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APA 关联部件功能说明



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| **Version** | **Version Description** | **Responsible** | **Date** |  |
|  |  |  |  |  |
| V1.0 | First draft | XYP | 2017-11-20 |  |
|  |  |  |  |  |
| V1.1 | 1、3.1.2 中增加《TTE APA 系统对轮速脉冲信号的性能要求》 | XYP | 2017-11-23 |  |
| 2、3.6 半自动泊车显示提示第 43 项文字修改 |  |  |  |
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**Change log**

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**1** **引言**

**1.1** **目的/范围**

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本文描述了 XYP APA 关联系统的内容。

**1.2** **参考文档**

表格中的内容是与该系统相关的一些参考文档.

Table 1.2.1: 参考文档

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Reference** | **Source** | **Title** | **Version or** | **Document** |
| **Num** |  |  | **date** | **Number** |
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| **1.3** | **缩写** | | |  |  |  |  |
|  | 表格中内容是本文中用到的缩写词. | | |  |  |  |  |
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Table 1.3.1: 缩写

|  |  |
| --- | --- |
| **Acronyms** | **Description** |
|  |  |
| APA | Auto Parking Assistance System |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**1.4** **定义**

Table 1.4.1: 系统定义

|  |  |
| --- | --- |
| **Term** | **Definition** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

