED current < 3 mA for 480 msec
└ \top AND \top Mirror LED ON (supposed to be ON)
└ Mirror LED voltage > 5.2 V

When the following conditions is met event(s) shall be set to OFF.

OR \top IG OFF (CPU reset)
└ With request to clear present diagnostic information

Event Set/Fail conditions for LED_SHORT2BAT :**Pre-condition:** Power Supply voltage ≥ 8 and Power Supply voltage ≤ 17 vWhen the following conditions are met continuously for 480ms, **LED_SHORT2BAT** event shall be set to ON.

AND \neg Driver State: OFF (HSD_EN = L)
 └ ADC_HSD_OUT_VOLTAGE \geq LED_out_stb_th_V
 {LED_out_stb_th_V = 5.9v}

Event Set/Fail conditions for LED_OPEN_LOAD :**Pre-condition:** Power Supply voltage ≥ 8 and Power Supply voltage ≤ 17 vWhen the following conditions are met continuously for 480ms, **LED_OPEN_LOAD** event shall be set to ON.

AND \neg Driver State: ON (HSD_EN = H)
 └ Current Setpoint ≥ 10 mA (HSD_LED_DIMMING Duty cycle $\geq 10\%$)
 └ ADC_HSD_OUT_VOLTAGE \geq LED_out_open_th_V
 └ ADC_HSD_CURRENT_FB_MOUNT_ID2 \leq LED_out_open_th_I
 {LED_out_open_th_V=5.9V, LED_out_open_th_I = 3mA}

Event Reset/Pass Conditions LED_SHORT2BAT and LED_OPEN_LOAD :

When the following conditions is met event(s) shall be set to OFF.

OR \neg IG OFF (CPU reset)
 └ With request to clear present diagnostic information
 AND \neg Corresponding DEM(**LED_SHORT2BAT** / **LED_OPEN_LOAD**) is not active/Failed
 └ ADC_LED_STATUS voltage is Normal Range 3650mV-5630mV(maximum valid value)

Note: Limitation will be to verify the LED voltage and current values by software validation team. Testing shall be done with

LED Fault Monitoring conditions shall be implemented from LED Driver Component

Debouncing of 480ms and Enable condition(Power Supply voltage range check) shall be handled from EH component

Linked events: ~~OMI_SHORT2BAT, OMI_OPENLOAD~~**LED_SHORT2BAT, LED_OPEN_LOAD****FIM reaction:** malfunction**Degradation Mapping:**

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

Fault detection counter decrement step: 2**Fault detection counter increment step: 2**U004688 <- ~~U007D88~~ <- ~~U007D~~ - Bus off detection for Public CANThe DTC, U007A, shall be changed to **U007D** since SW 02.00.00.**Description:** This DTC will be set if the Bus off situation appears on Public CAN. This DTC can be set by the both Master**Application condition:** The DTC shall be available**Subaru Failure code:** U004688 <- ~~U007D88~~ <- ~~U007D~~**Internal Failure code:** 0xC04688 <- ~~0xC07D88~~ <- ~~0xC07D~~**DTC qualification condition:** DTC shall be qualified if the dedicated DEM Event for public bus off is set .**DTC timing condition for qualification:** DTC shall be qualified as soon as the DEM Event is set.**DTC timing condition for disqualification:** No DTC disqualification shall be possible (even the setting conditions are not met)**Event setting conditions** are explained at ID 904 { ReqID: 2514136: Bus off }Linked events: ~~CAN_0_BUS_OFF_SU49~~**CANSM_E_BUSOFF_NETWORK_0****FIM reaction:** malfunction

Degradation Mapping:

DGM_SAFE_COMMUNICATION
DGM_SU_RDR_FAIL
DGM_NOEMISSION

Fault detection counter decrement step: 128 (immediate DTC trigger)

Fault detection counter increment step: 127 (immediate DTC trigger)

B2B0488 <- ~~B2354~~ - Bus off detection for Private CAN

Description: This DTC will be set if the Bus off situation appears on Private CAN. This DTC can be set by both ECUs, L

Subaru Failure code: B2B0488 <- ~~B2354~~

Internal Failure code: 0xAB0488 <- ~~0xA354~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event for private bus off is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are no

Event setting conditions are explained at ID 904 { ReqID: 2514136: Bus off }

Linked events: ~~CAN_1_BUS_OFF~~

CANSM_E_BUSOFF_NETWORK_1

FIM reaction: malfunction

Degradation Mapping:

DGM_SAFE_COMMUNICATION
DGM_SU_RDR_FAIL
DGM_NOEMISSION

Fault detection counter decrement step: 128 (immediate DTC trigger)

Fault detection counter increment step: 127 (immediate DTC trigger)

U0422 - BIU communication error

The DTC shall be removed since SW 03.00.00.

When Check sum error occurs, Check sum error should be treated as CAN data time out.

When Counter fail occurs, Counter fail should be counted as CAN data time out.

U0402 - TCU communication error

The DTC shall be removed since SW 03.00.00.

When Check sum error occurs, Check sum error should be treated as CAN data time out.

When Counter fail occurs, Counter fail should be counted as CAN data time out.

U0423 - METER communication error

The DTC shall be removed since SW 03.00.00.

When Check sum error occurs, Check sum error should be treated as CAN data time out.

When Counter fail occurs, Counter fail should be counted as CAN data time out.

U0416 - VDC communication error

The DTC shall be removed since SW 03.00.00.

When Check sum error occurs, Check sum error should be treated as CAN data time out.

When Counter fail occurs, Counter fail should be counted as CAN data time out.

U08408C <- ~~U014087~~ <- ~~U0140~~ - BIU data time out

Description: This DTC will be set if the input message from BIU (mBIU3AC) have a time out, DLC error, Checksum error

Subaru Failure code: U08408C <- ~~U014087~~ <- ~~U0140~~

Internal Failure code: C8408C <- ~~0xC14087~~ <- ~~0xC140~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are no

Events setting conditions are explained at ID 1469{ ReqID: 2513271: Message Timeout } and 1481{ ReqID: 2513281: M

Debounce Handling is explained in ReqID: 2947220

Detection time: 4000 ms (40 x 100ms)

Linked events: **CAN_MSG_TIMEOUT_BIU3AC**

FIM reaction: malfunction

Degradation Mapping:

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

U0101 - TCU data time out

Description: This DTC will be set if the input message(s) from TCU (mTCU048) have a time out, DLC error, Checksum error

Subaru Failure code: U0101

Internal Failure code: 0xC101

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are not met)

Events setting conditions are explained at ID 1469 and 1481.

Detection time: 2000 ms

Linked events: **CAN_MSG_TIMEOUT_TCU048**

FIM reaction: malfunction

U08558C <- ~~U015587~~ <- ~~U0155~~ - METER data time out

Description: This DTC will be set if the input message(s) from Meter (mMET390) have a time out, DLC error, Checksum error

Subaru Failure code: U08558C <- ~~U015587~~ <- ~~U0155~~

Internal Failure code: 0xC8558C <- ~~0xC15587~~ <- ~~0xC155~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are not met)

Events setting conditions are explained at ID 1469{ ReqID: 2513271: Message Timeout } and 1481{ ReqID: 2513281: Message Timeout }

Debounce Handling is explained in ReqID: 2947220

Detection time: 4000 ms (40 x 100ms)

Linked events: **CAN_MSG_TIMEOUT_MET390**

FIM reaction: malfunction

Degradation Mapping:

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

U08228C <- ~~U012287~~ <- ~~U0122~~ - VDC data time out

Description: This DTC will be set if the input message(s) from VDC (mVDC138, mVDC139 or mVDC328) have a time out, DLC error, Checksum error

Subaru Failure code: U08228C <- ~~U012287~~ <- ~~U0122~~

Internal Failure code: 0xC8228C <- 0xC12287 <- ~~0xC122~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are not met)

Events setting conditions: are explained at ID 1469{ ReqID: 2513271: Message Timeout } and 1481{ ReqID: 2513281: Message Timeout }

Debounce Handling is explained in ReqID: 2947220

Detection time:

VDC138 - 800 ms (40 x 20ms)

VDC139 - 800 ms (40 x 20ms)

VDC328 - 4000 ms (40 x 100ms)

Linked events: **CAN_MSG_TIMEOUT_VDC138, CAN_MSG_TIMEOUT_VDC139, CAN_MSG_TIMEOUT_VDC328**

FIM reaction: malfunction

DGM_SAFE_COMMUNICATION
DGM_SU_RDR_FAIL
DGM_NOEMISSION

Description: This DTC will be set if the input message(s) from TCU have a failure detection. This DTC can be set by both

Internal Failure code: 0xA311

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

Events setting conditions:

The event is set passive only at Reset or if DTC is deleted via Diag and the `mTCU048_1_6_STATUS_TCM` is 1.

FIM reaction: malfunction

Fault detection counter increment step: 127 (immediate DTC trigger)

Description: This DTC will be set if the input message(s) from VDC have a failure detection. This DTC can be set by both

Internal Failure code: 0x9F7068 <- ~~0xA313~~

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

Events setting conditions:

The event is set passive only at Reset or if DTC is deleted via Diag and the mVDC328_2_2_WARN_VDC_MET_LCD is 0

The event is set active, as soon as the signal mVDC328_2_1_WARN_ABS_MET_LCD is set to 1 and the Vehicle Speed

The event is set passive only at Reset or if DTC is deleted via Diag and the mVDC328_2_1_WARN_ABS_MET_LCD is 0

Example 1 (VDC unit failure is detected after the **vehicle speed** ≥ 2 km/h)

{IMAGE id=2513044 title="2457_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

{IMAGE id=2513048 title="2457 Object Text 1.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Events setting conditions:

VDC328_2_1_WARN_ABS_MET_LCD is 1 {Fail Judgement}

OR

VDC328_2_2_WARN_VDC_MET_LCD is 1 {Fail Judgement}

Received one of the above signal twice

The event is set passive only at Reset or if DTC is deleted via Diag and the VDC328_2_1_WARN_ABS_MET_LCD is 0

Linked events: **CAN_UNIT_FAILURE_VDC328**

FIM reaction: malfunction

Degradation Mapping:

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

Fault detection counter decrement step: 128 (immediate DTC trigger)

Fault detection counter increment step: 127 (immediate DTC trigger)

B2B0116 <- B2320 - Sensor LH/RH undervoltage (less than 8v <-9V)

Description: This DTC will be set if the Supply Voltage of the ECU in below 8v<-9V. This DTC can be set by both ECUs

Subaru Failure code: B2B0116 <- B2320

Internal Failure code: 0xAB0116 <- 0xA320

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: ~~DTC shall be disqualified as soon as the dedicated DEM Event is reset. No I~~

DTC shall be disqualified as soon as the dedicated DEM Event is reset.

Note: Changes effective from DV

The DEM Event shall be set only after 700 ms since the voltage is below 9V and, shall be reset only after 1000 ms (1s) si

Because this condition has to be valid also at extreme temperatures (-40 or +85 deg) the internal limit shall be set to 7.32

Events setting conditions:

When the following conditions are met continuously for 600ms, **MON_LOW_BATT_PERMANENT** event shall be set to A

AND $\begin{cases} \text{if } \mathbf{MON_LOW_BATT} \text{ DEM is active} \\ \text{Without request to clear present diagnostic information} \end{cases}$

The DEM is set passive for following conditions:

AND $\begin{cases} \mathbf{MON_LOW_BATT_PERMANENT} \text{ DEM is not reported as failed in same IG cycle} \\ \mathbf{MON_LOW_BATT} \text{ DEM is not reported as active} \\ \text{Test not completed this operation cycle flag for } \mathbf{MON_LOW_BATT} \text{ DEM are reset "0"} \end{cases}$

Note: Base DEM **MON_LOW_BATT** is having 100ms debouncing. Overall Debouncing shall be 100ms+600ms = **700ms**

DEM Setting Condition:

The DEM Event shall be set only after 100 ms since the voltage is below 8V

DEM Reset Conditions:

The DEM Event shall be reset only after 100 ms since the voltage is greater than 8.5V.

Note: When testing this feature, consider physical limitation of attached power supply devices and take additional +/- 10%

This DTC shall be considered and handled as a Cancel code (see also L3_SW_780).

Linked events:

~~MON_LOW_BATT_PERMANENT~~
~~MON_LOW_BATT~~

Note: Changes effective from DV

FIM reaction: protection

Degradation Mapping:

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

Fault detection counter is timer configured

Fault detection counter decrement step: 300

Fault detection counter increment step: 428

B2B0117 <- ~~B2324~~ - Sensor LH/RH overvoltage (17<-~~16V~~ or more)

Description: This DTC will be set if the Supply Voltage of the ECU is above 17V<-~~16V~~. This DTC can be set by both EC

Subaru Failure code: B2B0117 <- ~~B2324~~

Internal Failure code: 0xAB0117 <- ~~0xA324~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: ~~DTC shall be disqualified as soon as the dedicated DEM Event is reset. No I~~

DTC shall be disqualified as soon as the dedicated DEM Event is reset.

Note: Changes effective from DV.

The DEM Event shall be set only after 700 ms since the voltage is above 16V and, shall be reset only after 1000 ms (1s) .
Because this condition has to be valid also at extreme temperatures (-40 or +85 deg) the internal limit shall be set to 15.6

Events setting conditions:

When the following conditions are met continuously for 600ms, **MON_HIGH_BATT_PERMANENT** event shall be set to A

AND T OR T if **MON_HIGH_BATT** DEM is active

└ if **MON_HIGH_BATT_WARN** DEM is active

└ Without request to clear present diagnostic information

The DEM is set passive for following conditions:

AND T **MON_HIGH_BATT_PERMANENT** DEM is not reported as failed in same IG cycle

└ **MON_HIGH_BATT** DEM is not reported as active

└ **MON_HIGH_BATT_WARN** DEMs is not reported as active

└ Test not completed this operation cycle flag for **MON_HIGH_BATT** DEM is reset "0"

└ Test not completed this operation cycle flag for **MON_HIGH_BATT_WARN** DEM are reset "0"

Note: Base DEMs {**MON_HIGH_BATT** or **MON_HIGH_BATT_WARN** } are having 100ms debouncing. Overall Debounc

DEM Setting Condition:

The DEM Event shall be set only after 100 ms since the voltage is above 17V.

DEM Reset Condition:

The DEM Event shall be reset only after 100 ms since the voltage is below 16.5V.

Note: When testing this feature, consider physical limitation of attached power supply devices and take additional +/- 10%

This DTC shall be considered and handled as a Cancel code (see also L3_SW_780).

Linked events:

~~MON_HIGH_BATT_PERMANENT~~

~~MON_HIGH_BATT~~

Note: Changes effective from DV.

FIM reaction: protection

Degradation Mapping:

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

Fault detection counter is timer configured

Fault detection counter decrement step: 300

Fault detection counter increment step: 428

B2B0249 <- ~~B2327~~ - Sensor LH/RH internal failure - internal circuit malfunction

Description: This DTC will be set if an internal fault exists. This DTC can be set by both ECUs, LH and RH.

Subaru Failure code: B2B0249 <- ~~B2327~~

Internal Failure code: 0xAB0249 <- ~~0xA327~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are not met).

Event Set/Fail Conditions:

Pre-condition: Power Supply voltage ≥ 8 and Power Supply voltage ≤ 17 v

When the following conditions are met continuously for 480ms, **LED_DRIVER_FAULT_DIAGEN** event shall be set to Active.

AND \neg ADC_LED_STATUS < ADC_LED_STATUS_th_2

\neg ADC_LED_STATUS > ADC_LED_STATUS_th_3

{ADC_LED_STATUS_th_2 = 2280mV and ADC_LED_STATUS_th_3 = 840mV}

Event Reset/Pass Conditions:

When the following conditions are met event(s) shall be set to OFF.

OR \neg IG OFF (CPU reset)

\neg With request to clear present diagnostic information

AND \neg **LED_DRIVER_FAULT_DIAGEN** DEM is not active/Failed

\neg ADC_LED_STATUS voltage is Normal Range 3650mV-5630mV(maximum valid value)

Note: Limitation will be to verify the LED Drive fault by software validation team. DGM injection shall be used to verify the fault.

Note: DV change point - Pre-condition voltage range updated.

For **LED_DRIVER_FAULT_DIAGEN** DEM

LED Fault Monitoring conditions shall be implemented from LED Driver Component

Debouncing of 480ms and Enable condition(Power Supply voltage range check) shall be handled from EH component

A complete list of the internal faults which trigger this DTC can be found in **CESSAR configuration file**

Linked Events:

The following list was updated using CESSAR configuration file:

~~MON_OOR_LO_POWER_SENSE~~
~~MON_OOR_TX1_POWER_SENSE~~
~~MON_OOR_TX2_POWER_SENSE~~
~~PPAR_CRC_IMPLAUSIBLE~~
~~RHC_CM_LONG_TERM_ERR~~
~~RHC_FDC_LONG_TERM_ERR~~
~~SPT_TEST_LONG_TERM_ERR~~
~~OMI_DRV_FAULT1~~
~~OMI_DRV_FAULT2~~
CAN_RAM_CHECK_FAILED

Linked Events:

RHC_DEM_ERROR_IF_LOOPBACK_CHIRP_1_NO_EMISSION
RHC_DEM_ERROR_IF_LOOPBACK_CHIRP_2_NO_EMISSION
RHC_DEM_ERROR_IF_LOOPBACK_CHIRP_3_NO_EMISSION
IUC_RFCOM_ROC_PERFORMANCE_RX_NOISE_FIGURE_NO_EMISSION
IUC_RFCOM_ROC_InternalAnalog_NO_EMISSION
INFOBLOCK_CRC_VERIFICATION_FAILED
RFCOM_DEM_PERMANENT_ERROR_PERFORMANCE_INTERFERED
RHC_DEM_ERROR_CHIRP_LINEARITY_NO_EMISSION
~~LED_DRIVER_FAULT_OVER_TEMP~~ {Removed from DV onwards}
LED_DRIVER_FAULT_DIAGEN

FIM reaction: malfunction

Degradation Mapping:

DGM_SAFE_COMMUNICATION
DGM_SU_RDR_FAIL
DGM_NOEMISSION

For OMI_DRV_FAULTx

Fault detection counter decrement step: 2

Fault detection counter increment step: 2

For all other events:

Fault detection counter decrement step: 128 (immediate DTC trigger)

Fault detection counter increment step: 127 (immediate DTC trigger)

B1C7200 <- ~~B2328~~ - Sensor LH/RH internal failure - axis misalignment detection - UDMDTC

Description: This DTC will be set if the radar of the sensor is misaligned and this misalignment is detected by Algo in the

Subaru Failure code: B1C7200 <- ~~B2328~~

Internal Failure code: 0x9C7200 <- ~~0xA328~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set .

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set and SVRD main switch is ON.

Note: Enable conditions requirements are updated from KD1.5

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: ~~the DTC can be removed only after a successfully run of the alignment routine~~
DTC shall be disqualified as soon as the dedicated DEM Event is reset.

Enable Conditions:

DEM_EC_SRVD_SWITCH_ON
DEM_EC_TOWING_OFF

Events setting conditions:

- the algorithm reports a horizontal misalignment of the sensor.

Note: In SRR630 {6th Gen Project} Algo will directly report DEM fault{Active/Passive} to DgM through FCU_CEH. There a

Note: If any of these DEM's are active and 14 Service(clear Diagnostic Request) is requested, as per the L2 ALN require

{LINK title="46735: DEM event ALN_MON_AZIMUTH_LEFT shall be set if the device detects an azimuth correction angle

The events shall be set into inactive state if

* the algorithm reports the horizontal misalignment of the sensor in inactive state.

AND

* the dealer axis alignment was successfully finished

Linked events: ~~ALN_DIA_MON_AZ_FAILED_LEFT_NEAR, ALN_DIA_MON_AZ_FAILED_RIGHT_NEAR~~

~~IUC_ALN_MON_AZIMUTH_LEFT,~~

~~IUC_ALN_MON_AZIMUTH_RIGHT,~~

~~IUC_ALN_MON_ELEVATION_HIGH,~~

~~IUC_ALN_MON_ELEVATION_LOW,~~

"IUC_" Prefix removed from KD1.7/DV onwards

FIM reaction: alignment

Degradation Mapping:

DGM_LIMITED

DGM_SU_RDR_STOP

Fault detection counter decrement step: 128 (immediate DTC trigger)

Fault detection counter increment step: 127 (immediate DTC trigger)

B1C7000 <- ~~B2340~~ - Sensor LH/RH environs temperature too high (~~above 85degC~~) - UDMDTC

Description: This DTC will be set if the environmental temperature of the sensor is too high. This DTC can be set by bot

Subaru Failure code: B1C7000 <- ~~B2340~~

Internal Failure code: 0x9C7000 <- ~~0xA340~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: DTC shall be disqualified as soon as the dedicated DEM Event is reset.

Enable Conditions:

DEM_EC_SRVD_SWITCH_ON
DEM_EC_TOWING_OFF

Events setting conditions:

Dedicated DEM Event shall be set if the external temperature is equal or greater than 85degC.

Events setting conditions:

DSP Digital temperature monitor high: **MON_OVER_TEMPERATURE_DSP** DEM Event shall be set if the DSP Digital temperature monitor high.

HWA Digital temperature monitor high: **MON_OVER_TEMPERATURE_HWA** DEM Event shall be set if the HWA Digital temperature monitor high.

RHC Analog temperature monitor high: **RHC_OVER_TEMPERATURE_WARN** DEM Event shall be set if the RHC Analog temperature monitor high.

Event Set/Fail Conditions:

Pre-condition: Power Supply voltage ≥ 8 and Power Supply voltage ≤ 17 v

When the following conditions are met continuously for 1000ms, **LED_DRIVER_FAULT_OVER_TEMP** event shall be set.

AND $\neg \text{ADC_LED_STATUS} \leq \text{ADC_LED_STATUS_th_1}$

$\neg \text{ADC_LED_STATUS} \geq \text{ADC_LED_STATUS_th_2}$

{ADC_LED_STATUS_th_1 = 3650mV and ADC_LED_STATUS_th_2 = 2280mV}

Event Reset/Pass Conditions:

When the following conditions are met event(s) shall be set to OFF.

OR \neg IG OFF (CPU reset)

\neg With request to clear present diagnostic information

\neg ADC_LED_STATUS voltage is Normal Range 3650mV-5630mV(maximum valid value) for 1000ms

Note: Limitation will be to verify the LED Drive fault by software validation team. DGM injection shall be used to verify the LED Drive fault.

For **LED_DRIVER_FAULT_OVER_TEMP** DEM

LED Fault Monitoring conditions shall be implemented from LED Driver Component

Debouncing of 1000ms and Enable condition(Power Supply voltage range check) shall be handled from EH component

Linked events: **MON_OVER_TEMP1, MON_OVER_TEMP1_REF**

Linked events:

MON_OVER_TEMPERATURE_DSP

MON_OVER_TEMPERATURE_HWA

RHC_OVER_TEMPERATURE_WARN

Following DEMs are linked from DV onwards:

RHC_DIFF_TEMPERATURE_WARN

LED_DRIVER_FAULT_OVER_TEMP

FIM reaction: protection

Degradation Mapping:

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_STOP

DGM_NOEMISSION

Fault detection counter decrement step: 128 (immediate DTC trigger)

Fault detection counter increment step: 127 (immediate DTC trigger)

B1C7100 <- B2344 - Sensor LH/RH detection power degradation (blockage) - UDMDTC

Description: This DTC will be set if the sensor is blocked (blockage is active). This DTC can be set by both ECUs, LH and RH.

Subaru Failure code: B1C7100 <- B2344

Internal Failure code: 0x9C7100 <- 0xA344

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set.

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set and SVRD main switch is ON.

Note: Enable conditions requirements are updated from KD1.5

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: DTC shall be disqualified as soon as the dedicated DEM Event is reset.

Enable Conditions:

DEM_EC_SRVD_SWITCH_ON
DEM_EC_TOWING_OFF

Events setting conditions:

In SRR630 {6th Gen Project} Algo will directly report DEM fault{Active/Passive} to DgM through FCU_CEH. There are no

tbd - ALGO details for achieving blockage

I/F variable, "BlockageStateBSD", is used for blockage.

The sensor functionality shall be inactive if the sensor is in blockage.

