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# 1 High Level Description

This document defines the Serial Communications Interface of the PSCM. The PSCM shall utilize the **High Speed CAN BUS** to send and receive the data specified in this document.

In addition, the PSCM shall monitor received messages and set NTCs as specified.

EPS communication should work in range from 7V to 18V.

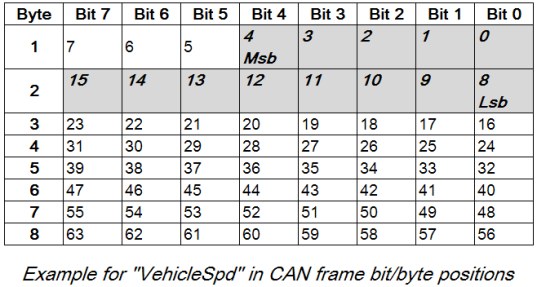
**Notes:**

Throughout this document all hexadecimal numbers will be indicated by either a ($) or (0x) preceding the number.

Throughout this document all calibratable values are for reference only, the actual calibration file overrides this document.

Required bit order:





**All checksum and rolling counter algorithm please follow below spec:**

****

# 2 High Speed CAN I/O

## 2.1 Messages Transmitted by the PSCM

All periodic messages shall have an interval tolerance of +/-10%

All unused bits shall be set to zero by the PSCM.

### 2.1.1 EPS1 (Msg ID $168) (CAN)

**Transmit Type:** Periodic

**Transmitter :** EPS

**Periodic Interval (msec):** 20ms

**Data Length (Bytes):** 8

**DataID:** High\_byte: 0x00 Low\_byte:0x35

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| CheckSum\_EPS1 | 7 | 8 | N/A | 1 | 0 | 0 - 255 | **0x00-0xFF:Valid values**  **Init value:0x0** |
| EPS\_FailSts | 13 | 2 | N/A | 1 | 0 | 0 - 3 | **0x0:No fault**  **0x1:Permanent Error Detected**  **0x2:Intermittent Error Detected**  **0x3:Reserved**  **Init value:0x0** |
| EPS\_TrqSnsrSts | 14 | 1 | N/A | 1 | 0 | 0 - 1 | **0x0:Normal**  **0x1:Abnormal**  **Init value:0x1** |
| EPS\_InterferDetd | 31 | 1 | N/A | 1 | 0 | 0 - 1 | **0x0:No Interference**  **0x1:Interference**  **Init value:0x0** |
| EPS\_InterferDetdVld | 30 | 1 | N/A | 1 | 0 | 0 - 1 | **0x0:Invalid**  **0x1:Valid**  **Init value:0x0** |
| EPS\_AvailSts | 29 | 2 | N/A | 1 | 0 | 0 - 3 | **0x0:Temporary inhibit**  **0x1:Available for control**  **0x2:Active**  **0x3:Permanently failed**  **Init value:0x0** |
| EPS\_SteerMod | 55 | 3 | N/A | 1 | 0 | 0 - 7 | **0x0:Comfort Mode**  **0x1:sport mode**  **0x2:Handiness Mode**  **0x3-0x7:Reserved**  **Init value: 0x3** |
| RollingCounter\_EPS1 | 59 | 4 | N/A | 1 | 0 | 0 - 15 | **0x0-0xE:Valid value**  **0xF:Invalid value**  **Init value:0x0** |
| EPS\_AssiRat | 23 | 7 | % | 1 | 0 | 0 - 100 | **0x00-0x64:Valid value**  **0x65~0x7F:Reserved**  **Init value:0x0** |

**Comments: Msg168 is designed for CAN communication in application layer.**

**EPS\_FailSts**

EPS\_FailSts indicates the status of the EPS warning light during system operation. Need to use the Client: Dem\_GetIndicatorStatus.

When the ReturnValue of Dem\_GetIndicatorStatus is E\_NOK, set EPS\_FailSts to Previous EPS\_FailSts;

When the ReturnValue of Dem\_GetIndicatorStatus is E\_OK, set as below:

If Major DTC(F1/F2 NTC) is current status and the DemSts is true, set EPS\_FailSts to 0x1:Permanent Error Detected;

If Minor DTC(F3 NTC) is current status and the DemSts is true, set EPS\_FailSts to 0x2: Intermittent Error Detected;

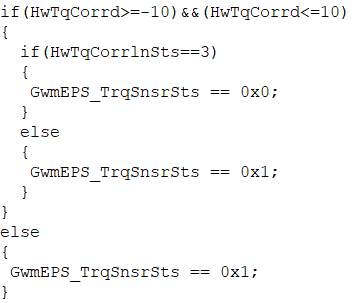
Otherwise set EPS\_FailSts to 0x0: No fault;

(Major DTC/Minor DTC is got by IndcrNr in client: Dem\_GetIndicatorStatus, Major/Minor DTC should be defined in FCR)

**EPS\_TrqSnsrSts**

EPS\_TrqSnsrSts indicates the status of torque sensor, it is related to the signal ‘HwTqCorrlnSts’ which from ES229B and ‘HwTqCorrd’ which from SF052A.

Detail logic shows as below:



**EPS\_InterferDetd**

EPS\_InterferDetd indicates if driver interrupt the APA function execution, it should be equal to the signal ‘GwmApaIntv’

which from CF173B\_GwmOvrlStMgr.

**EPS\_InterferDetdVld**

EPS\_InterferDetdVld indicates the result of driver interrupt detection valid or not, it should be related to ‘GwmApaIntvVld’ which from CF173B.

When GwmApaIntvVld is equal to 1, set EPS\_InterferDetdVld to 0x1: Valid;

Otherwise set EPS\_InterferDetdVld to 0x0: Invalid;

**EPS\_AvailSts**

EPS\_AvailSts indicates the APA state machine status, it should be related to ‘GwmApaSt’ which from CF173B\_GwmOvrlStMgr.

GwmApaSt1

GWMAPAST\_TMPINHB (0)

GWMAPAST\_AVLFORCTRL (1)

GWMAPAST\_ACTV (2)

GWMAPAST\_PRMNTFAIL (3)

If GwmApaSt is equal to GWMAPAST\_TMPINHB, set EPS\_AvailSts to 0x0;

If GwmApaSt is equal to GWMAPAST\_ AVLFORCTRL, set EPS\_AvailSts to 0x1;

If GwmApaSt is equal to GWMAPAST\_ ACTV, set EPS\_AvailSts to 0x2;

If GwmApaSt is equal to GWMAPAST\_ PRMNTFAIL, set EPS\_AvailSts to 0x3;

**EPS\_SteerMod**

EPS\_SteerMod indicates the driving mode, it should be equal to the signal ‘GwmSteerMod’ which from CF172B\_GwmSteerModSeln.

**EPS\_AssiRat**

EPS\_AssiRat indicates the percentage of assist EPS system can execute currently, it should be related to the signal ‘SysMotTqCmdSca’ which from SF005A. Change its data type form f32 to u08.

**RollingCounter\_EPS1**

Refer to the E2E communication protection specification V2.1.

**Checksum\_EPS1**

Refer to the E2E communication protection specification V2.1.

### 2.1.2 EPS1 (Msg ID $147) (CAN\_FD)

**Transmit Type:** Periodic

**Transmitter :** EPS

**Periodic Interval (msec):** 20ms

**Data Length (Bytes):** 64

**DataID:** EPS\_FD1: High\_byte: 0x00 Low\_byte:0x35 (bit0~bit63)

EPS\_FD1: High\_byte: 0x00 Low\_byte:0x36 (bit64~bit127)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| CheckSum\_EPS1 | 7 | 8 | NA | 1 | 0 | 0~255 | **0x00-0xFF:Valid values**  **Init value:0x0** |
| EPS\_FailSts | 13 | 2 | NA | 1 | 0 | 0~3 | **0x0:No fault**  **0x1:Permanent Error Detected**  **0x2:Intermittent Error Detected**  **0x3:Reserved**  **Init value:0x0** |
| EPS\_TrqSnsrSts | 14 | 1 | NA | 1 | 0 | 0~1 | **0x0:Normal**  **0x1:Abnormal**  **Init value:0x1** |
| EPS\_InterferDetd | 31 | 1 | NA | 1 | 0 | 0~1 | **0x0:No Interference**  **0x1:Interference**  **Init value:0x0** |
| EPS\_InterferDetdVld | 30 | 1 | NA | 1 | 0 | 0~1 | **0x0:Invalid**  **0x1:Valid**  **Init value:0x0** |
| EPS\_AvailSts | 29 | 2 | NA | 1 | 0 | 0~3 | **0x0:Temporary inhibit**  **0x1:Available for control**    **0x2:Active**  **0x3:Permanently failed**  **Init value:0x0** |
| EPS\_AssiRat | 23 | 7 | % | 1 | 0 | 0~100 | **0x00-0x64:Valid value**  **0x65-0x7F:Reserved**  **Init value:0x0** |
| EPS\_SteerMod | 55 | 3 | NA | 1 | 0 | 0~7 | **0x0: Comfort Mode**  **0x1: sport mode**  **0x2: Handiness Mode**  **0x3-0x7:Reserved**  **Init value:0x3** |
| SteerCorrnRmn | 63 | 2 | NA | 1 | 0 | 0~3 | **0x0:No Tip**  **0x1:Tip return finish**  **0x2:Tip return R**  **0x3:Tip return L**  **Init value:0x0** |
| SteerCorrnResp | 61 | 1 | NA | 1 | 0 | 0~1 | **0x0:OFF**  **0x1:ON**  **Init value:0x1** |
| RollingCounter\_EPS1 | 59 | 4 | NA | 1 | 0 | 0~15 | **0x0-0xE:Valid value  0xF:Invalid value** |
| CheckSum\_EPS2 | 71 | 8 | NA | 1 | 0 | 0~255 | **0x00-0xFF:Valid values**  **Init value:0x0** |
| EPS\_LKATorqOvrlDlvd | 111 | 16 | Nm | 0.01 | -15 | -15~15 | **0x000-0x0BB8:Valid value  0x0BB9-0xFFFF:Reserved**  **Init value:0x5DC** |
| EPS\_LKATorqOvrlDlvdVld | 127 | 1 | NA | 1 | 0 | 0~1 | **0x0:Invalid  0x1:Valid**  **Init value:0x0** |
| EPS\_LKATrqOvlDlvdSts | 125 | 2 | NA | 1 | 0 | 0~3 | **0x0:Not active  0x1:Active  0x2:Temporary inhibit  0x3:Permanently failed**  **Init value:0x0** |
| EPS\_DrvInpTrqVal\_HighReslolution | 79 | 12 | Nm | 0.015625 | -31.984375 | -31.984375~32 | **0x00~0xFFF: Valid Values**  **Init value:0x7FF** |
| EPS\_DrvInpTrqVal\_HighResVld | 126 | 1 | NA | 1 | 0 | 0~1 | **0x0:Invalid  0x1:Valid**  **Init value:0x0** |
| RollingCounter\_EPS2 | 123 | 4 | NA | 1 | 0 | 0~15 | **0x0-0xE:Valid value  0xF:Invalid value**  **Init value:0x0** |

**Comments: Msg147 is designed for CAN FD communication in application layer.**

**EPS\_FailSts**

EPS\_FailSts indicates the status of the EPS warning light during system operation. Need to use the Client: Dem\_GetIndicatorStatus.

When the ReturnValue of Dem\_GetIndicatorStatus is E\_NOK, set EPS\_FailSts to Previous EPS\_FailSts;

When the ReturnValue of Dem\_GetIndicatorStatus is E\_OK, set as below:

If Major DTC(F1/F2 NTC) is current status and the DemSts is true, set EPS\_FailSts to 0x1:Permanent Error Detected;

If Minor DTC(F3 NTC) is current status and the DemSts is true, set EPS\_FailSts to 0x2: Intermittent Error Detected;

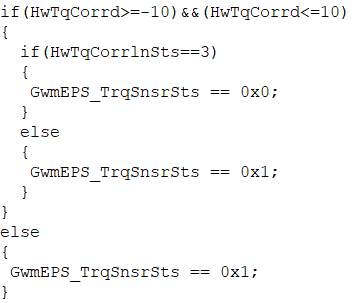
Otherwise set EPS\_FailSts to 0x0: No fault;

(Major DTC/Minor DTC is got by IndcrNr in client: Dem\_GetIndicatorStatus, Major/Minor DTC should be defined in FCR)

**EPS\_TrqSnsrSts**

EPS\_TrqSnsrSts indicates the status of torque sensor, it is related to the signal ‘HwTqCorrlnSts’ which from ES229B and ‘HwTqCorrd’ which from SF052A.