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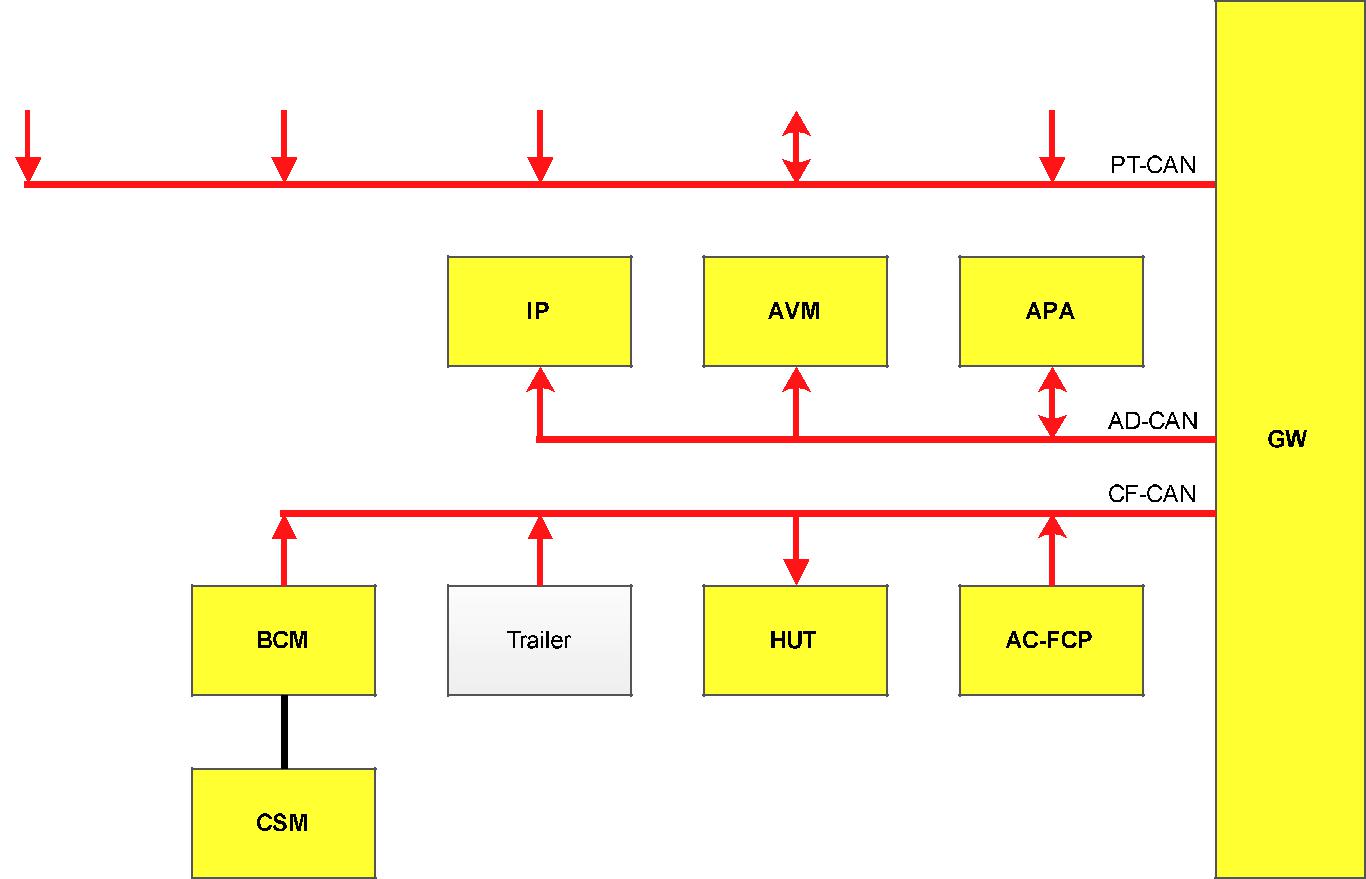
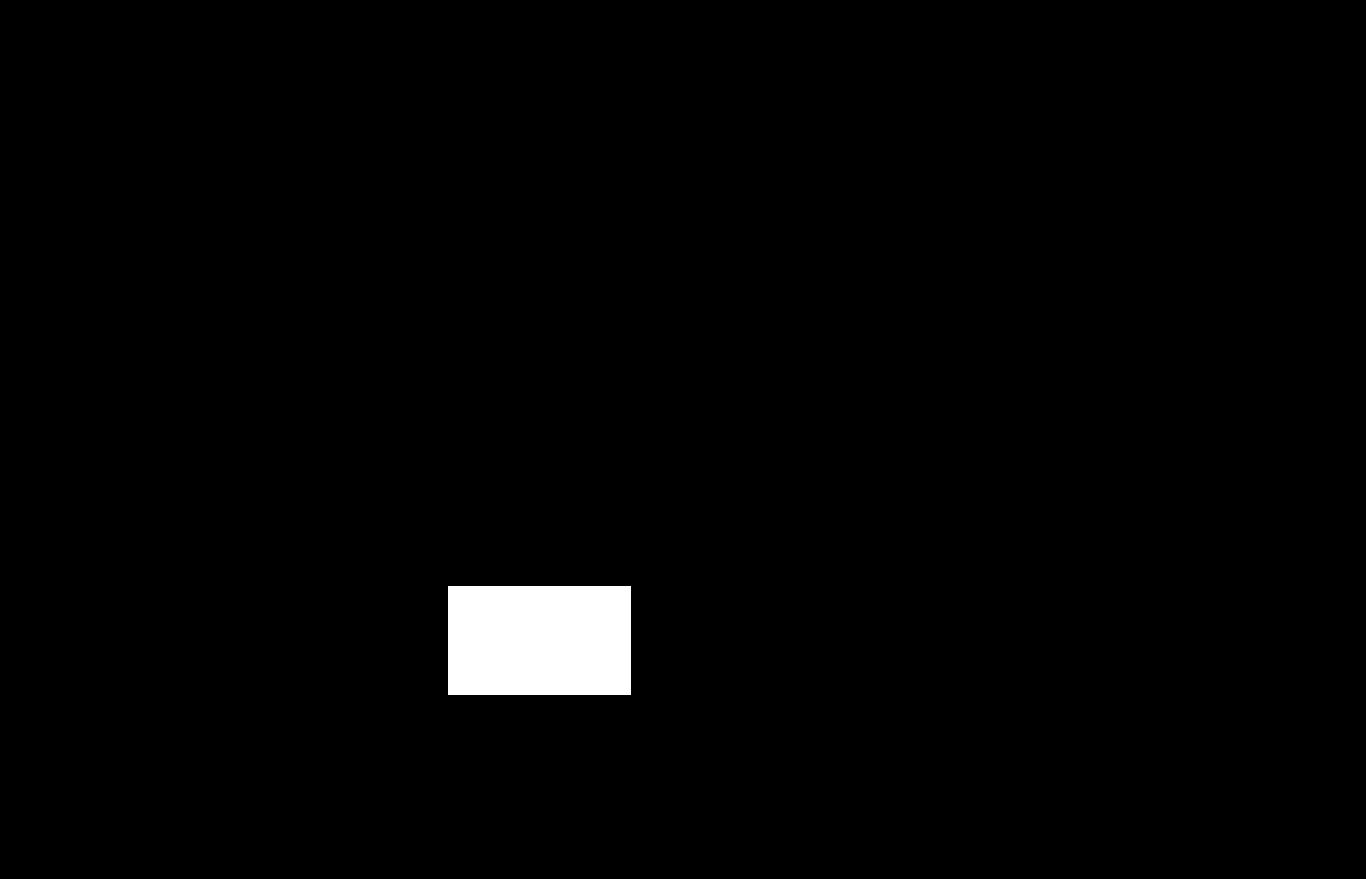
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* 系统分析