The "sensor blockage" state shall be indicated on vehicle CAN via CAN bus signal **RDR228_2_7_BLOCKAGE_FORMIN**

Linked events: ~~FCTSEN_BLOCKAGE~~

~~CEH_RPM_DEM_BLOCKAGE~~

~~CEH_RPM_DEM_PARTIAL_BLOCKAGE~~

~~CEH_RPM_DEM_INTERFERENCE~~ {Interference DEM is removed from KD1.7}

FIM reaction: blockage

Degradation Mapping:

DGM_LIMITED

DGM_SU_RDR_STOP

Fault detection counter decrement step: 128 (immediate DTC trigger)

Fault detection counter increment step: 127 (immediate DTC trigger)

B2B0254 <- B2329 - Incomplete adjustment of the radar axis LH/RH side

Description: This DTC is set if beam axis inspection has not been executed after resetting the beam axis inspection com

Subaru Failure code: B2B0254 <- B2329

Internal Failure code: 0xAB0254 <- 0xA329

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set, and only if Main Switch

DTC timing condition for disqualification: If the EOL routine for alignment is done successfully and the angles are in ra

Enable Conditions:

DEM_EC_SRVD_SWITCH_ON
DEM_EC_TOWING_OFF

Event setting conditions: DTC shall be set as soon as the EOL routine was done and the resulted angles are miss align

DTC shall be set as soon as the EOL routine failed because of any other reason (e.g. Algo, speed etc)

The dedicated event is set if the EOL alignment failed due to a too big misalignmnet angle.

DTC shall also be set if Sensor is never aligned.

Linked events: **DIAG_BEAM_AXIS_INSPECTION_INCOMPLETE**

Linked events:

ALN_SENSOR_NEVER_ALIGNED

ALN_EOL_RUNNING

ALN_EOL_AZIMUTH_LEFT

ALN_EOL_AZIMUTH_RIGHT

ALN_EOL_ELEVATION_HIGH

ALN_EOL_ELEVATION_LOW

ALN_EOL_TARGET_INVALID

FIM reaction: incomplete inspection

Degradation Mapping:

DGM_LIMITED

DGM_SU_RDR_FAIL

Fault detection counter decrement step: 128 (immediate DTC trigger)**Fault detection counter increment step: 127** (immediate DTC trigger)B2B0487 <- ~~B2350~~ - Master - Slave communication error between Master ECU and Slave ECU**Description:** This DTC will be set if the inter-communication between Master ECU and Slave ECU is failed. This DTC sh**Subaru Failure code:** B2B0487 <- ~~B2350~~**Internal Failure code:** 0xAB0487 <- ~~0xA350~~**DTC qualification condition:** DTC shall be qualified if the dedicated DEM Event is set .**DTC timing condition for qualification:** DTC shall be qualified as soon as the DEM Event is set.**DTC timing condition for disqualification:** No DTC disqualification shall be possible (even the setting conditions are no**Events setting conditions for Master ECU (left ECU):**

The event is set active if a sensor, which was set to "master" and after 1000 ms does not receive cyclic message from sla

AND

- over 3000ms passed after IG ON
- over 3000ms ~~4000ms~~ passed while power supply voltage more than 9v ~~8.34 V~~
- Judged as master module
- Busoff error not present
- Not receive smrSlave on the local bus at least 1000 ms

Note: "Busoff error not present" means that actual Busoff error is not active, at the same time, Busoff DTC might be active

Events setting conditions for Slave ECU (right ECU):

The event is set active if a sensor, which was set to "slave" and after 1000 ms does not receive cyclic message from mas

AND

- over 3000ms passed after IG ON
- over 3000ms ~~4000ms~~ passed while power supply voltage more than 9v ~~8.34 V~~
- Judged as slave module
- Busoff error not present
- Not receive smrMaster on the local bus at least 1000 ms

Note: "Busoff error not present" means that actual Busoff error is not active, at the same time, Busoff DTC might be active

Linked events: **CAN_MSG_TIMEOUT_SMR_MASTER** and **CAN_MSG_TIMEOUT_SMR_SLAVE****FIM reaction:** malfunction**Degradation Mapping:**

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

Fault detection counter decrement step: 128 (immediate DTC trigger)**Fault detection counter increment step: 127** (immediate DTC trigger)

U0463 - AVN communication error

The DTC shall be removed since SW 03.00.00.

When Check sum error occurs, Check sum error should be treated as CAN data time out.

When Counter fail occurs, Counter fail should be counted as CAN data time out.

U0162 - AVN data time out

Description: This DTC will be set if the input message(s) from AVN6BB have a time out, DLC error, Checksum error or C

Subaru Failure code: U0162

Internal Failure code: 0xC162

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are no

Events setting conditions are explained at ID 1469 and 1481.

Detection time: 48000 ms (40 x 1200ms)

Linked events: **CAN_MSG_TIMEOUT_AVN6BB**

FIM reaction: malfunction

U1075 - Bus off detection for EyeSight local bus

The DTC shall be removed since SW 03.00.00.

U1584 - BWR EYE communication error

The DTC shall be removed since SW 03.00.00.

When Check sum error occurs, Check sum error should be treated as CAN data time out.

When Counter fail occurs, Counter fail should be counted as CAN data time out.

U1B248C <- ~~U143387~~ <- ~~U127D~~ - BWR EYE data time out

The DTC, U1283, shall be changed to **U127D** since SW 03.

Description: This DTC will be set if the input message(s) from EYE (EYE321 or ~~EYE322~~) have a time out, DLC error, Ch

~~**Watch out for:** monitoring condition of EYE321 and EYE322 shall conform to L3_SW_3448.~~

Subaru Failure code: U1B248C <- ~~U143387~~ <- ~~U127D~~

Internal Failure code: 0xDB248C <- ~~0xD43387~~ <- ~~0xD27D~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are no

Events setting conditions are explained at ID 1469{ ReqID: 2513271: Message Timeout } and 1481{ ReqID: 2513281: M

Detection time:

EYE321 - 4000 ms (40 x 100ms)

~~**EYE322** - 4000 ms (40 x 100ms)~~

Linked events: **CAN_MSG_TIMEOUT_EYE321**, ~~**CAN_MSG_TIMEOUT_EYE322**~~

FIM reaction: No reaction.

B2343 - Sensor LH/RH Module Blockage 2 - Cancel Code

Description: This DTC will be set if the sensor is under blockage 2 is active. This DTC can be set by both ECUs, LH and
If left or right module detects blockage **2**, system shall **NOT** temporary stop and system shall send state (228_7_1=1).

Subaru Failure code: B2343

Internal Failure code: 0xA343

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set and Vehicle speed >= 40 kph and

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: DTC shall be disqualified as soon as the dedicated DEM Event is reset.

Events setting conditions:

ALGO details for achieving blockage 2

I/F variable, "BlockageStateLCA", is used for blockage 2

SVRD main switch is ON.

SVRD system is in Advanced Driving mode. (See L3_SW_2914 for more details of the mode)

Linked events: **FCTSEN_BLOCKAGE_2**

FIM reaction: No reaction.

Fault detection counter decrement step: 128 (immediate DTC trigger)

Fault detection counter increment step: 127 (immediate DTC trigger)

B2344 - Sensor LH/RH Vehicle Code Abnormal

Description: This DTC will be set if abnormal vehicle code is received. This DTC can be set by both ECUs, LH and RH.

Subaru Failure code: B2344

Internal Failure code: 0xA344

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set .

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set.

DTC timing condition for disqualification: DTC shall be disqualified as soon as the dedicated DEM Event is reset.

Events setting conditions: When CAN signal CECU6EE_7_4 is received to 0b100 three times consequentially.

example)

100-100-100 --> Failure Process

100-100-111-100 --> Not Failure Process (reset the count if any other values interrupts)

100-111-100-100 --> Not Failure Process (reset the count if any other values interrupts)

When other value than 100 is recieved, vehicle type judgement shall be processed based on L3_SW_4501.

Linked events: **DEM_VEHICLE_CODE_ABNORMAL**

FIM reaction: malfunction

Fault detection counter decrement step: 128 (immediate DTC trigger)

Fault detection counter increment step: 127 (immediate DTC trigger)

B1F7168 BEV failure detection

Description: This DTC will be set if the input message(s) from BEV have a failure detection. This DTC can be set by both

Subaru Failure code: B1F7168

Internal Failure code: 0x9F7168

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set.

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are not)

Events setting conditions:

2 times continuous detection of BEV074_5_2_RANGE_DG = 1(abnormal)

Linked events: **CAN_UNIT_FAILURE_BEV074**

Degradation Mapping:

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

B2B0368 C-ECU failure detection

Description: This DTC will be set if the input message(s) from C-ECU have a failure detection. This DTC can be set by both

Subaru Failure code: B2B0368

Internal Failure code: 0xAB0368

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set.

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are not)

Events setting conditions:

2 times continuous detection of CECU6EC_3_0_DATA_STATE = 1(abnormal)

Linked events: **CAN_UNIT_FAILURE_CECU6EC**

Degradation Mapping:

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

U1A208C <- ~~U12DB87~~ BEV Data Timeout

Description: This DTC will be set if the input message(s) from BEV (0x074) have a time out, DLC error, Checksum error

Subaru Failure code: U1A208C <- ~~U12DB87~~

Internal Failure code: 0xDA208C <- ~~0xD2DB87~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set.

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are not)

Events setting conditions: are explained at ID 1469{ ReqID: 2513271: Message Timeout } and 1481{ ReqID: 2513281:

Debounce Handling is explained in ReqID: 2947220

Detection Time:

0x074 - not received for 800ms(10ms cycle x 80 times)

Linked events: **CAN_MSG_TIMEOUT_BEV074**

Degradation Mapping:

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

P27FC8C <- ~~U144787~~ C-ECU Data Timeout

Description: This DTC will be set if the input message(s) from C-ECU (0x6EC or 0x6ED or 0x6EE) have a time out, DLC

Note: 0x6EC added from KD1.5

Subaru Failure code: P27FC8C <- ~~U144787~~

Internal Failure code: 0x27FC8C <- ~~0xD14787~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set.

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are not)

Events setting conditions: are explained at ID 1469{ ReqID: 2513271: Message Timeout } and 1481{ ReqID: 2513281:

Detection Time:

0x6ED - not received for 40s(1000ms cycle x 40 times)

0x6EE - not received for 40s(1000ms cycle x 40 times)

0x6EC - not received for 40s(1000ms cycle x 40 times)

Note: 0x6EC added from KD1.5

Linked events:

CAN_MSG_TIMEOUT_CECU6ED,

CAN_MSG_TIMEOUT_CECU6EE,

CAN_MSG_TIMEOUT_CECU6EC

Note: 0x6EC added from KD1.5

Degradation Mapping:

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

U08628C <- ~~U046287~~ CCU Data Timeout

Description: This DTC will be set if the input message(s) from CCU (0x6A8) have a time out, DLC error, Checksum error

Subaru Failure code: U08628C <- ~~U016287~~

Internal Failure code: 0xC8628C <- ~~0xC16287~~

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set.

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are not met)

Events setting conditions: are explained at ID 1469{ ReqID: 2513271: Message Timeout } and 1481{ ReqID: 2513281: Message Timeout }
Debounce Handling is explained in ReqID: 2947220

Detection Time:

0x6A8 - not received for 48s(1200ms cycle x 40 times)

Linked events: **CAN_MSG_TIMEOUT_CCU6A8**

Degradation Mapping:

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

B2B024A SW Version Mismatch between Right and Left Sensors

Description: This DTC will be set if the SW ID's are not compatibility between left and Right SWs.

SW IDs{ePF, APAR ID and Non-compatible design changes} should be maintained in each SW and compatibility of SW IDs

Subaru Failure code: B2B024A

Internal Failure code: 0xAB024A

DTC qualification condition: DTC shall be qualified if the dedicated DEM Event is set.

DTC timing condition for qualification: DTC shall be qualified as soon as the DEM Event is set

DTC timing condition for disqualification: No DTC disqualification shall be possible (even the setting conditions are not met)

Events setting conditions:

Detection Time:

The event is set active if following conditions met

AND $\left\{ \begin{array}{l} \text{over 3000ms passed after IG ON} \end{array} \right.$

$\left\{ \begin{array}{l} \text{over 300ms 4000ms-passed while power supply voltage more than 9v 8.34V} \end{array} \right.$

$\left\{ \begin{array}{l} \text{Judged as Right/Left Sensor} \end{array} \right.$

$\left\{ \begin{array}{l} \text{PCAN Bus-off error not present} \end{array} \right.$

$\left\{ \begin{array}{l} \text{PCAN Lost Communication Between Master and Slave not preset} \end{array} \right.$

OR $\left\{ \begin{array}{l} \text{ePF ID's mismatch between Left and Right sensor} \end{array} \right.$

$\left\{ \begin{array}{l} \text{APAR ID's mismatch between Left and Right sensor} \end{array} \right.$

$\left\{ \begin{array}{l} \text{Non-Compatible Design Change Value/ID mismatch between Left and Right sensor} \end{array} \right.$

{PCAN Signals: ePF, APAR_ID and SW_DesignID}

PCAN Left Message: Left_SW_INCOMP, CAN ID:0x10

PCAN Right Message:Right_SW_INCOMP, CAN ID:0x11}

Note: "Busoff error not present" means that actual Busoff error is not active, at the same time, Busoff DTC might be active

Linked events: **IUC_SW_VERSION_MISMATCH_RIGHT_AND_LEFT_SENSOR**

Degradation Mapping:

DGM_SAFE_COMMUNICATION

DGM_SU_RDR_FAIL

DGM_NOEMISSION

Freeze Frame Data (FFD)

Freeze frame data are those data which are recorded together with every DTC in the moment when that DTC is qualified.

FFD shall be stored in EEPROM together with each DTC, when the DTC is qualified.

Each DTC is stored on 14 bytes (both in RAM and NVM).
Each DTC shall have following information stored as FFD:

- DTC/ Cancel Code internal code (as specified at L3_SW_368) stored on 2 bytes.
 - Absolute time information (6 bytes)
- When it is determined that a failure has occurred, absolute time information must be acquired within 10ms±5%.

Description is in chapter from ID 4262.

- Time Stamp (6 bytes)
- When it is determined that a failure has occurred, time stamp must be acquired within 10ms±5%.

Description is in chapter from ID 736.

{EMBEDDED id=2535564 title="_4512.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_XhCSBVC9Ee-Gkr
If the status of the same diagnostic cancel code is changed (Ex.: Error detection → Normal recovery → Error detection), F
Time Stamp Function (Time counter and Trip counter)
The following requirements related to the time stamp feature have different requirements specified, based on the type of p
In the SRR2S0 project both SRR-ECUs (Master and Slave sensors) are of type "IGN input unit".

IGN input unit: Unit that can judge IGN OFF↯ON.

Units activated by IGN OFF↯ON

The following requirements related to Subaru time stamp feature uses the term "Master unit" and "Slave unit". This term

Master unit: is the unit that sends master counter (master time counter and master trip counter). Unit that provide vehicle

Slave unit: Unit that receives vehicle local time, counts internally, memorizes internal counter together with DTC.

Master counter: Vehicle common time information sent by master unit. Refers to Master time counter and Master trip counter

Master time counter, Slave time counter : Information that represents elapsed time from IGN ON.

Specific counts are as follows.

IGN Input unit --- Elapsed time from IGN ON.

Master trip counter, Slave trip counter: Information that represents number of trips (One trip = IGN OFF↯ON to next IGN

Specific counts are as follows.

IGN Input unit --- from one IGN OFF↯ON to next IGN OFF↯ON

Both SRR ECUs (SRR Master and SRR Slave) shall be considered Slave units, in relation with the time stamp.

- Each slave unit shall determine the internal counter (time and trip) . and shall updates the internal counter when the ve
- When master counter value is received, internal counter of the slave unit shall promptly update its slave counter to meet t

When master counter is not received, independent count shall be performed in each slave ECU.

Figures below should give a hint about the suncronization of slave counter with the master counter:

{IMAGE id=2513050 title="749_Object_Text_0.bmp" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR
Fig. 1: Synchronization scheme of slave time counter

{IMAGE id=2513049 title="750_Object_Text_0.bmp" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

Fig 2: General details for counter

When any DTC is stored, slave counter shall be stored in FFD (Freeze Frame Data), and this value shall be output through the CAN bus.

Slave time counter shall have a length of 4 bytes.

Slave time counter shall use the first 3 bytes for the counting with a data range from 000000h to FFFFFEh.

The 4th byte (the most significant byte) shall always have the following value:

- 0x00h if the Master time counter comes and it is valid

or

- 0x20h (in bits: 0 0 1 0 0 0 0 0) if the Master counter cannot be received for 3100msec continuously or received master counter is in fail value for 3100msec continuously.

Slave time counter shall have initial value 0 (zero) when the unit is manufactured.

Slave time counter shall be set to 0 (zero) in case of Reset and/or IGN OFF->ON.

Slave time counter internal incrementation shall be done with a resolution of 100 ms/ bit.

When maximum value is reached (which is 0xFFFFFE) and is about the internal incrementation, Slave time counter shall become 0 (zero).

When maximum value is reached and is about synchronization with the Master counter, Slave time counter shall synchronize with the Master counter.

The Master time counter with the value FFFFFFFh means Fail Value and shall not be used for synchronization.

Tolerance for slaveTime counter is not specified but fraction more than 100 msec shall be rounded down.

e.g.: If count is executed by 16msec cycle, 1 LSB shall be not by 96msec but by 112msec.

Slave trip counter shall have a length of 2 bytes.

Data range for Slave trip counter shall be between 0000h and FFFEh.

Slave trip counter shall have initial value 0 (zero) when the unit is manufactured.

When maximum value is reached and is about the internal incrementation, Slave trip counter shall become 0(zero) in the next ignition cycle.

When maximum value is reached and is about synchronization with the Master counter, Slave trip counter shall synchronize with the Master counter.

The Master trip counter with the value FFFFh means Fail Value and shall not be used for synchronization.

Slave trip counter internal incrementation shall be done with a resolution of 1 trip / IGN cycle..

Slave trip counter shall be stored in NVM.

If either master Time counter or master Trip counter has Fail value, slave Time counter and Slave Trip counter shall not store any data.
{IMAGE id=2513055 title="771_Object_Text_0.bmp" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WRAPPED_RESOURCES/771_Object_Text_0.bmp}

Fig. 3: Specific count method.

System Time Base

The timers of the master- and slave sensor modules shall be synchronized.

Design Note:

Master and slave runs asynchronously. Therefore there is a need to have a synchronized time base.

The timer on the master and on the slave sensor module shall correlate with a deviation of max 1 ms.

The resolution of the system time base shall be 500 us.

The timer shall not roll over within 24 h.

Note: Timer counter value after 24 h with 500 us resolution: 172800000 dec (A4CB800 hex) => 4 byte timer sufficient

A rollover of the timer shall not lead to any failure condition.

Starting after power-up the master sensor shall send the current value of the system timer to the slave sensor cyclically. The slave sensor shall store the value in NVM.

The system timer value shall be made available to the algorithm components and the BSW modules.

Absolute time information function

The following requirements related to Subaru absolute time information (ATI) function uses the term "Master unit" and "Slave unit".
ATI Master unit: is the unit that sends the obtained current time to the slave. This distributed information is called absolute time information.
For our sensors the ATI master is provided by the CECU661 message.

ATI Slave unit: is the unit that receives absolute time information.

Both SRR ECUs (SRR left and SRR right) shall be considered ATI Slave units, in relation with the absolute time information.

When any DTC is stored, the ATI slave unit shall store the absolute time information into FFD (Freeze Frame Data), and the DTC.

The ATI slave unit shall output a Fail value (FFh) when the power is turned on for the first time.

The ATI slave unit shall output a Fail value from system startup until absolute time information reception.

The ATI slave unit shall use the absolute time information received from the ATI master as it is (except when an abnormal value is received).

The ATI slave unit shall not count up by itself.

If any value received from the ATI master unit is a Fail value, it shall output all data as a Fail value.

For example, received YEAR data is a Fail value (FFh), other data shall also be output as the Fail value.

If the value received from the ATI master unit is outside the specified range defined in L3_SW_4276, the ATI slave unit shall output a Fail value.

Use case of valid/invalid value:

The ATI slave unit shall not hold the value.

Absolute time information counter details

{EMBEDDED id=2535598 title="_4276.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_vk3B9IC-Ee-Gkrm}

Absolute time information transmission format

{EMBEDDED id=2535597 title="_4278.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_tXUMUVC-Ee-Gkrm}

Absolute time information DID

The ATI slave unit shall set the DID so that the absolute time information is available in the diagnostic tool output

The ATI slave unit shall use 0x1014 for DID.

{EMBEDDED id=2535596 title="_4282.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_qp15c1C-Ee-Gkrm}

DTC/ Cancel Code storage levels and transitions

Subaru requested a very specific way to categorize, store and handle the DTCs.

There shall be 3 levels for DTC storage and each level has a maximum number of 3 DTC.

The functionality (warning for BSD, LCA and RCTA) shall be stopped if the system has an active DTC set.

Only first 3 new DTCs shall be stored to Active DTC slots. If a new DTC occurs, it shall be ignored.

{IMAGE id=2513053 title="784_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_784_Object_Text_0.png}

In the example above, DTC D1 is ignored.

A DTC must be stored to active slot, if it was not previously stored and if there is still enough free space (at least one location).

The DTCs shall be moved one level below at start-up. Precondition to move DTC shall be in accordance with L3_SW_790.

In case a DTC must be moved to passive 1 slot, all the DTCs stored in passive 1 slot shall be moved to passive 2.

eg. A2 is qualified in ignition cycle A, at startup in ignition cycle B it is disqualified:

{IMAGE id=2513054 title="787_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_787_Object_Text_0.png}

The same DTC may occur on the three levels (with different statuses).

When a DTC is moved from active slot, passive 2 slot shall be overwritten with passive 1 slot (the values from passive 2 a

At startup if no DTC is stored on active slot, no changes shall be performed (the DTCs keep their last location).

{EMBEDDED id=2535559 title="_791.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_MU04QFC9Ee-Gkrn
Besides the DTCs. Subaru also requested some additional temporary DTCs called Cancel Code (the list of supported Ca

The transition of the Cancel Code from one level to another shall be done in the same way as the transition of the DTCs (

Cancel Codes are independent of DTCs.

Reactions

FIM Inhibitions

FIM_MALFUNCTION

The FIM_MALFUNCTION Inhibition is set for BSD, LCA and RCTA function. See ch. 9.8.3 (ID 367) definitions of the DTCs
If neither of FIM_ALIGNMENT, FIM_BLOCKAGE or FIM_INCOMPLETE_INSPECTION is set, the software shall set the S

FIM_PROTECTION

The FIM_PROTECTION Inhibition is set for BSD, LCA and RCTA function. See ch. 9.8.3 (ID 367) definitions of the DTCs
If neither of FIM_ALIGNMENT, FIM_BLOCKAGE or FIM_INCOMPLETE_INSPECTION is set, the software shall set the S
The FIM_PROTECTION inhibition shall protect the sensor in case of Over/Under-Temperature or Over/Under-Voltage co

FIM_ALIGNMENT

The FIM_ALIGNMENT Inhibition is set for BSD, LCA and RCTA function. See ch. 9.8.3 (ID 367) definitions of the DTCs '
The FIM_ALIGNMENT inhibition indicates, that the sensor is not aligned to the originally measured position in the car, an

FIM_BLOCKAGE

The FIM_BLOCKAGE Inhibition is set for BSD, LCA and RCTA function. See ch. 9.8.3 (ID 367) definitions of the DTCs "
The FIM_BLOCKAGE inhibition indicates, that the sensor is currently blocked by snow or damp. In this case, the sensor c

FIM_INCOMPLETE_INSPECTION

The FIM_INCOMPLETE_INSPECTION Inhibition is set for BSD, LCA and RCTA function. See ch. 9.8.3 (ID 367) definition
The FIM_INCOMPLETE_INSPECTION indicates, that the sensor was not fully inspected by the Subaru EOL.

FIM_MALFUNCTION_RCTX

The FIM_MALFUNCTION_RCTX Inhibition is set for BSD, LCA and RCTA function. See ch. 9.8.3 (ID 367) definitions of
The FIM_MALFUNCTION_RCTX indicates, that the function RCTB can not be fulfilled by major error conditions. The RC

FIM_NOT_AVAILABLE_RCTX

The FIM_NOT_AVAILABLE_RCTX Inhibition is set for BSD, LCA and RCTA function. See ch. 9.8.3 (ID 367) definitions o
The FIM_MALFUNCTION_RCTX indicates, that the function RCTB can temporarily not be fulfilled by minor error conditio

DGM Reactions

Interface to read the degradation status: Dgm_GetDegradationStatus()

This function shall return the degradation status as either DGM_DEGRADATION_ON or DGM_DEGRADATION_OFF

Global Variable to Monitor the degradation status: Dgm_a_EventReactionCnt[]

This is array of Degradation status. To read the particular degradation status corresponding indexing shall be used. No

Indexes for the DgM Safe COM and DgM limited: DGM_SAFE_COMMUNICATION = 4, DGM_LIMITED = 10, DGM_NOEMISSION = 11

DGM_SAFE_COMMUNICATION

DGM_SAFE_COMMUNICATION is a degradation state. It is mapped to DTCs/UDMDTC as per the system state machine definition.

