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产品故障码表及维修指导

Product Fault Code Table and Maintenance Guide



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1 故障管理 Fault Management

1.1 故障模式

1.1 Fault mode

◆ 根据电机控制器以及 BMS 发出的故障信息进行等级处理，以及整车控制器运行环境及各个传感器的运行状态进行故障判定。

Perform treatment based on the level of fault sent by the MCU and BMS, as well as determine the fault according to the VCU operating environment and operating status of various sensors.

◆ 整车故障分为 3 级，其中三级故障为最严重故障。

The vehicle faults are divided into 3 levels, of which the level III fault is the most serious one.

◆ 无故障模式下：油门开度越大，扭矩输出越大，油门到底输出功率为最大峰值功率。

In the fault-free mode, the greater the throttle opening, the higher the torque output, with the maximum peak power achieved when the throttle is fully opened.

◆ 在出现故障时，需根据故障等级不同，限制输出如下：

In the event of a fault, the output will be restricted as follows based on the fault level:

➤ 一级故障：本故障等级只是为了警示，不影响动力的实际输出；

Level I fault: This fault level is only for warning and does not affect the actual power output;

- 二级故障：二级故障是由电机和电池系统引起，VCU 会根据电机和电池系统的已经降额之后的实际可用功率，进行降功率处理；如果二级故障是由电转向和打气泵引起的，VCU 会进行降功率；

Level II Fault: This type of fault is caused by the motor or battery system. The VCU will reduce power based on the actual power available from these systems after derating. If the fault is due to the electric steering or air pump, the VCU will also reduce power accordingly.

- 三级故障：当发生三级故障的时候，VCU 会在 2 秒内，把主动力关闭（电机系统）。如果车速大于 5km/h 时，VCU 会仍然保留打气泵和电转向工作。当车速低于 5km/h，VCU 会关闭所有电附件。

Level III fault: When a level III fault occurs, VCU will shut down the main power (motor system) within 2 seconds. If the vehicle speed is greater than 5Kmh, VCU will still keep the inflation pump and electric steering working. When the vehicle speed is below 5 km/h, the VCU will switch off all electrical accessories.



警告：

Warning:

- ❖ 动力电池、电机系统如出现故障，请及时联系本公司特约服务站，由专业人员进行维修，切勿自行插拔连接器，勿触摸连接器端子，切勿自行维修，以免发生触电等危险。

In case of any fault in the power battery and motor system, please contact our authorized service station in time for maintenance by professionals. Do not plug or unplug the connector, touch the connector terminal or repair it by yourself to avoid electric shock and other hazards.

1.2 故障读取

1.2 Fault reading

- ◆ 仪表界面图标处于模式，如果不显示该图标，按一次多功能方向盘 M 键。

The instrument interface icon  is in mode. If the icon is not displayed, press the multifunction steering wheel M key once

- ◆ 连续按两次多功能方向盘右按键，仪表切换至控制器状态界面。

Press the right button on the multifunction steering wheel twice in a row to switch the instrument panel to the controller status interface.



- ◆ 连续按三次多功能方向盘下按键，仪表切换至故障信息界面，根据故障代码查看第 2 章故障分析，根据故障分析排查故障。

Press the multifunction steering wheel button three times in a row to switch the instrument panel to the fault

information interface. Refer to Chapter 2 for fault analysis based on the fault code and troubleshoot according to the fault analysis.



按一次多功能
方向盘下箭头



Press the down arrow
on the multifunction
steering wheel once



按一次多功能
方向盘下箭头



Press the down arrow
on the multifunction
steering wheel once



按一次多功能
方向盘下箭头



Press the down arrow
on the multifunction
steering wheel once



2 故障分析 Fault Analysis

2.1 VCU 故障诊断

2.1 VCU Fault Diagnosis

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
1	TCU 三级故障 TCU Level 3 Fault	3	VCU 检测到 TCU 三级故障 VCU detects TCU third-level failure	查看 TCU 故障诊断 View TCU fault diagnosis
2	MCU1 三级故障 MCU1 Level 3 Fault	3	VCU 检测到 MCU1 三级故障 VCU detects MCU1 third-level failure	查看 MCU 故障诊断 View MCU fault diagnosis
3	MCU2 三级故障 MCU2 Level 3 Fault	3	VCU 检测到 MCU2 三级故障 VCU detects MCU2 third-level failure	查看 MCU 故障诊断 View MCU fault diagnosis
4	BMS 三级故障 BMS Level 3 Fault	3	VCU 检测到 BMS 三级故障 VCU detects BMS third-level failure	查看 BMS 故障诊断 View BMS fault diagnosis
5	EPS 三级故障 EPS Level 3 Fault	3	VCU 检测到 EPS 三级故障 VCU detects EPS third-level failure	查看 EPS 故障诊断 View EPS fault diagnosis

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
6	EAC 三级故障 EAC Level 3 Fault	3	VCU 检测到 EAC 三级故障 VCU detects EAC third-level failure	查看 EAC 故障诊断 View EAC fault diagnosis
7	VCU 与 BMS 通讯故障 Communication failure between VCU and BMS	3	VCU 未检测到 50 个周期 BMS 生命信号无变化 VCU did not detect any changes in BMS life signal for 50 cycles	查看整车总线通讯 View vehicle bus communication
8	VCU 与 TCU 通讯故障 Communication failure between VCU and TCU	3	VCU10 个周期未检测到 TCU 报文 VCU did not detect TCU message for 10 cycles	查看整车总线通讯 View vehicle bus communication
9	VCU 与 CLU 通讯故障 Communication failure between VCU and CLU	3	VCU 10 个周期未检测到 0x0C010305 报文。 VCU did not detect 0x0C010305 message for 10 cycles	查看整车总线通讯 View vehicle bus communication
10	CAN1 Bus-OFF	3	VCU 总线故障 VCU bus fault	查看整车总线通讯 View vehicle bus communication
11	CAN2 Bus-OFF	3	VCU 总线故障 VCU bus fault	查看整车总线通讯 View vehicle bus communication
12	制动踏板故障 Brake pedal malfunction	3	VCU 检测到制动踏板信号电压异常 VCU detects abnormal brake pedal signal voltage	检查制动踏板信号 Check the brake pedal signal

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
13	加速踏板三级故障 Third level accelerator pedal malfunction	3	VCU检测到两路回路信号电压均异常 VCU detected abnormal voltage in both circuit signals	检查加速踏板信号 Check the accelerator pedal signal
14	NVM故障（非易失性存储器EEPROM） NVM malfunction (non-volatile memory EEPROM)	3	VCU检测到EEPROM连续读时间 > 2000ms, 不成功 VCU detected EEPROM continuous read time>2000ms, unsuccessful	检查VCU硬件，蓄电池是否有异常下电 Check the VCU hardware and battery for any abnormal power failure
15	VCU供电电压异常 VCU power supply voltage abnormality	3	VCU检测到电源模块输入供电电压小于20V或大于32V VCU detects that the input power supply voltage of the power module is less than 20V or greater than 32V	检查供电回路 Check the power supply circuit
16	5V电源电压异常故障 5V power supply voltage abnormal fault	3	VCU检测到供电电源超过误差4.75-5.25V范围 VCU detected that the power supply exceeded the error range of 4.75-5.25V	检查供电回路 Check the power supply circuit
18	主正继电器粘连 Main positive relay adhesion	3	VCU检测到主正继电器故障状态为粘连 VCU detected a fault state of adhesion in the main positive relay	将控制器盖板打开，找到主回路接触器，使用万用表测量接触器电阻，若阻

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				值比较小，则接触器确实粘连，确认接触器损坏后更换新的接触器即可。 Open the controller cover, locate the main circuit contactor, and measure the contactor resistance with a multimeter. If the resistance value is relatively small, the contactor is indeed stuck. Replace it with a new one after confirming the contactor is damaged.
19	预充继电器粘连 Pre charging relay adhesion	3	VCU检测到预充继电器故障状态为粘连 VCU detected a fault state of adhesion in the pre charge relay	将控制器盖板打开，找到预充接触器，使用万用表测量接触器电阻，若阻值比较小，则接触器确实粘

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				连，确认接触器损坏后更换新的接触器即可。 Open the controller cover, find the pre charged contactor, and use a multimeter to measure the resistance of the contactor. If the resistance is relatively small, the contactor is indeed stuck. After confirming that the contactor is damaged, replace it with a new one.
21	空调继电器粘连 Air conditioning relay adhesion	3	VCU检测到空调继电器故障状态为粘连 VCU detected that the fault state of the air conditioning relay is adhesion	将控制器盖板打开，找到空调接触器，使用万用表测量接触器电阻，若阻值比较小，则接触器确实粘连，确认接触器损坏后更换新的接触器即可。 Open the controller cover, find the air conditioning

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				, and measure the contactor resistance with a multimeter. If the resistance value is relatively small, the contactor is indeed stuck. Replace it with a new one after confirming the contactor is damaged.
22	辅驱继电器粘连 Adhesion of auxiliary drive relay	3	VCU检测到辅驱继电器故障状态为粘连 VCU detected that the fault state of the auxiliary drive relay is adhesion	将控制器盖板打开，找到辅驱接触器，使用万用表测量接触器电阻，若阻值比较小，则接触器确实粘连，确认接触器损坏后更换新的接触器即可。 Open the controller cover, find the auxiliary drive contactor, and use a multimeter to measure the resistance of the contactor. If the resistance is relatively