2.1 关联部件网络拓扑图



2.2 信号列表范例



2041-001-013MM02

C\_Matrix for AD-CA

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* 各部件分析

3.1 ESP

APA 接收 ESP 发出的轮速信号、轮速方向信号、轮速脉冲信号、车速信号。

3.1.1 APA 接收 ESP 发出的轮速信号

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Signal Name** | **Signal Description** | **Size** | **Note** |
| 1 | FLWheelSpdValid | Front left wheel speed valid | 1 |  |
|  |  |  |  |  |
| 2 | FLWheelSpd | Front left wheel speed | 13 |  |
|  |  |  |  |  |
| 3 | FRWheelSpdValid | Front right wheel speed valid | 1 |  |
|  |  |  |  |  |
| 4 | FRWheelSpd | Front right wheel speed | 13 |  |
|  |  |  |  |  |
| 5 | RLWheelSpdValid | Rear left wheel speed valid | 1 |  |
|  |  |  |  |  |
| 6 | RLWheelSpd | Rear left wheel speed | 13 |  |
|  |  |  |  |  |
| 7 | RRWheelSpdValid | Rear right wheel speed valid | 1 |  |
|  |  |  |  |  |
| 8 | RRWheelSpd | Rear right wheel speed | 13 |  |

3.1.2 APA 接收 ESP 发出的轮速脉冲信号

要求：车轮每转动一圈的脉冲数大于 96 个,在低速行驶或点刹情况下不允许出现轮速脉冲丢失。



TTE APA

系统对轮速脉冲信号

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **No.** | | **Signal Name** |  | **Signal Description** | |  |  | **Size** | **Note** |  |
|  |  | 1 |  | WssFLEdgesSum | Sum of edge of Front Left Wheel speed sensor | | | | | 8 |  |  |
|  | 2 | |  | WssFREdgesSum | Sum of edge of Front Right Wheel speed sensor | | | | | 8 |  |  |
|  |  | |  |  |  | | | | |  |  |  |
|  | 3 | |  | WssRREdgesSum | Sum of edge of rear Right Wheel speed sensor | | | | | 8 |  |  |
|  |  | |  |  |  | | | | |  |  |  |
|  | 4 | |  | WssRLEdgesSum | Sum of edge of rear Left Wheel speed sensor | | | | | 8 |  |  |
|  |  | |  |  |  | | | | |  |  |  |
|  | 5 | |  | WssFLEdgesSumvalid | Valid signal for Sum of edge of Front Left Wheel | | | | | 1 |  |  |
|  |  |  |  | speed sensor | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  | |  |  |  | | | | |  |  |  |
|  | 6 | |  | WssFREdgesSumvalid | Valid signal for Sum of edge of Front Right Wheel | | | | | 1 |  |  |
|  |  |  |  | speed sensor | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  | |  |  |  | | | | |  |  |  |
|  | 7 | |  | WssRLEdgesSumvalid | Valid signal for Sum of edge of rear Left Wheel | | | | | 1 |  |  |
|  |  |  |  | speed sensor | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  | |  |  |  | | | | |  |  |  |
|  | 8 | |  | WssRREdgesSumvalid | Valid signal for Sum of edge of rear Right Wheel | | | | | 1 |  |  |
|  |  |  |  | speed sensor | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
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3.1.3 APA 接收 ESP 发出的轮速方向信号