PCAN Output Signals:

Left Sensor: Left_RLR:DgM_SafeCom_L

Right Sensor: Right_RLR::DgM_SafeCom_R

DGM_LIMITED

DGM_LIMITED is a degradation state. It is mapped to UDMDTCs as per the system state machine definition. The sensor

PCAN Output Signals:

Left Sensor: Left_RLR:DgM_Limited_L

Right Sensor: Right_RLR::DgM_Limited_R

DGM_SU_RDR_FAIL

DGM_SU_RDR_FAIL is a internal state. It is mapped to DTCs as per the system state machine definition. This shall be used

PCAN Output Signals:

Left Sensor: Left_RLR:DgM_SuRdrFail_L

Right Sensor: Right_RLR::DgM_SuRdrFail_R

DGM_SU_RDR_STOP

DGM_SU_RDR_STOP is a internal state. It is mapped to UDMDTCs as per the system state machine definition. This shall be used

PCAN Output Signals:

Left Sensor: Left_RLR:DgM_SuRdrStop_L

Right Sensor: Right_RLR::DgM_SuRdrStop_R

DGM_NOEMISSION

DGM_NOEMISSION is a internal state. It is mapped to DTC and UDMDTCs as per the system state machine definition. This shall be used

PCAN Output Signals:

Left Sensor: Left_RLR:DgM_NoEmission_L

Right Sensor: Right_RLR::DgM_NoEmission_R

Recovery

All DTCs/UDMDTCs shall be set as inactive at start up (after power off -> power on / reset) .

It shall not matter if a DTC/UDMDTC was active last IGN cycle. At each reset all DTCs//UDMDTCs shall be disqualified and

Error Memory Contents from NVM

Base requirement for Chrono and History Stack are here:

[doors://rbgs854a:40000/?version=2&prodID=0&view=00000002&urn=urn:telelogic::1-503e822e5ec3651e-O-508-000264](https://rbgs854a:40000/?version=2&prodID=0&view=00000002&urn=urn:telelogic::1-503e822e5ec3651e-O-508-000264)

Historical stack is implemented according to the following document:

[doors://rbgs854a:40000/?version=2&prodID=0&view=00000002&urn=urn:telelogic::1-503e822e5ec3651e-M-0003bae0](https://rbgs854a:40000/?version=2&prodID=0&view=00000002&urn=urn:telelogic::1-503e822e5ec3651e-M-0003bae0)

For error handling two types of memories shall be used:

Primary Event Memory:

The primary event memory addresses the chrono stack as defined in the DEM software component.

Mirror Event Memory:

~~The secondary event memory addresses the historical stack as defined in the DEM software component.~~

The system shall be able to store diagnostic related data in a non volatile memory (such as EEPROM).

The system shall store the reported DEM events in NVM memory (e.g. mirror of non volatile error memory).

The system non volatile error memory shall be able to be erased via external access (e.g. diagnostic interface, CANape in

Selftest

Memory

RAM

Flash

Watchdog

Portcheck

Internal Voltages

Task runtime monitoring

Stack usage

HMI - Human Machine Interface

General aspects

Our system is transmitting outputs not only via CAN but also via HMI. This module controls some of the pin of the ECU and

HMI module is responsible to handle information from different inputs (Algo, ECU PINs, CAN etc) and to judge based on t

Note: In SRR630SU17 HMI controls pin 9, which is connected to the +ve side of LED.

Wiring diagram:

{IMAGE id=2513058 title="802_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_

Note: When Advanced driving mode is present, EysSight Local bus1 will be connected.

Operational Specification

HMI module shall control the mirror LEDs with 2 modes for the intensity of the light:

- Daylight mode current

- Night mode current

HMI shall read the day mode and night mode LED current value from APAR via FCU.

Note:

For KD1.7 release only night mode current will be available. Day mode current switching will be implemented in KD2.0.

Test Interface:

Rte_FCU_SU_DF_P_FCU_HMI_Cust_LedCurrentNight_FCU_HMI_Cust_LedCurrentNight

Rte_FCU_SU_DF_P_FCU_HMI_Cust_LedCurrentDay_FCU_HMI_Cust_LedCurrentDay

LED Current value measured with multimeter should be same as the current value given in APAR.

The difference between the Daylight mode and the Night mode is done based on an information provided via CAN.

SU85: When Vehicle type (See L3_SW_4059) is equal to "G series SUV (CH2 XV)", "G series WGN (CH2 5D)", "S series

Daylight mode shall have an Electrical Current of 53 mA.

SU85 for SD(before SW04): When Vehicle type (See L3_SW_4059) is equal to "B series SUV (NB8)"

Daylight mode shall have an Electrical Current of 95 mA.

SU85 for K3(since SW04): When Vehicle type (See L3_SW_4501) is equal to "B series SUV (NB8)"

Daylight mode shall have an Electrical Current of 53 mA.

SU85: When Vehicle type (See L3_SW_4059->4501) is other than the above 6 conditions (L3_SW_4081 and 4082),

Daylight mode shall have an Electrical Current of 95 mA.

Daylight mode shall be set according to Dimmer Cancel requirement from L3_SW_1501.

SU85: When Vehicle type (See L3_SW_4059) is equal to "G series SUV (CH2 XV)", "G series WGN (CH2 5D)", "S series

Night mode shall have an Electrical Current of 13 mA.

SU85 for SD(before SW04): When Vehicle type (See L3_SW_4059) is equal to "B series SUV (NB8)"

Night mode shall have an Electrical Current of 20 mA.

SU85 for K3(since SW04): When Vehicle type (See L3_SW_4501) is equal to "B series SUV (NB8)"

Night mode shall have an Electrical Current of 13 mA.

SU85: When Vehicle type (See L3_SW_4059->4501) is other than the above 6 conditions (L3_SW_4084 and 4085),

Night mode shall have an Electrical Current of 20 mA.

Night mode shall be set according to Dimmer Cancel requirement from L3_SW_1501.

Initial Bulb check

At start up from

-> Power OFF -> Power ON AND MainSwitch ON

or

-> MainSwitch OFF -> MainSwitch ON

right and left mirror LED shall turn ON for 3 seconds after master/slave is defined.

At start up,

-> after Power ON, right and left mirror LEDs shall turn ON for 3 seconds without considering any preconditions and goes

Note : This 3 secs time will start after the start up time (after the software initialization time of 1 to 2 secs).

Test Interface for Validation team:

LED_Staus_val

During initial check the LED intensity shall be set on Night Mode (20mA).

Test Interface for Validation team:

Hmi_MirrLedParams.u_DimmingCurrent

Note:

1. Tolerance for LED current is 20% when LED current is less than or equal to 20mA.
2. Tolerance for LED current is 10% when the LED current is greater than 20mA.

After the system was turned ON the sensor modules shall start an initial output check, latest after 500ms.

During the initial bulb check BSD, LCA, RTCA, DOW algorithm warning requests shall be ignored.

HMI shall share the status of init bulb check to the FCU whether ON (1U) / OFF (0), so that the sibling sensor's status can

Test Interface :

Input:

Init bulb check during Power OFF to Power ON

Output:

Left Sensor : Rte_HMI_SYSTEM_P_HMI_HMI_BULB_CHK_STS_L_HMI_FCU_HMI_BULB_CHK_STS_L

Right Sensor : Rte_HMI_SYSTEM_P_HMI_HMI_BULB_CHK_STS_R_HMI_FCU_HMI_BULB_CHK_STS_R

Following figure shall be used for a better understanding of the requirements from above:

{IMAGE id=2513059 title="816_Object_Text_0.bmp" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

The dedicated mirror LED DEM Event shall be set active if the mirror LED circuit has a short to ground. This monitoring shall

If the detected failure condition from above (L3_SW_817) is not present anymore, the corresponding DEM Event shall be

The dedicated mirror LED DEM Event shall be set active if the mirror LED circuit is open or has a short to supply voltage.

If the detected failure condition from above (L3_SW_819) is not present anymore, the corresponding DEM Event shall be

Warning pattern and levels

HMI considers the system is in Normal Operation mode, when both left and right sensors are not in DGM Safe Communication

BSD/RCTA/LCA/DOW warning indicator Flashing / blinking frequency is 6.25 (Hz).

There are 2 levels of warning for BSD / LCA / DOW:

Warning level 1 shall warn visually by left or right BSD/LCA/DOW warning indicator, keeping the ON as long as the target

Warning level 2 shall warn visually by left or right BSD/LCA/DOW/RCTA warning indicator, keeping them blinking as long

The mirror LED shall be kept with status ON in the entire time when warning level 1 is active, for BSD, LCA and DOW.

The mirror LED shall be kept blinking in the entire time when warning level 2 is active, for BSD, LCA, DOW and for warning

Below image is the illustration of BSD, LCA, DOW level 1 to level 2 transition

{IMAGE id=3436978 title="img-06191425.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_IKgfx

A complete blinking cycle shall be 160 ms long. From this time, 80 ms the LED shall be OFF and the other 80 ms the LED

If warning level 2 have started for BSD/LCA, it has to be kept active for the time equal to at least 6 blinking cycles (160ms)

Note:

However, CAN outputs for level 2 shall be set to "OFF" after 530ms(*1) have passed from the falling edge of the Turn signal.

Note (*1): The value will be changed below for CAN output signal tolerance,

Left side: $530\text{ms} + 60\text{ms} - 50\text{ms}(\text{RDR228 Cycle Time}) = 580\text{ms} - 590\text{ms}$

Right side: $530\text{ms} + 70\text{ms}(\text{delay of communication through private bus}) + 60\text{ms} - 50\text{ms}(\text{RDR228 Cycle Time}) = 650\text{ms} - 660\text{ms}$

BSD Warning Level 2 LED blinking illustration

{IMAGE id=2513060 title="2362_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_2362_Object_Text_0.png}

BSD warning case and dependency with turn signal and mirror blinking pattern

Note: For DV, CAN output is not mandatory.

{IMAGE id=3443904 title="img-06241200.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_a1ForDV.png}

{IMAGE id=3443905 title="img-06241201.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_dYIA.png}

LCA Warning Level 2 LED blinking illustration

{IMAGE id=2513065 title="2363_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_2363_Object_Text_0.png}

LCA warning case and dependency with turn signal and mirror blinking pattern

Note: For DV, CAN output is not mandatory.

{IMAGE id=3443909 title="img-06241202.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_rhV-L.png}

{IMAGE id=3443911 title="img-06241202.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_tzXE.png}

If warning level 2 have started for DOW, it has to be kept active for the time equal to at least 6 blinking cycles (160ms x 6)

Note:

However, CAN outputs for level 2 shall be set to "OFF" immediately(*1) when there is no warning.

Note (*1): The value will be changed below for CAN output signal tolerance,

Left side: $50\text{ms}(\text{RDR228 Cycle Time}) = 50\text{ms} - 60\text{ms}$

Right side: $70\text{ms}(\text{delay of communication through private bus}) + 60\text{ms} - 50\text{ms}(\text{RDR228 Cycle Time}) = 120\text{ms} - 130\text{ms}$

DOW level 2 warning shall continue the pattern and complete its 960ms pattern when the DOOR signal are CLOSED(0) and

{IMAGE id=3344147 title="img-05061526.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_V1C

DOW level 2 warning shall continue the pattern and complete its 960ms pattern when the DOOR signal are OPEN(1U) and

{IMAGE id=3344145 title="img-05061525.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_PSR

DOW Warning Level 2 handling Illustration

{IMAGE id=3315780 title="img-04221455.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_v_X

LED shall start reacting time within 10ms from the time when door is open during DOW level 2 warning.

{IMAGE id=3443361 title="img-06231436.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_axJB

During BSD/LCA level 1 warning, when the Hazard lamp is ON (both left and right turn signals are ON (1U) at same time

During BSD/LCA level 2 warning, when the Hazard lamp is ON (both left and right turn signals are ON (1U) at same time

If warning level 2 have started for BSD/LCA/DOW, and the conditions for warning level 1 are no longer satisfied, the blink

Note :

CAN outputs for level 1 and level 2 shall be set to "OFF". Tolerance value for CAN outputs to set to OFF is cycle time (50

Illustration of stopping warning level 2 when conditions for warning level 1 is no longer satisfied

{IMAGE id=2513062 title="2364_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

LED shall blink on both Left and Right sides, when RCTA warning is active (0x1) on either sides of the sensor (left or right)

Note: CAN signal warning will update only on the respective sensor side.

If RCTA warning have started, it has to be kept active for the time equal to at least 6 blinking cycles (160ms x 6 times (960

Note:

CAN outputs for RCTA shall be set to "OFF" as soon as the RCTA conditions are no longer satisfied.

RCTA Warning level 2 handling illustration

{IMAGE id=2513063 title="2365_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

If following condition is satisfied, Mirror LED shall be controlled by other unit (calls External indicator control mode).

AND \neg SRVD System ON

- SRVD system is in "Advanced driving mode" (See Judgement of advanced driving mode)
- EYE321 is NOT data timeout (means DTC **U127D** is not active)
- EYE322 is NOT data timeout (means DTC **U127D** is not active)
- EYE321_3_0 = 0 (means no EYESIGHT halt)
- EYE321_6_0 = 0 (means no EYESIGHT fail)
- EYE322_2_4 = 1 (means External indicator control request)
- Not initial diagnosis mode
- Shift position != R
- SRVD right module is not in temporary stop or failure condition.
 - └ SRVD left module is not in temporary stop or failure condition.

otherwise Mirror LED shall be controlled by RADAR (calls Standalone indicator control mode).

Even if SRVD system is in Standalone indicator control mode or in Externanl indicator control mode, HMI module shall provide an interface to CAN module, for each of the following information:

- if BSD level 1 for Left side is active/inactive (0x1 / 0x0).
- if BSD level 1 for Right side is active/inactive (0x1 / 0x0).
- if BSD level 2 for Left side is active/inactive (0x1 / 0x0).
- if BSD level 2 for Right side is active/inactive (0x1 /0x 0).
- if LCA level 1 for Left side is active/inactive (0x1 / 0x0).
- if LCA level 1 for Right side is active/inactive (0x1 /0x 0).
- if LCA level 2 for Left side is active/inactive (0x1 / 0x0).
- if LCA level 2 for Right side is active/inactive (0x1 / 0x0).
- if RCTA level 1 for Left side is active/inactive (0x1 / 0x0).
- if RCTA level 1 for Right side is active/inactive (0x1 / 0x0).

When SRVD system is in Standalone indicator control mode, HMI module shall control the PIN outputs from Master/Slave

- if BSD level 1 for Left side is active, LED connected to the Master ECUshall be ON.
- if BSD level 1 for Right side is active, LED connected to the Slave ECUshall be ON.
- if BSD level 2 for Left side is active, LED connected to the Master ECUshall be blinking.
- if BSD level 2 for Right side is active, LED connected to the Slave ECUshall be blinking.
- if LCA level 1 for Left side is active, LED connected to the Master ECUshall be ON.
- if LCA level 1 for Right side is active, LED connected to the Slave ECUshall be ON.
- if LCA level 2 for Left side is active, LED connected to the Master ECUshall be blinking.
- if LCA level 2 for Right side is active, LED connected to the Slave ECUshall be blinking.
- if RCTA level 1 for Left side is active, both LEDs shall be ON.
- if RCTA level 1 for Right side is active, both LEDs shall be ON.

{EMBEDDED id=2535543 title="_2962.rtf" uri=https://jazz-1.automotive-wan.com/rm4/resources/TX_zXdRMVC7Ee-Gkr

Hold the previous LED status at the first external control request (EYE322_2_4=1).

Follow the status of Indicator mode (EYE322_6_5/EYE322_2_5) at the second external control request (EYE322_2_4=1).

Hunting case:

{IMAGE id=2513067 title="3273_Object_Text_0.bmp" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WB

Countermeasure:

{IMAGE id=2513070 title="3274_Object_Text_0.bmp" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WB

All "ON"/active warnings to LEDs and/or CAN via interfaces, shall become "OFF"/inactive in the moment when a DTC/Ca

A new I/F variable "bBSDToSDelay" for BSD ToS Off delay is added.

LED shall turn on when "bBSDWarning" or "bBSDToSDelay" is set to 1.

Image of BSD ToS off delay implementation:

{IMAGE id=2513066 title="3058_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WB

BSD - Blind Spot Detection function

BSD (Blind Spot Detection) system detects, by radar, vehicles moving on adjacent lane that are in the blind spot of the o
blind spot zone; level 2 means the LED is blinking and this level is reached if level 1 is active and the driver sets the turn s

BSD - Warning level 1

HMI shall consider BSD level 1 warning from algo as TRUE(1U), only when the below condition is satisfied, otherwise FA

OR $\begin{cases} \text{BSD_t_OutputType.eBSDWarning1} == 1\text{U} \\ \text{BSD_t_OutputType.eBSDWarning1} == 2\text{U} \end{cases}$

Note:

BSD_t_OutputType.eBSDWarning1 can be read from FCU, via Rte_FCU_SU_DF_P_FCU_BSD_eBSDWarning1_FCU_H

HMI shall set **BSD warning level 1 as TRUE (1U) for Left side (Master ECU)** when following conditions are met and ser

~~AND~~ ~~初期診断中でない~~ ~~Not initial diagnosis mode~~

~~左BSD機能警報領域に車両を検知~~

~~Target detected on left BSD function warning zone.~~

~~左ターンSW OFF~~ ~~Left turn SW OFF~~

~~車速~~ ~~Vehicle speed~~ ~~システム作動速度~~ ~~System activation speed~~

~~シフトポジションRでない~~ ~~Shift position not R~~

~~BSD右モジュール汚れ検知無し~~ ~~BSD right module not blockage~~

~~BSD左モジュール汚れ検知無し~~ ~~BSD left module not blockage~~

AND ~~Not initial diagnosis mode*~~

~~BSD Target detected on left BSD function warning zone.~~

~~Left turn SW is OFF (0)~~

~~Shift position is not Reverse (R)~~

~~BSD warning Customization is enabled (1U)~~

~~SRVD left module neither temporary stop nor fail*~~

~~SRVD right module neither temporary stop nor fail*~~

Note:

* -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for BSD warning is b_ForceBSD
3. To make left turn SW OFF, make CAN signal MET390_6_2_TURN_SIG_LEFT = 0
4. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
5. BSD warning Customization interface is Cstmz_Warn.Cstmz_BSDLCA_Warn_Flag

Output:

1. BSD level 1 warning from HMI to FCU interface is Rte_HMI_SYSTEM_P_HMI_RDR228_6_1_WARN_BSD_L_1ST_HM

HMI shall set **BSD warning level 1 as TRUE (1U) for Right side (Slave ECU)** when following conditions are met and se

~~AND~~ ~~初期診断中でない~~ ~~Not initial diagnosis mode~~
~~├ 右BSD機能警報領域に車両を検知~~
~~└ Target detected on right BSD function warning zone.~~
~~├ 右ターンSW OFF~~ ~~Right turn SW OFF~~
~~├ 車速 Vehicle speed > システム作動速度 System activation speed~~
~~├ シフトポジションRでない~~ ~~Shift position not R~~
~~├ BSD右モジュール汚れ検知無し~~ ~~BSD right module not blockage~~
~~└ BSD左モジュール汚れ検知無し~~ ~~BSD left module not blockage~~

AND ┌ Not initial diagnosis mode*
├ BSD Target detected on right BSD function warning zone.
├ Right turn SW is OFF (0)
├ Shift position is not Reverse (R)
├ BSD warning Customization is enabled
├ SRVD left module neither temporary stop nor fail*
└ SRVD right module neither temporary stop nor fail*

Note:

* -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for BSD warning is b_ForceBSD
3. To make right turn SW OFF, make CAN signal MET390_6_3_TURN_SIG_RIGHT = 0
4. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
5. BSD warning Customization interface is Cstmz_Warn.Cstmz_BSDLCA_Warn_Flag

Output:

1. BSD level 1 warning from HMI to FCU interface is Rte_HMI_SYSTEM_P_HMI_RDR228_6_0_WARN_BSD_R_1ST_HI

BSD - Warning level 2

HMI shall set **BSD warning level 2 as TRUE (1U) for Left side (Master ECU)** when following conditions are met and ser

AND ~~初期診断中でない~~ Not initial diagnosis mode

~~左BSD機能警報領域に車両を検知~~

~~Target detected on Left BSD function warning zone.~~

~~左ターンSW ON~~ Left turn SW ON

~~車速 Vehicle speed > システム作動速度~~ System activation speed

~~シフトポジションRでない~~ Shift position not R

~~BSD右モジュール汚れ検知無し~~ BSD right module not blockage

~~BSD左モジュール汚れ検知無し~~ BSD left module not blockage

AND ~~Not initial diagnosis mode*~~

~~BSD Target detected on Left BSD function warning zone.~~

~~Left turn SW ON (1U)~~

~~Shift position is not Reverse (R)~~

~~BSD warning Customization is enabled~~

~~SRVD left module neither temporary stop nor fail*~~

~~SRVD right module neither temporary stop nor fail*~~

Note:

* -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for BSD warning is b_ForceBSD
3. To make left turn SW ON, make CAN signals MET390_6_2_TURN_SIG_LEFT = 1 & MET390_6_3_TURN_SIG_RIGHT = 1
4. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
5. BSD warning Customization interface is Cstmz_Warn.Cstmz_BSDLCA_Warn_Flag

Output:

1. BSD level 2 warning from HMI to FCU interface is Rte_HMI_SYSTEM_P_HMI_RDR228_6_3_WARN_BSD_L_2ND_HMI

HMI shall set **BSD warning level 2 as TRUE (1U) for Right side (Slave ECU)** when following conditions are met and send

AND ~~初期診断中でない~~ Not initial diagnosis mode
+ ~~左BSD機能警報領域に車両を検知~~
Target detected on Right BSD function warning zone.
+ ~~左ターンSW ON~~ Right turn SW ON
+ ~~車速~~ Vehicle speed > ~~システム作動速度~~ System activation speed
+ ~~シフトポジションRでない~~ Shift position not R
+ ~~BSD右モジュール汚れ検知無し~~ BSD right module not blockage
+ ~~BSD左モジュール汚れ検知無し~~ BSD left module not blockage

AND ~~Not initial diagnosis mode*~~
+ BSD Target detected on right BSD function warning zone.
+ Right turn SW is ON (2U)
+ Shift position is not Reverse (R)
+ BSD warning Customization is enabled
+ SRVD left module neither temporary stop nor fail*
+ SRVD right module neither temporary stop nor fail*

Note:

* -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode(Refer 3220820).
2. Interface for BSD warning is b_ForceBSD
3. To make right turn SW ON, make CAN signals MET390_6_2_TURN_SIG_LEFT = 0 & MET390_6_3_TURN_SIG_RIGHT = 1
4. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
5. BSD warning Customization interface is Cstmz_Warn.Cstmz_BSDLCA_Warn_Flag

Output:

1. BSD level 2 warning from HMI to FCU interface is Rte_HMI_SYSTEM_P_HMI_RDR228_6_2_WARN_BSD_R_2ND_H

LCA - Lane Change Assist function

LCA (Lane Change Assist) system is an extension of the BSD system. LCA is intended to warn the subject vehicle driver of a vehicle in the blind spot zone; level 2 means the LED is blinking and this level is reached if

LCA - Warning level 1

HMI shall consider LCA level 1 warning from algo as TRUE(1U), only when the below condition is satisfied, otherwise FALSE

OR ~~LCA_t_OutputType.eLCAWarning1 == 1U~~
+ ~~LCA_t_OutputType.eLCAWarning1 == 2U~~

Note:

LCA_t_OutputType.eLCAWarning1 can be read from FCU, via Rte_FCU_SU_DF_P_FCU_LCA_eLCAWarning1_FCU_H

HMI shall set **LCA warning level 1 as TRUE (1U) for Left side (Master ECU)** when following conditions are met and ser

~~AND~~ ~~初期診断中でない~~ ~~Not initial diagnosis mode~~

~~左LCA機能警報領域に車両を検知~~

~~Target is detected on left LCA function zone.~~

~~Target TTC is \geq TTC criteria~~

~~左ターンSW OFF Left turn SW OFF~~

~~車速 Vehicle speed \geq システム作動速度 System activation speed~~

~~シフトポジションRでない Shift position not R~~

~~LCA右モジュール汚れ検知無し LCA right module not blockage~~

~~LCA左モジュール汚れ検知無し LCA left module not blockage~~

AND ~~Not initial diagnosis mode*~~

~~LCA Target detected on left LCA function warning zone.~~

~~Left turn SW is OFF (0)~~

~~Shift position is not Reverse (R)~~

~~LCA warning Customization is enabled~~

~~SRVD left module neither temporary stop nor fail*~~

~~SRVD right module neither temporary stop nor fail*~~

Note:

* -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for LCA warning is b_ForceLCA
3. To make left turn SW OFF, make CAN signal MET390_6_2_TURN_SIG_LEFT = 0
4. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
5. LCA warning Customization interface is Cstmz_Warn.Cstmz_BSDLCA_Warn_Flag

Output:

1. LCA level 1 warning from HMI to FCU interface is Rte_HMI_SYSTEM_P_HMI_RDR228_7_3_WARN_LCA_L_1ST_HM

HMI shall set **LCA warning level 1 as TRUE (1U) for Right side (Slave ECU)** when following conditions are met and se

AND ~~初期診断中でない~~ Not initial diagnosis mode
| ~~右LCA機能警報領域に車両を検知~~
| Target is detected on right LCA zone.
| ~~Target TTC is \geq TTC criteria~~
| ~~右ターンSW OFF~~ Right turn SW OFF
| ~~車速 Vehicle speed \geq システム作動速度 System activation speed~~
| ~~シフトポジションRでない~~ Shift position not R
| ~~LCA右モジュール汚れ検知無し~~ LCA right module not blockage
| ~~LCA左モジュール汚れ検知無し~~ LCA left module not blockage

AND ~~Not initial diagnosis mode*~~
| LCA Target detected on left LCA function warning zone.
| Right turn SW is OFF (0)
| Shift position is not Reverse (R)
| LCA warning Customization is enabled
| SRVD left module neither temporary stop nor fail*
| SRVD right module neither temporary stop nor fail*

Note:

* -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for LCA warning is b_ForceLCA
3. To make right turn SW OFF, make CAN signals MET390_6_3_TURN_SIG_RIGHT = 0
4. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
5. LCA warning Customization interface is Cstmz_BSDLCA_Warn_Flag

Output:

1. LCA level 1 warning from HMI to FCU interface is Rte_HMI_SYSTEM_P_HMI_RDR228_7_2_WARN_LCA_R_1ST_HM

LCA - Warning level 2

HMI shall set **LCA warning level 2 as TRUE (1U) for Left side (Master ECU)** when following conditions are met and ser

AND ~~初期診断中でない~~ Not initial diagnosis mode

~~左LCA機能警報領域に車両を検知~~

Something detected on left LCA function zone.