Detail logic shows as below:



**EPS\_InterferDetd**

EPS\_InterferDetd indicates if driver interrupt the APA function execution, it should be equal to the signal ‘GwmApaIntv’

which from CF173B\_GwmOvrlStMgr.

**EPS\_InterferDetdVld**

EPS\_InterferDetdVld indicates the result of driver interrupt detection valid or not, it should be related to ‘GwmApaIntvVld’ which from CF173B.

When GwmApaIntvVld is equal to 1, set EPS\_InterferDetdVld to 0x1: Valid;

Otherwise set EPS\_InterferDetdVld to 0x0: Invalid;

**EPS\_AvailSts**

EPS\_AvailSts indicates the APA state machine status, it should be related to ‘GwmApaSt’ which from CF173B\_GwmOvrlStMgr.

GwmApaSt1

GWMAPAST\_TMPINHB (0)

GWMAPAST\_AVLFORCTRL (1)

GWMAPAST\_ACTV (2)

GWMAPAST\_PRMNTFAIL (3)

If GwmApaSt is equal to GWMAPAST\_TMPINHB, set EPS\_AvailSts to 0x0;

If GwmApaSt is equal to GWMAPAST\_ AVLFORCTRL, set EPS\_AvailSts to 0x1;

If GwmApaSt is equal to GWMAPAST\_ ACTV, set EPS\_AvailSts to 0x2;

If GwmApaSt is equal to GWMAPAST\_ PRMNTFAIL, set EPS\_AvailSts to 0x3;

**EPS\_SteerMod**

EPS\_SteerMod indicates the driving mode, it should be equal to the signal ‘GwmSteerMod’ which from CF172B\_GwmSteerModSeln.

**EPS\_AssiRat**

EPS\_AssiRat indicates the percentage of assist EPS system can execute currently, it should be related to the signal ‘SysMotTqCmdSca’ which from SF005A. Change its data type form f32 to u08.

**SteerCorrnRmn**

SteerCorrnRmn indicates the status of Steering Return Correction Reminder function, should be equal to ‘GwmRtnCorrnRmnSts’ which from CFXXXA.

**SteerCorrnResp**

SteerCorrnResp indicates the feedback status of Steering Return Correction Reminder function, should be equal to ‘GwmRtnCorrnRmnFb’ which from CFXXXA.

**CheckSum\_EPS1**

Refer to the E2E communication protection specification V2.1.

**RollingCounter\_EPS1**

Refer to the E2E communication protection specification V2.1.

**EPS\_LKATorqOvrlDlvd**

EPS\_LKATorqOvrlDlvd indicates the actual Handwheel Overlay Command, should be related to ‘GwmLkaHwTqOvrlCmd’ which is the output of CF174B/A.

Corresponding calibration: GwmMsg147BusHiSpdLkaHwOvrlTqPolarity

When GwmLkaHwTqOvrlCmd is lower than or equal to 15Nm and greater than or equal to -15Nm AND GwmLkaHwTqOvrlCmdVld is valid, set EPS\_LKATorqOvrlDlvd to (GwmLkaHwTqOvrlCmd\* GwmMsg147BusHiSpdLkaHwOvrlTqPolarity-offset)/0.01.

When GwmLkaHwTqOvrlCmd is greater than 15Nm or lower than -15Nm OR GwmLkaHwTqOvrlCmdVld is invalid, EPS\_LKATorqOvrlDlvd should be equal to interface’s initial value 0X5DC.

**EPS\_LKATorqOvrlDlvdVld**

EPS\_LKATorqOvrlDlvdVld indicates the validity of GwmLkaHwTqOvrlCmd. should be related to ‘GwmLkaHwTqOvrlCmd’ and ‘GwmLkaHwTqOvrlCmdVld’ which are the outputs of CF174B/A.

When GwmLkaHwTqOvrlCmd is lower than or equal to 15Nm and greater than or equal to -15Nm, and GwmLkaHwTqOvrlCmdVld is equal to ture, set EPS\_LKATorqOvrlDlvdVld to true. Otherwise set EPS\_LKATorqOvrlDlvdVld to false.

**EPS\_LKATrqOvlDlvdSts**

EPS\_LKATrqOvlDlvdSts indicates the state of LKA function, it should be equal to ‘GwmLkaSt’ which is the output of CF173B.

**EPS\_DrvInpTrqVal\_HighReslolution**

EPS\_DrvInpTrqVal\_HighReslolution indicates the driver input torque, related to ‘HwTqCorrd’ which from SF052A and ‘HwTqCorrlnSts’ which from ES229B.

Corresponding calibration: GwmMsg147BusHiSpdHwTqPolarity

When HwTqCorrlnSts is equal to 3 AND [(HwTqCorrd <= 10)&&(HwTqCorrd >= -10)], set EPS\_DrvInpTrqVal\_HighReslolution to HwTqCorrd\* GwmMsg147BusHiSpdHwTqPolarity.

When HwTqCorrlnSts is not equal to 3 OR [(HwTqCorrd > 10)||(HwTqCorrd < -10), set EPS\_DrvInpTrqVal\_HighReslolution to 0x7FF.

**EPS\_DrvInpTrqVal\_HighResVld**

EPS\_DrvInpTrqVal\_HighResVld indicates the validity of Handwheel, related to ‘HwTqCorrlnSts’ which from ES229B.

When HwTqCorrlnSts is equal to 3 AND [(HwTqCorrd <= 10)&&(HwTqCorrd >= -10)], set EPS\_DrvInpTrqVal\_HighResVld to 0x1: Valid;

When HwTqCorrlnSts is not equal to 3 OR [(HwTqCorrd > 10)||(HwTqCorrd < -10), set EPS\_DrvInpTrqVal\_HighResVld to 0x0: Invalid;

**CheckSum\_EPS2**

Refer to the E2E communication protection specification V2.1. Get ‘E2E\_P01Protect’ as a client and used in callout function.

**RollingCounter\_EPS2**

Refer to the E2E communication protection specification V2.1. Get ‘E2E\_P01Protect’ as a client and used in callout function.

### 2.1.2 EPS\_Phy\_Resp (Msg ID $729)

**Transmitter:** Tester

**Transmit Type:** Event

**Event:** Tool Request

**Data Length (Bytes):** 8

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (LSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| DiagPhysRepFromEPS | 56 | 64 | N/A | N/A | N/A | N/A | N/A |

### 2.1.3 EPS\_XCP\_Tx (Msg ID $63D)

**Transmit Type:** Event

**Event:**  Tool Request

**Data Length (Bytes):** 8

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (LSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| Calibration\_Tx\_Byte0 | 0 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Tx\_Byte1 | 8 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Tx\_Byte2 | 16 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Tx\_Byte3 | 24 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Tx\_Byte4 | 32 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Tx\_Byte5 | 40 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Tx\_Byte6 | 48 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Tx\_Byte7 | 56 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |

### 2.1.4 CmnMfgSrvResp (Msg ID $710)

**Transmit Type:** Event

**Event:**  Tool Request

**Data Length (Bytes):** 8

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (LSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| XCP\_Diag\_Tx | 56 | 64 | UNM | 1 | 0 | N/A | N/A |

## 2.2 Messages Received by the PSCM

### 2.2.1 ABM2 (Msg ID $245) (CAN/CANFD)

**Transmit Type:** Periodic

**Transmitter :** GW

**Periodic Interval (msec):** 20ms

**Data Length (Bytes):** 8

**Missing Message NTC #:** $120

**Invalid Message NTC #:** $121

**E2E error NTC** #: $122

**DataID:** High\_byte: 0x00 Low\_byte:0x3B

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| CheckSum\_ABM2 | 7 | 8 | N/A | 1 | 0 | 0 to 255 | **0x00-0xFF:Valid values**  **Init value : 0x0** |
| VehYawRate | 47 | 16 | Rad/s | 0.00024 | -2.093 | -2.093 to 2.093 | **0x0000-0x4421:Valid Value**  **0x4422-0xFFFF:Reserved**  **Init value : 0x2211** |
| VehDynYawRateVld | 61 | 1 | N/A | 1 | 0 | 0 - 1 | **0x0:Invalid**  **0x1:Valid**  **Init value : 0x0** |
| RollingCounter\_ABM2 | 59 | 4 | N/A | 1 | 0 | 0 - 15 | **0x0-0xE:Valid value**  **0xF:Invalid value**  **Init value : 0x0** |

**Comments: Msg245 is designed for both CAN and CAN FD communication in application layer.**

**VehYawRate**

VehYawRate indicates the lateral movement of the vehicle and shall have a calibratable polarity with a default of ' + '. Corresponding output: VehYawRateSerlCom which should be input of SF033A.

Corresponding calibration: GwmMsg245BusHiSpdVehYawRatePolarity

VehYawRateSerlCom = (VehYawRate\*0.00024- 2.093) \*180/Pi\*Polarity.

**VehDynYawRateVld**

VehDynYawRateVld indicates the validity of the VehYawRate signal.

Corresponding output: VehYawRateVldSerlCom which should be input of SF033A.

When VehDynYawRateVld is equal to 0x0, set VehYawRateVldSerlCom to false;

When VehDynYawRateVld is equal to 0x1, set VehYawRateVldSerlCom to true;

(Missing/CheckSum/RollingCntr NTC not consider here, refer to the information described in following section 3.)

**RollingCounter\_ABM2**

Refer to the E2E communication protection specification V2.1.

**Checksum\_ABM2**

Refer to the E2E communication protection specification V2.1.

### 2.2.2 ABS1 (Msg ID $231) (CAN)

**Transmit Type:** Periodic

**Transmitter:** ESP

**Periodic Interval (msec):** 20ms

**Data Length (Bytes):** 8

**Missing Message NTC #:** $124

**Invalid Message NTC #:** $125

**E2E error NTC** #: $126

**DataID:** High\_byte: 0x00 Low\_byte:0x26

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| CheckSum\_ABS1 | 7 | 8 | N/A | 1 | 0 | 0 - 255 | **0x00-0xFF: Valid values**  **Init value: 0x0** |
| WssFLEdgesSum | 47 | 8 | N/A | 1 | 0 | 0 - 255 | **0x00-0xFF: Valid Values**  **Init value: 0x0** |
| WssFREdgesSum | 55 | 8 | N/A | 1 | 0 | 0 - 255 | **0x00-0xFF: Valid Values**  **Init value: 0x0** |
| WssFLEdgesSumVld | 63 | 1 | N/A | 1 | 0 | 0 - 1 | **0x0: Invalid**  **0x1: Valid**  **Init value: 0x1** |
| WssFREdgesSumVld | 62 | 1 | N/A | 1 | 0 | 0 - 1 | **0x0: Invalid**  **0x1: Valid**  **Init value : 0x1** |
| RollingCounter\_ABS1 | 59 | 4 | N/A | 1 | 0 | 0 - 15 | **0x0:Invalid**  **0x1:Valid**  **Init value : 0x0** |

**Comments: Msg231 is designed for CAN communication in application layer. So use the input GwmComTyp to distinguish current ECUId is for CAN or CAN FD.**

**When GwmComTyp is equal to 1(CAN FD), set all NTCs related to Msg231 as PASS, inhibit diagnostic and set all outputs to corresponding interface’s initial value.**

**When GwmComTyp is equal to 0(CAN), set outputs as below description and diagnostic as Section 3.4-3.6.**

**WssFLEdgesSum**

WssFLEdgesSum indicates the Left Wheel Distance Pulse Counter.

Corresponding output: GwmWhlLeDstPlsCntrFromSerlCom which is the input of CF310A.

**WssFREdgesSum**

WssFREdgesSum indicates the Right Wheel Distance Pulse Counter.

Corresponding output: GwmWhlRiDstPlsCntrFromSerlCom which is the input of CF310A.

**WssFLEdgesSumVld**

WssFLEdgesSumVld indicates the Valid of Front Left Wheel Speed Sensor.

Corresponding output: GwmWhlLeDstVldFromSerlCom which is the input of CF310A.