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Signal Name** | **Signal Description** | **Size** | **Note** |
| 1 | FLWheelDriveDirection | Front left wheel Moving direction | 2 |  |
| 2 | FRWheelDriveDirection | Front right wheel Moving direction | 2 |  |
|  |  |  |  |  |
| 3 | RLWheelDriveDirection | Rear left wheel Moving direction | 2 |  |
|  |  |  |  |  |
| 4 | RRWheelDriveDirection | Rear right wheel Moving direction | 2 |  |

3.1.4 APA 接收 ESP 发出的车速信号

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **No.** | **Signal Name** | **Signal Description** | **Size** | **Note** |  |
|  | 1 | VehicleSpd | Current Vehicle speed information (when v < 1 kph, set | 13 |  |  |
|  |  | value to 0.) refer to "Veh speed cal" tab for detail. |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  | 2 | VehicleSpdValid | Quality/fault information to current Vehicle speed | 1 |  |  |
|  |  | information. Refer to the "Veh speed cal" tab for detail. |  |  |  |
|  |  |  |  |  |  |
| 3.2 SAS | |  |  |  |  |  |

APA 接收 SAS 发出的方向盘转角信号、SAS 工作状态信号。

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **Signal Name** | **Signal Description** | **Size** | **Note** |  |
| 1 | SteeringWheelAngle | angle of steering wheel (raw data) | 15 |  |  |
|  |  |  |  |  |  |
|  |  | sign of steering wheel angle (+/-) definition according | 1 | 合并成一个带 |  |
| 2 | SteeringWheelAngleSign | to DIN 70000 / ISO 8855. wheel to left = positive; |  | 符号数也可以 |  |
|  |  | wheel to right = negative. straightforward = 0 (positive) |  |  |  |
|  |  |  |  |  |  |
| 3 | SteeringWheelSpeed | steering wheel rotation speed (raw data) | 15 |  |  |
|  |  | sign of steering wheel speed (+/-) definition according | 1 | 合并成一个带 |  |
|  |  | to DIN 70000 / ISO 8855 |  |  |
| 4 | SteeringWheelSpeedSign |  | 符号数也可以 |  |
| wheel to left = positive; wheel to right = negative |  |  |
|  |  |  |  |  |
|  |  | wheel straightforward = 0 (positive) |  |  |  |
|  |  |  |  |  |  |
| 5 | SAS\_Status | status of steering angle sensor (used in combination | 2 |  |  |
| with class 3 sensor) |  |  |  |
|  |  |  |  |  |

3.3 ABM

APA 接收 ABM 发出的加速度信号（补偿计算车辆的位置信息）。

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **No.** |  | **Signal Name** |  | **Signal Description** | |  | **Size** | | **Note** |  |  |
|  |  | 1 | LongitudeAcc | | Longitude acceleration | |  |  | 16 |  |  |  |  |
|  |  | |  | |  | |  |  |  |  |  |  |  |
|  |  | 2 | LateralAcce | | Indicates Lateral Acceleration | |  |  | 16 |  |  |  |  |
|  | 3 | | VehDynYawRate | | Vehicle yaw rate | |  |  | 16 |  |  |  |  |
|  |  | |  | |  | |  |  |  |  |  |  |  |
|  |  | 4 | LongitudeAccValid | | Longitude acceleration valid | |  |  | 1 |  |  |  |  |
|  | 5 | | LateralAcceValid | | Indicates Lateral Signal State | |  |  | 1 |  |  |  |  |
|  |  | |  | |  | |  |  |  |  |  |  |  |
|  | 6 | | VehDynYawRateValid | | Vehicle yaw rate valid | |  |  | 1 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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3.4 EPS