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				small, the contactor is indeed stuck. After confirming that the contactor is damaged, replace it with a new one.
23	预充失败故障 Pre charge failure fault	3	VCU发预充指令，3s未达到目标值 VCU sends pre charge command, target value not reached within 3 seconds	检查预充回路 Check the pre charging circuit
24	PTC1继电器粘连 PTC1 relay adhesion	3	VCU检测到PTC1继电器故障状态为粘连 VCU detected that the fault state of the PTC1 relay is adhesion	将控制器盖板打开，找到PTC1接触器，使用万用表测量接触器电阻，若阻值比较小，则接触器确实粘连，确认接触器损坏后更换新的接触器即可。 Open the controller cover, find the PTC1 contactor, and use a multimeter to measure the resistance of the contactor. If the resistance is relatively small, the contactor is indeed stuck.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				After confirming that the contactor is damaged, replace it with a new one.
25	PTC2继电器粘连 PTC2 relay adhesion	3	VCU检测到PTC2继电器故障状态为粘连 VCU detected that the fault state of the PTC2 relay is adhesion	将控制器盖板打开，找到PTC2接触器，使用万用表测量接触器电阻，若阻值比较小，则接触器确实粘连，确认接触器损坏后更换新的接触器即可。 Open the controller cover, find the PTC2 contactor, and use a multimeter to measure the resistance of the contactor. If the resistance is relatively small, the contactor is indeed stuck. After confirming that the contactor is damaged, replace it with a new one.
27	主正继电器开路 Open circuit of main positive relay	3	VCU检测到主正继电器故障状态为开路 VCU detected that the main positive relay fault	将控制器盖板打开，找到主正接触器，使用万用表

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
			state is open circuit	测量接触器电阻，若阻值比较大，则接触器确实开路，确认接触器损坏后更换新的接触器即可。 Open the controller cover and locate t the main positive relay. Use a multimeter to measure the resistance of the contactor. If the resistance is relatively high, the contactor is indeed open. After confirming that the contactor is damaged, replace it with a new one.
28	预充继电器开路 Pre charge relay open circuit	3	VCU检测到预充继电器故障状态为开路 VCU detected that the Pre charge relay fault state is open circuit	将控制器盖板打开，找到预充接触器，使用万用表测量接触器电阻，若阻值比较大，则接触器确实开路，确认接触器损坏后更换新的接触器即可。

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				Open the controller cover and locate the Pre charge relay. Use a multimeter to measure the resistance of the contactor. If the resistance is relatively high, the contactor is indeed open. After confirming that the contactor is damaged, replace it with a new one.
29	VCU 与 MCU1 通讯故障 Communication failure between VCU and MCU1	3	VCU 未接收到MCU1 报文 VCU did not receive MCU1 message	查看整车总线通讯 查看整车总线通讯 View vehicle bus communication
30	VCU 与 MCU2 通讯故障 Communication failure between VCU and MCU2	3	VCU 未接收到MCU2 报文 VCU did not receive MCU2 message	查看整车总线通讯 View vehicle bus communication
31	辅驱继电器开路 Open circuit of auxiliary drive relay	3	VCU 检测到辅驱继电器故障状态为开路 VCU detected that the auxiliary drive relay fault state is open circuit	将控制器盖板打开，找到辅驱接触器，使用万用表测量接触器电阻，若阻值

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				比较大，则接触器确实开路，确认接触器损坏后更换新的接触器即可。 Open the controller cover and locate the auxiliary drive relay. Use a multimeter to measure the resistance of the contactor. If the resistance is relatively high, the contactor is indeed open. After confirming that the contactor is damaged, replace it with a new one.
33	与EPS通讯故障 Communication failure with EPS	3	VCU未接收到EPS报文 VCU did not receive EPS message	查看整车总线通讯 View vehicle bus communication
34	与 EAC 通讯故障 Communication failure with EAC	3	VCU未接收到EAC报文 Communication failure with EAC	查看整车总线通讯 View vehicle bus communication
35	VCU 与 PDU 通讯故障 Communication failure with PDU	3	VCU未接收到PDU报文 VCU did not receive PDU message	查看整车总线通讯

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				View vehicle bus communication
81	TCU 二级故障 TCU Level 2 Fault	2	VCU 检测到 TCU 二级故障 VCU detects TCU second-level failure	查看 TCU 故障诊断 View TCU fault diagnosis
82	MCU1 二级故障 MCU1 Level 2 Fault	2	VCU 检测到 MCU1 二级故障 VCU detects MCU1 second-level failure	查看 MCU1 故障诊断 View MCU fault diagnosis
83	MCU2 二级故障 MCU2 Level 2 Fault	2	VCU 检测到 MCU2 二级故障 VCU detects MCU2 second-level failure	查看 MCU2 故障诊断 View MCU fault diagnosis
84	BMS 二级故障 BMS Level 2 Fault	2	VCU 检测到 BMS 二级故障 VCU detects BMS second-level failure	查看 BMS 故障诊断 View BMS fault diagnosis
85	EPS 二级故障 EPS Level 2 Fault	2	VCU 检测到 EPS 二级故障 VCU detects EPS second-level failure	查看 EPS 故障诊断 View EPS fault diagnosis
86	EAC 二级故障 EAC Level 2 Fault	2	VCU 检测到 EAC 二级故障 VCU detects EAC second-level failure	查看 EAC 故障诊断 View EAC fault diagnosis
88	空压机超时工作 The air compressor is working overtime	2	VCU检测到连续发送空压机使能15分钟 VCU detected continuous sending of air compressor enable for 15 minutes	检查空干器及气压信号 Check the air dryer and air pressure signal
89	气压过高或气压传感器故障 High air pressure or malfunction of air pressure sensor	2	前后储气筒气压超过11.5bar The pressure of the front and rear air reservoirs exceeds 11.5 bar	检查空干器及气压信号 Check the air dryer and air pressure signal
90	DCDC 通讯故障	2	VCU未接收到DCDC报文	查看整车总线通讯

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
	DCDC communication failure		VCU did not receive DCDC message	View vehicle bus communication
91	油门踏板第一路信号值过大 The first signal value of the accelerator pedal is too high	2	VCU检测到第一回路信号电压异常 VCU detects abnormal voltage of the first circuit signal	检查加速踏板信号 Check the accelerator pedal signa
92	油门踏板第一路信号值过小 The first signal value of the accelerator pedal is too small	2	VCU检测到第一回路信号电压异常 VCU detects abnormal voltage of the first circuit signal	检查加速踏板信号 Check the accelerator pedal signa
93	油门踏板第二路信号值过大 The second signal value of the accelerator pedal is too high	2	VCU检测到第二回路信号电压异常 VCU detected abnormal voltage of the second circuit signal	检查加速踏板信号 Check the accelerator pedal signa
94	油门踏板第二路信号值过小 The second signal value of the accelerator pedal is too low	2	VCU检测到第二回路信号电压异常 VCU detected abnormal voltage of the second circuit signal	检查加速踏板信号 Check the accelerator pedal signa
98	DCDC 三级故障 DCDC Level 3 Fault	2	VCU 检测到 DCDC 三级故障 VCU detects DCDC third-level failure	查看 DCDC 故障诊断 View DCDC fault diagnosis
161	TCU 一级故障 TCU Level1 Fault	2	VCU 检测到 TCU 一级故障 VCU detects TCU first-level failure	查看 TCU 故障诊断 View TCU fault diagnosis
162	MCU1 一级故障 MCU1 Level1 Fault	1	VCU 检测到 MCU1 一级故障 VCU detects MCU1 first-level failure	查看 MCU1 故障诊断 View MCU fault diagnosis
163	MCU2 一级故障	1	VCU 检测到 MCU2 一级故障	查看 MCU2 故障诊断

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
	MCU2 Level1 Fault		VCU detects MCU2 first-level failure	View MCU fault diagnosis
164	BMS 一级故障 BMS Level1 Fault	1	VCU 检测到 BMS 一级故障 VCU detects BMS first-level failure	查看 BMS 故障诊断 View BMS fault diagnosis
165	EPS 一级故障 EPS Level1 Fault	1	VCU 检测到 EPS 一级故障 VCU detects EPS first-level failure	查看 EPS 故障诊断 View EPS fault diagnosis
166	EAC 一级故障 EAC Level1 Fault	1	VCU 检测到 EAC 一级故障 VCU detects EAC first-level failure	查看 EAC 故障诊断 View EAC fault diagnosis
167	DCDC 一级故障 DCDC Level1 Fault	1	VCU 检测到 DCDC 一级故障 VCU detects DCDC first-level failure	查看 DCDC 故障诊断 View DCDC fault diagnosis
170	PTC1继电器开路 PTC1 relay open circuit	1	VCU检测到PTC1继电器故障状态为开路 VCU detected that the PTC1 relay fault state is open circuit	将控制器盖板打开，找到 PTC1接触器，使用万用表测量接触器电阻，若阻值比较大，则接触器确实开路，确认接触器损坏后更换新的接触器即可。 Open the controller cover and locate the PTC1 contactor. Use a multimeter to measure the resistance of the contactor. If the resistance is relatively high,