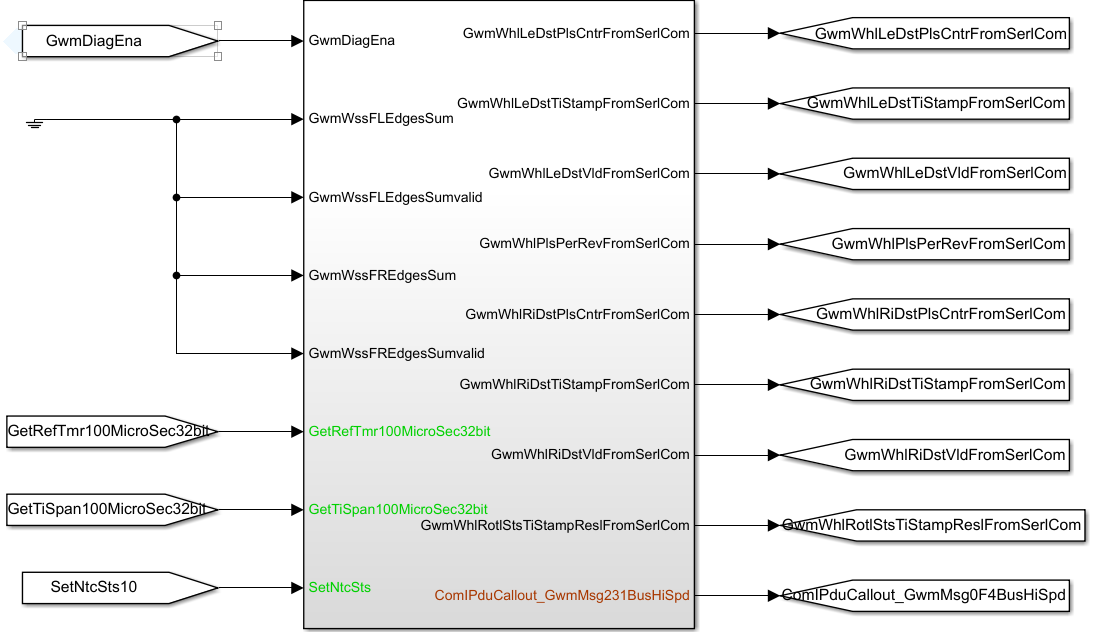
**WssFREdgesSumVld**

WssFREdgesSumVld indicates the Valid of Front Right Wheel Speed Sensor.

Corresponding output: GwmWhlRiDstVldFromSerlCom which is the input of CF310A.

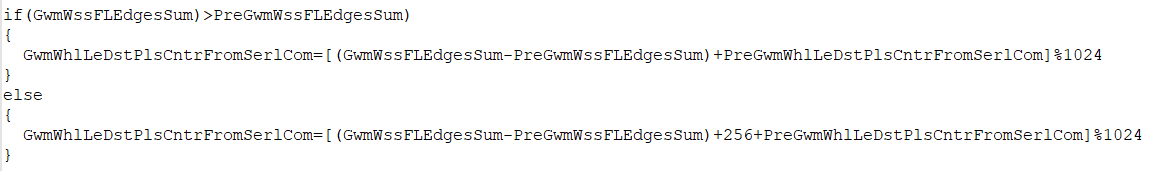
**Since this MM is complex, so describe the detail logic as below:**

Comments: Use Left wheel signals as example.



**GwmWhlLeDstPlsCntrFromSerlCom**

When GwmWssFLEdgesSum changed, update GwmWhlLeDstPlsCntrFromSerlCom.



**GwmWhlLeDstTiStampFromSerlCom**

When GwmWssFLEdgesSum changed, update GwmWhlLeDstTiStampFromSerlCom.

Corresponding calibration: GwmMsg231BusHiSpdTiStampReslCntPer100MicroSec

GwmWhlLeDstTiStampFromSerlCom=[(uint32)(Current System Time\* GwmMsg231BusHiSpdTiStampReslCntPer100MicroSec) ]BitwiseAND [65535].

**GwmWhlLeDstVldFromSerlCom**

When GwmWssFLEdgesSumVld is equal to 0x1: Valid, set GwmWhlLeDstVldFromSerlCom to TRUE.(Missing/CheckSum/RollingCntr NTC not consider here, refer to the information described in following section)

**GwmWhlRiDstPlsCntrFromSerlCom**

Refer to GwmWhlLeDstPlsCntrFromSerlCom.

**GwmWhlRiDstTiStampFromSerlCom**

Refer to GwmWhlLeDstTiStampFromSerlCom

**GwmWhlRiDstVldFromSerlCom**

Refer to GwmWhlLeDstVldFromSerlCom.

**GwmWhlRotlStsTiStampReslFromSerlCom**

Corresponding calibration: GwmMsg231BusHiSpdWhlRotlStsTiStampResl

GwmWhlRotlStsTiStampReslFromSerlCom should be equal to GwmMsg231BusHiSpdWhlRotlStsTiStampResl.

**GwmWhlPlsPerRevFromSerlCom**

Corresponding calibration: GwmMsg231BusHiSpdWhlPlsPerRev

GwmWhlPlsPerRevFromSerlCom should be equal to GwmMsg231BusHiSpdWhlPlsPerRev.

**RollingCounter\_ABS1**

Refer to the E2E communication protection specification V2.1.

**Checksum\_ABS1**

Refer to the E2E communication protection specification V2.1.

### 2.2.3 ABS3 (Msg ID $265)(CAN)

**Transmit Type:** Periodic

**Transmitter: ESP**

**Periodic Interval (msec):** 20ms

**Data Length (Bytes):** 8

**Missing Message NTC #:** $128

**Invalid Message NTC #:** $129

**E2E error NTC** #: $12A

**DataID:** High\_byte: 0x00 Low\_byte:0x28

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| CheckSum\_ABS3 | 7 | 8 | N/A | 1 | 0 | 0 to 255 | **0x00-0xFF:Valid values**  **Init value : 0x0** |
| VehSpdVld | 13 | 1 | N/A | 1 | 0 | 0 - 1 | **0x0:Invalid**  **0x1:Valid**  **Init value : 0x0** |
| VehSpd | 12 | 13 | KPH | 0.05625 | 0 | 0 – 299.98125 | **0x0000-0x14D5:Valid values**  **0x14D6-0x1FFF:Reserved**  **Init value : 0x0** |
| RollingCounter\_ABS3 | 59 | 4 | N/A | 1 | 0 | 0 - 15 | **0x0-0xE:Valid value**  **0xF:Invalid value**  **Init value : 0x0** |

**Comments: Msg265 is designed for CAN communication in application layer. So use the input GwmComTyp to distinguish current ECUId is for CAN or CAN FD.**

**When GwmComTyp is equal to 1(CAN FD), set all NTCs related to Msg265 as PASS, inhibit diagnostic and set all outputs to corresponding interface’s initial value.**

**When GwmComTyp is equal to 0(CAN), set outputs as below description and diagnostic as Section 3.7-3.9.**

**VehSpd**

VehSpd indicates the speed of the vehicle.

Corresponding output: VehSpdSerlCom which is the input of CF310A.

VehSpdSerlCom= GwmVehSpd\*0.05625.

**VehSpdVld**

VehSpdVld indicates the validity of VehicleSpd.

Corresponding output: VehSpdVldSerlCom which is the input of CF310A.

When VehSpdVld is equal to 0x1: Valid, set VehSpdVldSerlCom to TRUE;

When VehSpdVld is equal to 0x0: Invalid, set VehSpdVldSerlCom to FALSE;

(Missing/CheckSum/RollingCntr NTC not consider here, refer to the information described in following section)

**CheckSum\_ABS3**

Refer to the E2E communication protection specification V2.1.

**RollingCounter\_ABS3**

Refer to the E2E communication protection specification V2.1.

### 2.2.4 CSA2 (Msg ID $0A1)(CAN/CANFD)

**Transmit Type:** Periodic

**Transmitter: GW**

**Periodic Interval (msec):** 10ms

**Data Length (Bytes):** 8

**Missing Message NTC #:** $130

**Invalid Message NTC #:** $131

**E2E error NTC** #: $132

**DataID:** High\_byte: 0x00 Low\_byte:0x38

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| Checksum\_CSA2 | 7 | 8 | N/A | 1 | 0 | 0 to 255 | **0x00-0xFF:Valid values**  **Init value : 0x0** |
| SteerWheelAng | 15 | 15 | deg | 0.1 | 0 | 0 - 780 | **0x0000-0x1E78:Valid value**  **0x1E79-0x7FFE:Reserved**  **0x7FFF:Invalid**  **Init value : 0x0** |
| SteerWheelAngSign | 16 | 1 | N/A | 1 | 0 | 0 – 1 | **0x0:Left (Positive)**  **0x1:Right (Negative)**  **Init value : 0x0** |
| SAS\_Sts | 55 | 2 | N/A | 1 | 0 | 0 – 3 | **0x0:SAS Angle And Speed Correct**  **0x1:SAS Not Calibrated**  **0x2:Intermittent Error Detected**  **0x3:Permanent Error Detected**  **Init value:0x0** |
| Rollingcounter\_CSA2 | 59 | 4 | N/A | 1 | 0 | 0 - 15 | **0x0-0xE:Valid value**  **0xF:Invalid value**  **Init value : 0x0** |

**Comments: Msg0A1 is designed for both CAN and CAN FD communication in application layer.**

**SteerWheelAng**

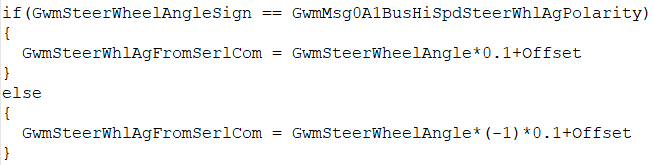
SteerWheelAng indicates the relative position angle of handwheel, merge with the signal value of SteerWheelAngSign and calibration of Polarity, then it can offer the absolute position angle.

Corresponding output: GwmSteerWhlAgFromSerlCom which is the input of SF045A(HwAgCorrd).

Corresponding calibrations: GwmMsg0A1BusHiSpdSteerWhlAgPolarity

**SteerWheelAngSign**

SteerWheelAngSign indicates the sign of SteerAngle.



**SAS\_Sts**

SAS\_Sts indicates the status of SAS.

Corresponding output: GwmSteerWhlAgVldFromSerlCom which is the input of SF045A(HwAgTrimPrfmd).

When SAS\_Sts is equal to 0x0: SAS Angle And Speed Correct, set GwmSteerWhlAgVldFromSerlCom to True.

When SAS\_Sts is not equal to 0x0, set GwmSteerWhlAgVldFromSerlCom to False.

(Missing/CheckSum/RollingCntr NTC not consider here, refer to the information described in following section)

**CheckSum\_ABS3**

Refer to the E2E communication protection specification V2.1.

**RollingCounter\_ABS3**

Refer to the E2E communication protection specification V2.1.

### 2.2.5 ECM1 (Msg ID $111)(CAN)

**Transmit Type:** Periodic

**Transmitter :ECM**

**Periodic Interval (msec):** 10ms

**Data Length (Bytes):** 8

**Missing Message NTC #:** $136

**Invalid Message NTC #:** $137

**DataID:** High\_byte: 0x00 Low\_byte:0x1B

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| EngSpd | 47 | 16 | RPM | 0.125 | 0 | 0 – 8191.875 | **0x0000- 0xFFFF:Valid values**  **Init value : 0x0** |
| EngSpdVldty | 63 | 2 | N/A | 1 | 0 | 0 - 2 | **0x0:Invalid**  **0x1:Valid**  **0x2:Initial value**  **0x3:Reserved**  **Init value : 0x2** |

**Comments:**

1. **Msg111 is designed for CAN communication in application layer. So use the input GwmComTyp to distinguish current ECUId is for CAN or CAN FD.**
2. **Msg111 is designed for Gasoline vehicle. So use the input GwmVehPrpnTyp to distinguish current vehicle type is Gasoline/PHEV/EV.**

**When GwmComTyp is equal to 1(CAN FD) OR GwmVehPrpnTyp is equal to 2(EV), set all NTCs related to Msg111 as PASS, inhibit diagnostic and set all outputs to corresponding interface’s initial value.**

**When GwmComTyp is equal to 0(CAN) and GwmVehPrpnTyp is equal to 0/1(Gasoline/PHEV), set outputs as below description and diagnostic as Section 3.18-3.19.**

**EngSpd**

EngSpd indicates the RPM of the engine.

Corresponding output: GwmEngSpdFromSerlCom which is the input of CF125B.

GwmEngSpdFromSerlCom= EngSpd\*0.125+Offset.

(Missing/CheckSum/RollingCntr NTC not consider here, refer to the information described in following section)

**EngSpdVldty**

EngSpdVldty indicates the validity of EngSpd.

Corresponding output: GwmEngSpdVldFromSerlCom which is the input of CF125B.

When EngSpdVldty is equal to 0x0: Invalid OR 0x3: Resd, set GwmEngSpdVldFromSerlCom to False.(Refer to logic of NTC137)

When EngSpdVldty is equal to 0x1: Valid OR 0x2: Initial value, set GwmEngSpdVldFromSerlCom to True.