~~Target TTC is \geq TTC criteria~~

~~右ターンSW ON~~ Left turn SW ON

~~車速 Vehicle speed \geq システム作動速度~~ System activation speed

~~シフトポジションRでない~~ Shift position not R

~~LCA右モジュール汚れ検知無し~~ LCA right module not blockage

~~LCA左モジュール汚れ検知無し~~ LCA left module not blockage

AND ~~Not initial diagnosis mode*~~

~~LCA Target detected on Left LCA function warning zone.~~

~~Left turn SW ON (1U)~~

~~Shift position is not Reverse (R)~~

~~LCA warning Customization is enabled~~

~~SRVD left module neither temporary stop nor fail*~~

~~SRVD right module neither temporary stop nor fail*~~

Note:

* -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for LCA warning is b_ForceLCA
3. To make left SW ON, make CAN signals MET390_6_2_TURN_SIG_LEFT = 1 & MET390_6_3_TURN_SIG_RIGHT = 0
4. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
5. LCA warning Customization interface is Cstmz_Warn.Cstmz_BSDLCA_Warn_Flag

Output:

1. LCA level 2 warning from HMI to FCU interface is Rte_HMI_SYSTEM_P_HMI_RDR228_7_5_WARN_LCA_L_2ND_HMI

HMI shall set **LCA warning level 2 as TRUE (1U) for Right side (Slave ECU)** when following conditions are met and se

AND ~~初期診断中でない~~ Not initial diagnosis mode

~~右LCA機能警報領域に車両を検知~~

~~Something detected on right LCA function zone.~~

~~Target TTC is \geq TTC criteria~~

~~右ターンSW ON~~ Right turn SW ON

~~車速 Vehicle speed \geq システム作動速度 System activation speed~~

~~シフトポジションRでない~~ Shift position not R

~~LCA右モジュール汚れ検知無し~~ LCA right module not blockage

~~LCA左モジュール汚れ検知無し~~ LCA left module not blockage

AND ~~Not initial diagnosis mode*~~

~~LCA Target detected on right LCA function warning zone.~~

~~Right turn SW is ON (2U)~~

~~Shift position is not Reverse (R)~~

~~LCA warning Customization is enabled (1U)~~

~~SRVD left module neither temporary stop nor fail*~~

~~SRVD right module neither temporary stop nor fail*~~

Note:

* -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for LCA warning is b_ForceLCA
3. To make right SW ON, make CAN signals MET390_6_2_TURN_SIG_LEFT = 0 & MET390_6_3_TURN_SIG_RIGHT = 1
4. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
5. LCA warning Customization interface is Cstmz_Warn.Cstmz_BSDLCA_Warn_Flag

Output:

1. LCA level 2 warning from HMI to FCU interface is Rte_HMI_SYSTEM_P_HMI_RDR228_7_4_WARN_LCA_R_2ND_HMI

RCTA - Rear Crossing Traffic Alert function

Rear Traffic Crossing Alert (RCTA) System warns the driver against potential side collisions with other moving vehicles

RCTA equipped systems are intended to provide assistance functionality during a normal backing up situation with a focus **of the subject vehicle for potentially colliding traffic, evaluates the situation and warns the driver not to start or c**

RCTA is intended for use on passenger cars up to 3.5t and for warning against possible collision with low-to-mid speed (30-60km/h) stationary and very low speed moving objects. It is not intended to reliably detect pedestrians or animals. **The system wi**

RCTA - Warning level 1

HMI shall consider RCTA level 1 warning from algo as TRUE(1U), only when the below condition is satisfied, otherwise FALSE

CTM_t_OutputsType.bWarningActive == 1U

Note:

CTM_t_OutputsType.bWarningActive can be read from FCU, via Rte_FCU_SU_DF_P_FCU_RCTA_bWarningActive_FCU

HMI shall set **RCTA warning level 1 as TRUE (1U) for Left side (Master ECU)** when following conditions are met and satisfied

~~AND~~ ~~初期診断中でない~~ Not initial diagnosis mode

~~+~~ ~~自車右・左側に検知あり~~ Something detected on left of the Subject vehicle.

~~+~~ ~~検知対象の速度が検知対象絶対速度範囲内~~

~~Velocity of target vehicle is within the target absolute velocity range~~

~~+~~ ~~自車速度がシステム作動速度内~~

~~Velocity of subject vehicle is within the System activation speed~~

~~+~~ ~~検知対象とBSDモジュールx軸とのTTCが警報TTC以下~~

~~TTC of the targets to the BSD module x axis is less than the warning TTC~~

~~+~~ ~~シフトポジションReverse~~ Shift position Reverse

~~+~~ ~~x axis breakthrough pointが範囲内 $-7m \leq x \leq +1m$~~

~~+~~ ~~x axis breakthrough point is in range $-7m \leq x \leq +1m$~~

~~than~~

~~Both sides LEDs shall blink.~~

AND ~~+~~ Not initial diagnosis mode*

~~+~~ RCTA target something detected on left of the Subject vehicle

~~+~~ Shift position is Reverse (R)

~~+~~ RCTA warning Customization is enabled (1U)

~~+~~ SRVD left module neither temporary stop nor fail*

~~+~~ SRVD right module neither temporary stop nor fail*

Note:

* -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for RCTA warning is b_ForceRCTA - (1U - Target detected)
3. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
4. RCTA warning Customization interface is Cstmz_Warn.Cstmz_RCTA_Warn_Flag

Output:

1. RCTA level 1 warning from HMI to FCU interface is Rte_HMI_SYSTEM_P_HMI_RDR228_7_7_WARN_RCTA_L_HMI

HMI shall set **RCTA warning level 1 as TRUE (1U) for Right side (Slave ECU)** when following conditions are met and s

~~AND~~ ~~初期診断中でない~~ ~~Not initial diagnosis mode~~

~~├ 自車右・左側に検知あり~~ ~~Something detected on right of the Subject vehicle.~~

~~├ 検知対象の速度が検知対象絶対速度範囲内~~

~~Velocity of target vehicle is within the target absolute velocity range~~

~~├ 自車速度がシステム作動速度内~~

~~Velocity of subject vehicle is within the System activation speed~~

~~├ 検知対象とBSDモジュールx軸とのTTCが警報TTC以下~~

~~TTC of the targets to the BSD module x axis is less than the warning TTC~~

~~├ シフトポジションReverse~~ ~~Shift position Reverse~~

~~├ x-axis breakthrough pointが範囲内~~ ~~$-7m \leq x \leq +1m$~~

~~└ x-axis breakthrough point is in range~~ ~~$-7m \leq x \leq +1m$~~

than

~~Both sides LEDs shall blink.~~

AND ~~└~~ Not initial diagnosis mode*

~~└ RCTA target something detected on right of the Subject vehicle~~

~~└ Shift position is Reverse (R)~~

~~└ RCTA warning Customization is enabled (1U)~~

~~└ SRVD left module neither temporary stop nor fail*~~

~~└ SRVD right module neither temporary stop nor fail*~~

Note:

* -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).

2. Interface for RCTA warning is b_ForceRCTA - (1U - Target detected)

3. Shift position interface is CAN signal BEV074_3_0_RANGE_POS

4. RCTA warning Customization interface is Cstmz_Warn.Cstmz_RCTA_Warn_Flag

Output:

1. RCTA level 1 warning from HMI to FCU interface is Rte_HMI_SYSTEM_P_HMI_RDR228_7_6_WARN_RCTA_R_HMI.

Warning OFF condition for RCTA shall be:

~~OR~~ ~~└ 検知対象がx-breakthroughを通過~~ ~~Target passed x-breakthrough~~

~~└ 検知対象のx-breakthrough pointが自車から規定の距離($-8m < x < 2m$)以上離れる~~

~~x-breakthrough point of target vehicle leaves the defined distance behind subject ($-8m < x < 2m$)~~

~~└ シフトポジションがRではない~~ ~~Shift position not in R~~

OR ~~└~~ 検知対象がx-breakthroughを通過 Target passed x-breakthrough

└ 検知対象のx-breakthrough pointが自車から規定の距離($-8m < x < 2m$)以上離れる

x-breakthrough point of target vehicle leaves the defined distance behind subject ($-8m < x < 2m$)

└ シフトポジションがRではない Shift position not in R

DOW - Door Open Warning

DOW Warning level 1

HMI shall consider DOW level 1 warning from algo as TRUE(1U), only when the below condition is satisfied, otherwise FALSE(0U)

OSE_t_OutputType.outputs.bPreWarnActive == 1U

Note:

OSE_t_OutputType.outputs.bPreWarnActive can be read from FCU, via Rte_FCU_SU_DF_P_FCU_DOW_outputs_bPreWarnActive

HMI shall set **DOW warning level 1 as TRUE (1U) for Left side** when following conditions are met and send it to FCU, otherwise FALSE(0U)

For Region A (JPAN, EK, Thai & Singapore, Australia, South Africa & Other)

AND {
 Not initial diagnosis mode*
 DOW level 1 warning from algo
 OR {
 DOW Shift Position Customization == FALSE (0U).
 DOW Shift Position Customization == TRUE(1U) & Shift position == Parking (P).
 }
 OR {
 DOW level 2 warning from algo == FALSE (0). [Refer ID: 3241756]
 AND {
 BIU3AC_4_3_DOOR_RRLH == CLOSE (0)
 BIU3AC_4_1_DOOR_PASS == CLOSE (0)
 }
 }
 DOW warning Customization is enabled
 SRVD left module neither temporary stop nor fail*
 SRVD right module neither temporary stop nor fail*

For Region B (US, Canada, Europe LH, Standard LH & Latin America, Saudi Arabia, China, Korea)

AND {
 Not initial diagnosis mode*
 DOW level 1 warning from algo
 OR {
 DOW Shift Position Customization == FALSE (0).
 DOW Shift Position Customization == TRUE(1U) & Shift position == Parking (P).
 }
 OR {
 DOW level 2 warning from algo == FALSE (0). [Refer ID: 3241756]
 AND {
 BIU3AC_4_3_DOOR_RRLH == CLOSE (0)
 BIU3AC_4_0_DOOR_DRVR == CLOSE (0)
 }
 }
 DOW warning Customization is enabled
 SRVD left module neither temporary stop nor fail*
 SRVD right module neither temporary stop nor fail*

Note:

1. For KD1.7 release, region will be hardcoded as US/CANADA. So testing can be limited to Region B.
2. * -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).
3. DOW level 2 warning from algo == FALSE (0), BIU3AC_4_2_DOOR_RRLH == CLOSE (0U), BIU3AC_4_1_DOOR_PASS == CLOSE (0U)

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for DOW level 1 warning from algo is b_ForceDOW. (TEST_STIMULI should be enabled in CMakeLists.txt file)
3. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
4. DOW warning Customization interface is Cstmz_Warn.Cstmz_DOW_Warn_Flag
5. DOW Shift position customization interface is Cstmz_Flags.Cstmz_DOWSP
6. Interface for DOW level 2 warning from algo is **b_ForceDOW_Lv2**. (TEST_STIMULI should be enabled in CMakeLists.txt file)
7. Interface for BIU3AC_4_2_DOOR_RRLH, BIU3AC_4_1_DOOR_PASS, BIU3AC_4_0_DOOR_DRVR are CAN Rx signals

Output:

1. DOW level 1 warning from HMI to FCU interface is Rte_HMI_SYSTEM_P_HMI_RDR228_4_2_WARN_DOW_1ST_L_H

HMI shall set **DOW warning level 1 as TRUE (1U) for Right side** when following conditions are met and send it to FCU,

For Region A (JAPAN, EK, Thai & Singapore, Australia, South Africa & Other)

AND {
 Not initial diagnosis mode*
 {
 DOW level 1 warning from algo
 OR {
 DOW Shift Position Customization == FALSE (0).
 DOW Shift Position Customization == TRUE(1U) & Shift position == Parking (P).
 }
 OR {
 DOW level 2 warning from algo == FALSE (0). [Refer ID: 3241756]
 AND {
 BIU3AC_4_2_DOOR_RRRH == CLOSE (0U)
 BIU3AC_4_0_DOOR_DRVR == CLOSE (0U)
 }
 }
 }
 DOW warning Customization is enabled
 SRVD left module neither temporary stop nor fail*
 SRVD right module neither temporary stop nor fail*

For Region B (US, Canada, Europe LH, Standard LH & Latin America, Saudi Arabia, China, Korea)

AND {
 Not initial diagnosis mode*
 {
 DOW level 1 warning from algo
 OR {
 DOW Shift Position Customization == FALSE (0).
 DOW Shift Position Customization == TRUE(1U) & Shift position == Parking (P).
 }
 OR {
 DOW level 2 warning from algo == FALSE (0). [Refer ID: 3241756]
 AND {
 BIU3AC_4_2_DOOR_RRRH == CLOSE (0U)
 BIU3AC_4_1_DOOR_PASS == CLOSE (0U)
 }
 }
 }
 DOW warning Customization is enabled
 SRVD left module neither temporary stop nor fail*
 SRVD right module neither temporary stop nor fail*

Note:

1. For KD1.7 release, region will be hardcoded as US/CANADA. So testing can be limited to Region B.
2. * -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).
3. DOW level 2 warning from algo == FALSE (0), BIU3AC_4_2_DOOR_RRRH == CLOSE (0U), BIU3AC_4_1_DOOR_PASS == CLOSE (0U)

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for DOW level 1 warning from algo is b_ForceDOW. (TEST_STIMULI should be enabled in CMakeLists.txt file)
3. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
4. DOW warning Customization interface is Cstmz_Warn.Cstmz_DOW_Warn_Flag
5. DOW Shift position customization interface is Cstmz_Flags.Cstmz_DOWSP
6. Interface for DOW level 2 warning from algo is **b_ForceDOW_Lv2**. (TEST_STIMULI should be enabled in CMakeLists.txt file)
7. Interface for BIU3AC_4_2_DOOR_RRRH, BIU3AC_4_1_DOOR_PASS, BIU3AC_4_0_DOOR_DRVR are CAN Rx signals

Output:

1. DOW level 1 warning from HMI to FCU interface is Rte_HMI_SYSTEM_P_HMI_RDR228_4_1_WARN_DOW_1ST_R_R
- DOW Warning level 2

HMI shall consider DOW level 2 warning from algo as TRUE(1U), only when the below condition is satisfied, otherwise FALSE

OSE_t_OutputType.outputs.bAcuteWarnActive == 1U

Note:

OSE_t_OutputType.outputs.bAcuteWarnActive can be read from FCU, via Rte_FCU_SU_DF_P_FCU_DOW_outputs_bAcuteWarnActive

For **Left** sensor, HMI shall set Rte_HMI_SYSTEM_P_HMI_RDR228_4_4_WARN_DOW_2ND_L_HMI_FCU_RDR228_4_4_WARN_DOW_2ND_L

AND

- Not initial diagnosis mode*
- DOW level 1 warning from algo is TRUE(1U) [Refer ID: 3221804]
 - OR
 - DOW Shift Position Customization == FALSE (0).
 - DOW Shift Position Customization == TRUE(1U) & Shift position == Parking (P).
- DOW level 2 warning from algo is TRUE (1U) [Refer ID: 3241756]
- DOW warning Customization is enabled
- SRVD left module neither temporary stop nor fail*
- SRVD right module neither temporary stop nor fail*

Note:

1. This requirement is an internal software design made between HMI and FCU to send the warning on CAN within 10ms
2. * -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).
3. Note the door open condition will be handled in FCU to reduce the time of the CAN signal warning to be sent on the vehicle

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for DOW level 1 warning from algo is b_ForceDOW. (TEST_STIMULI should be enabled in CMakeLists.txt file)
3. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
4. DOW warning Customization interface is Cstmz_Warn.Cstmz_DOW_Warn_Flag
5. DOW Shift position customization interface is Cstmz_Flags.Cstmz_DOWSP
6. Interface for DOW level 2 warning from algo is **b_ForceDOW_Lv2**. (TEST_STIMULI should be enabled in CMakeLists.txt file)

Output:

1. Rte_HMI_SYSTEM_P_HMI_RDR228_4_4_WARN_DOW_2ND_L_HMI_FCU_RDR228_4_4_WARN_DOW_2ND_L

For **Right** sensor, HMI shall set Rte_HMI_SYSTEM_P_HMI_RDR228_4_3_WARN_DOW_2ND_R_HMI_FCU_RDR228_4_3_WARN_DOW_2ND_R

AND

- Not initial diagnosis mode*
- DOW level 1 warning from algo is TRUE(1U) [Refer ID: 3221804]
 - OR
 - DOW Shift Position Customization == FALSE (0).
 - DOW Shift Position Customization == TRUE(1U) & Shift position == Parking (P).
- DOW level 2 warning from algo is TRUE (1U) [Refer ID: 3241756]
- DOW warning Customization is enabled
- SRVD left module neither temporary stop nor fail*
- SRVD right module neither temporary stop nor fail*

Note:

1. This requirement is an internal software design made between HMI and FCU to send the warning on CAN within 10ms
2. * -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).
3. Note the door open condition will be handled in FCU to reduce the time of the CAN signal warning to be sent on the vehicle

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for DOW level 1 warning from algo is b_ForceDOW. (TEST_STIMULI should be enabled in CMakeLists.txt file)
3. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
4. DOW warning Customization interface is Cstmz_Warn.Cstmz_DOW_Warn_Flag
5. DOW Shift position customization interface is Cstmz_Flags.Cstmz_DOWSP
6. Interface for DOW level 2 warning from algo is **b_ForceDOW_Lv2**. (TEST_STIMULI should be enabled in CMakeLists.txt file)

Output:

1. Rte_HMI_SYSTEM_P_HMI_RDR228_4_3_WARN_DOW_2ND_R_HMI_FCU_RDR228_4_3_WARN_DOW_2ND_R

HMI shall set DOW warning level 2 as TRUE (1U) for **Left side** when following conditions are met and send it to FCU, other

For Region A (JPAN, EK, Thai & Singapore, Australia, South Africa & Other)

AND

- └ Not initial diagnosis mode*
 - └ DOW level 1 warning from algo is TRUE(1U) [Refer ID: 3221804]
 - └ OR
 - └ DOW Shift Position Customization == FALSE (0).
 - └ DOW Shift Position Customization == TRUE(1U) & Shift position == Parking (P).
 - └ DOW level 2 warning from algo is TRUE (1U) [Refer ID: 3241756]
 - └ OR
 - └ BIU3AC_4_3_DOOR_RRLH == OPEN (1U)
 - └ BIU3AC_4_1_DOOR_PASS == OPEN (1U)
 - └ DOW warning Customization is enabled
 - └ SRVD left module neither temporary stop nor fail*
 - └ SRVD right module neither temporary stop nor fail*

For Region B (US, Canada, Europe LH, Standard LH & Latin America, Saudi Arabia, China, Korea)

AND

- └ Not initial diagnosis mode*
 - └ DOW level 1 warning from algo is TRUE(1U) [Refer ID: 3221804]
 - └ OR
 - └ DOW Shift Position Customization == FALSE (0).
 - └ DOW Shift Position Customization == TRUE(1U) & Shift position == Parking (P).
 - └ DOW level 2 warning from algo is TRUE (1U) [Refer ID: 3241756]
 - └ OR
 - └ BIU3AC_4_3_DOOR_RRLH == OPEN (1U)
 - └ BIU3AC_4_0_DOOR_DRVR == OPEN (1U)
 - └ DOW warning Customization is enabled
 - └ SRVD left module neither temporary stop nor fail*
 - └ SRVD right module neither temporary stop nor fail*

Note:

1. For KD1.7 release, region will be hardcoded as US/CANADA. So testing can be limited to Region B.
2. * -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).
3. Note the door open condition will be handled in FCU to reduce the time of the CAN signal warning to be sent on the vehicle.