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				the contactor is indeed open. After confirming that the contactor is damaged, replace it with a new one.
171	PTC2继电器开路 PTC2 relay open circuit	1	VCU检测到PTC2继电器故障状态为开路 VCU detected that the PTC2 relay fault state is open circuit	将控制器盖板打开，找到PTC2接触器，使用万用表测量接触器电阻，若阻值比较大，则接触器确实开路，确认接触器损坏后更换新的接触器即可。 Open the controller cover and locate the PTC2 contactor. Use a multimeter to measure the resistance of the contactor. If the resistance is relatively high, the contactor is indeed open. After confirming that the contactor is damaged, replace it with a new one.
172	空调继电器开路	1	VCU检测到空调继电器故障状态为开路	将控制器盖板打开，找到

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
	Air conditioning relay open circuit		VCU detected that the Air conditioning relay fault state is open circuit	空调接触器，使用万用表测量接触器电阻，若阻值比较大，则接触器确实开路，确认接触器损坏后更换新的接触器即可。 Open the controller cover and locate the Air conditioning relay. Use a multimeter to measure the resistance of the contactor. If the resistance is relatively high, the contactor is indeed open. After confirming that the contactor is damaged, replace it with a new one.
176	VCU与IC通讯故障 Communication failure between VCU and IC	1	VCU未接收到IC报文 VCU did not receive IC message	查看整车总线通讯 View vehicle bus communication
177	VCU与ABS/EBS通讯故障 Communication failure between VCU and ABS/EBS	1	VCU未接收到ABS/EBS报文 VCU did not receive ABS/EBS message	查看整车总线通讯 View vehicle bus communication