(Missing/CheckSum/RollingCntr NTC not consider here, refer to the information described in following section)

### 2.2.6 ECM2 (Msg ID $271)(CAN)

**Transmit Type:** Periodic

**Transmitter :ECM**

**Periodic Interval (msec):** 20ms

**Data Length (Bytes):** 8

**Missing Message NTC #:** $138

**~~Invalid Message NTC #:~~** ~~$139~~

**E2E error NTC** #: $13A

**DataID:** High\_byte: 0x00 Low\_byte:0x1E

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| Checksum\_ECM2 | 7 | 8 | N/A | 1 | 0 | 0 to 255 | **0x00-0xFF:Valid values**  **Init value : 0x0** |
| EngState | 62 | 2 | N/A | 1 | 0 | 0 - 3 | **0x0:Stopped**  **0x1:Cranking**  **0x2:Running**  **0x3:Stalling**  **Init value : 0x0** |
| RollingCounter\_ECM2 | 59 | 4 | N/A | 1 | 0 | 0 - 15 | **0x0-0xE:Valid value**  **0xF:Invalid value**  **Init value : 0x0** |

**Comments:**

1. **Msg271 is designed for CAN communication in application layer. So use the input GwmComTyp to distinguish current ECUId is for CAN or CAN FD.**
2. **Msg271 is designed for Gasoline vehicle. So use the input GwmVehPrpnTyp to distinguish current vehicle type is Gasoline/PHEV/EV.**

**When GwmComTyp is equal to 1(CAN FD) OR GwmVehPrpnTyp is equal to 2(EV), set all NTCs related to Msg271 as PASS, inhibit diagnostic and set all outputs to corresponding interface’s initial value.**

**When GwmComTyp is equal to 0(CAN) and GwmVehPrpnTyp is equal to 0/1(Gasoline/PHEV), set outputs as below description and diagnostic as Section 3.20-3.21.**

**EngState**

EngState indicates the Vehicle engine status.

Corresponding output: GwmEngStFromSerlCom, GwmEngStVldFromSerlCom

GwmEngStFromSerlCom should be equal to EngState.

(Missing/CheckSum/RollingCntr NTC not consider here, refer to the information described in following section)

GwmEngStVldFromSerlCom should be set to false when the qualifier status of NTC 138/13A/13B is FAILED. Otherwise set it to true.

**Checksum\_ECM2**

Refer to the E2E communication protection specification V2.1.

**RollingCounter\_ECM2**

Refer to the E2E communication protection specification V2.1.

### 2.2.7ECM3 (Msg ID $371) (CAN)

**Transmit Type:** Periodic

**Transmitter: ECM**

**Periodic Interval (msec):** 100ms

**Data Length (Bytes):** 8

**Missing Message NTC #:** $188

**Invalid Message NTC #:** $189

**E2E ERROR NTC #:** $18A

**DataID:** High\_byte: 0x00 Low\_byte:0x1F

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| Checksum\_ECM3 | 7 | 8 | N/A | 1 | 0 | 0 to 255 | **0x00-0xFF:Valid values**  **Init value : 0x0** |
| MaxEngTrqNorm | 23 | 7 | Nm | 5 | 0 | 0~510 | **0x00-0x66:Valid values**  **0x67-0x7F:Rserved**  **Initial Value: 0x00** |
| RollingCounter\_ECM3 | 59 | 4 | N/A | 1 | 0 | 0 - 15 | **0x0-0xE:Valid value**  **0xF:Invalid value**  **Init value : 0x0** |

**Comments:**

**Msg371 is designed for CAN communication in application layer. So use the input GwmComTyp to distinguish current ECUId is for CAN or CAN FD.**

**Msg371 is designed for Gasoline vehicle. So use the input GwmVehPrpnTyp to distinguish current vehicle type is Gasoline/PHEV/EV.**

**When GwmComTyp is equal to 1(CAN FD) OR GwmVehPrpnTyp is equal to 1/2(PHEV/EV), set all NTCs related to Msg371 as PASS, inhibit diagnostic and set all outputs to corresponding interface’s initial value.**

**When GwmComTyp is equal to 0(CAN) and GwmVehPrpnTyp is equal to 0(Gasoline), set outputs as below description and diagnostic as Section 3.50-3.52.**

**MaxEngTrqNorm**

MaxEngTrqNorm indicates the Max Engine Torque of the engine on current vehicle, used for TSC function.

Corresponding output: GwmMaxEngTq

GwmMaxEngTq = MaxEngTrqNorm\*5

(NTC not consider here, refer to the information described in following section)

**Checksum\_ECM3**

Refer to the E2E communication protection specification V2.1.

**RollingCounter\_ECM3**

Refer to the E2E communication protection specification V2.1.

### 2.2.8 ECM4 (Msg ID $082) (CAN)

**Transmit Type:** Periodic

**Transmitter: ECM**

**Periodic Interval (msec):** 10ms

**Data Length (Bytes):** 8

**Missing Message NTC #:** $13C

**Invalid Message NTC #:** $13D

**DataID:** High\_byte: 0x00 Low\_byte:0x18

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| NetEngTrq | 15 | 16 | % | 0.0030518 | -100 | -100 to 99.9966612 | **0x0000-0xFFFE:Valid values**  **0xFFFF:Invalid**  **Init value : 0x7FFF** |

**Comments:**

**Msg082 is designed for CAN communication in application layer. So use the input GwmComTyp to distinguish current ECUId is for CAN or CAN FD.**

**Msg082 is designed for Gasoline vehicle. So use the input GwmVehPrpnTyp to distinguish current vehicle type is Gasoline/PHEV/EV.**

**When GwmComTyp is equal to 1(CAN FD) OR GwmVehPrpnTyp is equal to 1/2(PHEV/EV), set all NTCs related to Msg082 as PASS, inhibit diagnostic and set all outputs to corresponding interface’s initial value.**

**When GwmComTyp is equal to 0(CAN) and GwmVehPrpnTyp is equal to 0(Gasoline), set outputs as below description and diagnostic as Section 3.23-3.24.**

**NetEngTrq**

NetEngTrq indicates the torque sent by engine fly wheel. Used for TSC function. Related to GwmMaxEngTq which is the output of Msg371.

Corresponding output: GwmEngTq, GwmEngTqInvld.

~~Corresponding calibration: GwmMsg082BusHiSpdEngTqMax.~~

GwmEngTq = (NetEngTrq\* Res+Offset)\* GwmMaxEngTq

(Missing/CheckSum/RollingCntr NTC not consider here, refer to the information described in following section)

GwmEngTqInvld should be set to true when the qualifier status of NTC 13C/13D is FAILED. Otherwise set it to false.

### 2.2.9 ESP\_FD2 (Msg ID $137)(CANFD)

**Transmit Type:** Periodic

**Transmitter :ESP**

**Periodic Interval (msec):** 20ms

**Data Length (Bytes):** 64

**Missing Message NTC #:** $170

**Invalid Message NTC #:** $171

**E2E error NTC** #: $172

**DataID:** High\_byte: 0x00 Low\_byte: 0x28

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| CheckSum\_ABS3 | 327 | 8 | NA | 1 | 0 | 0~255 | **0x00-0xFF:Valid values**  **Init value:0x0** |
| VehSpdVld | 333 | 1 | NA | 1 | 0 | 0~1 | **0x0:Invalid values  0x1:Valid values**  **Init value:0x0** |
| VehSpd | 332 | 13 | kph | 0.05625 | 0 | 0~299.98125 | **0x0000-0x14D5: Valid values  0x14D6-0x1FFF: Reserved**  **Init value:0x0** |
| RollingCounter\_ABS3 | 379 | 4 | NA | 1 | 0 | 0~15 | **0x0-0xE: Valid value  0xF:Invalid value**  **Init value:0x0** |

**Comments: Msg137 is designed for CAN FD communication in application layer. So use the input GwmComTyp to distinguish current ECUId is for CAN or CAN FD.**

**When GwmComTyp is equal to 0(CAN), set all NTCs related to Msg137 as PASS, inhibit diagnostic and set all outputs to corresponding interface’s initial value.**

**When GwmComTyp is equal to 1(CAN FD), set outputs as below description and diagnostic as Section 3.36-3.38.**

**VehSpd**

VehSpd indicates the speed of the vehicle.

Corresponding output: VehSpdSerlComFd which is the input of CF310A.

VehSpdSerlComFd= GwmVehSpdFd\*0.05625.

**VehSpdVld**

VehSpdVld indicates the validity of VehicleSpd.

Corresponding output: VehSpdVldSerlComFd which is the input of CF310A.

When GwmVehSpdVldFd is equal to 0x1:Valid, set VehSpdVldSerlComFd to TRUE;

When GwmVehSpdVldFd is equal to 0x0:Invalid, set VehSpdVldSerlComFd to FALSE;

(Missing/CheckSum/RollingCntr NTC not consider here, refer to the information described in following section)

**CheckSum\_ABS3**

Refer to the E2E communication protection specification V2.1.

**RollingCounter\_ABS3**

Refer to the E2E communication protection specification V2.1.

### 2.2.10ESP\_FD3 (Msg ID $13B)(CANFD)

**Transmit Type:** Periodic

**Transmitter :ESP**

**Periodic Interval (msec):** 20ms

**Data Length (Bytes):** 64

**Missing Message NTC #:** $174

**Invalid Message NTC #:** $175

**E2E error NTC** #: $176

**DataID:** High\_byte: 0x00 Low\_byte:0x26

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| CheckSum\_ABS1 | 7 | 8 | NA | 1 | 0 | 0~255 | **0x00-0xFF:Valid**  **Init value:0x0** |
| WssFLEdgesSum | 47 | 8 | NA | 1 | 0 | 0~255 | **0x00-0xFF:Valid values**  **Init value:0x0** |
| WssFREdgesSum | 55 | 8 | NA | 1 | 0 | 0~255 | **0x00-0xFF:Valid values**  **Init value:0x0** |
| WssFLEdgesSumVld | 63 | 1 | A | 1 | 0 | 0~1 | **0x0:Invalid  0x1:Valid**  **Init value:0x1** |
| WssFREdgesSumVld | 62 | 1 | NA | 1 | 0 | 0~1 | **0x0:Invalid  0x1:Valid**  **Init value:0x1** |
| RollingCounter\_ABS1 | 59 | 4 | NA | 1 | 0 | 0~15 | **0x0-0xE:Valid value  0xF:Invalid value**  **Init value:0x0** |

**Comments:**

**Msg13B is designed for CAN FD communication in application layer. So use the input GwmComTyp to distinguish current ECUId is for CAN or CAN FD.**

**When GwmComTyp is equal to 0(CAN), set all NTCs related to Msg13B as PASS, inhibit diagnostic and set all outputs to corresponding interface’s initial value.**

**When GwmComTyp is equal to 1(CAN FD), set outputs as below description and diagnostic as Section 3.39-3.41.**

**WssFLEdgesSum**

WssFLEdgesSum indicates the Left Wheel Distance Pulse Counter.

Corresponding output: GwmWhlLeDstPlsCntrFromSerlComFd which is the input of CF310A.

**WssFREdgesSum**

WssFREdgesSum indicates the Right Wheel Distance Pulse Counter.

Corresponding output: GwmWhlRiDstPlsCntrFromSerlComFd which is the input of CF310A.

**WssFLEdgesSumVld**

WssFLEdgesSumVld indicates the Valid of Front Left Wheel Speed Sensor.

Corresponding output: GwmWhlLeDstVldFromSerlComFd which is the input of CF310A.

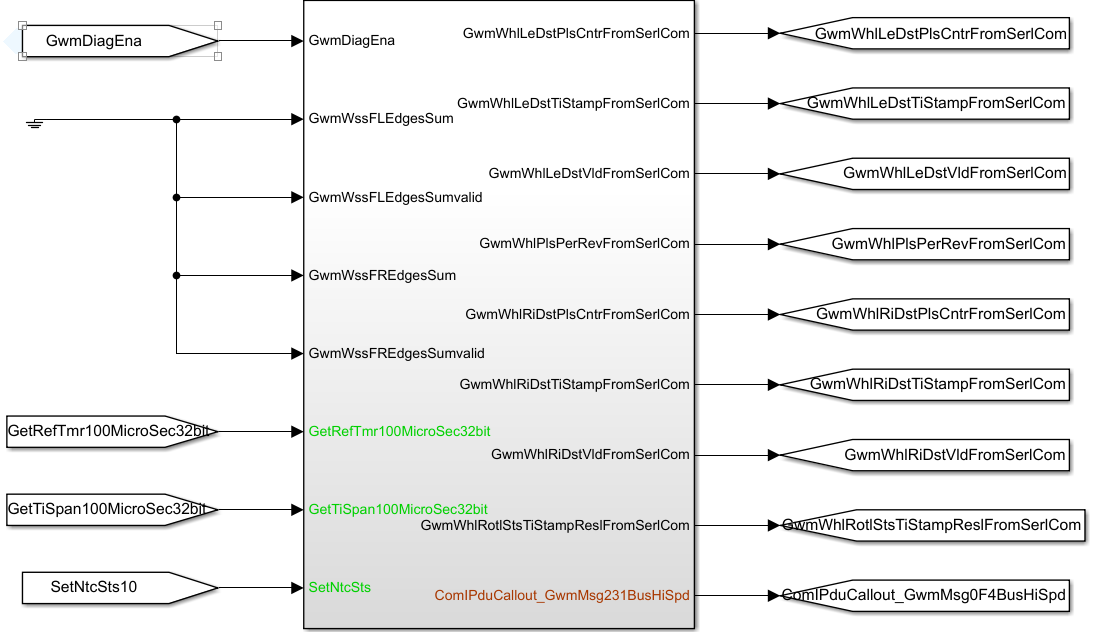
**WssFREdgesSumVld**

WssFREdgesSumVld indicates the Valid of Front Right Wheel Speed Sensor.