APA 接收 EPS 发出的驾驶员干预信号、EPS 工作状态信号。

EPS 接收 APA 发出的控制信号、APA 工作状态信号

3.4.1 APA 接收 EPS 发出的驾驶员干预信号、EPS 工作状态信号

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **No.** | **Signal Name** |  | **Signal Description** | **Size** | **Note** |  |
|  | 1 | EPS\_InterferDect | Driver Steering Interference Detected | | 1 |  |  |
|  |  |  |  |  |  |  |  |
|  | 2 | EPS\_InterferDectValid | Driver Steering Interference Detected Validity | | 1 |  |  |
|  |  |  |  |  |  |  |  |
|  | 3 | EPS\_AvailSts | Electrical Power Steering Available Status | | 2 |  |  |
| 3.4.2 EPS 接收 APA 发出的控制信号、APA 工作状态信号 | | | | |  |  |  |
|  |  |  |  |  |  |  |  |
|  | **No.** | **Signal Name** |  | **Signal Description** | **Size** | **Note** |  |
|  | 1 | APA\_WorkSts |  | Advanced Parking Assist Status | 2 |  |  |
|  |  |  |  |  |  |  |  |
|  | 2 | APA\_ReqEPSTargetAngle | | Steering Wheel Angle Request: | 16 |  |  |
|  |  |  |  |  |  |
|  |  |  |  | Target Angle |  |  |  |
|  | 3 | APA\_ReqControlEPSValid | | Steering Wheel Angle Request: | 1 |  |  |
|  |  |  |  |  |  |
|  |  |  |  | Request Control EPS Validity |  |  |  |
|  | 4 | APA\_ReqControlEPS |  | Steering Wheel Angle Request: | 1 |  |  |
|  |  |  | Request Control EPS |  |  |  |
|  |  |  |  |  |  |  |

3.4.3 APA 与 EPS 的通信



CHB041-Communicat

ion between APA a

3.4.4 APA 对 EPS 的要求



TTE APA System

Performance Requi

3.5 TCU

APA 接收 TCU 发出的档位信号。

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Signal Name** | **Signal Description** | **Size** | **Note** |
| 1 | TGS\_LEVER | Transmission gear selector lever position | 16 |  |
|  |  |  |  |  |

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3.6 IPC

IPC 接收 APA 发出的声音信号、APA 泊车引导信号。

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Signal Name** | **Signal Description** | **Size** |
| 1 | FPAS\_WorkSts | Park Assistant Front System Status | 2 |
|  |  |  |  |
| 2 | FPAS\_SoundIndication | Front Park Assistant System Sound Indication | 3 |
|  |  |  |  |
| 3 | RPAS\_WorkSts | Park Assistant Rear System Status | 2 |
| 4 | RPAS\_SoundIndication | Rear Park Assistant System Sound Indication | 3 |
|  |  |  |  |
| 5 | APA\_InfoDisplayReq | Advanced Parking Information display request | 8 |
|  |  |  |  |
| 6 | APA\_WorkSts | Advanced Parking Assist Status | 2 |
|  |  |  |  |
| 7 | APA\_SysSoundIndication | APA System Sound Indication | 4 |
| 8 | APA\_ParkBarFillDirection | APA(Advanced Parking Assist) Parking progress bar fill direction | 1 |
|  |  |  |  |
| 9 | APA\_ParkBarPercent | APA(Advanced Parking Assist) Parking progress percentage bar | 7 |