2.1 BMS 故障诊断

2.2 BMS Fault Diagnosis

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
1	单体欠压报警 (充电模式下不请求下高压) Single module under-voltage alarm (No high-voltage request in charging mode)	3	$T_{min} \geq 0^{\circ}\text{C}: U_{min} \leq 2.4\text{V}$ $T_{min} < 0^{\circ}\text{C}: U_{min} \leq 2.2\text{V}$	
2	总电压欠压报警 (充电模式下不请求下高压) Total voltage undervoltage alarm (Do not request high voltage in charging mode)	3	$T_{min} \geq 0^{\circ}\text{C}: U_{bat} \leq 2.4\text{V} * N$ $T_{min} < 0^{\circ}\text{C}: U_{bat} \leq 2.2\text{V} * N$	
3	电芯高温报警 Electric core high temperature alarm	3	$T_{max} \geq 67^{\circ}\text{C}$	
4	行车绝缘过低报警 Excessively low traveling insulation alarm	3	$R \leq 400\Omega/\text{V}$	
5	电芯过放故障 Electric core over-discharge fault	极限故障 Extreme fault	$U_{min} \leq 1\text{V}$	
6	电芯低温报警 Electric core low temperature alarm	/	$T_{min} \leq -35^{\circ}\text{C}$	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
7	电池包火灾报警 Battery Pack Fire Alarm	极限故障 Extreme fault	火灾报警故障标志位置 1 Fire alarm fault sign position 1	
8	电池包自保护故障 Battery pack self-protection failure	极限故障 Extreme fault	极限过压、极限过温、极限欠压(充电不判定 极限欠压) Limit over-voltage, limit over-temperature and limit under-voltage (limit under-voltage is not determined during charging)	
9	高压互锁故障报警 High voltage interlock fault alarm	/	硬线高压互锁故障标志位置 1 Hard wire high voltage interlocking fault mark position 1	
10	BMS 低压供电电压异常报警 BMS low voltage supply voltage abnormal alarm	/	24V 系统: BMS 供电电压 $\geq 32V$ 或 BMS 供 电电压 $\leq 18V$ 12V 系统: BMS 供电电压 $\geq 16V$ 或 BMS 供 电电压 $\leq 9V$ 24V system: BMS power supply voltage $\geq 32V$ or BMS power supply voltage $\leq 18V$ 12V system: BMS power supply voltage $\geq 16V$ or BMS power supply voltage $\leq 9V$	
11	BMS 内部通信故障 BMS internal communication failure	/	发生电流传感器通信丢失故障 发生菊花 链通信故障 发生 HVB 通信故障 Current sensor communication loss fault occurs//daisy chain communication fault occurs//HVB communication fault occurs	
12	ACAN 通讯故障 ACAN communication failure	/	ACAN 通信故障标志位置 1 ACAN communication fault flag location 1	
81	单体欠压报警 (充电模式下不请求下高压) Single module under-voltage alarm (No high-voltage request in charging mode)	2	$T_{min} \geq 0^{\circ}C$: $U_{min} \leq 2.5V$ $T_{min} < 0^{\circ}C$: $U_{min} \leq 2.3V$	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
82	总电压欠压报警 (充电模式下不请求下高压) Total voltage undervoltage alarm (Do not request high voltage in charging mode)	2	$T_{min} \geq 0^{\circ}\text{C}$: $U_{bat} \leq 2.6\text{V} * N$ $T_{min} < 0^{\circ}\text{C}$: $U_{bat} \leq 2.3\text{V} * N$	
83	电芯高温报警 Electric core high temperature alarm	2	$T_{max} \geq 65^{\circ}\text{C}$	
84	行车绝缘过低报警 Excessively low traveling insulation alarm	2	$R \leq 500\Omega/\text{V}$	
85	脉冲放电电流超限报警 Over-limit alarm of pulse discharge current	1	$\geq I * 105\%$	
85	脉冲放电电流超限报警 Over-limit alarm of pulse discharge current	2	$\geq I * 120\%$	
85	脉冲放电电流超限报警 Over-limit alarm of pulse discharge current	3	$\geq I * 125\%$	
86	持续放电过流 Continuous discharge overcurrent	1	$\geq I * 105\%$	
86	持续放电过流 Continuous discharge overcurrent	2	$\geq I * 120\%$	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
86	持续放电过流 Continuous discharge overcurrent	3	$\geq I^*125\%$	
87	主负接触器无法断开故障报警 Main negative contactor fails to open fault alarm	/	当项目标称电压$>750V$: 高压触点两侧电压值压差$\leq 21V$ 当项目标称电压为$(320V, 750V)$: 高压触点两侧电压值压差$\leq 16V$ 当项目标称电压$[0V, 320V]$: 高压触点两侧电压值压差$\leq 8V$ When the nominal voltage of the project is more than $750V$:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to $21V$ When the nominal voltage of the project is $(320V, 750V)$:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to $16V$ When the nominal voltage of the project is less than or equal to $[0V, 320V]$:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to $8V$	
88	直流充电 A 正接触器无法断开故障报警 DC charging A positive contactor fails to open fault alarm	/	当项目标称电压$>750V$: 高压触点两侧电压值压差$\leq 21V$ 当项目标称电压为$(320V, 750V)$: 高压触点两侧电压值压差$\leq 16V$ 当项目标称电压$[0V, 320V]$: 高压触点两侧电压值压差$\leq 8V$ When the nominal voltage of the project is more than $750V$:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to $21V$ When the nominal voltage of the project is $(320V, 750V)$:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to $16V$ When the nominal voltage of the project is less than or equal to	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
			[0V, 320V]:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 8V	
89	直流充电 B 正接触器无法断开故障报警 DC charging B positive contactor cannot be disconnected fault alarm	/	当项目标称电压>750V: 高压触点两侧电压值压差 ≤21V 当项目标称电压为(320V, 750V): 高压触点两侧电压值压差 ≤16V 当项目标称电压[0V, 320V]: 高压触点两侧电压值压差 ≤8V When the nominal voltage of the project is more than 750V:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 21V When the nominal voltage of the project is (320V, 750V):>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 16V When the nominal voltage of the project is less than or equal to [0V, 320V]:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 8V	
90	直流充电 A 负接触器无法断开故障报警 DC charging A negative contactor fails to open fault alarm	/	当项目标称电压>750V: 高压触点两侧电压值压差 ≤21V 当项目标称电压为(320V, 750V): 高压触点两侧电压值压差 ≤16V 当项目标称电压[0V, 320V]: 高压触点两侧电压值压差 ≤8V When the nominal voltage of the project is more than 750V:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 21V When the nominal voltage of the project is (320V, 750V):>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 16V When the nominal voltage of the project is less than or equal to	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
			[0V, 320V]:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 8V	
91	直流充电 B 负接触器无法断开故障报警 DC charging B negative contactor fails to open fault alarm	/	当项目标称电压>750V: 高压触点两侧电压值压差 ≤21V 当项目标称电压为(320V, 750V): 高压触点两侧电压值压差 ≤16V 当项目标称电压[0V, 320V]: 高压触点两侧电压值压差 ≤8V When the nominal voltage of the project is more than 750V:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 21V When the nominal voltage of the project is (320V, 750V):>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 16V When the nominal voltage of the project is less than or equal to [0V, 320V]:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 8V	
94	交流充电正接触器无法断开故障报警 Alarm for failure of AC charging positive contactor to disconnect	/	当项目标称电压>750V: 高压触点两侧电压值压差 ≤21V 当项目标称电压为(320V, 750V): 高压触点两侧电压值压差 ≤16V 当项目标称电压[0V, 320V]: 高压触点两侧电压值压差 ≤8V When the nominal voltage of the project is more than 750V:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 21V When the nominal voltage of the project is (320V, 750V):>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 16V When the nominal voltage of the project is less than or equal to	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
			[0V, 320V]:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 8V	
95	支路电流差异过大 Excessive branch current difference	/	Amax-Amin≥50A	
96	支路断路故障报警 Branch circuit break fault alarm	/	软件内部故障计数≥5 次(当“任一支路的 Umean 变化量≥30mV, 持续 300ms”&“第 N 支路的 Umean 变化量≤5mV”时, 软件内部故障计数+1) Software internal fault counting ≥ 5 times (when "Umean variation of any branch ≥ 30mV, lasting for 300ms"&"Umean variation of the Nth branch ≤ 5mV", software internal fault counting+1)	
97	电流传感器故障 Current sensor fault	/	电流传感器故障标志位置 1 Current sensor fault flag position 1	
102	交流充电负接触器无法断开故障报警 Alarm for failure of AC charging negative contactor to open	/	当项目标称电压>750V: 高压触点两侧电压值压差 ≤21V 当项目标称电压为(320V , 750V): 高压触点两侧电压值压差 ≤16V 当项目标称电压[0V , 320V]: 高压触点两侧电压值压差 ≤8V When the nominal voltage of the project is more than 750V:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 21V When the nominal voltage of the project is (320V, 750V):>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 16V When the nominal	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
			voltage of the project is less than or equal to [0V, 320V]:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 8V	
103	集电弓正接触器无法断开故障报警 Fault alarm for failure of pantograph positive contactor to disconnect	/	当项目标称电压>750V: 高压触点两侧电压值压差 ≤21V 当项目标称电压为(320V, 750V): 高压触点两侧电压值压差 ≤16V 当项目标称电压[0V, 320V]: 高压触点两侧电压值压差 ≤8V When the nominal voltage of the project is more than 750V:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 21V When the nominal voltage of the project is (320V, 750V):>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 16V When the nominal voltage of the project is less than or equal to [0V, 320V]:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 8V	
104	集电弓负接触器无法断开故障报警 Pantograph negative contactor fails to open fault alarm	/	当项目标称电压>750V: 高压触点两侧电压值压差 ≤21V 当项目标称电压为(320V, 750V): 高压触点两侧电压值压差 ≤16V 当项目标称电压[0V, 320V]: 高压触点两侧电压值压差 ≤8V When the nominal voltage of the project is more than 750V:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 21V When the nominal voltage of the project is (320V, 750V):>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 16V When the nominal voltage of the project is less than or equal to	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
			[0V, 320V]:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 8V	
105	主正接触器无法断开故障报警 Main positive contactor fails to open fault alarm	/	当项目标称电压>750V: 高压触点两侧电压值压差 ≤21V 当项目标称电压为(320V, 750V): 高压触点两侧电压值压差 ≤16V 当项目标称电压[0V, 320V]: 高压触点两侧电压值压差 ≤8V When the nominal voltage of the project is more than 750V:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 21V When the nominal voltage of the project is (320V, 750V):>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 16V When the nominal voltage of the project is less than or equal to [0V, 320V]:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 8V	
161	单体欠压报警 (充电模式下不请求下高压) Single module under-voltage alarm (No high-voltage request in charging mode)	1	Tmin≥0°C: Umin≤2.8V Tmin<0°C: Umin≤2.5V	
162	总电压欠压报警 (充电模式下不请求下高压) Total voltage undervoltage alarm (Do not request high voltage in charging mode)	1	Tmin≥0°C: Ubat≤2.85V*N Tmin<0°C: Ubat≤2.6V*N	
163	电芯高温报警 Electric core high temperature alarm	1	Tmax≥60°C	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
164	行车绝缘过低报警 Excessively low traveling insulation alarm	1	$R \leq 600\Omega/V$	
165	脉冲回充电电流超限报警 Pulse recharge current over-limit alarm	1	$\geq I * 105\%$	
165	脉冲回充电电流超限报警 Pulse recharge current over-limit alarm	2	$\geq I * 120\%$	
165	脉冲回充电电流超限报警 Pulse recharge current over-limit alarm	3	$\geq I * 125\%$	
167	主负接触器无法闭合故障报警 Main negative contactor fails to close fault alarm	/	当项目标称电压为$>750V$: 高压触点两侧电压值压差$\geq 30V$ 当项目标称电压为$(320V, 750V)$: 高压触点两侧电压值压差$\geq 20V$ 当项目标称电压$[0V, 320V)$: 高压触点两侧电压值压差$\geq 10V$ When the nominal voltage of the project is $> 750V$: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 30V$ when the nominal voltage of the project is $(320V, 750V)$: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 20V$ when the nominal voltage of the project is $[0V, 320V)$: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 10V$	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
166	行车持续回充过流 Continuous recharge and overcurrent of traveling crane	1	$\geq I \cdot 105\%$	
166	行车持续回充过流 Continuous recharge and overcurrent of traveling crane	2	$\geq I \cdot 120\%$	
166	行车持续回充过流 Continuous recharge and overcurrent of traveling crane	3	$\geq I \cdot 125\%$	
168	直流充电 A 正接触器无法闭合故障报警 DC charging A positive contactor fails to close fault alarm	/	当项目标称电压为$>750V$: 高压触点两侧电压值压差$\geq 30V$ 当项目标称电压为$(320V, 750V)$: 高压触点两侧电压值压差$\geq 20V$ 当项目标称电压$[0V, 320V]$: 高压触点两侧电压值压差$\geq 10V$ When the nominal voltage of the project is $>750V$: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 30V$ when the nominal voltage of the project is $(320V, 750V)$: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 20V$ when the nominal voltage of the project is $[0V, 320V]$: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 10V$	