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for DOW level 1 warning from algo is b_ForceDOW. (TEST_STIMULI should be enabled in CMakeLists.txt file)
3. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
4. DOW warning Customization interface is Cstmz_Warn.Cstmz_DOW_Warn_Flag
5. DOW Shift position customization interface is Cstmz_Flags.Cstmz_DOWSP
6. Interface for DOW level 2 warning from algo is **b_ForceDOW_Lv2**. (TEST_STIMULI should be enabled in CMakeLists.txt file)
7. Interface for BIU3AC_4_2_DOOR_RRLH, BIU3AC_4_1_DOOR_PASS, BIU3AC_4_0_DOOR_DRVR are CAN Rx signals

Output:

1. RDR228_4_4_WARN_DOW_2ND_L signal in RDR228 message shall become TRUE (1U)
2. LED starts the DOW level 2 blinking pattern

HMI shall set DOW warning level 2 as TRUE (1U) for **Right side** when following conditions are met and send it to FCU, o

For Region A (JPAN, EK, Thai & Singapore, Australia, South Africa & Other)

AND

- Not initial diagnosis mode*
- DOW level 1 warning from algo is TRUE(1U) [Refer ID: 3221804]
 - OR
 - DOW Shift Position Customization == FALSE (0).
 - DOW Shift Position Customization == TRUE(1U) & Shift position == Parking (P).
- DOW level 2 warning from algo is TRUE (1U) [Refer ID: 3241756]
 - OR
 - BIU3AC_4_2_DOOR_RRRH == OPEN (1U)
 - BIU3AC_4_0_DOOR_DRVR == OPEN (1U)
- DOW warning Customization is enabled
- SRVD left module neither temporary stop nor fail*
- SRVD right module neither temporary stop nor fail*

For Region B (US, Canada, Europe LH, Standard LH & Latin America, Saudi Arabia, China, Korea)

AND

- Not initial diagnosis mode*
- DOW level 1 warning from algo is TRUE(1U) [Refer ID: 3221804]
 - OR
 - DOW Shift Position Customization == FALSE (0).
 - DOW Shift Position Customization == TRUE(1U) & Shift position == Parking (P).
- DOW level 2 warning from algo is TRUE (1U)
 - OR
 - BIU3AC_4_2_DOOR_RRRH == OPEN (1U)
 - BIU3AC_4_1_DOOR_PASS == OPEN (1U)
- DOW warning Customization is enabled
- SRVD left module neither temporary stop nor fail*
- SRVD right module neither temporary stop nor fail*

Note:

1. For KD1.7 release, region will be hardcoded as US/CANADA. So testing can be limited to Region B.
2. * -> Combination of these three * conditions means SRVD modules are in normal operation mode (Refer 3220820).
3. Note the door open condition will be handled in FCU to reduce the time of the CAN signal warning to be sent on the ve

Test Interfaces :

Input:

1. For * conditions make sure SRVD modules system state is in normal operation mode (Refer 3220820).
2. Interface for DOW level 1 warning from algo is b_ForceDOW. (TEST_STIMULI should be enabled in CMakeLists.txt file)
3. Shift position interface is CAN signal BEV074_3_0_RANGE_POS
4. DOW warning Customization interface is Cstmz_Warn.Cstmz_DOW_Warn_Flag
5. DOW Shift position customization interface is Cstmz_Flags.Cstmz_DOWSP
6. Interface for DOW level 2 warning from algo is **b_ForceDOW_Lv2**. (TEST_STIMULI should be enabled in CMakeLists.txt file)
7. Interface for BIU3AC_4_2_DOOR_RRRH, BIU3AC_4_1_DOOR_PASS, BIU3AC_4_0_DOOR_DRVR are CAN Rx sig

Output:

1. RDR228_4_3_WARN_DOW_2ND_R signal in RDR228 message shall become TRUE (1U)
 2. LED starts the DOW level 2 blinking pattern
- DOW level 2 warning should be sent on CAN immediately within **10ms** (Excluding T_MinDelayTx (10ms)) from the Left Door open statu

{IMAGE id=3347752 title="img-05081434.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_dcdN

FCU shall send the DOW level 2 warning to CAN immediately within 10ms T_MinDelayTx of the CAN standard specification.

{IMAGE id=3347752 title="img-05081434.png" uri="https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_dcdM...}

Hardware Main-Switch momentary button, handling

Main-Switch is directly connected as input, via a PIN, to the Master ECU as shown in Req. ID L3_SW_802.

~~Main-Switch button shall be a momentary switch type.~~

Note: SU85 don't support hardware switch.

~~Main-Switch shall enable/disable the functionalities of the ECU.~~

The Main-Switch status shall be stored in the EEPROM. At start of the current IGN cycle the Main-Switch status shall start

The Main-Switch status shall be ON in the EEPROM image which will be flashed in production line, as default value.

Main-Switch status shall be ON if following conditions exists:

AND \neg Main-Switch status = OFF

\neg OFF→ON edge of BSD Voltage of BSD Main-Switch terminal (PIN)
(Threshold 6.5V, 10ms× 3 times check for Judgment)

Main-Switch status shall be OFF if following conditions exists:

AND \neg Main-Switch status = ON

\neg OFF→ON edge of BSD Voltage of BSD Main-Switch terminal (PIN)
(Threshold 6.5V, 10ms× 3 times check for Judgment)

Main-Switch status shall be provided via an HMI interface to the CAN module.

Main-Switch dedicated DEM Event shall be set active if the time when the voltage input is available, lasts longer than 30 s

(Threshold 6.5V, 10ms× 3000 times check for Judgment)

Main Switch state shall freeze in the moment when output signal **RDR228_2_4_FAIL_RDRSYS** is set to 1, even if the input

These freeze state shall be kept until Reset or until DTCs are deleted and output signal **RDR228_2_4_FAIL_RDRSYS** b

Main Switch influence on SCTL state machine

The SCTL_State shall remain in SCTL_NORMAL_OPERATION mode regardless MainSwitch position (ON/OFF). Only so

Software Switch, handling

If value of received CAN data "AVN6BB_4_5" (SRVD status change request flag) is "1" (=change request), SRVD system

When value of "AVN6BB_4_5" is 0, SRVD system shall be kept in current status even if "AVN6BB_3_0" is changed.

However, if system is FAIL or HALT, system shall not be changed the status.

Main Switch shall enable/disable the functionalities of the ECU.

The Main-Switch status shall be stored in the EEPROM. At start of the current IGN cycle the Main-Switch status shall start

Main-Switch status shall be provided via an HMI interface to the CAN module.

Main Switch state shall freeze in the moment when output signal **RDR228_2_4_FAIL_RDRSYS** is set to 1, even if the input signal **RDR228_2_4_FAIL_RDRSYS** is set to 0. These freeze state shall be kept until Reset or until DTCs are deleted and output signal **RDR228_2_4_FAIL_RDRSYS** is set to 0.
Use case:

Normal operation:

{IMAGE id=2513073 title="2877_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_3gvyb

Main Switch influence on SCTL state machine

The SCTL_State shall remain in SCTL_NORMAL_OPERATION mode regardless MainSwitch position (ON/OFF). Only sensor mounting position shall be determined.

After IGN OFF=>ON the sensor shall determine if it shall act as a module which is mounted to the right or the left hand side.

The master sensor mounting position shall be based on the determined Node-Id (Master/Slave sensor).

The master sensor mounting position shall be LEFT side.

Blockage situation influence on HMI warning

The sensor component shall not send any signals to HMI (no flashing nor meter display pictograms expected) when the performance is degraded (in blockage situation).

The sensor component shall send a blockage signal to HMI via hardware LED when the performance is degraded (in blockage situation).

HMI Diag Interface Requirements

HMI shall provide interface to Diag for LED Control

HMI shall provide interface to Diag components for LED ON, LED OFF, LED Blinking functionalities for the DID control of the LED.

Note:

Refer section 9.8.1.3.14 SID 0xBA Conti Internal Requirement (2981812) for DID related information.

When Diag requests LED ON, HMI shall make the LED ON until receiving another request.

Note:

Refer section 9.8.1.3.14 SID 0xBA Conti Internal Requirement (2981812) for DID related information.

When Diag requests LED OFF, HMI shall make the LED OFF until receiving another request.

Note:

Refer section 9.8.1.3.14 SID 0xBA Conti Internal Requirement (2981812) for DID related information.

When Diag request for LED blinking, HMI shall make the LED blink for 3 times (LED ON for 3 secs and LED OFF for 1 sec).

LED blinking pattern for DV test:

{IMAGE id=3006931 title="img-12201019.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_3gvyb

Note:

Refer section 9.8.1.3.14 SID 0xBA Conti Internal Requirement (2981812) for DID related information.

HMI shall provide interface to Diag for LED Brightness Control

HMI shall provide interface to Diag for adjusting LED Brightness for DID control of LED brightness in the Short term adjustment mode.

Test Interface for Validation team:

1. Mode interface is

Refer section 9.8.1.3.14 SID 0xBA Conti Internal Requirement (2981812) for DID related information.

Diag request shall provide the LED current value for adjusting the LED brightness and the same current value shall be updated to the HMI.

Note:

1. Maximum current for LED current is 100mA.

2. Refer section 9.8.1.3.14 SID 0xBA Conti Internal Requirement (2981812) for DID related information.

HMI shall provide interface to Diag to read the LED status and current value

HMI shall provide interface to Diag to read the LED status in both short term adjustment mode and Return control to ECU.

Note:

Refer section RID for related information.

HMI shall provide interface to Diag to read the LED current value, in both "short term adjustment" mode and "Return control" mode.

Note:

Refer section RID for related information.

Software Download

This chapter shall contain all requirements that are relevant for downloading the executable binaries into the ECU flash memory.

The application software version number shall be stored in flash memory.

Master Sensor Flashing

XCP CAN-message-Ids for the master sensor shall be selected which are not used in the Subaru's vehicle specification.

In the best case the selected XCP CAN-message-Ids fit for all vehicle platforms which we have to supply.

Customer Reprogramming

Programming sequence

The following figure shows the flow of the reprogramming process described in this specification.

{IMAGE id=2513071 title="4515_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources/4515_Object_Text_0.png}

Received data interval will be short than CAN communication while reprogramming according to C-ECU spec. The reprogramming function shall be designed with considering about unexpected received data time out, IG OFF and so on.

The reprogramming function shall be designed with considering about unexpected received data time out, IG OFF and so on.

Security related reprogramming sequence

Tool qualification

Tool qualification is handled by security access SID27.

{IMAGE id=2513074 title="3516_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources/3516_Object_Text_0.png}

{IMAGE id=2513078 title="3536_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WrappedResources/3536_Object_Text_0.png}

Algorithm : AES, Key length 128bit, Confidentiality mode : ECB

This service shall be allowed during Programming Session (0x02).

Even after ROM deletion (SID 0x31 sub-function 0x01 RID FF00), Security Access shall be executed when reprogramming

Thus, Security Access function needs to be present in the boot software area.

Security Access encryption key for Tool qualification (COMMON key)

The following requirements are described in AD1-23-S013Δ0 and AD1-23-S014Δ0.

- SSM ID of RCR_L and RCR_R
- SID\$27 Sub Function
- Security access (AES) DID 0x0250
- Encryption Key version DID 0x0251
- Encryption key

【AD1-23-S013Δ0】 RCR Master side (RCR_L) Security Access Encryption Key Specification:

IMS:

{LINK title="http://ims-adas:7001/si/viewrevision?projectName=%23p%3D/nfs/projekte1/PROJECTS/PROJECTS.pj%23S013%E2%8A%BF0_%E5%BE%8C%E5%81%B4%E6%96%B9%E3%83%AC%E3%83%BC%E3%83%80LH%E5%81%6%A7%98%E6%9B%B8%2825ePF%29.pdf7" uri=http://ims-adas:7001/si/viewrevision?projectName=%23p%3D/nfs/projS013%E2%8A%BF0_%E5%BE%8C%E5%81%B4%E6%96%B9%E3%83%AC%E3%83%BC%E3%83%80LH%E5%81%6%A7%98%E6%9B%B8%2825ePF%29.pdf7}

JAZZ:

{LINK title="https://jazz.conti.de/ccm4/web/projects/Radar_SRR320SU85_DM#action=com.ibm.team.scm.browseElementwan.com/ccm4/web/projects/Radar_SRR320SU85_DM#action=com.ibm.team.scm.browseElement&workspaceItemId=_C

【AD1-23-S014Δ0】 RCR Slave side (RCR_R) Security Access Encryption Key Specification:

IMS:

{LINK title="http://ims-adas:7001/si/viewrevision?projectName=%23p%3D/nfs/projekte1/PROJECTS/PROJECTS.pj%23S014%E2%8A%BF0_%E5%BE%8C%E5%81%B4%E6%96%B9%E3%83%AC%E3%83%BC%E3%83%80RH%E5%81%E6%A7%98%E6%9B%B8%2825ePF%29.pdf" uri=http://ims-adas:7001/si/viewrevision?projectName=%23p%3D/nfs/projS014%E2%8A%BF0_%E5%BE%8C%E5%81%B4%E6%96%B9%E3%83%AC%E3%83%BC%E3%83%80RH%E5%81%E6%A7%98%E6%9B%B8%2825ePF%29.pdf}

JAZZ:

{LINK title="https://jazz.conti.de/ccm4/web/projects/Radar_SRR320SU85_DM#action=com.ibm.team.scm.browseElementwan.com/ccm4/web/projects/Radar_SRR320SU85_DM#action=com.ibm.team.scm.browseElement&workspaceItemId=_C

Software tampering detection

Software tampering detection is handled during SUM confirmation

{IMAGE id=2513076 title="3519_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WF

Algorithm : Digital Signature (RSASSA-PKCS1_v1_5)

Use SHA-256 for the hash algorithm

Key shall be used the "Key for software tampering detection."

Authenticator shall be generated based on software data in the reprogramming target area (the status before software encryption mentioned later) and "Key for software tampering detection," and store it in the reprogramming target area.

Example of authenticator generation and comparison

{IMAGE id=2513082 title="3526_Object_Text_0.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR

Software tampering detection procedure

The integrity shall be judged at the timing of "SUM confirmation (*)" in the reprogramming sequence or at the timing of act
Authenticators shall be compared as specified below to detect software tampering.

When authenticator stored in the downloaded software is equal to Authenticator generated by calculating downloaded softw
both authenticator is corresponded : executable
both authenticator is corresponded : Not executable

Key for software tampering detection

Signature verification key: public and private keys (Source=Conti)

Software encryption/decryption

Encrypted data shall be transferred.

The software for reprogramming shall be stored in Flash memory after being decrypted.

Algorithm : AES, Key length 128bit, Concealment mode : CBC

Initial Vector (IV) is needed to carry out computation in the confidentiality modes
above. It shall be stored in each ECU.

Computation for encryption/decryption shall be carried out using the software data, IV and "Key for software encryption/de
Key shall be used the software encryption/decryption:

SRR320SU85 encryption_decryption-key from OTC.docx

{LINK title="https://jazz.conti.de/ccm4/web/projects/Radar_SRR320SU85_DM#action=com.ibm.team.scm.browseElement
wan.com/ccm4/web/projects/Radar_SRR320SU85_DM#action=com.ibm.team.scm.browseElement&workspaceItemId=_u

Uncompressed data shall be transferred.

NVM Handling

The system shall be able to store calibration and operational data in NVM.

The validity flag of each NVM parameter that is forwarded to the algorithm shall be set to VALID after the parameter is su
Possible NVM parameter read issues: 1. NVM initialization failed; 2. CRC check failed for NVM parameter

NVM memory shall be able to be erased by external access via XCP.

MTS

The state of the physical layer (e.g. Bus-off, bus-normal, error active and passive) shall be displayed in a MTS measurement

Activation of MI data

If **NVM_V1_MTS_SWITCH_OFF** is set to 1 measurement data shall be sent

If **NVM_V1_MTS_SWITCH_OFF** is set to 0 measurement data shall not be sent

By default, the init value from NVM shall be 0.

The switch allows to reduce electromagnetic emission in series ECUs. For investigation of returned ECUs measurement c

Enable/Disable XCP protocol

XCP Enable procedure

XCP protocol shall be enabled if the following sequence is sent on Vehicle CAN:

- 1) Request on message <SSM ID request>: 0x1F 0x0D 0xE6 0xEA 0xBA Response: <SSM ID response> 0x7F 0x1F 0x00
- 2) Request on message <SSM ID request>: 0x22 0xF1 0x0A
if XCP enable procedure is successful, Response: <SSM ID response> 0x62 0xF1 0x0A 0x00
if XCP enable procedure is not successful, Response: <SSM ID response> 0x62 0x7F 0x31 0x00

The L3_SW_3569 requirement of old XCP Enable procedure shall be removed since SW 04.00.00.

Test criteria: It's need to confirm the procedure is removed by SW Req Test. XCP shall not be enabled.
SID22 D1DF10A is not supported. (NRC will be responded)

XCP Disable procedure

XCP protocol shall be disabled if the following sequence is sent on Vehicle CAN:

- 1) Request on message <SSM ID request>: 0x1F 0x0D 0xE6 0xEA 0xBA Response: 0x74A 0x7F 0x1F 0x11
- 2) Request on message 0x742: 0x22 0xF1 0x0D
if XCP Disable procedure is successful, Response: 0x74A 0x62 0xF1 0x0D 0x00
if XCP Disable procedure is not successful, Response: 0x74A 0x62 0x7F 0x31 0x00

The L3_SW_3470 requirement of old XCP Disable procedure shall be removed since SW 04.00.00.

Test criteria: It's need to confirm the procedure is removed by SW Req Test. XCP shall not be disabled.
SID22 D1DF10D is not supported. (NRC will be responded)

XCP disabling for sample delivery to customer

XCP shall be disabled before sample delivery to customer.

Cyber Security

Security and Privacy requirements

Random Number

General Properties

The component shall use the output of a true random number generation (TRNG) for seeding a pseudo/deterministic RNG.

The ECU shall initialize the PRNG during start up.

For all C&R authentication mechanisms using the output from the PRNG, the challenge (ie., the random number) shall be

A random number being the all-zero bitstring shall be discarded.

A random number being the all-one bitstring shall be discarded.

If a random number is equivalent to the previously generated random number, it shall be discarded.

The PRNG shall generate random number of at least *length* bits.

Generated Random number length = 128 bits

Evaluation and Certification

The RNG shall pass statistical tests [*test_id*] as defined in [KS11].

Note:

SRR320TAD2 = T1, T2, T3, T4, T5

Secret Information Management and Deployment

Secret and Security-relevant Information Management Implementation

When processing secret information (e.g., symm. keys), the component shall ensure its confidentiality, e.g., by encrypting

When processing secret and security-relevant information (e.g., symm. keys, certificates), the component shall ensure its

When processing secret and security-relevant information (e.g., symm. keys, certificates), the component shall ensure its
The component shall use original secret information if update of secret information was not successful (e.g. power failure)

Key and Certificate Management: General Requirements

The component shall support different keys for different purposes.

Remark : Some of them may be specified by OEM.

Note :

*"Key for software encryption/decryption" is used for Reprogramming sequence.

Secret Information Distribution

For the tool authentication between the reprogramming tool and the component to be rewritten, a KEY value shall be calculated.

AES-128 in ECB mode shall be used as encryption algorithm

As seed a 128 bit random-number shall be used.

Secure Debug Interfaces (SecDeb)

All debug interfaces that are unused in field operation or that are requested by the customer shall be disabled/locked.

SW Scope : API for disabling/locking the XCP

The system product's MTSI external debug interface's output shall be disabled in the field before shipping it to the OEM.

SW Scope : API for disabling/locking the MTSI.

Note:

SRR320SU85: Default value of MTSI shall be OFF for production SW.

Secure Diagnostic Interfaces (SecDia)

All diagnostic interfaces/jobs that are unused in field operation or that are requested by the customer to be disabled/locked.

Component shall wait for at least [*min_time*], After [*num*] failed authentication attempts, before the next diagnostic unlock.

Note:

SRR320SU85: attempts = 2, min_time = 6 sec.

After Every power cycle keep the ECU locked(security access locked)

Note :To unlock ECU in same IG cycle, security service should be executed.

Bootloader: Security Level1

The challenge/response mechanism shall use a symmetric algorithm to encrypt/decrypt the response.

Note:

SRR320SU85 : AES-128 ECB shall be used.

The length of the challenge(seed) shall be 128 bits long.

Use the hard-coded value, from Bootloader, for the challenge/response mechanism.

Info : SRR320SU85 : The Reprogramming common key (for tool authentication) shall be used.

Software Update

The SW shall be decrypted before being written.

Note:

SRR320SU85 : AES 128 CBC mode

The downloaded SW shall be decrypted and then verified.

The key for decrypting the SW shall be hard-coded into the bootloader.

Note: "Key for software encryption/decryption"

The system product shall verify all SW which is downloaded into the product system during a programming session.

~~Note : The downloaded SW shall be verified with AES 128 CMAC algorithm.~~

Note : The downloaded SW shall be verified with the Digital Signature (RSASSA-PKCS1_v1_5) algorithm.

The flash bootloader (flashloader) shall not allow to overwrite the flashloader's own memory area.

The component shall ensure that only OEM reprogramming tool can be flashed, that has been verified and signed by the

Note: SRR320SU85 : SSM5 (SUBARU Select Monitor 5)

Secure coding

The software shall be developed according to ADAS SW Process

Note : MISRA-C: 2012 and MISRA-C: 2012 Amendment 1 guidelines.

see {LINK title="https://processcenter.auto.contiwan.com/pkit/go/pelement.do?id=4404145&type=Activity" uri=https://proc

The software's conformity to the coding guidelines shall be checked by an automatic code checker, e.g., QAC.

Fuzz Testing

The component's [interface] shall be tested for [time] with [tool].

Note: Interface = CAN and CAN FD, time = minimum 8 hours, tool = CANoe (raw data signal layer fuzz test)

SW -Technical Security Architecture

SW Architecture with Hardware Security Module

To ensure Security the generic SW architecture shall follow AUTOSAR [version].

Note :

SRR320SU85 : version = 4.3

Functions which are not specified and agreed with the customer shall be removed.

User Customization

General Customization details

Driving Functions (BSD,LCA, RCTA and DOW) can be enabled or disabled by APAR settings and customization user swi

Priority of Customization Function execution:

"Customization RCR Reset Operation" will have the highest priority among all other customization function. When there

Towing (**ID: 3013522**) > SRVD(**ID:3013531**) > BSD/LCA _E and BSD/LCA _A

Towing > SRVD > CH1 BSD/LCA (**ID: 3013875**) > BSD/LCA 2nd Buzzer (**ID: 3013880**)

Towing > SRVD > RCTA (**ID:3051108**)

Towing > SRVD > DoW (**ID: 3051266**) > DoW Shift pos (**ID: 3051280**)

Note:

BSD/LCA_E related CAN output signals are below, Here 'E' stands for "Emergency lane keep assist (ELKA)"

{TABLE id=_1738259329112}

BSD/LCA_A related CAN output signals are below, here 'A' stands for "Autonomous Emergency Steering (AES)"

{TABLE id=_1738259329113}

CH1 BSD/LCA related CAN signals are below, here CH1 is SRVD specific warning output signals

{TABLE id=_1738259329114}

CAN RX input Processing (Display Operation)

When any of the below signal value changed from '0' to '1'(Rising edge) (Event occurred on Display(Other node)) .

For any of the below CAN Rx input signal, consider 200ms as a single event from 1st rising edge. Once event occurred (

1) CCU6A8_2_0_SRVD_SET

2)CCU6A8_3_2_BSD_LCA_SET

3) CCU6A8_2_2_BSD_LCA_2ND_ALERT_SET

4) CCU6A8_2_4_RCTA_SET

5) CCU6A8_2_6_DOW_SET

6) CCU6A8_3_0_DOW_VALID_SHIFT_POS

7)CCU6A8_1_6_RCR_CSTM_RESET_REQ

Example for CAN input signal processing

{IMAGE id=3012982 title="CAN_input.jpg" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_7QVPoM

Note:

1. Only '0' to '1' (Rising edge) is valid input all other transitions (Ex: '1' to '2' or '2' to '3' and etc..) are **invalid** inputs.

Customization Function Inputs - Application Parameter Variables for Customization

Following parameters need to be prepared for this function.