半自动泊车辅助泊

车信息提示.doc

3.7 AVM/HUT

AVM/HUT 接收 APA 发出的探测距离信号、工作状态信号。

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **No.** |  | **Signal Name** | **Signal Description** | | | |  |  |  | **Size** | |  | **Note** |  |  |
|  |  | 1 | PAS\_ObjectSts\_FLC | | Park Assistant Front Left Corner Object Status | | | | | |  | 4 |  |  |  |  |  |
|  |  | |  | |  | | |  | | |  |  |  |  |  |  |  |
|  |  | 2 | PAS\_ObjectSts\_FLM | | Park Assistant Front Left Middle Object Status | | | | | |  | 4 |  |  |  |  |  |
|  | 3 | | PAS\_ObjectSts\_FRM | | Park Assistant Front Right Middle Object Status | | | | | |  | 4 |  |  |  |  |  |
|  |  | |  | |  | | |  | | |  |  |  |  |  |  |  |
|  |  | 4 | PAS\_ObjectSts\_FRC | | Park Assistant Front Right Corner Object Status | | | | | |  | 4 |  |  |  |  |  |
|  | 5 | | PAS\_ObjectSts\_RLC | | Park Assistant Rear Left Corner Object Status | | | | | |  | 4 |  |  |  |  |  |
|  |  | |  | |  | | |  | | |  |  |  |  |  |  |  |
|  |  | 6 | PAS\_ObjectSts\_RLM | | Park Assistant Rear Left Middle Object Status | | | | | |  | 4 |  |  |  |  |  |
|  | 7 | | PAS\_ObjectSts\_RRM | | Park Assistant Rear Right Middle Object Status | | | | | |  | 4 |  |  |  |  |  |
|  |  | |  | |  | | |  | | |  |  |  |  |  |  |  |
|  |  | 8 | PAS\_ObjectSts\_RRC | | Park Assistant Rear Right Corner Object Status | | | | | |  | 4 |  |  |  |  |  |
|  | 9 | | FPAS\_WorkSts | | Park Assistant Front System Status | | | |  |  |  | 2 |  |  |  |  |  |
|  |  | |  | |  | | |  |  |  |  |  |  |  |  |  |  |
|  |  | 10 | RPAS\_WorkSts | | Park Assistant Rear System Status | | | |  |  |  | 2 |  |  |  |  |  |
| 3.8 AC-FCP | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| APA 接收 AC-FCP 发出的温度信号。 | | | | | | |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | |  |  |  | |  |  |  |  |  |  |  |
|  |  | **No.** |  | **Signal Name** | **Signal Description** | |  |  | **Size** | |  |  |  |  | **Note** |  |  |
|  | 1 | | CdngAmbTemp | | Air Conditioning Ambient Temperature | | |  | 8 | | 温度补偿计算 | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | Document Name |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | **APA 关联部件** |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | | | | | | Document Type |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Owner Domain: Document Prefix | | |  |  |  |  |  |  |  |  |  |
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| Document No | Revision | |  | Volume No | | |  |  | Page No |  |  |
| **TBD** | **1.0** | | |  |  |  |  |  | **10 (11)** |  |  |



Document Release Status

**DRAFT**

|  |  |
| --- | --- |
| Release Date | Version |

2017-11-23 1.0

3.9 Trailer

APA 接收 Trailer（GWA）发出的拖车信号。

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Signal Name** | **Signal Description** | **Size** | **Note** |
| 1 | TrailerSts | Trailer Status | 1 | 拖车时关闭 RPAS |
|  |  |  |  |  |

3.10 BCM

APA 接收 BCM 发出的拖车信号。

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Signal Name** | **Signal Description** | **Size** | **Note** |
| 1 | TrunkSts | Trunk status | 1 | 后背门开启时关闭 RPAS |
|  |  |  |  |  |
| 2 | LeftTurnSWSts | Left turn switch status | 1 | APA 泊车方向选择 |
|  |  |  |  |  |
| 3 | RightTurnSWSts | Right turn switch status | 1 | APA 泊车方向选择 |
| 4 | APASwCmd | APA switch command. | 1 | APA 开关 |
|  |  |  |  |  |
| 5 | APASwErrSts | APA switch error status. | 1 | APA 开关 |
|  |  |  |  |  |
| 6 | HeadLampWashCmd | Head lamp washer command | 1 | 前大灯清洗时对 FPAS 补偿 |
|  |  |  |  |  |
| 7 | PASSwSts | Radar switch status | 1 | PAS 开关（没用，改 BCM 控制） |
| 8 | PASSwErrSts | Radar switch Error status | 1 | PAS 开关（没用，改 BCM 控制） |
|  |  |  |  |  |
| 9 | PASWorkCmd | PAS Work command | 1 | PAS 功能开关（BCM 控制逻辑） |

* **其他**

4.1 CheckSum 和 RollingCounter

参照 XXX 标准执行

|  |  |  |  |  |  |  |
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|  |  | Document Name |  |  |  |  |
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|  | | Document Type |  |  |  |  |
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| Owner Domain: Document Prefix | | |  |  |
|  |  |  |  |  |
| Document No | Revision | Volume No | Page No |  |
| **TBD** | **1.0** |  | **11 (11)** |  |