169	直流充电 B 正接触器无法闭合故障报警 DC charging B positive contactor fails to close fault alarm	/	当项目标称电压为$>750V$: 高压触点两侧电压值压差$\geq 30V$ 当项目标称电压为$(320V, 750V)$: 高压触点两侧电压值压差$\geq 20V$ 当项目标称电压$[0V, 320V]$: 高压触点两侧电压值压差$\geq 10V$ When the nominal voltage of the project is $>750V$: $\rightarrow$ voltage difference between voltage	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
			values on both sides of the high voltage contact is $\geq 30V$ when the nominal voltage of the project is (320V, 750V]: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 20V$ when the nominal voltage of the project is [0V, 320V]: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 10V$	
170	直流充电 A 负接触器无法闭合故障报警 DC charging A negative contactor fails to close fault alarm	/	当项目标称电压为$>750V$: 高压触点两侧电压值压差$\geq 30V$ 当项目标称电压为(320V , 750V]: 高压触点两侧电压值压差$\geq 20V$ 当项目标称电压[0V , 320V]: 高压触点两侧电压值压差$\geq 10V$ When the nominal voltage of the project is $> 750V$: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 30V$ when the nominal voltage of the project is (320V, 750V]: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 20V$ when the nominal voltage of the project is [0V, 320V]: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 10V$	
171	直流充电 B 负接触器无法闭合故障报警 DC charging B negative contactor unable to close fault alarm	/	当项目标称电压为$>750V$: 高压触点两侧电压值压差$\geq 30V$ 当项目标称电压为(320V , 750V]: 高压触点两侧电压值压差$\geq 20V$ 当项目标称电压[0V , 320V]: 高压触点两侧电压值压差$\geq 10V$ When the nominal voltage of the project is $> 750V$: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 30V$ when the nominal voltage of the project is (320V, 750V]: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 20V$ when the nominal	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
			voltage of the project is [0V, 320V]: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 10V$	
174	交流充电正接触器无法闭合故障报警 Alarm for failure of AC charging positive contactor closing	/	当项目标称电压为$>750V$: 高压触点两侧电压值压差$\geq 30V$ 当项目标称电压为(320V , 750V): 高压触点两侧电压值压差$\geq 20V$ 当项目标称电压[0V , 320V]: 高压触点两侧电压值压差$\geq 10V$ When the nominal voltage of the project is $>750V$: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 30V$ when the nominal voltage of the project is (320V, 750V]: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 20V$ when the nominal voltage of the project is [0V, 320V]: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 10V$	
175	加热膜或 TMS 接触器故障无法闭合报警 Heating membrane or TMS contactor failure to close alarm	/	当项目标称电压为$>750V$: 高压触点两侧电压值压差$\geq 30V$ 当项目标称电压为(320V , 750V): 高压触点两侧电压值压差$\geq 20V$ 当项目标称电压[0V , 320V]: 高压触点两侧电压值压差$\geq 10V$ When the nominal voltage of the project is $>750V$: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 30V$ when the nominal voltage of the project is (320V, 750V]: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 20V$ when the nominal voltage of the project is [0V, 320V]: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 10V$	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
176	加热膜或 TMS 接触器故障无法断开报警 Alarm for failure of heating membrane or TMS contactor to disconnect	/	当项目标称电压$>750V$: 高压触点两侧电压值压差$\leq 21V$ 当项目标称电压为(320V, 750V): 高压触点两侧电压值压差$\leq 16V$ 当项目标称电压[0V, 320V]: 高压触点两侧电压值压差$\leq 8V$ When the nominal voltage of the project is more than 750V:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 21V When the nominal voltage of the project is (320V, 750V):>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 16V When the nominal voltage of the project is less than or equal to [0V, 320V]:>voltage difference between voltage values on both sides of the high-voltage contact is less than or equal to 8V	
177	SOC 过高故障 SOC too high fault	/	SOC $>100\%$	
178	SOC 跳变故障报警 SOC jump fault alarm	/	SOC 跳变检测故障标志位置 1（存储在 NVM 中的显示 SOC 丢失） SOC Jump Detection Fault Flag Position 1 (SOC loss displayed stored in NVM)	
179	SOC 差异过大报警 Alarm for excessive SOC difference	/	任一支路 SOC$\max$-SOC$\min \geq 15\%$ Any branch SOC max-SOCmin $\geq 15\%$	
180	电池单体一致性差 Poor battery monomer consistency	/	U $\max$ -U $\min \geq 300mV$	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
182	温差过大报警 Alarm for excessive temperature difference	1	$\Delta T \geq 25^{\circ}\text{C}$	
182	温差过大报警 Alarm for excessive temperature difference	2	$\Delta T \geq 30^{\circ}\text{C}$	
182	温差过大报警 Alarm for excessive temperature difference	3	$\Delta T \geq 35^{\circ}\text{C}$	
183	热管理系统故障 Thermal management system failure	/	TMS 故障 TMS Fault	
184	加热膜加热回路故障 Heating membrane heating circuit failure	/	NVM 中计数 ≥ 3 次（若连续加热 40min，任一 CSC 最小的平均温度温升 $\leq 3^{\circ}\text{C}$ ，计数+1） Count ≥ 3 times in NVM (if continuously heated for 40min, the minimum average temperature rise of any CSC $\leq 3^{\circ}\text{C}$, count+1)	
185	充电绝缘阻值低 Low charging insulation resistance	/	$R \leq 100\Omega/\text{V}$	
186	可充电储能系统不匹配故障报警 Chargeable energy storage system mismatch fault alarm	/	配置的前端采样芯片节点数 $<$ 实际安装的前端采样芯片节点数 Number of configured front-end sampling chip nodes $<$ number of actually installed front-end sampling chip nodes	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
187	充电电流超限报警 Charging current over-limit alarm	/	低温 CC 状态: $ 总回路的电流 \geq 总回路允许充电电流 + \max(20A, 0.1 * 总回路允许充电电流 , 0.1 * 充电请求电流)$ 非低温 CC 状态: $ 总回路的电流 \geq 充电请求电流 + \max(10A, 0.1 * 总回路允许充电电流 , 0.1 * 充电请求电流)$ Low-temperature CC state: $ current\ of\ the\ main\ circuit \geq allowable\ charging\ current\ of\ the\ main\ circuit + \max(20A, 0.1 * allowable\ charging\ current\ of\ the\ main\ circuit , 0.1 * allowable\ charging\ current\ of\ the\ main\ circuit)$ Non-low temperature CC state: $ current\ of\ the\ main\ circuit \geq charging\ request\ current + \max(10A, 0.1 * allowable\ charging\ current\ of\ the\ main\ circuit , 0.1 * charging\ request\ current)$	
188	充电时放电电流过大 Excessive discharge current during charging	/	充电时放电电流 $\geq \max(20A, 2 * 加热请求电流)$ Discharge current $\geq \max$ during charging (20A, 2 * heating request current)	
189	充电插座 NTC 故障 Charging socket NTC fault	/	充电插座 NTC 开路或短路故障 Charging socket NTC open circuit or short circuit	
190	充电插座过温报警 Over-temperature alarm of charging socket	1	(非交流)充电插座温度 $\geq 100^{\circ}C$ (交流)充电插座温度 $\geq 90^{\circ}C$ Temperature of (non-AC) charging socket $\geq 100^{\circ}C$ Temperature of (AC) charging socket $\geq 90^{\circ}C$	
190	充电插座过温报警 Over-temperature alarm of charging socket	2	(非交流)充电插座温度 $\geq 120^{\circ}C$ (交流)充电插座温度 $> 100^{\circ}C$ Temperature of (non-AC) charging socket $\geq 120^{\circ}C$ Temperature of (AC) charging socket $> 100^{\circ}C$	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
191	充电器故障 Charger failure	/	充电器发送 CST 中“故障中止” The charger sends "fault interruption" in CST	
192	电子锁故障 Electronic lock failure	/	电子锁故障 Electronic lock failure	
192	火警探测器故障 Fire detector failure	/	火警探测器内部故障或 火警探测器通信故障 Internal fault of fire detector or Fire detector communication failure	
193	插枪连接信号异常 The connection signal of gun is abnormal	/	插枪连接信号 CC/CP/CC2 异常 Gun connection signal CC/CP/CC2 abnormal	
194	单体过压报警 Single cell overvoltage alarm	1	$U_{max} \geq 3.8V$	
194	单体过压报警 Single cell overvoltage alarm	2	$U_{max} \geq 3.85V$	
194	单体过压报警 Single cell overvoltage alarm	3	$U_{max} \geq 3.9V$	
195	总电压过压报警 Total voltage overvoltage alarm	1	$V_{bat} \geq 3.65V * N$	
195	总电压过压报警 Total voltage overvoltage alarm	2	$V_{bat} \geq 3.75V * N$	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
195	总电压过压报警 Total voltage overvoltage alarm	3	$V_{bat} \geq 3.8V * N$	
197	主回路预充或预检故障 Main circuit precharge or pre-check fault	/	预充超时：预充继电器闭合后，不满足主继电器闭合条件持续 1.5s； 预充负载短路：外侧高压$\leq 0.2 * \text{电池电压}$ && 总回路电流$\geq 0.8 * (\text{电池电压} / \text{预充电阻阻值})$，持续 500ms； 预充过流：总回路电流$\geq 0.3 * (\text{电池电压} / \text{预充电阻阻值})$ 预检测失败：主回路预继电器闭合后，不满足主继电器闭合条件持续 300ms Pre-charge timeout: after the precharge relay is closed, it fails to meet the main relay closing conditions for 1.5s; Short circuit of precharged load: external high voltage $\leq 0.2 * \text{battery voltage}$ && total circuit current $\geq 0.8 * (\text{battery voltage} / \text{precharged resistance value})$, lasting for 500ms; Pre-charge overcurrent: total circuit current $\geq 0.3 * (\text{battery voltage} / \text{precharge resistance value})$ Pre-detection failure: after the main circuit pre-relay is closed, the main relay closing condition is not met for 300ms	
198	辅件回路预充或预检故障 Pre-charge or pre-check fault of auxiliary circuit	/	预充超时：辅件预充继电器闭合后，不满足辅件继电器闭合条件持续 1.5s； 预充负载短路：辅件回路外侧高压$\leq 0.2 * \text{电池电压}$ 预检测失败：辅件回路预继电器闭合后，不满足辅件继电器闭合条件持续 300ms Pre-charge timeout: after the auxiliary part precharge relay is closed, the closing condition of auxiliary part relay is not met for 1.5s;	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
			Short circuit of precharged load: high voltage outside auxiliary circuit $\leq 0.2 \times$ battery voltage Pre-detection failure: after the auxiliary circuit pre-relay is closed, the closing condition of auxiliary relay is not met for 300ms	
199	BMS-DC-DC 故障 BMS-DC-DC failure	/	BMS-DC-DC 故障标志位置 1 BMS-DC-DC fault flag position 1	
200	主正接触器无法闭合故障报警 Main positive contactor fails to close fault alarm	/	当项目标称电压为 $> 750V$: 高压触点两侧电压值压差 $\geq 30V$ 当项目标称电压为 $(320V, 750V)$: 高压触点两侧电压值压差 $\geq 20V$ 当项目标称电压 $[0V, 320V]$: 高压触点两侧电压值压差 $\geq 10V$ When the nominal voltage of the project is $> 750V$: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 30V$ when the nominal voltage of the project is $(320V, 750V)$: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 20V$ when the nominal voltage of the project is $[0V, 320V]$: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 10V$	
201	交流充电负接触器无法闭合故障报警 Alarm for failure of closing AC charging negative contactor	/	当项目标称电压为 $> 750V$: 高压触点两侧电压值压差 $\geq 30V$ 当项目标称电压为 $(320V, 750V)$: 高压触点两侧电压值压差 $\geq 20V$ 当项目标称电压 $[0V, 320V]$: 高压触点两侧电压值压差 $\geq 10V$ When the nominal voltage of the project is $> 750V$: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 30V$ when the nominal voltage of the project is $(320V, 750V)$: $\rightarrow$ voltage difference between voltage values on both sides of the high voltage contact is $\geq 20V$ when the nominal	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
			voltage of the project is [0V, 320V]: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 10V$	
202	集电弓正接触器无法闭合故障报警 Fault alarm for failure of closing of pantograph positive contactor	/	当项目标称电压为$>750V$: 高压触点两侧电压值压差$\geq 30V$ 当项目标称电压为(320V , 750V]: 高压触点两侧电压值压差$\geq 20V$ 当项目标称电压[0V , 320V]: 高压触点两侧电压值压差$\geq 10V$ When the nominal voltage of the project is $>750V$: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 30V$ when the nominal voltage of the project is (320V, 750V]: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 20V$ when the nominal voltage of the project is [0V, 320V]: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 10V$	
203	集电弓负接触器无法闭合故障报警 Pantograph negative contactor fails to close fault alarm	/	当项目标称电压为$>750V$: 高压触点两侧电压值压差$\geq 30V$ 当项目标称电压为(320V , 750V]: 高压触点两侧电压值压差$\geq 20V$ 当项目标称电压[0V , 320V]: 高压触点两侧电压值压差$\geq 10V$ When the nominal voltage of the project is $>750V$: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 30V$ when the nominal voltage of the project is (320V, 750V]: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 20V$ when the nominal voltage of the project is [0V, 320V]: → voltage difference between voltage values on both sides of the high voltage contact is $\geq 10V$	