LastEna_SRVD	APAR Last memory enable-SRVD
FuncEna_BSDLCA	APAR Function enable-BSD/LCA
CustEna_BSDLCA	APAR Customize enable-BSD/LCA
LastEna_BSDLCA	APAR Last memory enable-BSD/LCA
FuncEna_BSDLCABuz	APAR Function enable-BSD/LCA_2nd_Buzzer
CustEna_BSDLCABuz	APAR Customize enable-BSD/LCA_2nd_Buzzer
LastEna_BSDLCABuz	APAR Last memory enable-BSD/LCA_2nd_Buzzer
FuncEna_RCTA	APAR Function enable-RCTA
CustEna_RCTA	APAR Customize enable-RCTA & FuncEna_RCTA
LastEna_RCTA	APAR Last memory enable-RCTA & CustEna_RCTA
FuncEna_DOW	APAR Function enable-DOW
LastEna_DOW	APAR Last memory enable-DOW
CustEna_DOW	APAR Customize enable-DOW
LastEna_DOWSP	APAR Last memory enable-DOW_Shift_Pos
CustEna_DOWSP	APAR Customize enable-DOW_Shift_Pos
FuncEna_TOW	APAR Function enable-TOWING
FuncEna_Reset	APAR Function enable-Custmize Reset

Test Interfaces:

Function Enable Variables

Cstmz_FuncEna.FuncEna_TOW
Cstmz_FuncEna.FuncEna_BSDLCA
Cstmz_FuncEna.FuncEna_BSDLCABuz
Cstmz_FuncEna.FuncEna_RCTA
Cstmz_FuncEna.FuncEna_DOW
Cstmz_FuncEna.FuncEna_Reset

LastEnable Variables

Cstmz_LastEna.LastEna_SRVD
Cstmz_LastEna.LastEna_BSDLCA
Cstmz_LastEna.LastEna_BSDLCABuz
Cstmz_LastEna.LastEna_RCTA
Cstmz_LastEna.LastEna_DOW
Cstmz_LastEna.LastEna_DOWSP

Customization Enable Variables

Cstmz_CustEna.CustEna_BSDLCA
Cstmz_CustEna.CustEna_BSDLCABuz
Cstmz_CustEna.CustEna_RCTA
Cstmz_CustEna.CustEna_DOW
Cstmz_CustEna.CustEna_DOWSP

If FuncEna_*** is 0

CustEna_*** shall be 0

If CustEna_*** is 0

LastEna_*** shall be 0

Internal Customization memory flags:

Following flags needs to be prepared for the Customization state transition at each IGN start

Flag Cstmz_SRVD	internal customize memory-SRVD
Flag Cstmz_BSDLCA	internal customize memory-BSD/LCA
Flag Cstmz_BSDLCABuz	internal customize memory-BSD/LCA_2nd_Buzzer
Flag Cstmz_RCTA	internal customize memory-RCTA
Flag Cstmz_DOW	internal customize memory-DOW
Flag Cstmz_DOWSP	internal customize memory-DOW_SFT_POS
Flag Cstmz_TOW	internal customize memory-TOWING

These Customization flags needs to be stored in NVM for every value change. (Except for Cstmz_TOW)

Test Interfaces:

Cstmz_Flags.Cstmz_SRVD
Cstmz_Flags.Cstmz_BSDLCA
Cstmz_Flags.Cstmz_BSDLCABuz
Cstmz_Flags.Cstmz_RCTA
Cstmz_Flags.Cstmz_DOW
Cstmz_Flags.Cstmz_DOWSP
Cstmz_Flags.Cstmz_TOW

Internal Customization NVM Block details - NVM ROM Default values

NVM Block details:

{TABLE id=_1738431882007}

{TABLE id=_1738431882008}

For the very first IGN cycle from the factory, these NVM ROM default values will be used for the internal customization transition. From the next IGN cycle NVM RAM memorized values will be used for the internal customization transition (When its LastIgnCycle is 0). NVM ROM Default values for each of the customization flags are defined below

Cstmz_SRVD =1
Cstmz_BSDLCA =1
Cstmz_BSDLCABuz =1
Cstmz_RCTA =1
Cstmz_DOW =1
Cstmz_DOWSP=0

Customization Output - With or without display CAN output Signal list:

These CAN output signals are relates to display the Customization availability in Display Panel (Other node in the Vehicle)

RDR228_1_4_CSTM_DSP_BSD_LCA

RDR228_2_2_CSTM_DSP_DOW_SFT_POS

RDR228_2_0_CSTM_DSP_DOW

RDR228_3_7_CSTM_DSP_RCTA

RDR228_3_6_CSTM_DSP_BSD_LCA_2ND

Customization Output - Display ON/OFF CAN output signal list:

These CAN output signals are relates to display the Customization ON/OFF status on the Display Panel (Other node in the

RDR228_3_5_CSTM_STS_TOWING

RDR228_2_6_ON_OFF_RDRSYS – SRVD Customization ON/OFF status

RDR228_3_4_CSTM_STS_BSD_LCA

RDR228_4_6_CSTM_STS_BSD_LCA_2ND

RDR228_4_7_CSTM_STS_RCTA

RDR228_3_2_CSTM_STS_DOW

RDR228_3_3_CSTM_STS_DOW_SFT_POS

Customization Output - Gray control CAN output signal list:

These CAN output signals are relates to the gray out of the Customization function on the Display Panel (Other Node in the

RDR228_1_5_CSTM_GLO_1 - BSD/LCA, RCTA, DOW are targets

RDR228_1_7_CSTM_GLO_2 - DOW shift position is target

RDR228_1_6_CSTM_GLO_3 - BSD/LCA2nd Buzzer is target

Customization Output - Warning CAN output Signal list:

Following Cstmz_***_Warn_Flag variables will be defined based on its customization function.

These flag's shall be used as pre condition for enabling (1) or disabling (0) respective driving function warning

1. Cstmz_BSDLCA_Warn_Flag

Above flag should be considered for below CAN output signals

RDR228_6_1_WARN_BSD_L_1ST

RDR228_6_0_WARN_BSD_R_1ST

RDR228_7_3_WARN_LCA_L_1ST

RDR228_7_2_WARN_LCA_R_1ST

RDR228_6_3_WARN_BSD_L_2ND

RDR228_6_2_WARN_BSD_R_2ND

RDR228_7_5_WARN_LCA_L_2ND

RDR228_7_4_WARN_LCA_R_2ND

2. Cstmz_BSDLCA_A_E_Warn_Flag

Above flag should be considered for below CAN output signals

RDR228_5_0_BSD_R_E

RDR228_5_1_BSD_L_E

RDR228_5_2_LCA_R_E

RDR228_5_3_LCA_L_E

RDR228_5_4_BSD_R_A

RDR228_5_5_BSD_L_A

RDR228_5_6_LCA_R_A

RDR228_5_7_LCA_L_A

3. Cstmz_BSDLCABuz_Warn_Flag

Above flag should be considered for below CAN output signals

RDR228_3_1_WARN_BSD_LCA_L_2ND

RDR228_3_0_WARN_BSD_LCA_R_2ND

4. Cstmz_RCTA_Warn_Flag

Above flag should be considered for below CAN output signals

RDR228_7_7_WARN_RCTA_L

RDR228_7_6_WARN_RCTA_R

5. Cstmz_DOW_Warn_Flag

Above flag should be considered for below CAN output signals

RDR228_4_4_WARN_DOW_2ND_L
RDR228_4_3_WARN_DOW_2ND_R
RDR228_4_2_WARN_DOW_1ST_L
RDR228_4_1_WARN_DOW_1ST_R

Test Interfaces:

Cstmz_Warn.Cstmz_BSDLCA_Warn_Flag
Cstmz_Warn.Cstmz_BSDLCA_A_E_Warn_Flag
Cstmz_Warn.Cstmz_BSDLCABuz_Warn_Flag
Cstmz_Warn.Cstmz_RCTA_Warn_Flag
Cstmz_Warn.Cstmz_DOW_Warn_Flag

Note: Refer Requirement 3235911 for above above RDR228 Signal processing requirement

Driving function output - Customization Warn flag output relation

If (Cstmz_***_Warn_Flag == 0)

Update Respective driving function CAN Warning output to OFF

Update Respective driving function HMI output to OFF

Else

Follow the Actual Driving function warning output (For both CAN and HMI) requirement

Customization RCR Reset Operation

AND \neg FuncEna_Reset == 1

└ CAN Rx input signal "CCU6A8_1_6_RCR_CSTM_RESET_REQ" 0 -> 1 (Raising edge - Refer ID: 30119

When above conditions are satisfied, Update RCR Reset default values as below (Internal customization data, Customiza

Internal Customization state:

Cstmz_SRVD =1

Cstmz_BSDLCA =1

Cstmz_BSDLCABuz =1

Cstmz_RCTA =1

Cstmz_DOW =1

Cstmz_DOWSP=0

Customization Gray Control output :

RDR228_1_5_CSTM_GLO_1 = 0

RDR228_1_7_CSTM_GLO_2 = 0

RDR228_1_6_CSTM_GLO_3 = 0

Customization State Display Output :

RDR228_2_6_ON_OFF_RDRSYS = 1

RDR228_3_4_CSTM_STS_BSD_LCA = 1

RDR228_4_6_CSTM_STS_BSD_LCA_2ND = 1

RDR228_4_7_CSTM_STS_RCTA = 1

RDR228_3_2_CSTM_STS_DOW = 1

RDR228_3_3_CSTM_STS_DOW_SFT_POS = 0

Warning Flag output:

Cstmz_BSDLCA_Warn_Flag = 1

Cstmz_BSDLCA_A_E_Warn_Flag=1

Cstmz_BSDLCABuz_Warn_Flag = 1

Cstmz_RCTA_Warn_Flag = 1

Cstmz_DOW_Warn_Flag = 1

Note:

In case FuncEna_** of individual customization function is '0' then priority will go to individual function requirement (FuncEna_*

When Func_Ena_*** is '0' and if there is RCR_Reset operation then the values should retain as per func_Ena_** requirem

When FuncEna_Reset == 0

Customization RCR reset operation should not work even there is rising edge on "CCU6A8_1_6_RCR_CSTM_RESET_REQ"

There should not be impact on the any customization function output.

Note: No specific implementation required for this condition

Customization Towing (Cstmz_TOW) Function

When FuncEna_TOW == 0

set Cstmz_TOW = 0 (OFF)

Enable TOW at run time

If FuncEna_TOW == 1 and CECU_x_x_TOWING_SET == 1

Set Cstmz_TOW to '1'

***NA for KD1.5 (CECU_x_x_TOWING_SET is not defined in CAN spec**

Pending requirement from Customer)

Disable TOW at run time

If FuncEna_TOW == 0 or CECU_x_x_TOWING_SET == 0

Set Cstmz_TOW to '0'

***NA for KD1.5 (CECU_x_x_TOWING_SET is not defined in CAN spec
Pending requirement from Customer)**

When Cstmz_TOW == 1 (ON)

Refer the SRVD customization requirement **ID: 3013536**

***NA for KD1.5 (CECU_x_x_TOWING_SET is not defined in CAN spec
Pending requirement from Customer)**

When Cstmz_TOW == 0 (OFF)

Refer the SRVD customization requirement **ID: 3013537**

Update Output CAN signal "RDR228_3_5_CSTM_STS_TOWING"

RDR228_3_5_CSTM_STS_TOWING = Cstmz_TOW

Customization SRVD (Cstmz_SRVD) Function

At IG-ON

If LastEna_SRVD is '1'

Cstmz_SRVD = NvM_s_RamAddr_Customization.Cstmz_SRVD_NVM

Else

Cstmz_SRVD = 1 (ON)

Enable(1) SRVD at run time

AND \neg Cstmz_TOW == 0 (OFF)

└ Cstmz_SRVD == 0 (OFF)

└ CCU6A8_2_0_SRVD_SET == 0 ->1 (Raising edge - Refer **ID: 3011911**)

When above conditions are satisfied then update Cstmz_SRVD = 1 (ON)

Disable(0) SRVD at run time

AND \neg Cstmz_TOW == 0 (OFF)

└ Cstmz_SRVD == 1 (ON)

└ CCU6A8_2_0_SRVD_SET == 0 ->1 (Raising edge - Refer **ID: 3011911**)

When above conditions are satisfied then update Cstmz_SRVD = 0 (OFF)

Customization output values when Towing Active or SRVD Disable

1. OR \neg (Cstmz_TOW == 1)
 └ (Cstmz_SRVD == 0)

When above conditions are satisfied update the CAN output as below

RDR228_2_6_ON_OFF_RDRSYS = 0

RDR228_1_5_CSTM_GLO_1 = 1

RDR228_1_7_CSTM_GLO_2 = 1

RDR228_1_6_CSTM_GLO_3 = 1

RDR228_3_4_CSTM_STS_BSD_LCA = 0

RDR228_4_6_CSTM_STS_BSD_LCA_2ND = 0

RDR228_4_7_CSTM_STS_RCTA = 0

RDR228_3_2_CSTM_STS_DOW = 0

RDR228_3_3_CSTM_STS_DOW_SFT_POS = 0

Cstmz_BSDLCA_A_E_Warn_Flag = 0

Cstmz_BSDLCA_Warn_Flag = 0

Cstmz_BSDLCABuz_Warn_Flag = 0

Cstmz_RCTA_Warn_Flag = 0

Cstmz_DOW_Warn_Flag = 0

Note for Testing the CAN Signal priority:

Please check the Priority of the requirements defined for all the RDR228 CAN signal in the requirement 3235911.

Note:

1. When Towing is active or SRVD is disabled, the values for internal customization state flags should not be impacted (N
2. BSD/LCA_E and BSD/LCA_A related CAN warning output signals does not have its function customization, these warn

Note for KD#1.5: Here, Towing is always OFF by FuncEna_TOW = 0 in KD#1.5 and this requirement can be tested by m

Customization CAN output and Warning output flag update:

Condition 1: $\text{AND}_{\top} (\text{Cstmz_TOW} == 0)$

└ (Cstmz_SRVD == 1)

When condition:1 satisfied update CAN signal output and Warning flags as below.

RDR228_2_6_ON_OFF_RDRSYS = 1

Cstmz_BSDLCA_A_E_Warn_Flag = 1

RDR228_1_5_CSTM_GLO_1 = 0

Condition 2: $\text{AND}_{\top} (\text{Cstmz_TOW} == 0)$

└ (Cstmz_SRVD == 1)

└ FuncEna_*** = 1 (** stands for BSD/LCA, BSDLCA_Buz, RCTA and DoW)

└ CustEna_*** = 0 (** stands for BSD/LCA, BSDLCA_Buz, RCTA and DoW)

When condition:2 satisfied update the customization Warning output flags as below.

Cstmz_****_Warn_Flag = 1 (** stands for BSD/LCA, BSDLCA_Buz, RCTA and DoW)

Condition 3: $\text{AND}_{\top} (\text{Cstmz_TOW} == 0)$

└ (Cstmz_SRVD == 1)

└ FuncEna_*** = 1 (** stands for BSD/LCA, BSDLCA_Buz, RCTA and DoW)

└ CustEna_*** = 1 (** stands for BSD/LCA, BSDLCA_Buz, RCTA and DoW)

When condition:3 satisfied, the other customization function output will be defined based on its internal customization status

Cstmz_BSDLCA -> Refer BSD/LCA customization requirement ID 3013882 and 3013885

Cstmz_BSDLCABuz -> Refer BSD/LCA 2nd Buzzer customization requirements ID 3043189 and 3043262

Cstmz_RCTA -> Refer RCTA customization requirements ID: 3051112 and 3051114

Cstmz_DOW -> Refer DoW customization requirements ID: 3051270 and 3051274

LCA/BSD(CH1) Customization (Cstmz_BSDLCA) Function

At IGN On

When FuncEna_BSDLCA is '1'

{

If (LastEna_BSDLCA == 1)

Cstmz_BSDLCA = NvM_s_RamAddr_Customization.Cstmz_BSDLCA_NVM

Else

Cstmz_BSDLCA = 1

}

When FuncEna_BSDLCA is '0' then set Cstmz_BSDLCA = 0

Enable Cstmz_BSDLCA at Runtime

AND \neg FuncEna_BSDLCA =1
└ CustEna_BSDLCA=1
└ Cusmz_TOW = 0
└ Cstmz_SRVD =1
└ Cstmz_BSDLCA =0
└ CCU6A8_3_2_BSD_LCA_SET =0→1 (Raising edge - Refer **ID:** 3011911)

If above conditions are satisfied

update Cstmz_BSDLCA = 1

RDR228_3_4_CSTM_STS_BSD_LCA =1
RDR228_1_6_CSTM_GLO_3 =0
Cstmz_BSDLCA_Warn_Flag =1

Note: Other Customization function flag output and CAN signal output shall keep the previous values (Should

Disable Cstmz_BSDLCA at Runtime

AND \neg FuncEna_BSDLCA =1
└ CustEna_BSDLCA=1
└ Cstmz_TOW = 0
└ Cstmz_SRVD =1
└ Cstmz_BSDLCA =1
└ CCU6A8_3_2_BSD_LCA_SET = 0→1 (Raising edge - Refer **ID:** 3011911)

If Above conditions are met

Update Cstmz_BSDLCA = 0

RDR228_3_4_CSTM_STS_BSD_LCA = 0
RDR228_1_6_CSTM_GLO_3 = 1
Cstmz_BSDLCA_Warn_Flag = 0
Cstmz_BSDLCABuz_Warn_Flag = 0

Note: Other Customization function flag output and CAN signal output shall keep the previous values (Should

When (FuncEna_BSDLCA = 0)

Update below CAN output signal and flag values

1. Customization internal state: Set Cstmz_BSDLCA = 0
2. Customization Display CAN output : RDR228_1_4_CSTM_DSP_BSD_LCA = 0
3. Customization Display ON/OFF status CAN output: RDR228_3_4_CSTM_STS_BSD_LCA = 0
4. Display Gray out CAN output : RDR228_1_6_CSTM_GLO_3 = 0
5. Warning flag out put flag: Cstmz_BSDLCA_Warn_Flag = 0

Note: Other Customization function flag output and CAN signal output shall keep the previous values (Should not change)

Note for Testing the CAN Signal priority:

Please check the Priority of the requirements defined for all the RDR228 CAN signal in the requirement 3235911.

Condition: AND \neg FuncEna_BSDLCA = 1
 \neg CustEna_BSDLCA = 0

When above conditions are satisfied update below values

1. Customization internal state: Set Cstmz_BSDLCA = 1
2. Customization Display ON/OFF status CAN output: RDR228_3_4_CSTM_STS_BSD_LCA = 0
3. Display Gray out CAN output : RDR228_1_6_CSTM_GLO_3 = 0
4. Warning flag out put flag: Cstmz_BSDLCA_Warn_Flag : When CustEna_BSDLCA is '0', Warning flag output shall be set to 1

Note:

1. Other Customization function flag output and CAN signal output shall keep the previous values (Should not change)
2. In this Case, "Cstmz_BSDLCA = 1" will not be used for Customization Status output and Warning output. Customer in this case shall not use the Customization Status output and Warning output.

BSD/LCA2nd Buzzer Customization function output dependency with BSD/LCA(CH1) Customization function

If (RDR228_3_4_CSTM_STS_BSD_LCA == 0)

RDR228_4_6_CSTM_STS_BSD_LCA_2ND = 0

Else

Can output "RDR228_4_6_CSTM_STS_BSD_LCA_2ND" and "Cstmz_BSDLCABuz_Warn_Flag" value shall be set to 1

Update Output CAN signal RDR228_1_4_CSTM_DSP_BSD_LCA

RDR228_1_4_CSTM_DSP_BSD_LCA = CustEna_BSDLCA

BSD/LCA2nd Buzzer Customization (Cstmz_BSDLCABuz) Function

At IGN On

When FuncEna_BSDLCABuz is '1'

{

If (LastEna_BSDLCABuz == 1)

Cstmz_BSDLCABuz = NvM_s_RamAddr_Customization.Cstmz_BSDLCABuz_NVM

Else

Cstmz_BSDLCABuz = 1

}

When FuncEna_BSDLCABuz is '0' then set Cstmz_BSDLCABuz =0

Enable Cstmz_BSDLCABuz at Runtime

AND \neg FuncEna_BSDLCABuz =1
└ CustEna_BSDLCABuz =1
└ Cusmz_TOW = 0
└ Cstmz_SRVD =1
└ Cstmz_BSDLCA =1
└ Cstmz_BSDLCABuz =0
└ CCU6A8_2_2_BSD_LCA_2ND_ALERT_SET = 0→1 (Raising edge - Refer **ID:** 3011911)

If above conditions are satisfied

update Cstmz_BSDLCABuz = 1

RDR228_4_6_CSTM_STS_BSD_LCA_2ND = 1

Cstmz_BSDLCABuz_Warn_Flag =1

Note: Other Customization function flag output and CAN signal output shall keep the previous values (Should

Disable Cstmz_BSDLCABuz at Runtime

AND \neg FuncEna_BSDLCABuz =1
└ CustEna_BSDLCABuz =1
└ Cusmz_TOW = 0
└ Cstmz_SRVD =1
└ Cstmz_BSDLCA =1
└ Cstmz_BSDLCABuz =1
└ CCU6A8_2_2_BSD_LCA_2ND_ALERT_SET = 0→1 (Raising edge - Refer **ID:** 3011911)

If above conditions are satisfied

update Cstmz_BSDLCABuz = 0

RDR228_4_6_CSTM_STS_BSD_LCA_2ND = 0

Cstmz_BSDLCABuz_Warn_Flag = 0

Note: Other Customization function flag output and CAN signal output shall keep the previous values (Should

When (FuncEna_BSDLCABuz = 0)

Update below CAN output signal and flag values

1. Customization internal state: Set Cstmz_BSDLCABuz = 0
2. Customization Display CAN output : RDR228_3_6_CSTM_DSP_BSD_LCA_2ND = 0
3. Customization Display ON/OFF status CAN output: RDR228_4_6_CSTM_STS_BSD_LCA_2ND = 0
4. Warning flag out put flag: Cstmz_BSDLCABuz_Warn_Flag = 0

Note: Other Customization function flag output and CAN signal output shall keep the previous values (Should not change)

Note for Testing the CAN Signal priority:

Please check the Priority of the requirements defined for all the RDR228 CAN signal in the requirement **3235911**.

Condition: AND \neg FuncEna_BSDLCABuz = 1

└ CustEna_BSDLCABuz = 0

When above conditions are satisfied update below values

1. Customization internal state: Set Cstmz_BSDLCABuz = 1
2. Customization Display ON/OFF status CAN output: RDR228_4_6_CSTM_STS_BSD_LCA_2ND = 0
3. Warning flag out put flag: Cstmz_BSDLCABuz_Warn_Flag : When CustEna_BSDLCABuz is '0', Warning flag output shall be set to 1

Note:

1. Other Customization function flag output and CAN signal output shall keep the previous values (Should not change)
2. In this Case, "Cstmz_BSDLCABuz = 1" will not be used for Customization Status output and Warning output. Customization Status output and Warning output shall be set to 0

Update Output CAN signal RDR228_3_6_CSTM_DSP_BSD_LCA_2ND

RDR228_3_6_CSTM_DSP_BSD_LCA_2ND = CustEna_BSDLCABuz

RCTA Customization (Cstmz_RCTA) Function

At IGN On

When FuncEna_RCTA = 1

{

If (LastEna_RCTA == 1)

Cstmz_RCTA = NvM_s_RamAddr_Customization.Cstmz_RCTA_NVM

Else

Cstmz_RCTA = 1

}

When FuncEna_RCTA is '0' then Set Cstmz_RCTA = 0

Enable Cstmz_RCTA at Runtime

AND \neg FuncEna_RCTA = 1
 \vdash CustEna_RCTA = 1
 \vdash Cusmz_TOW = 0
 \vdash Cstmz_SRVD = 1
 \vdash Cstmz_RCTA = 0
 \vdash CCU6A8_2_4_RCTA_SET = 0 \rightarrow 1 (Raising edge - Refer **ID:** 3011911)

If above conditions are satisfied

update Cstmz_RCTA = 1

RDR228_4_7_CSTM_STS_RCTA = 1

Cstmz_RCTA_Warn_Flag = 1

Note: Other Customization function flag output and CAN signal output shall keep the previous values (Should

Disable Cstmz_RCTA at Runtime

AND \neg FuncEna_RCTA = 1
 \vdash CustEna_RCTA = 1
 \vdash Cusmz_TOW = 0
 \vdash Cstmz_SRVD = 1
 \vdash Cstmz_RCTA = 1
 \vdash CCU6A8_2_4_RCTA_SET = 0 \rightarrow 1 (Raising edge - Refer **ID:** 3011911)

If above conditions are satisfied

update Cstmz_RCTA = 0

RDR228_4_7_CSTM_STS_RCTA = 0

Cstmz_RCTA_Warn_Flag = 0

Note: Other Customization function flag output and CAN signal output shall keep the previous values (Should

When (FuncEna_RCTA = 0)

Update below CAN output signal and flag values

1. Customization internal state: Set Cstmz_RCTA = 0
2. Customization Display CAN output : CAN signal RDR228_3_7_CSTM_DSP_RCTA = 0
3. Customization Display ON/OFF status CAN output: RDR228_4_7_CSTM_STS_RCTA = 0
4. Warning flag out put flag: Cstmz_RCTA_Warn_Flag = 0

Note: Other Customization function flag output and CAN signal output shall keep the previous values (Should

Note for Testing the CAN Signal priority:

Please check the Priority of the requirements defined for all the RDR228 CAN signal in the requirement 3235911.