Corresponding output: GwmWhlRiDstVldFromSerlComFd which is the input of CF310A.

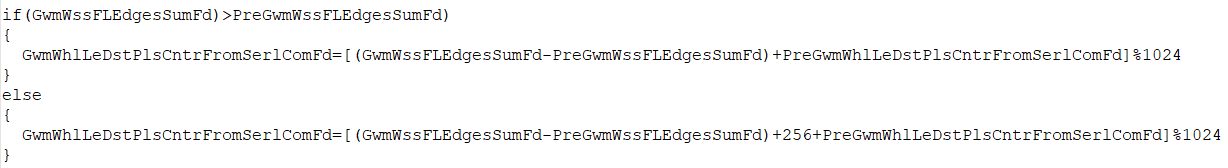
**Since this MM is complex, so describe the detail logic as below:**

Comments: Use Left wheel signals as example.



**GwmWhlLeDstPlsCntrFromSerlComFd**

When GwmWssFLEdgesSumFd changed, update GwmWhlLeDstPlsCntrFromSerlComFd.



**GwmWhlLeDstTiStampFromSerlComFd**

When GwmWssFLEdgesSumFd changed, update GwmWhlLeDstTiStampFromSerlComFd.

Corresponding calibration: GwmMsg13BBusHiSpdTiStampReslCntPer100MicroSec

GwmWhlLeDstTiStampFromSerlComFd=[(uint32)(Current System Time\* GwmMsg13BBusHiSpdTiStampReslCntPer100MicroSec) ]BitwiseAND [65535].

**GwmWhlLeDstVldFromSerlComFd**

When GwmWssFLEdgesSumVldFd is equal to 0x1: Valid, set GwmWhlLeDstVldFromSerlComFd to TRUE.(Missing/CheckSum/RollingCntr NTC not consider here, refer to the information described in following section)

**GwmWhlRiDstPlsCntrFromSerlComFd**

Refer to GwmWhlLeDstPlsCntrFromSerlComFd.

**GwmWhlRiDstTiStampFromSerlComFd**

Refer to GwmWhlLeDstTiStampFromSerlComFd

**GwmWhlRiDstVldFromSerlComFd**

Refer to GwmWhlLeDstVldFromSerlComFd.

**GwmWhlRotlStsTiStampReslFromSerlComFd**

Corresponding calibration: GwmMsg13BBusHiSpdWhlRotlStsTiStampResl

GwmWhlRotlStsTiStampReslFromSerlComFd should be equal to GwmMsg13BBusHiSpdWhlRotlStsTiStampResl.

**GwmWhlPlsPerRevFromSerlComFd**

Corresponding calibration: GwmMsg231BusHiSpdWhlPlsPerRev

GwmWhlPlsPerRevFromSerlComFd should be equal to GwmMsg231BusHiSpdWhlPlsPerRev.

**RollingCounter\_ABS1**

Refer to the E2E communication protection specification V2.1.

**Checksum\_ABS1**

Refer to the E2E communication protection specification V2.1.

### 2.2.11 ECM\_FD5 (Msg ID $08F)(CANFD)

**Transmit Type:** Periodic

**Transmitter :ECM**

**Periodic Interval (msec):** 10ms

**Data Length (Bytes):** 64

**Missing Message NTC #:** $180

**Invalid Message NTC #:** $181

**DataID:** High\_byte: 0x00 Low\_byte:0x1B

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| EngSpd\_PHEV | 47 | 16 | RPM | 0.125 | 0 | 0~8191.875 | 0x0000-0xFFFF:Valid values  Init value:0x0 |
| EngSpdVldty\_PHEV | 63 | 2 | NA | 1 | 0 | 0~3 | 0x0:InValid values  0x1:Valid values  0x2:Init value  0x3:Reserved  Init value:0x2 |

**Comments:**

**Msg08F is designed for CAN FD communication in application layer. So use the input GwmComTyp to distinguish current ECUId is for CAN or CAN FD.**

**Msg08F is designed for Gasoline vehicle. So use the input GwmVehPrpnTyp to distinguish current vehicle type is Gasoline or PHEV/EV.**

**Confirmed with customer, use this Msg08F as gasoline vehicle’s propulsion message though the signal’s name is XXX\_PHEV.**

**When GwmComTyp is equal to 0(CAN) OR GwmVehPrpnTyp is equal to 2(EV), set all NTCs related to Msg08F as PASS, inhibit diagnostic and set all outputs to corresponding interface’s initial value.**

**When GwmComTyp is equal to 1(CAN FD) and GwmVehPrpnTyp is equal to 0/1(Gasoline/PHEV), set outputs as below description and diagnostic as Section 3.42-3.43.**

**EngSpd\_PHEV**

EngSpd\_PHEV indicates the speed of the engine.

Corresponding output: GwmEngSpdFromSerlComFd which is the input of CF125B.

GwmEngSpdFromSerlComFd= EngSpd\_PHEV\*0.125+Offset.

(NTC not consider here, refer to the information described in following section)

**EngSpdVldty\_PHEV**

EngSpdVldty\_PHEV indicates the validity of EngSpd.

Corresponding output: GwmEngSpdVldFromSerlComFd which is the input of CF125B.

When EngSpdVldty\_PHEV is equal to 0x0: Invalid OR 0x3: Resd, set GwmEngSpdVldFromSerlComFd to False. (Refer to logic of NTC181)

When EngSpdVldty\_PHEV is equal to 0x1: Valid OR 0x2: Initial value, set GwmEngSpdVldFromSerlComFd to True.

(NTC not consider here, refer to the information described in following section)

### 2.2.12 ECM\_FD2 (Msg ID $103)(CANFD)

**Transmit Type:** Periodic

**Transmitter: ECM**

**Periodic Interval (msec):** 20ms

**Data Length (Bytes):** 64

**Missing Message NTC #:** $182

**Invalid Message NTC #:** $183

**DataID:** High\_byte: 0x00 Low\_byte:0x92

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| EngState\_PHEV | 351 | 3 | NA | 1 | 0 | 0~7 | **0x0:Stand by**  **0x1:Ready**  **0x2:Cranking**  **0x3:Running**  **0x4:Stopping**  **0x5:Finish**  **0x6:Autostopping**  **0x7:Reserved**  **Init value:0x0** |

**Comments:**

1. **Msg103 is designed for CAN FD communication in application layer. So use the input GwmComTyp to distinguish current ECUId is for CAN or CAN FD.**
2. **Msg103 is designed for Gasoline vehicle. So use the input GwmVehPrpnTyp to distinguish current vehicle type is Gasoline or PHEV/EV.**

**When GwmComTyp is equal to 0(CAN) OR GwmVehPrpnTyp is equal to 2(EV), set all NTCs related to Msg103 as PASS, inhibit diagnostic and set all outputs to corresponding interface’s initial value.**

**When GwmComTyp is equal to 1(CAN FD) and GwmVehPrpnTyp is equal to 0/1(Gasoline/PHEV), set outputs as below description and diagnostic as Section 3.44-3.45.**

**EngState\_PHEV**

EngState\_PHEV indicates the Vehicle engine status.

Corresponding output: GwmEngStFromSerlComFd, GwmEngStVldFromSerlComFd

GwmEngStFromSerlComFd should be equal to EngState\_PHEV.

(NTC not consider here, refer to the information described in following section)

GwmEngStVldFromSerlComFd should be set to false when the qualifier status of NTC 182/183 FAILED. Otherwise set it to true.

### 2.2.13 HCU\_FD1 (Msg ID $060)(CANFD)

**Transmit Type:** Periodic

**Transmitter :HCU**

**Periodic Interval (msec):** 10ms

**Data Length (Bytes):** 64

**Missing Message NTC #:** $184

**Invalid Message NTC #:** $185

**DataID:** High\_byte: 0x00 Low\_byte:0x81 (message Segment2)

**DataID:** High\_byte: 0x00 Low\_byte:0XC7 (message Segment3)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| TotWheelTrq | 147 | 12 | Nm | 5 | -6000 | -6000~ 14475 | **0x000~0xFFF:Vaild value**  **Init value:** **0x4B0** |
| TotWheelTrqVld | 171 | 1 | NA | 1 | 0 | 0~1 | **0x0:Invaild**  **0x1:Valid**  **Init value: 0x0** |

**Comments:**

1. **Msg060 is designed for CAN FD communication in application layer. So use the input GwmComTyp to distinguish current ECUId is for CAN or CAN FD.**
2. **Msg060 is designed for PHEV(HEV) vehicle. So use the input GwmVehPrpnTyp to distinguish current vehicle type is Gasoline or PHEV(HEV) or EV.**

**When GwmComTyp is equal to 0(CAN) OR GwmVehPrpnTyp is equal to 0/2(Gasoline/EV), set all NTCs related to Msg060 as PASS, inhibit diagnostic and set all outputs to corresponding interface’s initial value.**

**When GwmComTyp is equal to 1(CAN FD) and GwmVehPrpnTyp is equal to 1 (PHEV), set outputs as below description and diagnostic as Section 3.46-3.47.**

**TotWheelTrq**

TotWheelTrq indicates the output torque of propulsion. The output value should be limited to -6000~6000Nm.

**TotWheelTrqVld**

TotWheelTrqVld indicates the validity of propulsion’s output torque.

Corresponding output: GwmPhevEngTqFd, GwmPhevEngTqInvldFd

When TotWheelTrqVld is equal to 0x1(valid):

GwmPhevEngTqFd = TotWheelTrq\*5+(-6000), GwmPhevEngTqInvldFd=false(valid)

When TotWheelTrqVld is equal to 0x0(Invalid):

GwmPhevEngTqFd = 0Nm, GwmPhevEngTqInvldFd=true(Invalid)

(NTC not consider here, refer to the information described in following section)

### 2.2.14 HCU\_FD3 (Msg ID $12F)(CANFD)

**Transmit Type:** Periodic

**Transmitter :HCU**

**Periodic Interval (msec):** 20ms

**Data Length (Bytes):** 64

**Missing Message NTC #:** $186

**Invalid Message NTC #:** $187

**DataID:** High\_byte: 0x00 Low\_byte:0x8A (message Segment2)

**DataID:** High\_byte: 0x00 Low\_byte:0X8B (message Segment3)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (MSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| HCU\_GearSts | 164 | 4 | NA | 1 | 0 | 0~15 | **0x0:Select lever in position "P"**  **0x1:Reserved**  **0x2:Reserved**  **0x3:Reserved**  **0x4:Reserved**  **0x5:Select lever in position "D"**  **0x6:Select lever in position "N"**  **0x7:Select lever in position "R"**  **0x08-0xD:Reserved**  **0xE:Intermediate position**  **0xF:Invalid**  **Init value: 0xE** |
| HCU\_EPSEnable | 83 | 1 | NA | 1 | 0 | 0-1 | **0x0:Disable**  **0x1:Enable**  **Init value: 0x0** |

**Comments: Msg12F is designed for CAN FD communication in application layer. So use the input GwmComTyp to distinguish current ECUId is for CAN or CAN FD.**

**When GwmComTyp is equal to 0(CAN), set all NTCs related to Msg12F as PASS, inhibit diagnostic and set all outputs to corresponding interface’s initial value.**

**When GwmComTyp is equal to 1(CAN FD), set outputs as below description and diagnostic as Section 3.57-3.58.**

**HCU\_GearSts**

HCU\_GearSts indicates the gear status, used for Steering Return Correction Reminder function.

Corresponding output: GwmGearStsFd.

When HCU\_GearSts is equal to 0x0, set GwmGearStsFd to 0x0;

When HCU\_GearSts is equal to 0x5, set GwmGearStsFd to 0x1;

When HCU\_GearSts is equal to 0x6, set GwmGearStsFd to 0x2;

When HCU\_GearSts is equal to 0x7, set GwmGearStsFd to 0x3;

When HCU\_GearSts is equal to 0xE, set GwmGearStsFd to 0x4;

Otherwise set GwmGearStsFd to 0x5.