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
204	电池 SOC 过低报警 Battery SOC too low alarm	1	SOC≤20%	
204	电池 SOC 过低报警 Battery SOC too low alarm	2	SOC≤12%	
204	电池 SOC 过低报警 Battery SOC too low alarm	3	SOC≤8%	

2.3 PDU 故障诊断

2.3 PDU Fault Diagnosis

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
1	主正继电器粘连故障 Main Positive Relay Sticking Fault	3	上高压时，自检 1.1s 后，主正继电器的后端电压 > (BMS 电池电压 + 100V)或前后压差在 30V 内且后端电压不满足下降趋势，持续 50ms 上报粘连 After high-voltage power-on, within 1.1s of self-inspection, the voltage at the rear end of the main positive relay > (BMS battery voltage + 100V), or the pressure difference between the front and rear ends is within 30V and the rear end voltage does not show a downward trend, and sticking is reported continuously for 50ms	将控制器盖板打开，找到主回路接触器，使用万用表测量接触器电阻，若阻值比较小，则接触器确实粘连，确认接触器损坏后更换新的接触器即可。 Open the controller cover, locate the main circuit contactor, and measure the contactor resistance with a multimeter. If the resistance value is relatively small, the contactor is indeed stuck.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				Replace it with a new one after confirming the contactor is damaged.
2	主正继电器开路故障	3	主正继电器闭合、预充继电器断开 200ms 后，检测到主正继电器前后端压差持续 500ms 大于 120V 200ms after the main positive relay is closed and the pre-charge relay is disconnected, the pressure difference between the front and rear ends of the main positive relay is detected to be greater than 120V continuously for 500ms	将控制器盖板打开，找到主回路接触器，使用万用表测量接触器电阻，若阻值比较大，则接触器确实开路，确认接触器损坏后更换新的接触器即可。 Open the controller cover, locate the main circuit contactor, and measure the contactor resistance with a multimeter. If the resistance value is relatively large, the contactor is indeed open-circuited. Replace it with a new one after confirming the contactor is damaged.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
3	主驱回路上电预充超时故障 Main Drive Circuit Power-on Pre-charge Timeout Fault	3	预充继电器闭合 800ms 后没有收到 VCU 指令且前后端压差小于 20V 800ms after the pre-charge relay is closed, no VCU command is received and the pressure difference between the front and rear ends is less than 20V	确认前端输入电压有无问题，预充控制策略有无问题，排除以上因素后，可将控制器盖板打开,需检查是否是缓充电阻、缓充接触器出现断路问题，使用万用表进行排查，确认有损坏的话更换新的即可 Confirm whether there is a problem with the front-end input voltage and the pre-charge control strategy. After eliminating the above factors, open the controller cover and check if there is an open circuit problem with the slow charging resistor and slow charging contactor. Use a multimeter for

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				troubleshooting and replace with new ones if damaged.
5	辅驱继电器粘连故障 Auxiliary Drive Relay Sticking Fault	3	上高压自检 1.1s 后的后端电压 > (BMS 电 池电压 + 100V)或前后压差在 30V 内且后端 电压不满足下降趋势, 持续 50ms 上报粘连 After 1.1s of high-voltage power-on self- inspection, the voltage at the rear end of the auxiliary drive relay > (BMS battery voltage + 100V), or the pressure difference between the front and rear ends is within 30V and the rear end voltage does not show a downward trend, and sticking is reported continuously for 50ms	将控制器盖板打开, 找到 辅驱回路接触器, 使用万 用表测量接触器电阻, 若 阻值比较小, 则接触器确 实粘连, 更换新的接触器 即可。 Open the controller cover, locate the auxiliary drive circuit contactor, and measure the contactor resistance with a multimeter. If the resistance value is relatively small, the contactor is indeed stuck. Replace it with a new one.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
6	辅驱继电器开路故障 Auxiliary Drive Relay Open Circuit Fault	3	辅驱继电器闭合、预充继电器断开 200ms 后，检测到辅驱继电器前后端压差持续 500ms 大于 120V 200ms after the auxiliary drive relay is closed and the pre-charge relay is disconnected, the pressure difference between the front and rear ends of the auxiliary drive relay is detected to be greater than 120V continuously for 500ms	将控制器盖板打开，找到辅驱回路接触器，使用万用表测量接触器电阻，若阻值比较大，则接触器确实开路，确认接触器损坏后更换新的接触器即可。 Open the controller cover, locate the auxiliary drive circuit contactor, and measure the contactor resistance with a multimeter. If the resistance value is relatively large, the contactor is indeed open-circuited. Replace it with a new one after confirming the contactor is damaged.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
7	辅驱预充继电器粘连故障 Auxiliary Drive Pre-charge Relay Sticking Fault	3	上高压自检 100ms，主正后端采样电压与 10ms 主正后端采样电压压差大于 50V During 100ms of high-voltage power-on self-inspection, the pressure difference between the sampled voltage at the rear end of the main positive and the sampled voltage at the rear end of the main positive 10ms ago is greater than 50V	将控制器盖板打开，找到辅驱预充回路接触器，使用万用表测量接触器电阻，若阻值比较小，则接触器确实粘连，更换新的接触器即可。 Open the controller cover, locate the auxiliary drive pre-charge circuit contactor, and measure the contactor resistance with a multimeter. If the resistance value is relatively small, the contactor is indeed stuck. Replace it with a new one.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
8	辅驱回路上电预充超时故障 Auxiliary Drive Circuit Power-on Pre-charge Timeout Fault	3	预充继电器闭合 800ms 后没有收到 VCU 指令且前后端压差小于 20V 800ms after the pre-charge relay is closed, no VCU command is received and the pressure difference between the front and rear ends is less than 20V	确认前端输入电压有无问题，预充控制策略有无问题，排除以上因素后，可将控制器盖板打开,需检查是否是缓充电阻、缓充接触器出现断路问题，使用万用表进行排查，确认有损坏的话更换新的即可 Confirm whether there is a problem with the front-end input voltage and the pre-charge control strategy. After eliminating the above factors, open the controller cover and check if there is an open circuit problem with the slow charging resistor and slow charging contactor. Use a multimeter for troubleshooting and replace with new ones if damaged.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
9	PTC1 继电器粘连故障 PTC1 Relay Sticking Fault	2	上高压自检 800ms，PTC1 继电器的后端电压 > (BMS 电池电压 + 100V)或前后压差在 30V 内且后端电压不满足下降趋势，持续 100ms 上报粘连 During 800ms of high-voltage power-on self-inspection, the voltage at the rear end of the PTC1 relay > (BMS battery voltage + 100V), or the pressure difference between the front and rear ends is within 30V and the rear end voltage does not show a downward trend, and sticking is reported continuously for 100ms	将控制器盖板打开，找到 PTC1 接触器，使用万用表测量接触器电阻，若阻值比较小，则接触器确实粘连，更换新的接触器即可。 Open the controller cover, locate the PTC1 contactor, and measure the contactor resistance with a multimeter. If the resistance value is relatively small, the contactor is indeed stuck. Replace it with a new one.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
10	PTC1 继电器开路故障 PTC1 Relay Open Circuit Fault	2	PTC1 继电器前后端压差持续每 10ms 大于 40V The pressure difference between the front and rear ends of the PTC1 relay is greater than 40V every 10ms continuously	将控制器盖板打开，找到 PTC1 接触器，使用万用表测量接触器电阻，若阻值比较大，则接触器确实开路，确认接触器损坏后更换新的接触器即可。 Open the controller cover, locate the PTC1 contactor, and measure the contactor resistance with a multimeter. If the resistance value is relatively large, the contactor is indeed open-circuited. Replace it with a new one after confirming the contactor is damaged.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
11	PTC2 继电器粘连故障 PTC2 Relay Sticking Fault	2	上高压自检 800ms，PTC2 继电器的后端电压 > (BMS 电池电压 + 100V)或前后压差在 30V 内且后端电压不满足下降趋势，持续 100ms 上报粘连 During 800ms of high-voltage power-on self-inspection, the voltage at the rear end of the PTC2 relay > (BMS battery voltage + 100V), or the pressure difference between the front and rear ends is within 30V and the rear end voltage does not show a downward trend, and sticking is reported continuously for 100ms	将控制器盖板打开，找到 PTC2 接触器，使用万用表测量接触器电阻，若阻值比较小，则接触器确实粘连，更换新的接触器即可。 Open the controller cover, locate the PTC2 contactor, and measure the contactor resistance with a multimeter. If the resistance value is relatively small, the contactor is indeed stuck. Replace it with a new one.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
12	PTC2 继电器开路故障 PTC2 Relay Open Circuit Fault	2	PTC2 继电器前后端压差持续每 10ms 大于 40V The pressure difference between the front and rear ends of the PTC2 relay is greater than 40V every 10ms continuously	将控制器盖板打开，找到 PTC2 接触器，使用万用表测量接触器电阻，若阻值比较大，则接触器确实开路，确认接触器损坏后更换新的接触器即可。 Open the controller cover, locate the PTC2 contactor, and measure the contactor resistance with a multimeter. If the resistance value is relatively large, the contactor is indeed open-circuited. Replace it with a new one after confirming the contactor is damaged.