Condition: AND \neg FuncEna_RCTA =1
 \hookrightarrow CustEna_RCTA =0

When above conditions are satisfied update below values

1. Customization internal state: Set Cstmz_RCTA = 1
2. Customization Display ON/OFF status CAN output: RDR228_4_7_CSTM_STS_RCTA = 0
3. Warning flag out put flag: Cstmz_RCTA_Warn_Flag : When CustEna_RCTA is '0', Warning flag output

Note:

1. Other Customization function flag output and CAN signal output shall keep the previous values (Should not)
2. In this Case, "Cstmz_RCTA = 1" will not be used for Customization Status output and Warning output. Customer int

Update Output CAN signal RDR228_3_7_CSTM_DSP_RCTA

RDR228_3_7_CSTM_DSP_RCTA = CustEna_RCTA

DOW Customization (Cstmz_DOW) Function

At IGN On

When FuncEna_DOW =1

{

If (LastEna_DOW == 1)

Cstmz_DOW = NvM_s_RamAddr_Customization.Cstmz_DOW_NVM

Else

Cstmz_DOW = 1

}

When FuncEna_DOW = '0' then Cstmz_DOW = 0

Enable Cstmz_DOW at Runtime

AND \neg FuncEna_DOW =1

\vdash CustEna_DOW =1

\vdash Cusmz_TOW = 0

\vdash Cstmz_SRVD =1

\vdash Cstmz_DOW =0

\hookrightarrow CCU6A8_2_6_DOW_SET = 0 \rightarrow 1 (Raising edge - Refer **ID:** 3011911)

If above conditions are satisfied

update Cstmz_DOW = 1

 RDR228_3_2_CSTM_STS_DOW = 1

 Cstmz_DOW_Warn_Flag =1

 RDR228_1_7_CSTM_GLO_2 =0

Note:

1. Other Customization function flag output and CAN signal output shall keep the previous values (Should not)

Disable Cstmz_DOW at Runtime

AND \neg FuncEna_DOW = 1
└─ CustEna_DOW = 1
└─ Cusmz_TOW = 0
└─ Cstmz_SRVD = 1
└─ Cstmz_DOW = 1
└─ CCU6A8_2_6_DOW_SET = 0 \rightarrow 1 (Raising edge - Refer **ID:** 3011911)

If above conditions are satisfied

update Cstmz_DOW = 0

RDR228_3_2_CSTM_STS_DOW = 0

Cstmz_DOW_Warn_Flag = 0

RDR228_1_7_CSTM_GLO_2 = 1

Note:

1. Other Customization function flag output and CAN signal output shall keep the previous values (Should not change)

When (FuncEna_DOW = 0)

Update below CAN output signal and flag values

1. Customization internal state: Set Cstmz_DOW = 0
2. Customization Display CAN output : CAN signal RDR228_2_0_CSTM_DSP_DOW = 0
3. Customization Display ON/OFF status CAN output: RDR228_3_2_CSTM_STS_DOW = 0
4. Warning flag out put flag: Cstmz_DOW_Warn_Flag = 0
5. Gray out CAN signal output: RDR228_1_7_CSTM_GLO_2 = 0

Note:

1. Other Customization function flag output and CAN signal output shall keep the previous values (Should not change)

Note for Testing the CAN Signal priority:

Please check the Priority of the requirements defined for all the RDR228 CAN signal in the requirement 3235911.

Condition: AND \neg FuncEna_DOW =1
 └ CustEna_DOW =0

When above conditions are satisfied update below values

1. Customization internal state: Set Cstmz_DOW = 1
2. Customization Display ON/OFF status CAN output: RDR228_3_2_CSTM_STS_DOW = 0
3. Gray out CAN signal output: RDR228_1_7_CSTM_GLO_2 = 0
4. Warning flag output flag: Cstmz_DOW_Warn_Flag : When CustEna_DOW is '0', Warning flag output :

Note:

1. Other Customization function flag output and CAN signal output shall keep the previous values (Should not be updated)
2. In this Case, "Cstmz_DOW = 1" will not be used for Customization Status output and Warning output. Customer internal state shall be updated based on Cstmz_DOW

DoW SFT_POS function output dependency with DoW Customization function

If (RDR228_3_2_CSTM_STS_DOW == 0)

RDR228_3_3_CSTM_STS_DOW_SFT_POS = 0

Else

CAN output "RDR228_3_3_CSTM_STS_DOW_SFT_POS" values shall be updated based on Cstmz_DoW

Update Output CAN signal RDR228_2_0_CSTM_DSP_DOW

RDR228_2_0_CSTM_DSP_DOW = CustEna_DOW

DOW SFT_POS Customization (Cstmz_DOWSP) Function

At IGN On

If (LastEna_DOWSP == 1)

Cstmz_DOWSP = NvM_s_RamAddr_Customization.Cstmz_DOWSP_NVM

Else

Cstmz_DOWSP = 0

Enable Cstmz_DOWSP at Runtime

AND \neg CustEna_DOWSP =1

└ Cusmz_TOW = 0

└ Cstmz_SRVD =1

└ Cstmz_DOW =1

└ Cstmz_DOWSP = 0

└ CCU6A8_3_6_DOW_VALID_SHIFT_POS = 0 → 1 (Raising edge - Refer **ID:** 3011911)

If above conditions are satisfied

update Cstmz_DOWSP = 1

RDR228_3_3_CSTM_STS_DOW_SFT_POS = 1

Note:

1. Other Customization function flag output and CAN signal output shall keep the previous values (Should not

Disable Cstmz_DOWSP at Runtime

AND \neg CustEna_DOWSP = 1

└ Cusmz_TOW = 0

└ Cstmz_SRVD = 1

└ Cstmz_DOW = 1

└ Cstmz_DOWSP = 1

└ CCU6A8_3_6_DOW_VALID_SHIFT_POS = 0 → 1 (Raising edge - Refer **ID:** 3011911)

If above conditions are satisfied

update Cstmz_DOWSP = 0

RDR228_3_3_CSTM_STS_DOW_SFT_POS = 0

Note:

1. Other Customization function flag output and CAN signal output shall keep the previous values (Should not

When (CustEna_DOWSP = 0)

Update below CAN output signal and flag values

1. Customization internal state: Set Cstmz_DOWSP = 0
2. Customization Display CAN output : CAN signal RDR228_2_2_CSTM_DSP_DOW_SFT_POS= 0
3. Customization Display ON/OFF status CAN output: RDR228_3_3_CSTM_STS_DOW_SFT_POS = 0

Note:

1. Other Customization function flag output and CAN signal output shall keep the previous values (Should not

Update Output CAN signal RDR228_2_2_CSTM_DSP_DOW_SFT_POS

RDR228_2_2_CSTM_DSP_DOW_SFT_POS = CustEna_DOW

Customization CAN Output Safe Values, When RCR Fails (DTC or UDMDTC Active)

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

OOL When RCR Fail or Temporary stop

When "DGM_SAFE_COMMUNICATION" or "DGM_LIMITED" is set to '1' in Left or Right then

Both Left (RCR29X) and Right (RCR2Ax) sensors should output the OOL CAN output data as '0'

OOL, DTC and RDR228 Stop signal handling When Towing ON or SRVD OFF

Condition: OR┐ (Cstmz_TOW == 1)
 └ (Cstmz_SRVD == 0)

When above condition satisfied

Both Left (29X) and Right (2Ax) sensors should output the OOL CAN output data as '0'.

RDR228_2_5_STOP_RDRSYS CAN output should be disabled (0)

RDR228_2_7_BLOCKAGE_FORMING CAN output should be disabled (0)

Note:

RDR228_2_5_STOP_RDRSYS and RDR228_2_7_BLOCKAGE_FORMING CAN signal output need not be disabled b

When there is any UDMDTC already active (RDR228_2_5_STOP_RDRSYS =1 and RDR228_2_7_BLOCKAGE_FORM

not be cleared when SRVD changes from OFF ->ON, It will not be cleared in same IG cycle, it will be cleared next IG cycle

As SRVD Switch is memorized, it will disable the DEMs in the very next IG cycle.

Condition: OR┐ (Cstmz_TOW == 1)
 └ (Cstmz_SRVD == 0)

When above condition is satisfied

Auto alignment DTC (B1C7200), Blockage DTC (B1C7100) and Out of temperature (B1C7000) DTC's should be disabled

Condition: OR┐ (Cstmz_TOW == 1)
 └ (Cstmz_SRVD == 0)

When Above condition satisfied

SW should update Algo Interface (ARS620.AlignmentCycle.ALN_ControlDataMeas.opMode) should be updated as AL

APAR - Application Parameters

Application Parameter Table

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

Application parameters for KD#1 event shall be as per below given table:

Reference : The below table is as per AD27仕様変更概要/12_SBR241210.xlsx sheet.

{TABLE id=_1734171366144}

DF - Driving Function Parameters Table

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

OTA - Over The Air

General

OTA requirements are derived from DPK2-23-S023.
Reference documents : DPK2-24-S008, DPSBT-22-S003, DPSBT-22-S004

Glossary

{TABLE id=_1746776092539}

TargetECU Bank Details

CAN IDs for OTA reprogramming

{TABLE id=_1749102610361}

CECU : Central ECU/ Master ECU / Gateway ECU/ Client

Reprogramming data to be handled is only the bin format
1 reprogramming data should be designed as 1 logical block. Address should be continuous for 1 logical block
Fill free space with 0xFF, reprogramming data should have same value

When SPRMIB = false is set in request message and the process is completed successfully, send positive response message.
If there is any error, reply with negative response.

OTA CAMPAIGN

General

Campaign Check sequence: Read out ECU information

{IMAGE id=3228109 title="img-03102246.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_XWIR}

Campaign check Steps

{TABLE id=_1741627932715}

Read HWID : Based on HWID Campaign targets are filtered by Client

Read SWID : Read SWID before executing OTA. SWID will be updated after OTA successfully completed and then we can

STEP 1 : Read out ECU information (HWID)

Message Format

Support Information

{TABLE id=_1741072710664}

Request Message

{TABLE id=_1741067487623}

Target ECU server shall receives and processes request message

Positive Response Message

{TABLE id=_1741067635727}

※ : Refer below requirement for values of dataRecord#1

dataRecord#1 [HWID] is defined in DIAG requirement {LINK id=2514796 title="2514796: DID 0xF102 - HW DID" uri=https

Negative Response Message

{TABLE id=_1741635276954}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_1742190224614}

Note :

Other NRCs related to multiple DIDs request in single request message is DIAG responsible

To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Task to Perform by the Server

General

TargetECU shall Process the request message received as per : {LINK id=3292433 title="3292433: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=32924
wan.com/rm4/resources/BI_xEe0JhXbEfCBZYYpxO_XjA?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mgE

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant
wan.com/rm4/resources/BI_xEe0JhXbEfCBZYYpxO_XjA?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mgE

STEP 2 : Read out ECU information (SWID)
Message Format

Support Information

{TABLE id=_17410727106641513327761418339}

Request Message

{TABLE id=_17410674876231513327800809490}

Target ECU server shall receives and processes request message

Positive Response Message

{TABLE id=_17410676357271513327835474312}

※ : Refer below requirement for values of dataRecord#1

dataRecord#1 [SWID] is defined in DIAG requirement : {LINK id=2514795 title="2514795: DID 0xF101 - SW DID" uri=http

Negative Response Message

{TABLE id=_17416352769541513327877923484}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_17421902246141513328376323913}

Note :

Other NRCs related to multiple DIDs request in single request message is DIAG responsible
To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Task to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3292448 title="3292448: Request Message" ur

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=32924
wan.com/rm4/resources/BI_0RH51RXcEfCBZYYpxO_XjA?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mg

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant
wan.com/rm4/resources/BI_0RH52BXcEfCBZYYpxO_XjA?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mg

INSTALL

General

Install sequence : Download new SW to inactive bank

{IMAGE id=3228126 title="img-03102315.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_esm0

Note : STEP 7 is Write Nonce, it's wrong in above sequence diagram.

Install Steps to be executed in sequence to download new SW through OTA

{TABLE id=_1742877853487}

STEP 1 : Installation Feasibility check
Message Format

Support Information

{TABLE id=_17410727106641513328505271519}

Request Message

{TABLE id=_17410674876231513328543226130}

Target ECU server shall receives and processes request message

Positive Response Message

{TABLE id=_17410676357271513328573925442}

※ : Refer below requirement for values of dataRecord#1 [Install feasibility information]

dataRecord#1 [Install feasibility information] should follow below table

{TABLE id=_1741069193369}

Target ECU shall reply with response message based on [Install feasibility information] judgement table

Negative Response Message

{TABLE id=_17416352769541513328643326138}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_17421902246141513328678683537}

Note :

Other NRCs related to multiple DIDs request in single request message is DIAG responsible
To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3221856 title="3221856: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=3221856 title="3221856: Response Message" u
children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant error code. For example, if the requested message is not supported, the response message should be as follows:
I0pow?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mgBTsRXXEfCBZYYpxO_XjA}{including children)

Functionality

Judgement of {LINK id=3221860 title="3221860: dataRecord#1 [Install feasibility information] should follow below table" u

TBD

Note

Client/Test tool process for Server response

{TABLE id=_1746781176291}

Abnormality/termination process shall be executed for below responses also

- Response to request message is negative response.
- No response for request message (SPRMIB = false)

STEP 2 : Extended Session Transition

Message Format

Support Information

{TABLE id=_1741075188046}

Request Message

{TABLE id=_1741075468274}

Positive Response Message

{TABLE id=_1741076104785}

Negative Response Message

{TABLE id=_17416352769541513328894595852}

※ : Refer below requirement for Supported NRC

Supported NRCs

SID specific NRCs are applicable. Please refer DIAG module(chapter 9.8) for SID 0x10 supported NRCs.

OTA Specific NRC :

0x7E(SubFunctionNotSupportedInActiveSession) : Extended Session Transition request not supported in OTA Session

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3221955 title="3221955: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=32219

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant
I0pow?oslc_config.context=https://jazz.conti.de/gc/configuration/44058}(including children)

Note

Client/Test tool process for Server response

- Positive response : Move to next STEP

Abnormality/termination process shall be executed for below responses

- Response to request message is negative response.
- No response for request message (SPRMIB = false)

STEP 3 : OTA Session Transition

Message Format

Support Information

{TABLE id=_1741077451429}

Request Message

{TABLE id=_1741077196811}

Positive Response Message

{TABLE id=_1741077044088}

Negative Response Message

{TABLE id=_17416352769541513329065837239}

※ : Refer below requirement for Supported NRC

Supported NRCs

SID specific NRCs are applicable. Please refer DIAG module(chapter 9.8) for SID 0x10 supported NRCs.

OTA Specific NRC :

0x7E(SubFunctionNotSupportedInActiveSession) : OTA Session Transition request not supported in Default Session

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3221963 title="3221963: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=32219

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant
l0pow?oslc_config.context=https://jazz.conti.de/gc/configuration/44058}{including children)

Note

Client/Test tool process for Server response

Positive response : Move to next STEP

Abnormality/termination process shall be executed for below responses

- Response to request message is negative response.
- No response for request message(SPRMIB = false)

OTA Session is different from Programming Session.

For OTA Session transition TargetECU control should be continued in Application only.

STEP 4 : Security Access(OTA Session)

Message Format

Support Information

{TABLE id=_1741078011484}

Request SEED [0x31]

Request Message

{TABLE id=_1741078586502}

Positive Response Message

{TABLE id=_1741078789746}

※ : Value depends on SID 27 requirement,

Note : please refer {LINK title="DPK2-24-S008.pdf - Change and Configuration Management" uri=https://jazz-1.automotive.ibm.com/ccm4/web/projects/Radar_SRR630SU17_DM#action=com.ibm.team.scm.browseElement&workspaceItemId=_2A5Y4ODrZfEA&oslc_config.context=https%3A%2F%2Fjazz.conti.de%2Fgc%2Fconfiguration%2F27009} or Diagnostics r

Negative Response Message

{TABLE id=_17416352769541513329221612269}

※ : Refer below requirement for Supported NRC

Supported NRCs

SID specific NRCs are applicable. Please refer DIAG module(chapter 9.8) for SID 0x27 supported NRCs.

OTA Specific NRC :

0x7E(SubFunctionNotSupportedInActiveSession) : SecurityAccess (OTASession) request not supported in Default and E

Send KEY [0x32]

Request Message

{TABLE id=_1741081397849}

※ : Value depends on SID 27 requirement,

Note : please refer {LINK title="DPK2-24-S008.pdf - Change and Configuration Management" uri=https://jazz-1.automotive-wan.com/ccm4/web/projects/Radar_SRR630SU17_DM#action=com.ibm.team.scm.browseElement&workspaceItemId=_A5Y4ODrZfEA&oslc_config.context=https%3A%2F%2Fjazz.conti.de%2Fgc%2Fconfiguration%2F27009} or Diagnostics r

Positive Response Message

{TABLE id=_1741081587416}

Negative Response Message

{TABLE id=_17416352769541513329325225573}

※ : Refer below requirement for Supported NRC

Supported NRCs

SID specific NRCs are applicable. Please refer DIAG module(chapter 9.8) for SID 0x27 supported NRCs.

OTA Specific NRC :

0x7E(SubFunctionNotSupportedInActiveSession) : SecurityAccess (OTASession) request not supported in Default and E

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per below

For Request seed [0x31]: {LINK id=3221966 title="3221966: Request Message" uri=<https://jazz-1.automotive-wan.com/rm>}

For Send Key [0x32]: {LINK id=3222024 title="3222024: Request Message" uri=<https://jazz-1.automotive-wan.com/rm4/re>}

TargetECU shall respond with positive response message after processing the request message as per below

For Request seed [0x31]: {LINK id=3221967 title="3221967: Positive Response Message" uri=https://jazz-1.automotive-wan.com/rm4/res}

For Send Key [0x32]: {LINK id=3222025 title="3222025: Positive Response Message" uri=https://jazz-1.automotive-wan.com/rm4/res}

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant error code

For Request seed [0x31]: {LINK id=3236236 title="3236236: Supported NRCs" uri=https://jazz-1.automotive-wan.com/rm4/res}

For Send Key [0x32]: {LINK id=3236238 title="3236238: Supported NRCs" uri=https://jazz-1.automotive-wan.com/rm4/res}

Functionality

TargetECU shall follow below mentioned scheme to verify and then disable Security access

Encryption/Decryption scheme : AES (Advanced Encryption Standard)

Key Length : 128 (16 bytes)

Mode : ECB (Electronic codebook)

Note

The key value used in the OTA should be set differently from the value used in the Wired Repro

Client/Test tool process for Server response

Positive response : Move to next STEP

Abnormality/termination process shall be executed for below responses

- Response to request message is negative response.
- No response for request message (SPRMIB = false)

STEP 5 : Get Install Information

General

{IMAGE id=3295833 title="img-04132306.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_2a7D

Message Format Support Information

{TABLE id=_1741090137441}

{TABLE id=_1741167532714}

Request Message

{TABLE id=_1741091190240}

※ : Refer below requirement for values of routineControlOption #1 [LogicalBlock No.]

RoutineControlOption #1 [LogicalBlock No.] should follow below table

{TABLE id=_1741091664969}

OTA reprogramming supports only one Logical Block **0x01**

Positive Response Message

{TABLE id=_1741092136759}

※1 : Refer below requirement for routineStatus#1 [Install state] values

※2 : Address where download should start/resume. Address varies for each pause cases.

routineStatus#1 [Install state] values should follow below table

{TABLE id=_1741093987680}

routineStatus#1 [Install state] values should **reset** on below condition

{TABLE id=_1741095127070}

Negative Response Message

{TABLE id=_17416352769541513331879051542}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_1741938040522}

Note : To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3221969 title="3221969: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=3221969 title="3221969: Response Message" u
children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant error code as per : {LINK id=3221969 title="3221969: Response Message" u
l0pow?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mgBTsRXxEfCBZYYpxO_XjA}{including children)

Functionality

Current CONTI TargetECU supported Application Supermot flashing through FOTA. It can be considered as 1 logical block.

TargetECU shall manage install state of each logical block and be able to reply current state no matter when requests come.

Record the MemoryAddress/Remaining size where the writing is completed during download (SID 0x34, 0x36, 0x37)

In the case of suspend/resume, specify the next MemoryAddress of the address at which the write is completed.

If writing is completed, set MemoryAddress value as 0.

MemoryAddress is same with active bank and inactive bank in DualBank unit, have the logic to identify the specified Mem

Note : MemoryAddress which will be same for both the banks which can be referred as virtual address. Virtual address to

Note

Store Install_state in NVM

Client/Test tool process for Server response

{TABLE id=_1746789773556}

Abnormality/termination process shall be executed for below responses also

- Response to request message is negative response.
- No response for request message (SPRMIB = false)

STEP 6 : Write Application SW Fingerprint

Message Format

Support Information

{TABLE id=_1741097131759}

Request Message

{TABLE id=_1741097286973}

※1 : Set within 20 byte and if value is less than Size, pad with 0x00.

※2 : OTA repro. execution year, month, day in “YYYYMMDD” format and set using binary-coded decimal (BCD) represen

Positive Response Message

{TABLE id=_1741097901947}

Negative Response Message

{TABLE id=_17416352769541513332699387408}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_1741947350410}

Note : To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3221972 title="3221972: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=3221972 title="3221972: Response Message" u
children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant details as per : {LINK id=3221972 title="3221972: Response Message" u
I0pow?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mgBTsRXxEfCBZYYpxO_XjA}{including children)

Note

Store Client Serial Number and Reprogramming Date in NVM

Client/Test tool process for Server response

Positive response : Move to next STEP

Abnormality/termination process shall be executed for below responses

- Response to request message is negative response.
- No response for request message (SPRMIB = false)

STEP 7 : Write Nonce(IV)

Message Format

Support Information

{TABLE id=_1741098141858}

SID 22(RDBI) is not supported

Request Message

{TABLE id=_1741098351260}

※ : Nonce value is a random 16 bytes HEX data which is used as IV(initial Vector) for reprogramming data encryption

Positive Response Message

{TABLE id=_1741098817890}

Negative Response Message

{TABLE id=_17416352769541513332948848979}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_1742203427119}

Note : To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3221975 title="3221975: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=3221975 title="3221975: Response Message" u
children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant
wan.com/rm4/resources/BI_IUOLsgMPEfCiJNomsIkDmg?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mgE

Functionality

If there are multiple logical blocks, common nonce data can be used among logical blocks.

Note : Currently we have only 1 logical block

Once data download is completed(SID 0x37) replace Nonce data with all 0x00 or 0xFF

Note

Store Nonce data in NVM

Client/Test tool process for Server response

Positive response : Move to next STEP

Abnormality/termination process shall be executed for below responses

- Response to request message is negative response.
- No response for request message(SPRMIB = false)

STEP 8 : ROM Erase

STEP 8 [A] : Full Erase

Message Format

Support Information

{TABLE id=_1741099182796}

{TABLE id=_1741167582313}

Request Message

{TABLE id=_1741154468700}

※1 : Address where Erase should start.

※2 : Size of logical block to be erased before download [size should be multiple of 4Kb=4096 Bytes, which is minimum er

Positive Response Message

{TABLE id=_1741156072409}

Negative Response Message

{TABLE id=_17416352769541513333247773537}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_17419380405221513333284135491}

Note : To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3221978 title="3221978: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=3221978 title="3221978: Response Message" u
children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant error code as per : {LINK id=3221978 title="3221978: Response Message" u
l0pow?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mgBTsRXxEfCBZYYpxO_XjA}{including children)

Functionality

Erase Inactive bank during this routine request

MemoryAddress is same with active bank and inactive bank in DualBank unit, have the logic to identify the specified MemoryAddress

Note : MemoryAddress which will be same for both the banks which can be referred as virtual address. Virtual address to be used for both the banks

If **activate completed flag**(STEP 19 variable) is set, reset it to default value(0) during routine process.

Note

Client/Test tool process for Server response

Positive response : Move to next STEP

Abnormality/termination process shall be executed for below responses

- Response to request message is negative response.
- No response for request message (SPRMIB = false)

STEP 8 [B] : Partial Erase

Message Format

Support Information

{TABLE id=_1741167716790}

{TABLE id=_1741167716791}

Request Message

{TABLE id=_1741169568731}

Positive Response Message

{TABLE id=_1741169647269}

Negative Response Message

{TABLE id=_17416352769541513333544705630}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_1742207086873}

Note : To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3221981 title="3221981: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=32219
children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant
l0pow?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mgBTsRXxEfCBZYYpxO_XjA}{including children)

Functionality

Partially Erase Inactive bank.

Start erase from Writing Start Memory address from response of STEP 5

Erase until end of current sector from start address and next sector(to ensure better probability of erase of partially written

Note : sector Size of Bank A and B is 16KB (16384 bytes) allocated in RAD600, minimum erasable size is 4KB (4096 byte

Note

Client/Test tool process for Server response

Positive response : Move to next STEP

Abnormality/termination process shall be executed for below responses

- Response to request message is negative response.
- No response for request message(SPRMIB = false)

STEP 9 : Data Download Start

Message Format

Support Information

{TABLE id=_1741170107646}

Request Message

{TABLE id=_1741170617873}

※1, ※2 : Refer below requirements for value of dataFormatIdentifier and addressAndLengthFormatIdentifier

※3 : Address where download should start/resume. Address varies for each pause cases.