GwmGearStsFd: just Cnt, not enumeration.

0X0: P.

0X1: D.

0X2: N.

0X3: R.

0X4: Intermediate position.

0x5:Invalid

(NTC not consider here, refer to the information described in following section)

**HCU\_EPSEnable**

HCU\_EPSEnable indicates the powertrain status of PHEV/EV vehicle.

Corresponding output: GwmPtStsFd, GwmPtStsVldFd

GwmPtStsFd should be equal to HCU\_EPSEnable.

When the qualifier status of NTC186 is FAILED, set GwmPtStsVldFd to False(Invalid).

Otherwise set GwmPtStsVldFd to True(Valid).

(NTC not consider here, refer to the information described in following section)

### 2.2.15 EPS\_Phy\_Req (Msg ID $721)

**Transmitter:** Tester

**Transmit Type:** Event

**Event:** Tool Request

**Data Length (Bytes):** 8

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (LSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| DiagPhysRepToEPS | 56 | 64 | N/A | N/A | N/A | N/A | N/A |

### 2.2.16 Diag\_Fun\_Req (Msg ID $760)

**Transmitter:** Tester

**Transmit Type:** Event

**Event:** Tool Request

**Data Length (Bytes):** 8

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (LSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| DiagFuncReq | 56 | 64 | N/A | N/A | N/A | N/A | N/A |

### 2.2.17 EPS\_XCP\_Rx (Msg ID $63C)

**Transmit Type:** Event

**Event:**  Tool Request

**Data Length (Bytes):** 8

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (LSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| Calibration\_Rx\_Byte0 | 0 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Rx\_Byte1 | 8 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Rx\_Byte2 | 16 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Rx\_Byte3 | 24 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Rx\_Byte4 | 32 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Rx\_Byte5 | 40 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Rx\_Byte6 | 48 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |
| Calibration\_Rx\_Byte7 | 56 | 8 | UNM | 1 | 0 | 0 to 255 | N/A |

### 2.2.18 CmnMfgSrvReq (Msg ID $712)

**(This ID carry over A26, and GWM ID $635 to be implemented by LV3)**

**Transmit Type:** Event

**Event:**  Tool Request

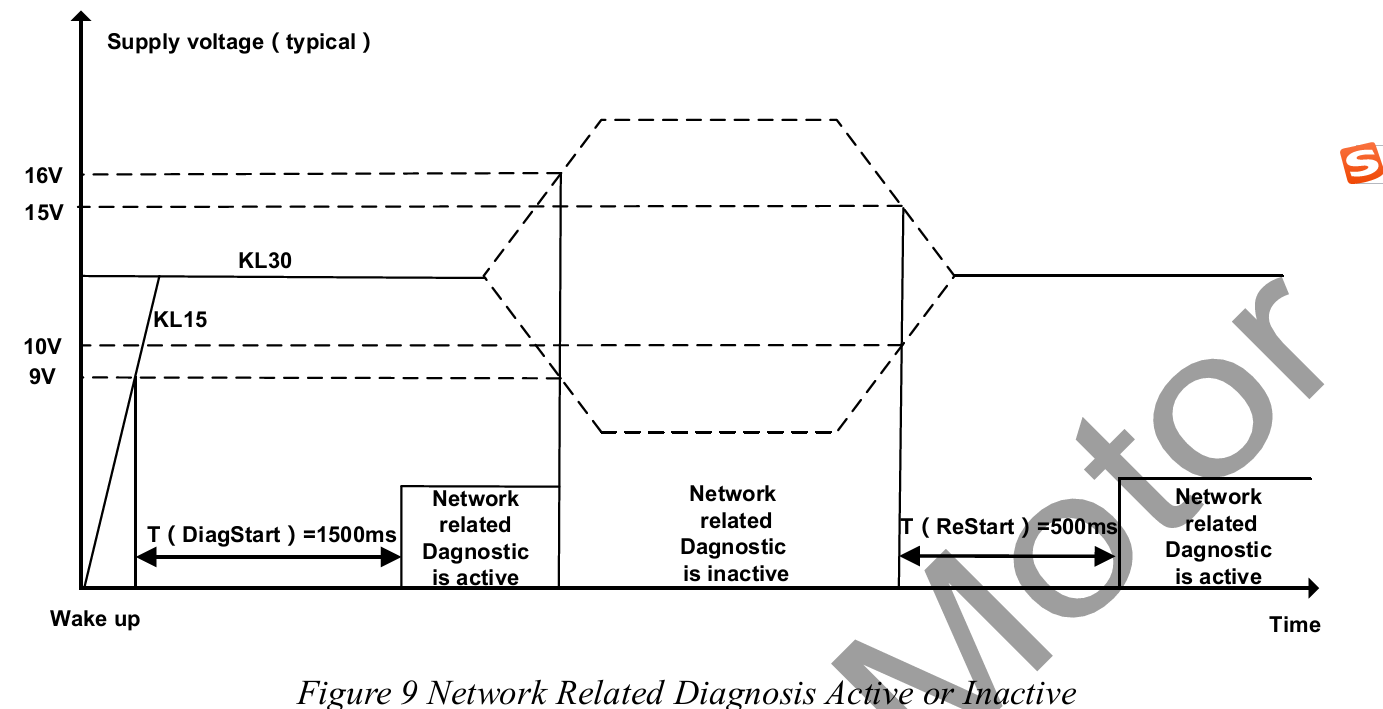
**Data Length (Bytes):** 8

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Start Bit (LSB)** | **Length** | **Units** | **Res.** | **Offset** | **Range** | **Encoding** |
| XCP\_Diag\_Rx | 56 | 64 | UNM | 1 | 0 | N/A | N/A |

# 3 Serial Communication NTCs

-The following criteria shall be satisfied for the below Serial Communication NTCs to be enabled (DiagEna is 1).

The detail please the below diagram:



**AND**

PSCM is in WARM INIT **OR** ENABLE State **OR** DISABLE State

**AND**

Bus Off fault is not current (After Bus off recover, there is a calibration to delay a while to open network related diagnostic)

**AND**

MEC is $00-$05 **OR** $FF

Otherwise, shall inhibit related NTCs(set to PASS), but should keep the execution logic as usual.

-For all Serial Communication NTCs, once the fault is no longer present, or if the PSCM is cycled, the fault shall remain in history.

Note: Invalid NTC triggering condition: Message is not missing and E2E check correct.

## 3.1 NTC $120 – Yaw Rate Signal Missing (Msg ID $245)

**NTC Failure Criteria:** Missing Message (Msg ID $245) 10 periods continuously while DiagEna is 1.

**Failure Condition**: $245 message missed or DLC of Msg $245 not equal to 8.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the VehYawRateSerlCom and VehDynYawRateVld signal.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall use the Initial value of VehYawRateSerlCom, and set VehYawRateVldSerlCom=0x0.

**NTC Recover Criteria:** All monitor message received && DLC==8 on bus at least 10 times continuous

## 3.2 NTC $121 – Yaw Rate Signal Invalid (Msg ID $245)

**NTC Failure Criteria:** Invalid Message (Msg ID $245) 10 periods continuously while DiagEna is 1.

**Failure Condition**: VehYawRate = 0x4422-0xFFFF or VehDynYawRateVld = Invalid

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the VehYawRateSerlCom and VehDynYawRateVld signal.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall use the Initial value of VehYawRateSerlCom, and set VehYawRateVldSerlCom=0x0.

**NTC Recover Criteria:** $245 message is valid at least 10 times continuous

## 3.3 NTC $122 – Yaw Rate Signal E2E Error (Msg ID $245)

**NTC Failure Criteria:** E2E error (Msg ID $245) 10 periods continuously DiagEna is 1.

**Failure Condition:** $245 message E2E error

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the VehYawRateSerlCom and VehDynYawRateVld signal.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall use the Initial value of VehYawRateSerlCom, and set VehYawRateVldSerlCom=0x0.

**NTC Recover Criteria:** $245 message E2E error recover at least 10 times continuous

## 3.4 NTC $124 – Wheel Speed Signal Missing (Msg ID $231)

**NTC Failure Criteria:** Missing Message (Msg ID $231) 10 periods continuously DiagEna is 1.

**Failure Condition:** $231 message missing or DLC of Msg $231 not equal to 8

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmWhlLeDstPlsCntrFromSerlCom, GwmWhlLeDstTiStampFromSerlCom,GwmWhlLeDstVldFromSerlCom, GwmWhlRiDstPlsCntrFromSerlCom, GwmWhlRiDstTiStampFromSerlCom,GwmWhlRiDstVldFromSerlCom.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall hold the last known valid value for the GwmWhlLeDstPlsCntrFromSerlCom, GwmWhlLeDstTiStampFromSerlCom, GwmWhlRiDstPlsCntrFromSerlCom, GwmWhlRiDstTiStampFromSerlCom, set GwmWhlLeDstVldFromSerlCom and GwmWhlRiDstVldFromSerlCom to Invalid.

**NTC Recover Criteria:** All monitor message received && DLC==8 on bus at least 10 times continuous.

## 3.5 NTC $125 – Wheel Speed Signal Invalid (Msg ID $231)

**NTC Failure Criteria:** Invalid Message (Msg ID $231) 10 periods continuously while DiagEna is 1.

**Failure Condition:** WssFLEdgesSumVld = Invalid or WssFREdgesSumVld = Invalid.

**NOTE**: While the timer is active(caused by WssFLEdgesSumVld = Invalid), the PSCM shall hold the last known valid value for the GwmWhlLeDstPlsCntrFromSerlCom, GwmWhlLeDstTiStampFromSerlCom,GwmWhlLeDstVldFromSerlCom, and use the actual value for GwmWhlRiDstPlsCntrFromSerlCom, GwmWhlRiDstTiStampFromSerlCom, GwmWhlRiDstVldFromSerlCom.

While the timer is active(caused by WssFREdgesSumVld = Invalid), the PSCM shall hold the last known valid value for the GwmWhlRiDstPlsCntrFromSerlCom, GwmWhlRiDstTiStampFromSerlCom,GwmWhlRiDstVldFromSerlCom, and use the actual value for GwmWhlLeDstPlsCntrFromSerlCom, GwmWhlLeDstTiStampFromSerlCom, GwmWhlLeDstVldFromSerlCom.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall hold the last known valid value for the GwmWhlLeDstPlsCntrFromSerlCom, GwmWhlLeDstTiStampFromSerlCom, GwmWhlRiDstPlsCntrFromSerlCom, GwmWhlRiDstTiStampFromSerlCom, set GwmWhlLeDstVldFromSerlCom and GwmWhlRiDstVldFromSerlCom to Invalid.

**NTC Recover Criteria:** $231 message invalid recover at least 10 times continous.

## 3.6 NTC $126 – Wheel Speed Signal E2E Error (Msg ID $231)

**NTC Failure Criteria:** Message (Msg ID $231) E2E error occur 10 periods continuously while DiagEna is 1.

**Failure Condition:** $231 message E2E error

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmWhlLeDstPlsCntrFromSerlCom, GwmWhlLeDstTiStampFromSerlCom,GwmWhlLeDstVldFromSerlCom, GwmWhlRiDstPlsCntrFromSerlCom, GwmWhlRiDstTiStampFromSerlCom,GwmWhlRiDstVldFromSerlCom.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall hold the last known valid value for the GwmWhlLeDstPlsCntrFromSerlCom, GwmWhlLeDstTiStampFromSerlCom, GwmWhlRiDstPlsCntrFromSerlCom, GwmWhlRiDstTiStampFromSerlCom, set GwmWhlLeDstVldFromSerlCom and GwmWhlRiDstVldFromSerlCom to Invalid.

**NTC Recover Criteria:** $231 message E2E error recover at least 10 times continuous.

## 3.7 NTC $128 – Vehicle Speed Signal Missing (Msg ID $265)

**NTC Failure Criteria:** (Msg ID $265) Message Missing 10 periods continuously while DiagEna is 1.

**Failure Condition:** $265 message missing or DLC of Msg $265 not equal to 8

**NOTE:** While the timer is active, the PSCM shall hold the last known valid value for the VehSpdSerlCom and VehSpdVldSerlCom signals.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set VehSpdSerlCom to the calibrated default Vehicle Speed, and set VehSpdVldSerlCom to Invalid.

**NTC Recover Criteria:** All monitor message received && DLC==8 on bus at least 10 times continuous.

## 3.8 NTC $129 – Vehicle Speed Signal Invalid (Msg ID $265)

**NTC Failure Criteria:** Message (Msg ID $265) is Invalid 10 periods continuously while DiagEna is 1.

**Failure Condition:** VehSpd = 0x14D6-0x1FFF or VehSpdVld = Invalid.

**NOTE:** While the timer is active, the PSCM shall hold the last known valid value for the VehSpdSerlCom and VehSpdVldSerlCom signals.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set VehSpdSerlCom to the calibrated default Vehicle Speed, and set VehSpdVldSerlCom to Invalid.