2.4 MCU 故障诊断

2.4 MCU Fault Diagnosis

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
1	自检三级故障 Self-inspection Level 3 Fault	3	硬件检测到对地短路 Hardware detects short circuit to ground	检查控制器搭铁是否正常，是否发生对地短路，故障排除后重新上电即可。 Check if the controller ground is normal and if there is a short circuit to ground. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
2	EEROM 自检三级故障 EEROM Self-inspection Level 3 Fault	3	驱动器参数读写异常 Abnormal reading and writing of driver parameters	需连接厂家上位机检查哪些读写参数异常，故障排除后重新上电即可 Connect to the manufacturer's upper computer to check which read/write parameters are abnormal. Power on again after troubleshooting the fault.
3	CAN 通讯二级故障 CAN Communication Level 2 Fault	2	未收到 VCU 命令报文 No VCU command message received	需检查 VCU 报文是否发出，控制器自身 CAN 线是否有问题，故障排除后重新上电即可。 Check if the VCU message is sent and if there is a problem with the controller's own CAN line. Power on

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				again after troubleshooting the fault.
6	电机过温三级故障 Motor Over-temperature Level 3 Fault	3	电机温度>160℃ Motor temperature > 160℃	需检查电机是否发生过 载或过流、环境温度是 否过高、电机冷却水路 是否正常，故障排除后 重新上电即可 Check if the motor is overloaded or overcurrent, if the ambient temperature is too high, and if the motor cooling water circuit is normal. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
7	电机控制器过温三级故障 Motor Controller Over-temperature Level 3 Fault	3	电控温度>105℃ Electronic control temperature > 105℃	需检查电控是否发生过载或过流、环境温度是否过高、电控冷却水路是否正常，故障排除后重新上电即可 Check if the electronic control is overloaded or overcurrent, if the ambient temperature is too high, and if the electronic control cooling water circuit is normal. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
8	电机相电流过流三级故障 Motor Phase Current Overcurrent Level 3 Fault	3	电控输出电流>941.1A Electronic control output current > 941.1A	需检查电机参数是否设置正确、电机电流采样模块是否正常，是否存在电机带转速启动工况或后端负载过大工况，故障排除后重新上电即可 Check if the motor parameters are set correctly, if the motor current sampling module is normal, and if there are working conditions such as motor starting with speed or excessive load at the rear end. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
9	母线过压三级故障 Bus Overvoltage Level 3 Fault	3	母线电压>750V 或硬件检测到过压 Bus voltage > 750V or hardware detects overvoltage	需检查是否是电池端输出电压过高导致母线电压过压、或者是否存在电机运行过程中断主接触器的情况，故障排除后重新上电即可 Check if the bus overvoltage is caused by excessively high output voltage at the battery end, or if the main contactor is disconnected during motor operation. Power on again after troubleshooting the fault

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
10	母线欠压三级故障 Bus Undervoltage Level 3 Fault	3	母线电压<400V Bus voltage < 400V	需检查是否是电池端输出电压不稳导致母线电压欠压、或者是否存在高压线断线掉线情况，故障排除后重新上电即可 Check if the bus undervoltage is caused by unstable output voltage at the battery end, or if there is a disconnection or dropout of the high-voltage line. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
13	IGBT 三级故障 IGBT Level 3 Fault	3	硬件检测到驱动异常 Hardware detects drive abnormality	需检查 IGBT 硬件检测电路是否正常、此外再排查驱动异常，故障排除后重新上电即可 Check if the IGBT hardware detection circuit is normal, and then troubleshoot the drive abnormality. Power on again after troubleshooting the fault.
14	硬件 IGBT 检测三级故障 Hardware IGBT Detection Level 3 Fault	3	工况超出了驱动器模块承受的能力 Working conditions exceed the capacity of the driver module	需检查 IGBT 后端负载是否过大，故障排除后重新上电即可 Check if the load at the rear end of the IGBT is too large. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
15	硬件过流故障 Hardware Overcurrent Fault	3	硬件检测到峰值电流>1482A Hardware detects peak current > 1482A	需检查硬件过流检测电路是否正常，此外检查是否存在后端负载过载或电机堵转工况等，故障排除后重新上电即可 Check if the hardware overcurrent detection circuit is normal, and also check if there are working conditions such as overload at the rear end load or motor stalling. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
17	MCU 低压电源故障 MCU Low-voltage Power Supply Fault	3	硬件检测到模块低压供电电源问题 Hardware detects problems with the module's low-voltage power supply	需检查低压整车端低压 供电电压是否正常，此 外排查低压供电线束是 否断线，故障排除后重 新上电即可 Check if the low-voltage power supply voltage at the low-voltage vehicle end is normal, and also troubleshoot if there is a disconnection of the low- voltage power supply wiring harness. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
18	三相缺相三级故障 Three-phase Phase Loss Level 3 Fault	3	电机三相线连接异常 Abnormal connection of the motor's three-phase wires	需检查电机三相线连接是否存在异常，故障排除后重新上电即可 Check if there is an abnormality in the connection of the motor's three-phase wires. Power on again after troubleshooting the fault.
20	A 相电流传感器故障 Phase A Current Sensor Fault	3	硬件检测到 U 相霍尔异常或插线松动 Hardware detects abnormality of U-phase Hall or loose plug-in wire	需检查电机 U 相霍尔电流传感器是否出现故障或插件松动，故障排除后重新上电即可。 Check if the motor's U-phase Hall current sensor is faulty or if the connector is loose. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
21	B 相电流传感器故障 Phase B Current Sensor Fault	3	硬件检测到 V 相霍尔异常或插线松动 Hardware detects abnormality of V-phase Hall or loose plug-in wire	需检查电机 V 相霍尔电流传感器是否出现故障或插件松动，故障排除后重新上电即可。 Check if the motor's V-phase Hall current sensor is faulty or if the connector is loose. Power on again after troubleshooting the fault.
22	C 相电流传感器故障 PhaseC Current Sensor Fault	3	硬件检测到 W 相霍尔异常或插线松动 Hardware detects abnormality of W-phase Hall or loose plug-in wire	需检查电机 W 相霍尔电流传感器是否出现故障或插件松动，故障排除后重新上电即可。 Check if the motor's W-phase Hall current sensor is faulty or if the connector is loose. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
24	旋变三级故障 Resolver Level 3 Fault	3	旋变无信号或缺信号或编码器连接断线 No resolver signal, missing signal, or disconnected encoder connection	需检查电机旋变插件是否松动或退针，故障排除后重新上电即可。 Check if the motor resolver connector is loose or has pin retraction. Power on again after troubleshooting the fault.
25	电机自学习三级故障 Motor Self-learning Level 3 Fault	3	电机接线不良或电机问题 Poor motor wiring or motor problems	需检查电机接线是否松动，此外检查电机电气参数与上位机设置参数是否一致，故障排除后重新上电即可。 Check if the motor wiring is loose, and also check if the motor's electrical parameters are consistent with the parameters set by the upper computer. Power

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				on again after troubleshooting the fault.
27	堵转保护 Stall Protection	3	电控输出电流>1.1 倍额定电流且运行频率 <10Hz Electronic control output current > 1.1 times the rated current and operating frequency < 10Hz	需检查电机是否因外部因素堵转了，故障排除后重新上电即可。 Check if the motor is stalled due to external factors. Power on again after troubleshooting the fault.
81	电机过温二级故障 Motor Over-temperature Level 2 Fault	2	电机温度>150°C Motor temperature > 150°C	需检查电机是否发生过载或过流、环境温度是否过高、电机冷却水路是否正常，故障排除后重新上电即可 Check if the motor is overloaded or overcurrent, if the ambient temperature is

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				too high, and if the motor cooling water circuit is normal. Power on again after troubleshooting the fault.
82	电机控制器过温二级故障 Motor Controller Over-temperature Level 2 Fault	2	电控温度>85℃ Electronic control temperature > 85℃	需检查电机控制器是否发生过载或过流、环境温度是否过高、电机冷却水路是否正常，故障排除后重新上电即可 Check if the motor controller is overloaded or overcurrent, if the ambient temperature is too high, and if the motor controller cooling water circuit is normal. Power