※4 : Size of data to be downloaded. Size varies for each pause cases.

※5, ※6 : depends on ※2 value

Refer below table for value of dataFormatIdentifier

{TABLE id=_1741171414810}

OTA reprogramming data will be encrypted hence dataFormatIdentifier = 0x01

Refer below table for addressAndLengthFormatIdentifier

{TABLE id=_1741172090630}

Target ECU support CAN communication hence addressAndLengthFormatIdentifier = 0x44

4 Byte of MemoryAddress

4 Byte of MemorySize

Positive Response Message

{TABLE id=_1741172758986}

※1 : Refer below requirement for value of lengthFormatIdentifier

※2 : Total size of \$36 including SID, block sequence counter, Address, Data (2054 bytes (0x0806) = SID(1)+Counter(1)

Refer below table for lengthFormatIdentifier

{TABLE id=_1741173483302}

Target ECU support CAN communication hence lengthFormatIdentifier = 0x20

Negative Response Message

{TABLE id=_17416352769541513333863533353}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_1742306695880}

Note : To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3221984 title="3221984: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=3221984 title="3221984: Response Message" u
children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant error code. For more details refer to the link : wan.com/rm4/resources/BI_uUH9gQPhEfCiJNomsIkDmg?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mg

Functionality

MemoryAddress is same with active bank and inactive bank in DualBank unit, have the logic to identify the specified MemoryAddress.

Note : MemoryAddress which will be same for both the banks which can be referred as virtual address. Virtual address to be used for download.

Request should be processed with respect to Inactive bank, it is always the target area for download.

Note

store below data with initial values in NVM for normal sequence(non-resume sequence)

size/address : Start address of Bank A/B

Intermediate IV : IV value from STEP 7

Intermediate Hash : SHA256 init Hash state values(standard values)

Client/Test tool process for Server response

Positive response : Move to next STEP

Abnormality/termination process shall be executed for below responses

- Response to request message is negative response.
- No response for request message (SPRMIB = false)

STEP 10 : Data Transfer

Message Format

Support Information

{TABLE id=_1741173686466}

Request Message

{TABLE id=_1741174509059}

※1 : Address where data should be downloaded. Value varies for each \$36 request.

※2 : transferData value is the encrypted reprogramming data

※3 : Size of transferData considered as 2048 bytes (2 KB)

Positive Response Message

{TABLE id=_1741174730955}

Negative Response Message

{TABLE id=_17416352769541513334093709261}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_1742306345822}

Note : To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3221987 title="3221987: Request Message" ur

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=3221987 title="3221987: Response Message" children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant error code. For more details refer [wan.com/rm4/resources/BI_8cz7MQP8EfCiJNomsIkDmg?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mgf...](https://www.jazzconti.de/rm4/cm/changeset/_mgf...)

Functionality

In first SID 0x36 request that follows SID 0x34 request the BlockSequenceCounter value is set to 0x01.

SID 0x36 response BlockSequenceCounter is a copy of BlockSequenceCounter parameter specified in request message.

BlockSequenceCounter value is incremented by 1 for each subsequent SID 0x36 request.

BlockSequenceCounter value rolls over at 0xFF and becomes 0x00 in the next SID 0x36 request and continues again.

If TargetECU re-receives transfer data request with same BlockSequenceCounter, TargetECU does not need to re-write data.

Request should be processed with respect to Inactive bank, it is always the target area for download.

MemoryAddress is same with active bank and inactive bank in DualBank unit, have the logic to identify the specified MemoryAddress.

Note : MemoryAddress which will be same for both the banks which can be referred as virtual address. Virtual address to physical address mapping is done by TargetECU.

transferRequestParameter #2 [transferData] is encrypted data, this should be decrypted and then decrypted data should be used for transfer.

Decryption Scheme : AES

Key Length : 128 bits (16 bytes)

Mode : CBC

IV : Use value received from DID F050 at Step 7 for initial download, incase of pause/resume case store IV in NVM and use it for subsequent downloads.

transferRequestParameter #2 [transferData] is encrypted data, this should be decrypted and then signature should be cal

Verification Scheme : RSASSA-PSS 3072

HASH function : SHA-256

Public exponent : 65537

Note : In case of Pause/Resume case intermediate Hash need to be stored in NVM and use it during resume to continue

TargetECU shall store size/address of data written to SDF in NVM to keep track of next start address that need to be sen

Note

store below data in NVM for every 4KB of data written to SDF

size/address of data written to SDF

Intermediate IV

Intermediate Hash

Decryption and Signature verification internal design

{IMAGE id=3468236 title="img-07031457.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_97bU

Client/Test tool process for Server response

Positive response : Move to next STEP

Abnormality/termination process shall be executed for below responses

- Response to request message is negative response.
- No response for request message (SPRMIB = false)

STEP 11 : Data Transfer Completed

Message Format

Support Information

{TABLE id=_1741175343505}

Request Message

{TABLE id=_1741176198476}

Positive Response Message

{TABLE id=_1741176282864}

Negative Response Message

{TABLE id=_17416352769541513334544168689}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_1742306840012}

Note : To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3221990 title="3221990: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=3221990 title="3221990: Response Message" u
children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant error code. For more details refer wan.com/rm4/resources/BI_DwLB0gQCEfCiJNomsIkDmg?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mg

Note

Client/Test tool process for Server response

Positive response : Move to next STEP

Abnormality/termination process shall be executed for below responses

- Response to request message is negative response.
- No response for request message (SPRMIB = false)

STEP 12 : Data Consistency Check (Check Memory SW / Data)

Message Format

Support Information

{TABLE id=_1741244643110}

{TABLE id=_1741247246817}

Request Message

{TABLE id=_1741244954125}

※1 : Refer below requirement for value of routineControlOption #1 [checkTypeIdentifier]

※2 : Refer below requirement for value of routineControlOption #2 [checkDataLength]

※3 : checkData value will be different for each OTA reprogramming

※4 : Size depend on ※2

routineControlOption #1 [checkTypeIdentifier] value should follow below table

{TABLE id=_1741245174372}

checkTypeIdentifier value should be **0x01**, as we have only signature verification as data consistency check option.

routineControlOption #2 [checkDataLength] should follow below table

{TABLE id=_1741245671614}

ECDSA is considered for Signature verification for OTA reprogramming, hence checkDataLength shall be 0x0040 (64 bytes)

Size of routineControlOption #3 [checkData] should be 64 **bytes**, as ECDSA signature algorithm is selected for Data consistency check

Positive Response Message

{TABLE id=_1741246359178}

※1 : refer below requirement for value of routineStatus #1 [checkStatus]

※2 : refer below requirement for value of routineStatus #2 [FailedCause]

routineStatus #1 [checkStatus] should follow below table

{TABLE id=_1741246506201}

routineStatus #2 [FailedCause] should follow below table

{TABLE id=_1741246718266}

Negative Response Message

{TABLE id=_17416352769541513334971319568}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_17419380405221513335005350177}

Note : To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3221993 title="3221993: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=32219
children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant
wan.com/rm4/resources/BI_O4YS8QMeEfCiJNomsIkDmg?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mg

Functionality

Use original data during SID 0x36 to calculate the HASH.

Note : data received in SID 0x36 is encrypted, decrypt the data and calculate HASH during SID 0x36(internal design), cal

Decrypt the signature received from RID request message to get HASH.

Compare decrypted HASH with Calculated HASH during 0x36.

If Decrypted HASH same as Calculated HASH

set

routineStatus #1 [checkStatus] = verificationSuccess (0x02)

routineStatus #2 [FailedCause] = noFailed (OK) (0x00)

Else if Decrypted HASH not same as Calculated HASH

set

routineStatus #1 [checkStatus] = verificationFailed (0x01)

routineStatus #2 [FailedCause] = Signature error (0x02)

Else // (HSM job failed)

set

routineStatus #1 [checkStatus] = verificationFailed (0x01)

routineStatus #2 [FailedCause] = General error (0x01)

Use below scheme

Validation algorithm : ECDSA using P-256 curve

HASH function : SHA-256

ECDSA Public Key Length : 64

ECDSA Private Key Length : 32

Note

Store Checkdata/signature of logical blocks to NVM (to be used in STEP 13)

Client/Test tool process for Server response

{TABLE id=_1747027971142}

Abnormality/termination process shall be executed for below responses also

- Response to request message is negative response.
- No response for request message (SPRMIB = false)

STEP 13 : Data Consistency Check (Validate Application)

Message Format

Support Information

{TABLE id=_1741247232804}

{TABLE id=_1741247232805}

Request Message

{TABLE id=_17412449541251513335229522289}

※1 : Refer below requirement for value of routineControlOption #1 [checkTypeIdentifier]

※2 : Refer below requirement for value of routineControlOption #2 [checkDataLength]

※3 : checkData value will be different for each OTA reprogramming

※4 : Size depend on ※2

routineControlOption #1 [checkTypeIdentifier] value should follow below table

{TABLE id=_17412451743721513335274219441}

checkTypeIdentifier value should be **0x01**, as we have only signature verification as data consistency check option.

routineControlOption #2 [checkDataLength] should follow below table

{TABLE id=_17412456716141513335306483016}

ECDSA is considered for Signature verification for OTA reprogramming, hence checkDataLength shall be 0x0040 (64 bytes)

Size of routineControlOption #3 [checkData] should be **64 bytes**, as ECDSA signature algorithm is selected for Data consistency check

Positive Response Message

{TABLE id=_17412463591781513335340642095}

※1 : refer below requirement for value of routineStatus #1 [checkStatus]

※2 : refer below requirement for value of routineStatus #2 [FailedCause]

routineStatus #1 [checkStatus] should follow below table

{TABLE id=_17412465062011513335381279647}

routineStatus #2 [FailedCause] should follow below table

{TABLE id=_17412467182661513335411770750}

Negative Response Message

{TABLE id=_17416352769541513335444086486}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_17419380405221513335478385217}

Note : To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3224712 title="3224712: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=3224712 title="3224712: Response Message" u
children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant
l0pow?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mgBTsRXxEfCBZYYpxO_XjA}{including children)

Functionality

Use CheckData/Signature of logical blocks received in STEP 12 and calculate HASH for this and verify with checkData of

Decrypt the signature received from RID request message to get HASH.

Compare decrypted HASH with Calculated HASH for CheckData/Signature of logical blocks received in STEP 12

If Decrypted HASH same as Calculated HASH

set

routineStatus #1 [checkStatus] = verificationSuccess (0x02)

routineStatus #2 [FailedCause] = noFailed (OK) (0x00)

Else if Decrypted HASH not same as Calculated HASH

set

routineStatus #1 [checkStatus] = verificationFailed (0x01)

routineStatus #2 [FailedCause] = Signature error (0x02)

Else // (HSM job failed)

set

routineStatus #1 [checkStatus] = verificationFailed (0x01)

routineStatus #2 [FailedCause] = General error (0x01)

TargetECU maintains validation result of this process and use it as activate feasibility check at STEP 15 & STEP 19

Note : If validation result isn't normal or this process is not executed, activate can't be executed due to repro target software

TargetECU should also apply the same verification algorithm and padding method and public key as used in STEP 12

Use below scheme

Validation algorithm : RSASSA-PSS 3072

HASH function : SHA-256

RSA public exponent : 65537

Note

Store Validation result in NVM (to be used in STEP 15 & STEP 19)

Client/Test tool process for Server response

{TABLE id=_17470279711421513335555105856}

Abnormality/termination process shall be executed for below responses also

- Response to request message is negative response.
- No response for request message (SPRMIB = false)

STEP 14 : Default Session Transition

Message Format

Support Information

{TABLE id=_1741247916340}

Request Message

{TABLE id=_17410754682741513335629737242}

Positive Response Message

{TABLE id=_17410761047851513335662159793}

Negative Response Message

{TABLE id=_17416352769541513335709255457}

※ : Refer below requirement for Supported NRC

Supported NRCs

SID specific NRCs are applicable. Please refer DIAG module(chapter 9.8) for SID 0x10 supported NRCs.

OTA Specific NRC : None

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3225069 title="3225069: Request Message" ur

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=32250
children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant
wan.com/rm4/resources/BI__AwyoQMgEfCiJNomsIkDmg?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mg

Note

Client/Test tool process for Server response

- Positive response : Move to next STEP

Abnormality/termination process shall be executed for below responses

- Response to request message is negative response.
- No response for request message (SPRMIB = false)

ACTIVATE

General

Activate sequence : Process of activating new SW which is downloaded to inactive bank during Install sequence

{IMAGE id=3247812 title="img-03251008.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_EJ5-

Activate Steps

{TABLE id=_1742877727552}

IG OFF-ON after step 20

STEP 15 : Activate Feasibility check

Message Format

Support Information

{TABLE id=_1741255410583}

Request Message

{TABLE id=_1741255520140}

Positive Response Message

{TABLE id=_1741255665185}

※ : Refer below requirement for value of dataRecord#1 [Activate feasibility information]

dataRecord#1 [Activate feasibility information] value should follow below table

{TABLE id=_1741255786177}

Negative Response Message

{TABLE id=_17416352769541513335952465865}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_17421902246141513335986736064}

Note :

Other NRCs related to multiple DIDs request in single request message is DIAG responsible

To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3225277 title="3225277: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=32252 children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant wan.com/rm4/resources/BI_RkFPcQR3EfCiJNomsIkDmg?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mg

Functionality

Judgement of {LINK id=3225307 title="3225307: dataRecord#1 [Activate feasibility information] value should follow below

TBD

If signature verification result is NG or signature verification is not executed at STEP 13 then set Activate feasibility inform

Note

Client/Test tool process for Server response

{TABLE id=_1747158550964}

Abnormality/termination process shall be executed for below responses also

- Response to request message is negative response.
- No response for request message(SPRMIB = false)

STEP 16 : Extended Session Transition

Requirement is same as STEP 2

Please follow : {LINK id=3150309 title="3150309: STEP 2 : Extended Session Transition" uri=https://jazz-1.automotive-wa

STEP 17 : OTA Session Transition

Requirement is same as STEP 3

Please follow : {LINK id=3150323 title="3150323: STEP 3 : OTA Session Transition" uri=https://jazz-1.automotive-wan.co

STEP 18 : Security Access(OTA Session)

Requirement is same as STEP 4

Please follow : {LINK id=3150327 title="3150327: STEP 4 : Security Access(OTA Session)" uri=https://jazz-1.automotive-

STEP 19 : Activate

Message Format

Support Information

{TABLE id=_1741256756854}

{TABLE id=_1741256756855}

Request Message

{TABLE id=_1741256864089}

Positive Response Message

{TABLE id=_1741256986708}

※ : Refer below requirement for value of routineStatus#1 [Activate execution result]

routineStatus#1 [Activate execution result] shall follow below table

{TABLE id=_1741257116358}

Negative Response Message

{TABLE id=_17416352769541513336307726203}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_1742362898385}

Note : To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3225288 title="3225288: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=3225288 title="3225288: Response Message" u
children)

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant information : {LINK id=3225288 title="3225288: Response Message" u
l0pow?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mgBTsRXxEfCBZYYpxO_XjA}(including children)

Functionality

Judgement condition for {LINK id=3225316 title="3225316: routineStatus#1 [Activate execution result] shall follow below t

TBD

If signature verification result is NG or signature verification is not executed at STEP 13 then set Activate execution result

When request message is received and judged Activate execution results is "Activate Possible"
set

Activate reservation flag = 1

Activate completed flag = 0

then set Activate execution result as "activate execution completed (0x02)"

When **Activate reservation flag = 1** and if IG is turned from ON to OFF

Do power off the server or reset.

When **Activate reservation flag = 1** and if IG is turned from ON to OFF and then from OFF to ON and New SW is activated
set

Activate reservation flag = 0

Activate completed flag = 1

When **Activate reservation flag = 1** Don't erase inactive bank

When **activate completed flag** is set(1), don't set **activate reservation flag**.

At ROM erase during next OTA campaign at STEP 8
set

Activate completed flag = 0

Note

Store **Activate reservation flag** and **Activate completed flag** in NVM

Client/Test tool process for Server response

{TABLE id=_1747158976218}

STEP 20 : Default Session Transition

Requirement is same as STEP 14

Please follow : {LINK id=3150369 title="3150369: STEP 14 : Default Session Transition" uri=https://jazz-1.automotive-wan.com/}

SW Update COMPLETE

General

{IMAGE id=3348251 title="img-05091103.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_MVU.png}

Software updates complete sequence

{TABLE id=_1746769142840}

Abnormality/Termination Process

General

Abnormality/termination process shall be executed when response from TargetECU is as below at any FOTA STEPS.

- Response to request message is negative response.
- No response for request message(SPRMIB = false)
- Judge as abnormality/termination based on the individual judgement of each process.

During Abnormality/Termination process, transition the state server to the normal state.

Abnormality/Termination Process sequence

General

Activation Abnormality/Termination process sequence

General

Activate Cancel

Message Format
Support Information

{TABLE id=_17412567568541513336498317053}

{TABLE id=_17412567568551513336498383553}

Request Message

{TABLE id=_17412568640891513336608874096}

Positive Response Message

{TABLE id=_17412569867081513336650072639}

※ : Refer below requirement for value of routineStatus#1 [Activate cancel execution result]

routineStatus#1 [Activate execution result] shall follow below table

{TABLE id=_17412571163581513336692141243}

Negative Response Message

{TABLE id=_17416352769541513336724024526}

※ : Refer below requirement for Supported NRC

Supported NRCs

{TABLE id=_17423628983851513336759355615}

Note : To test higher order NRCs, lower order NRCs should be cleared/satisfied.

Tasks to Perform by Server

General

TargetECU shall Process the request message received as per : {LINK id=3247823 title="3247823: Request Message" u

TargetECU shall respond with positive response message after processing the request message as per : {LINK id=32478
wan.com/rm4/resources/BI_DMh1yAk1EfCiJNomsIkDmg?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mg

If TargetECU cannot process the requested message then it shall respond with negative response message with relevant
wan.com/rm4/resources/BI_DMh1wQk1EfCiJNomsIkDmg?vvc.configuration=https://jazz.conti.de/rm4/cm/changeset/_mg

Functionality

When request message is received

reset **Activate reservation flag (0)** which was set at STEP 19

send Activate cancel execution result as "Activate execution completed (0x01)"

In other words, if IG is turned on after setting the activate reservation flag to the default value , the active bank must not b

Note

Client/Test tool process for Server response

{TABLE id=_1747159764326}

Abnormality/termination process shall be executed for below responses also

- Response to request message is negative response.
- No response for request message (SPRMIB = false)

Pause/Resume Process

General

Interrupt Process Sequence

Pause/Resume Process during installation

Handling Server Retention Parameter ["routineStatus#1 Installation status" of RID 0x3200 (STEP 5)]

CRRRS4241E This content cannot be exported because it is greater than 32 KB.

Handling Parameters in the Resume Process

First Installation(Nominal sequence) :

1. Installation not yet started
2. When RID 0x3200 is requested
Installation status = 0x00
Write Start Memory Address = 0x00 (Starting address of logical block)
3. Download starts, SID 0x34 with
Address = 0x00 (Starting address of logical block)
Size = 0x20 (Total size of Logical block/Segment)

{IMAGE id=3381302 title="img-05261346.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_r6XK

Note :

Address and Size used here is only for demonstration of Pause/Resume scenarios
Currently we have only one Logical block and one Segment : {LINK id=3348622 title="3348622: TargetECU Bank Deta

Pause/Resume scenario 1:

1. Data transfer started and paused at address 0x0E
2. During resume execute STEP 1 - STEP 4 again
3. When RID 0x3200 is requested at STEP 5
Installation status = 0x01
Write Start Memory Address = 0x0F (Next address from pause point)
4. Download starts, SID 0x34 with
Address = 0x0F (Response from RID 0x3200)
Size = 0x11 (Remaining data to be transferred)

{IMAGE id=3381353 title="img-05261431.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR__Wz

Note :

Address and Size used here is only for demonstration of Pause/Resume scenarios
Currently we have only one Logical block and one Segment : {LINK id=3348622 title="3348622: TargetECU Bank Deta

Pause/Resume scenario 2:

1. Data transfer completed for logical block 1 but signature verification not performed
2. During resume execute STEP 1 - STEP 4 again
3. When RID 0x3200 is requested for logical block 1 at STEP 5
Installation status = 0x03
Write Start Memory Address = 0x00 (specify 0x00 as download completed)
4. Verify signature of logical block 1 using RID 0xDD01(STEP 12)
5. Once positive response received start download of logical block 2

{IMAGE id=3381663 title="img-05261509.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_VeS

Note :

Address and Size used here is only for demonstration of Pause/Resume scenarios
Currently we have only one Logical block and one Segment : {LINK id=3348622 title="3348622: TargetECU Bank Deta

Pause/Resume scenario 3:

1. Data transfer completed for logical block 1, signature verification performed but response not received
2. During resume execute STEP 1 - STEP 4 again
3. When RID 0x3200 is requested for logical block 1 at STEP 5
Installation status = 0x07
Write Start Memory Address = 0x00 (specify 0x00 as download completed)
4. As install status is 0x07 start download of logical block 2

{IMAGE id=3381680 title="img-05261529.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_Eu8V

Note :

Address and Size used here is only for demonstration of Pause/Resume scenarios
Currently we have only one Logical block and one Segment : {LINK id=3348622 title="3348622: TargetECU Bank Deta

Pause/Resume scenario 4:

1. Download completed for logical block 1, but client does not know which is next logical block to download
2. During resume execute STEP 1 - STEP 4 again
3. Request RID 0x3200 for each logical at STEP 5
Installation status = 0x07
Write Start Memory Address = 0x00 (specify 0x00 as download completed)
4. Start download of logical block if Installation status is other than 0x07

{IMAGE id=3381989 title="img-05271001.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_aCD

Note :

Address and Size used here is only for demonstration of Pause/Resume scenarios
Currently we have only one Logical block and one Segment : {LINK id=3348622 title="3348622: TargetECU Bank Deta

Pause/Resume scenario 5:

1. Data transfer completed for logical block 2 but signature verification not performed
2. During resume execute STEP 1 - STEP 4 again
3. When RID 0x3200 is requested for logical block 2 at STEP 5
Installation status = 0x03
Write Start Memory Address = 0x00 (specify 0x00 as download completed)
4. Verify signature of logical block 2 using RID 0xDD01(STEP 12)
5. Once positive response received and no other logical blocks are there perform STEP 13 (validate application RID 0x

{IMAGE id=3381692 title="img-05261606.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_OgR

Note :

Address and Size used here is only for demonstration of Pause/Resume scenarios
Currently we have only one Logical block and one Segment : {LINK id=3348622 title="3348622: TargetECU Bank Deta

Pause/Resume scenario 6:

1. Data transfer completed for logical block 2, signature verification performed but response not received
2. During resume execute STEP 1 - STEP 4 again
3. When RID 0x3200 is requested for logical block 2 at STEP 5
Installation status = 0x07
Write Start Memory Address = 0x00 (specify 0x00 as download completed)
4. As install status is 0x07 , if no other logical blocks are there perform STEP 13(validate application RID 0xDD02)

{IMAGE id=3381696 title="img-05261614.png" uri=https://jazz-1.automotive-wan.com/rm4/wrappedResources/WR_WrsA

Note :

Address and Size used here is only for demonstration of Pause/Resume scenarios

Currently we have only one Logical block and one Segment : {LINK id=3348622 title="3348622: TargetECU Bank Deta

SPAR Parameter

DV specific SPAR update

{TABLE id=_1752050683906}

Note:

There is no direct test scope for SRT. These values are used in ST component.

In indirect way, by checking through reaction Dem XPAR values can be confirmed.

Non Functional requirements

Version numbering

Vector package which shall be used for CAN (Driver etc), DIAG (Main Handler etc), Identity Mapping and TP is version C

Vector package which shall be used for FBL is version CBD2300705_D00. (Production SIP)

See L3_SW_4487.

Using the MICROSAR package from Vector, a DaVinci configuration shall be done for CAN, TP, DIAG and Identity mapping

See L3_SW_4487.

Limitation of maximum allowed workload of available resources

ROM usage shall not exceed 90% (Available FLASH: 960KB)

NVM usage shall not exceed 90% (Available FLASH: 16KB)

RAM usage shall not exceed 90% (Available RAM: 992KB)

Stack usage shall not exceed 75%