**NTC Recover Criteria:** $265 message invalid recover at least 10 times continuous.

## 3.9 NTC $12A – Vehicle Speed Signal E2E Error (Msg ID $265)

**NTC Failure Criteria:** Message (Msg ID $265) E2E error occur 10 periods continuously while DiagEna is 1.

**Failure Condition:** $265 message E2E error

**NOTE:** While the timer is active, the PSCM shall hold the last known valid value for the VehSpdSerlCom and VehSpdVldSerlCom signals.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set VehSpdSerlCom to the calibrated default Vehicle Speed, and set VehSpdVldSerlCom to Invalid.

**NTC Recover Criteria:** $265 message E2E error recover at least 10 times continuous.

## 3.10 NTC $12C – APS4 Signal Missing (Msg ID $167) (Not used in L2)

**NTC Failure Criteria:** (Msg ID $167) Message Missing 10 periods continuously while DiagEna is 1.

Failure Condition: $167 message missing or DLC of Msg $167 not equal to 8.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous.

## 3.11 NTC $12D – APS4 Signal Invalid (Msg ID $167) (Not used in L2)

**NTC Failure Criteria:** Message (Msg ID $167) is Invalid 10 periods continuously while DiagEna is 1.

Failure Condition: APS\_ReqEPSTgtAngValid`s value: invalid.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** $167 message invalid recover at least 10 times continuous.

## 3.12 NTC $12E – APS4 Signal E2E Error (Msg ID $167) (Not used in L2)

**NTC Failure Criteria:** Message (Msg ID $167) E2E error occur 10 periods continuously while DiagEna is 1.

Failure Condition: $167 message E2E error fault.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** $167 message E2E error recover at least 10 times continuous.

## 3.13 NTC $130 – CSA2 Signal Missing (Msg ID $0A1)

**NTC Failure Criteria:** (Msg ID $0A1) Message Missing 10 periods continuously while DiagEna is 1.

**Failure Condition:** $0A1 message missing or DLC of Msg $0A1 not equal to 8.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmSteerWhlAgFromSerlCom and GwmSteerWhlAgVldFromSerlCom signal.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmSteerWhlAgFromSerlCom to 0 degree and set GwmSteerWhlAgVldFromSerlCom to Invalid.

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous.

## 3.14 NTC $131 – CSA2 Signal Invalid (Msg ID $0A1)

**NTC Failure Criteria:**  Message (Msg ID $0A1) is Invalid 10 periods continuously while DiagEna is 1.

Failure Condition: SteerWheelAng = 0x1E79-0x7FFF or SAS\_Sts != 0x0.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmSteerWhlAgFromSerlCom and GwmSteerWhlAgVldFromSerlCom signal.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmSteerWhlAgFromSerlCom to 0 degree and set GwmSteerWhlAgVldFromSerlCom to Invalid.

**NTC Recover Criteria:** $0A1 message invalid recover at least 10 times continuous.

## 3.15 NTC $132 – CSA2 Signal E2E Error (Msg ID $0A1)

**NTC Failure Criteria:** Message (Msg ID $0A1) E2E error occur 10 periods continuously while DiagEna is 1.

**Failure Condition:** $0A1 message E2E error.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmSteerWhlAgFromSerlCom and GwmSteerWhlAgVldFromSerlCom signal.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmSteerWhlAgFromSerlCom to 0 degree and set GwmSteerWhlAgVldFromSerlCom to Invalid.

**NTC Recover Criteria:** $0A1 message E2E error recover at least 10 times continuous .

## 3.16 NTC $134 – DCT5 Signal Missing (Msg ID $221) (Not used in L2)

**NTC Failure Criteria:** (Msg ID $221) Message Missing 10 periods continuously while DiagEna is 1.

Failure Condition: $221 message missing or DLC of Msg $221 not equal to 8.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous.

## 3.17 NTC $135 – DCT5 Signal Invalid (Msg ID $221) (Not used in L2)

**NTC Failure Criteria:** **:** Message (Msg ID $221) is Invalid 10 periods continuously while DiagEna is 1.

Failure Condition: TGS\_LEVER`s value :0x1~0x4 ,0x9~0xD ,OxF.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** $221 message invalid recover at least 10 times continuous.

## 3.18 NTC $136 – ECM1 Signal Missing (Msg ID $111)

**NTC Failure Criteria:** (Msg ID $111) Message Missing 10 periods continuously while DiagEna is 1.

**Failure Condition:** $111 message Missing or DLC of Msg $111 not equal to 8.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmEngSpdFromSerlCom and GwmEngSpdVldFromSerlCom.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmEngSpdFromSerlCom to 0 RPM, and set GwmEngSpdVldFromSerlCom to Invalid.

**NTC Recover Criteria:** All monitor message received && DLC==8 on bus at least 10 times continuous.

## 3.19 NTC $137 – ECM1 Signal Invalid (Msg ID $111)

**NTC Failure Criteria:** Message (Msg ID $111) is Invalid 10 periods continuously while DiagEna is 1.

**Failure Condition:** EngSpdVldty = 0x0 or 0x3.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmEngSpdFromSerlCom and GwmEngSpdVldFromSerlCom.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmEngSpdFromSerlCom to 0 RPM, and set GwmEngSpdVldFromSerlCom to Invalid.

**NTC Recover Criteria:** $111 message invalid recover at least 10 times continuous.

## 3.20 NTC $138 – ECM2 Signal Missing (Msg ID $271)

**NTC Failure Criteria:** (Msg ID $271) Message Missing 10 periods continuously while DiagEna is 1.

**Failure Condition:** $271 message missing or DLC of Msg $271 not equal to 8.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmEngStFromSerlCom and GwmEngStVldFromSerlCom.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmEngStFromSerlCom to its initial value, and set GwmEngStVldFromSerlCom to Invalid.

**NTC Recover Criteria:** All monitor message received && DLC==8 on bus at least 10 times continuous.

## ~~3.21 NTC $139 – ECM2 Signal Invalid (Msg ID $271)~~

**~~NTC Failure Criteria:~~** ~~Message (Msg ID $271) is Invalid 10 periods continuously while DiagEna is 1.~~

**~~Failure Condition:~~** ~~$271 message invalid.~~

**~~NOTE~~**~~: While the timer is active, the PSCM shall hold the last known valid value for the GwmEngState signal.~~

**~~Failsoft Action:~~** ~~While the fault is CURRENT, the PSCM shall:~~

~~- While the fault is CURRENT, the PSCM shall set GwmEngState to its initial value, and set GwmEngStVldFromSerlCom to Invalid.~~

**~~NTC Recover Criteria:~~** ~~$271 message invalid recover at least 10 times continuous.~~

## 3.22 NTC $13A – ECM2 Signal E2E Error (Msg ID $271)

**NTC Failure Criteria:** Message (Msg ID $271) E2E error occur 10 periods continuously while DiagEna is 1.

**Failure Condition:** $271 message E2E error.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmEngStFromSerlCom and GwmEngStVldFromSerlCom.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmEngStFromSerlCom to its initial value, and set GwmEngStVldFromSerlCom to Invalid.

**NTC Recover Criteria:** $271 message E2E error recover at least 10 times continuous.

## 3.23 NTC $13C – ECM4 Signal Missing (Msg ID $082)

**NTC Failure Criteria:** (Msg ID $082) Message Missing 10 periods continuously while DiagEna is 1.

**Failure Condition:** $082 message missing or DLC of Msg $082 not equal to 8.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmEngTq and GwmEngTqInvld.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmEngTq to its initial value, and set GwmEngTqInvld to Invalid.

**NTC Recover Criteria:** All monitor message received && DLC==8 on bus at least 10 times continuous.

## 3.24 NTC $13D – ECM4 Signal Invalid (Msg ID $082)

**NTC Failure Criteria:** Message (Msg ID $082) is Invalid 10 periods continuously while DiagEna is 1.

**Failure Condition:** NetEngTrq = 0xFFFF.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmEngTq and GwmEngTqInvld.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmEngTq to its initial value, and set GwmEngTqInvld to Invalid.

**NTC Recover Criteria:** $082 message invalid recover at least 10 times continuous.

## 3.25 NTC $13E – ESP2 Signal Missing (Msg ID $145) (Not use in L2)

**NTC Failure Criteria:** (Msg ID $145) Message Missing 10 periods continuously while DiagEna is 1.

Failure Condition: $145 message missing or DLC of Msg $145 not equal to 8.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous .

## 3.26 NTC $13F – ESP2 Signal Invalid (Msg ID $145) (Not use in L2)

**NTC Failure Criteria:** Message (Msg ID $145) is Invalid 10 periods continuously while GWM Gwm CanDtcInhb is 0.

Failure Condition: DrivingModReq\_ESP`s value:0x4,0x6,0x8,0x9,0xB,0xC,0xE,0xF, 0x10~0x1F .

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** $145 message invalid recover at least 10 times continuous.

## 3.27 NTC $140 – HUT34 Signal Missing (Msg ID $370) (Not use in L2)

**NTC Failure Criteria:** (Msg ID $370) Message Missing 10 periods continuously while GWM Gwm CanDtcInhb is 0.

Failure Condition: $370 message missing or DLC of Msg $370 not equal to 8.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous.

## 3.28 NTC $141 – HUT34 Signal Invalid (Msg ID $370) (Not use in L2)

**NTC Failure Criteria:** Message (Msg ID $370) is Invalid 10 periods continuously while GWM Gwm CanDtcInhb is 0.

Failure Condition: Time\_Hour`s range: 0x18-0x1F or Time\_Minutes`s range: 0x3C-0x3F or Time\_Year\_Left`s range: 0xA-0xF or Time\_Year\_Right`s range: 0xA-0xF or Time\_Month`s range: 0xD-0xF or Time\_Day`s value: 0x0

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** $370 message invalid recover at least 10 times continuous.

## 3.29 NTC $144 – HUT8 Signal Missing (Msg ID $2C6) (Not use in L2)

**NTC Failure Criteria:** (Msg ID $2C6) Message Missing 10 periods continuously while GWM Gwm CanDtcInhb is 0 .

Failure Condition: $2C6 message missing or DLC of Msg $2C6 not equal to 8.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous .

## 3.30 NTC $145 – HUT8 Signal Invalid (Msg ID $2C6) (Not use in L2)

**NTC Failure Criteria:** Message (Msg ID $2C6) is Invalid 10 periods continuously while GWM Gwm CanDtcInhb is 0.

Failure Condition: $2C6 message invalid.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** $ message invalid recover at least 10 times continuous.

## 3.31 NTC $148 – IFC1 Signal Missing (Msg ID $109) (Not use in L2)

**NTC Failure Criteria:** (Msg ID $109) Message Missing 10 periods continuously while GWM Gwm CanDtcInhb is 0.

Failure Condition: $109 message missing or DLC of Msg $109 not equal to 8.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous.

## 3.32 NTC $149 – IFC1 Signal Invalid (Msg ID $109) (Not use in L2)

**NTC Failure Criteria:** Message (Msg ID $109) is Invalid 10 periods continuously while GWM Gwm CanDtcInhb is 0.

Failure Condition: IFCFuncTrqCmdReqFlag`s range: 0x3~0x7 or IFCVibrationWarning`s range: 0x2~0x3.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** $109 message invalid recover at least 10 times continuous.

## 3.33 NTC $14A – IFC1 Signal E2E Error (Msg ID $109) (Not use in L2)

**NTC Failure Criteria:** Message (Msg ID $109) E2E error occur 10 periods continuously while GWM Gwm CanDtcInhb is 0.

Failure Condition: $109 message E2E error.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** $109 message E2E error recover at least 10 times continuous.

## 3.34 NTC $14C – IP2 Signal Missing (Msg ID $27F) (Not use in L2)

**NTC Failure Criteria:** (Msg ID $27F) Message Missing 10 periods continuously while GWM Gwm CanDtcInhb is 0 .

Failure Condition: $27F message missing or DLC of Msg $27F not equal to 8.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous.

## 3.35 NTC $14D – IP2 Signal Invalid (Msg ID $27F) (Not use in L2)

**NTC Failure Criteria:** Message (Msg ID $27F) is Invalid 10 periods continuously while GWM Gwm CanDtcInhb is 0.

Failure Condition: IP\_VehTotDistance`s range: 0x989680-0xFFFFFF.

**Failsoft Action:** While the fault is CURRENT, the PSCM shall:

-

**NTC Recover Criteria:** $27F message invalid recover at least 10 times continuous.

## 3.36 NTC $170 – ESP\_FD2 Missing (Msg ID $137)

**NTC Failure Criteria:** (Msg ID $137) Message Missing 10 periods continuously while DiagEna is 1.

**Failure Condition**: $137 message missing or DLC != 64.

**NOTE:** While the timer is active, the PSCM shall hold the last known valid value for the VehSpdSerlComFd and VehSpdVldSerlComFd.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set VehSpdSerlComFd to the calibrated default Vehicle Speed, and set VehSpdVldSerlComFd to Invalid.

**NTC Recover Criteria:** All monitor message received && DLC==64 on bus at least 10 times continuous.

## 3.37 NTC $171 – ESP\_FD2 Invalid (Msg ID $137)

**NTC Failure Criteria:** Message (Msg ID $137) is Invalid 10 periods continuously while DiagEna is 1.

**Failure Condition:** **:** VehSpd = 0x14D6-0x1FFF or VehSpdVld = Invalid.

**NOTE:** While the timer is active, the PSCM shall hold the last known valid value for the VehSpdSerlComFd and VehSpdVldSerlComFd.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set VehSpdSerlComFd to the calibrated default Vehicle Speed, and set VehSpdVldSerlComFd to Invalid.

**NTC Recover Criteria:** $137 message invalid recover at least 10 times continuous.

## 3.38 NTC $172 – ESP\_FD2 E2E Error (Msg ID $137)

**NTC Failure Criteria:** E2E error (Msg ID $137) 10 periods continuously while DiagEna is 1.

**Failure Condition:** $137 message E2E error

**NOTE:** While the timer is active, the PSCM shall hold the last known valid value for the VehSpdSerlComFd and VehSpdVldSerlComFd.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set VehSpdSerlComFd to the calibrated default Vehicle Speed, and set VehSpdVldSerlComFd to Invalid.

**NTC Recover Criteria:** $137 message E2E error recover at least 10 times continuous

## 3.39 NTC $174 – ESP\_FD3 Missing (Msg ID $13B)

**NTC Failure Criteria**(Msg ID $13B) Message Missing 10 periods continuously while DiagEna is 1.

**Failure Condition:** $13B message missing or DLC != 64.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmWhlLeDstPlsCntrFromSerlComFd, GwmWhlLeDstTiStampFromSerlComFd,GwmWhlLeDstVldFromSerlComFd, GwmWhlRiDstPlsCntrFromSerlComFd, GwmWhlRiDstTiStampFromSerlComFd,GwmWhlRiDstVldFromSerlComFd.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall hold the last known valid value for the GwmWhlLeDstPlsCntrFromSerlComFd, GwmWhlLeDstTiStampFromSerlComFd, GwmWhlRiDstPlsCntrFromSerlComFd, GwmWhlRiDstTiStampFromSerlComFd, set GwmWhlLeDstVldFromSerlComFd and GwmWhlRiDstVldFromSerlComFd to Invalid.

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous.

## 3.40 NTC $175 – ESP\_FD3 Invalid (Msg ID $13B)

**NTC Failure Criteria:** Message (Msg ID $13B) is Invalid 10 periods continuously while DiagEna is 1.

**Failure Condition:** WssFLEdgesSumVld = Invalid or WssFREdgesSumVld = Invalid.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmWhlLeDstPlsCntrFromSerlComFd, GwmWhlLeDstTiStampFromSerlComFd,GwmWhlLeDstVldFromSerlComFd, GwmWhlRiDstPlsCntrFromSerlComFd, GwmWhlRiDstTiStampFromSerlComFd,GwmWhlRiDstVldFromSerlComFd.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall hold the last known valid value for the GwmWhlLeDstPlsCntrFromSerlComFd, GwmWhlLeDstTiStampFromSerlComFd, GwmWhlRiDstPlsCntrFromSerlComFd, GwmWhlRiDstTiStampFromSerlComFd, set GwmWhlLeDstVldFromSerlComFd and GwmWhlRiDstVldFromSerlComFd to Invalid.

**NTC Recover Criteria:** $13B message invalid recover at least 10 times continuous.

## 3.41 NTC $176 – ESP\_FD3 E2E Error (Msg ID $13B)

**NTC Failure Criteria:** E2E error (Msg ID $13B) 10 periods continuously while DiagEna is 1.

**Failure Condition:** $13B message E2E error (CheckSum\_ABS1)

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmWhlLeDstPlsCntrFromSerlComFd, GwmWhlLeDstTiStampFromSerlComFd,GwmWhlLeDstVldFromSerlComFd, GwmWhlRiDstPlsCntrFromSerlComFd, GwmWhlRiDstTiStampFromSerlComFd,GwmWhlRiDstVldFromSerlComFd.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall hold the last known valid value for the GwmWhlLeDstPlsCntrFromSerlComFd, GwmWhlLeDstTiStampFromSerlComFd, GwmWhlRiDstPlsCntrFromSerlComFd, GwmWhlRiDstTiStampFromSerlComFd, set GwmWhlLeDstVldFromSerlComFd and GwmWhlRiDstVldFromSerlComFd to Invalid.

**NTC Recover Criteria:** $13B message E2E error recover at least 10 times continuous

## 3.42 NTC $180 – ESP\_FD2 Missing (Msg ID $08F)

**NTC Failure Criteria**(Msg ID $08F) Message Missing 10 periods continuously while DiagEna is 1.

**Failure Condition:** $08F message missing or DLC != 64.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmEngSpdFromSerlComFd and GwmEngSpdVldFromSerlComFd signal.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmEngSpdFromSerlComFd to 0 RPM, and set GwmEngSpdVldFromSerlComFd to Invalid.

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous.

## 3.43 NTC $181 – ESP\_FD2 Invalid (Msg ID $08F)

**NTC Failure Criteria:** Message (Msg ID $08F) is Invalid 10 periods continuously while DiagEna is 1.

**Failure Condition:** EngSpdVldty\_PHEV= 0x0 or 0x3.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmEngSpdFromSerlComFd and GwmEngSpdVldFromSerlComFd signal.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmEngSpdFromSerlComFd to 0 RPM, and set GwmEngSpdVldFromSerlComFd to Invalid.

**NTC Recover Criteria:** $08F message invalid recover at least 10 times continuous.

## 3.44 NTC $182 – ESP\_FD2 Missing (Msg ID $103)

**NTC Failure Criteria**(Msg ID $103) Message Missing 10 periods continuously while DiagEna is 1.

**Failure Condition:** $103 message missing or DLC != 64.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmEngStFromSerlComFd and GwmEngStVldFromSerlComFd.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmEngStFromSerlComFd to its initial value, and set GwmEngStVldFromSerlComFd to Invalid.

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous.

## 3.45 NTC $183 – ESP\_FD2 Invalid (Msg ID $103)

**NTC Failure Criteria:** Message (Msg ID $103) is Invalid 10 periods continuously while DiagEna is 1.

**Failure Condition:** EngState\_PHEV = 0x7.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmEngStFromSerlComFd and GwmEngStVldFromSerlComFd.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmEngStFromSerlComFd to its initial value, and set GwmEngStVldFromSerlComFd to Invalid.

**NTC Recover Criteria:** $103 message invalid recover at least 10 times continuous.

## 3.46 NTC $184 – ESP\_FD2 Missing (Msg ID $060)

**NTC Failure Criteria**(Msg ID $060) Message Missing 10 periods continuously while DiagEna is 1.

**Failure Condition**: $060 message missing or DLC != 64.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmPhevEngTqFd and GwmPhevEngTqInvldFd.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmPhevEngTqFd to its initial value, and set GwmPhevEngTqInvldFd to True(Invalid).

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous.

## 3.47 NTC $185 – ESP\_FD2 Invalid (Msg ID $060)

**NTC Failure Criteria:** Message (Msg ID $060) is Invalid 10 periods continuously while DiagEna is 1.

Failure Condition: TotWheelTrqVld=0x0.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmPhevEngTqFd and GwmPhevEngTqInvldFd.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmPhevEngTqFd to its initial value, and set GwmPhevEngTqInvldFd to True(Invalid).

**NTC Recover Criteria:** $060 message invalid recover at least 10 times continuous.

## 3.48 NTC $186 – ESP\_FD2 Missing (Msg ID $12F)

**NTC Failure Criteria**(Msg ID $12F) Message Missing 10 periods continuously while DiagEna is 1.

**Failure Condition:** $12F message missing or DLC != 64.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmGearStsFd, GwmPtStsFd, GwmPtStsVldFd.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmGearStsFd to 0x5, set GwmPtStsFd to 0x0, and set GwmPtStsVldFd to 0x0(Invalid).

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous.

## 3.49 NTC $187 – ESP\_FD2 Invalid (Msg ID $12F)

**NTC Failure Criteria:** Message (Msg ID $12F) is Invalid 10 periods continuously while DiagEna is 1.

**Failure Condition:** HCU\_GearSts = 0x1 or 0x2 or 0x3 or 0x4 or 0x8~0xD or 0xF.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value for the GwmGearStsFd and set GwmPtStsFd to HCU\_EPSEnable’s actual value.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmGearStsFd to 0x5, set GwmPtStsFd to HCU\_EPSEnable’s actual value, and set GwmPtStsVldFd to 0x1(Valid)

**NTC Recover Criteria:** $12F message invalid recover at least 10 times continuous.

## 3.50 NTC $188 – ECM3 Missing (Msg ID $371)

**NTC Failure Criteria**(Msg ID $371) Message Missing 10 periods continuously while DiagEna is 1.

**Failure Condition:** $371 message missing or DLC != 8.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmMaxEngTq to 0x0.

**NTC Recover Criteria:** All monitor message received on bus at least 10 times continuous.

## 3.51 NTC $189 – ECM3 Invalid (Msg ID $371)

**NTC Failure Criteria:** Message (Msg ID 371F) is Invalid 10 periods continuously while DiagEna is 1.

**Failure Condition:**. MaxEngTrqNorm = 0x67-0x7F.

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmMaxEngTq to 0x0.

**NTC Recover Criteria:** $371 message invalid recover at least 10 times continuous.

## 3.52 NTC $18A - ECM3 E2E Error (Msg ID $371)

**NTC Failure Criteria:** Message (Msg ID 371F) is Invalid 10 periods continuously while DiagEna is 1.

**Failure Condition:** $371 message E2E error (CheckSum\_ECM3)

**NOTE**: While the timer is active, the PSCM shall hold the last known valid value.

**Failsoft Action:**

- While the fault is CURRENT, the PSCM shall set GwmMaxEngTq to 0x0.

**NTC Recover Criteria:** $371 message E2E error recover at least 10 times continuous

# 4 Notes

## 4.1 Glossary

A glossary of words and terms that have special meaning within the context of this specification is provided below.

## 4.2 Acronyms, Abbreviations, and Symbols

**ABS** = Anti-lock Brake System

**BCM** = Body Control Module

**CAN** = Controller Area Network

**CTC** = Customer Trouble Code

**DID** = Data Identifier

**DTC** = Diagnostic Trouble Code

**ECM** = Engine Control Module

**ECU** = Electronic Control Unit

**ENM** = Enumerated

**EPAS** = Electronic Power Assisted Steering

**LSB** = Most Significant Bit

**NTC** = Nexteer Trouble Code

**PSCM** = Power Steering Control Module

**SAS** = Steering Angle Sensor

**TBD** = To Be Determined

**UNM** = Unsigned Numeric

## 4.3 Reference Documents

|  |  |  |  |
| --- | --- | --- | --- |
| **Document #** | **Document Name** | **Rev/ Date** | **Exceptions** |
| ISO 14230 | Road Vehicles - Diagnostic Systems- KWP2000 |  | None |
| ISO 14229-1 | Road Vehicles - Diagnostic Systems- Diagnostic Services | 2006 | None |
| ISO 15031 | Road Vehicles- Communication Between Vehicle and External Equipment for Emissions-Related Diagnostics | 6.4 | None |
| ISO 15765-2 | Road vehicles — Diagnostics on Controller Area Networks (CAN) —Part 2: Network layer services | 1.015OC04 | None |
| GWM | A07-001-014MM01 C\_Matrix for PT-CAN\_V1.0--.xlsx |  | None |
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# 5 Specification Change Record

**Document:** Serial Communications Interface Requirements (SCIR)

**Program:** GWM A0607

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| --- | --- | --- | --- | --- | --- | --- |
| **SHT** | **DATE** | **REV** | **REVISION HISTORY** | **AU** | **DR** | **CK** |
| Lv2 | 8Feb21 | 1.0 | Initial Release | PS | DZ |  |
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| **NAME:** Serial Communications Interface Requirements (SCIR) | **PART NO.**TBD | JW |