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				on again after troubleshooting the fault.
84	电机控制器过载二级故障 Motor Controller Overload Level 2 Fault	2	1.电控输出>1.5 倍额定电流或 2.电控单相输出>1.6 倍额定输出电流且电机 运行频率<10Hz 1. Electronic control output > 1.5 times the rated current; or 2. Electronic control single-phase output > 1.6 times the rated output current and motor operating frequency < 10Hz	需检查电机控制器后端负载是否过高，超出电控自身能力，故障排除后重新上电即可 Check if the load at the rear end of the motor controller is too high, exceeding the electronic control's own capacity. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
85	母线过压二级故障 Bus Overvoltage Level 2 Fault	2	母线电压>730V Bus voltage > 730V	需检查是否是电池端输出电压过高导致母线电压过压、或者是否存在电机运行过程中断主接触器的情况，故障排除后重新上电即可 Check if the bus overvoltage is caused by excessively high output voltage at the battery end, or if the main contactor is disconnected during motor operation. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
86	母线欠压二级故障 Bus Undervoltage Level 2 Fault	2	母线电压<420V Bus voltage < 420V	需检查是否是电池端输出电压不稳导致母线电压欠压、或者是否存在高压线断线掉线情况，故障排除后重新上电即可 Check if the bus undervoltage is caused by unstable output voltage at the battery end, or if there is a disconnection or dropout of the high-voltage line. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
87	电机超速二级故障 Motor Over-speed Level 2 Fault	2	电机转速>3600rpm Motor speed > 3600rpm	需检查电机转速是否 速>3600rpm，故障排除 后重新上电即可 Check if the motor speed is > 3600rpm. Power on again after troubleshooting the fault.
89	高速异常换挡 High-speed Abnormal Gear Shift	2	电机转速>780rpm 时由前进挡切换为倒档 位，或由倒档位切为前进挡 Switch from forward gear to reverse gear or from reverse gear to forward gear when the motor speed > 780rpm	需检查电机是否存在以下 工况，电机转 速>780rpm 时由前进挡 切换为倒档位，或由倒 档位切为前进挡，故障 排除后重新上电即可 Check if the motor has the following working conditions: switching from forward gear to reverse gear or from reverse gear to forward

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				gear when the motor speed > 780rpm. Power on again after troubleshooting the fault.
90	实际方向与档位异常 Abnormality between Actual Direction and Gear Position	2	速度方向设置与挡位前进方向不符 The set speed direction is inconsistent with the forward direction of the gear position	需检查电机是否存在速度方向设置与挡位前进方向不符，故障排除后重新上电即可 Check if the motor has an inconsistent set speed direction with the forward direction of the gear position. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
91	踩刹车，速度与档位方向异常 Abnormality between Speed and Gear Position Direction When Braking	2	踩刹车时出现与挡位方向相反的转速 Rotational speed opposite to the gear position direction occurs when braking	需检查踩刹车时是否出现与挡位方向相反的转速，故障排除后重新上电即可 Check if there is a rotational speed opposite to the gear position direction when braking. Power on again after troubleshooting the fault.
92	电控温度模块断线 Electronic Control Temperature Module Disconnection	2	电控温度传感器插头接触不良 Poor contact of the electronic control temperature sensor connector	需检查电控温度传感器插头是否接触不良，故障排除后重新上电即可 Check if the electronic control temperature sensor connector has poor contact. Power on again after troubleshooting the fault.

2.5 EPS/EAC 故障诊断

2.5 EPS/EAC Fault Diagnosis

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
2	硬件过压故障 Hardware Overvoltage Fault	3	母线电压超过电压阈值 902V; Bus voltage exceeds the voltage threshold of 902V	需检查是否是电池端输出电压过高导致母线电压过压、或者是否存在电机运行过程中断主接触器的情况，故障排除后重新上电即可 Check if the bus overvoltage is caused by excessively high output voltage at the battery end, or if the main contactor is disconnected during motor operation. Power on again after

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				troubleshooting the fault.
4	直流母线输入过压三级故障 DC Bus Input Overvoltage Level 3 Fault	3	直流电压高于 800V DC voltage is higher than 800V	需检查是否是电池端输出电压过高导致母线电压过压、或者是否存在电机运行过程中断主接触器的情况，故障排除后重新上电即可 Check if the bus overvoltage is caused by excessively high output voltage at the battery end, or if the main contactor is disconnected during motor operation. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
5	直流母线输入欠压三级故障 DC Bus Input Undervoltage Level 3 Fault	3	直流电压低于 240V DC voltage is lower than 240V	需检查是否是电池端输出电压不稳导致母线电压欠压、或者是否存在高压线断线掉线情况，故障排除后重新上电即可 Check if the bus undervoltage is caused by unstable output voltage at the battery end, or if there is a disconnection or dropout of the high-voltage line. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
6	控制器过流三级故障 Controller Overcurrent Level 3 Fault	3	输出电流超过硬件过流触发点: IGBT*0.9A; Output current exceeds the hardware overcurrent trigger point: IGBT * 0.9A	需检查电控是否发生过载或电控内部是否发生短路, 故障排除后重新上电即可 Check if the electronic control is overloaded or if there is a short circuit inside the electronic control. Power on again after troubleshooting the fault.
7	控制器过温三级故障 Controller Over-temperature Level 3 Fault	3	控制器温度高于 100°C Controller temperature is higher than 100°C	需检查电控是否发生过载或过流、环境温度是否过高、电控冷却水路是否正常, 故障排除后重新上电即可 Check if the electronic control is overloaded or overcurrent, if the ambient temperature is

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				too high, and if the electronic control cooling water circuit is normal. Power on again after troubleshooting the fault.
8	电机过温三级故障 Motor Over-temperature Level 3 Fault	3	根据电机厂家规定温度配置 Configured according to the motor manufacturer's specified temperature	需检查电机是否发生过载或过流、环境温度是否过高、电机冷却水路是否正常，故障排除后重新上电即可 Check if the motor is overloaded or overcurrent, if the ambient temperature is too high, and if the motor cooling water circuit is normal. Power on again after

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				troubleshooting the fault.
9	KL30 低压电源过压 KL30 Low-voltage Power Supply Overvoltage	3	24V 平台，弱电电压大于 32V For 24V platform, the weak current voltage is greater than 32V	需检查低压整车端低压供电电压是否正常，此外排查低压供电线束是否断线，故障排除后重新上电即可 Check if the low-voltage power supply voltage at the low-voltage vehicle end is normal, and also troubleshoot if there is a disconnection of the low-voltage power supply wiring harness. Power on again after

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
10	输出缺相故障 Output Phase Loss Fault	3	在一定检测周期内，计算 U 、 V 、 W 各相电流的平均电流值，平均电流值最大与最小的比值超过 10 倍，报三相电流异常 Within a certain detection cycle, calculate the average current value of each phase of U, V, W, and the ratio of the maximum to the minimum average current value exceeds 10 times, reporting three-phase current abnormality	需检查电机三相线连接是否存在异常，故障排除后重新上电即可 Check if there is an abnormality in the connection of the motor's three-phase wires. Power on again after troubleshooting the fault.
11	控制器 EEPROM 故障 Controller EEPROM Fault	3	(1) EEPROM 连续读时间 > 2000ms, 不成功; (2) EPROM 连续写时间 > 2000ms, 不成功; (3) EPROM 初始化时间 > 2000ms, 不成功; (1) OR (2) OR (3) (1) EEPROM continuous reading time > 2000ms, unsuccessful; (2) EPROM continuous writing time > 2000ms, unsuccessful; (3) EPROM initialization time > 2000ms, unsuccessful; (1) OR (2) OR (3)	需排查是否是读写过程中 24V 掉电：读写 EEPROM 过程中，24V 外部供电异常可能导致错误。故障排除后重新上电即可 Troubleshoot if the 24V power supply is cut off during reading and writing: abnormal 24V

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				external power supply during EEPROM reading and writing may cause errors. Power on again after troubleshooting the fault.
12	交流零漂过大 Excessively Large AC Zero Drift	3	UVW 三相中超过一相电流的滤波绝对值 > 零漂 阈值(0.156 倍霍尔基值); The filtered absolute value of the current of more than one phase among the UVW three phases > zero drift threshold (0.156 times the Hall base value)	需排查硬件是否存在 对采样的干扰, 故障 排除后重新上电即可 Troubleshoot if there is hardware interference with sampling. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
81	直流母线输入过压二级故障 DC Bus Input Overvoltage Level 2 Fault	2	直流段电压高于 760V DC segment voltage is higher than 760V	需检查是否是电池端输出电压过高导致母线电压过压、或者是否存在电机运行过程中断主接触器的情况，故障排除后重新上电即可 Check if the bus overvoltage is caused by excessively high output voltage at the battery end, or if the main contactor is disconnected during motor operation. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
82	直流母线输入欠压二级故障 DC Bus Input Undervoltage Level 2 Fault	2	直流段电压低于 280V DC segment voltage is lower than 280V	需检查是否是电池端输出电压不稳导致母线电压欠压、或者是否存在高压线断线掉线情况，故障排除后重新上电即可 Check if the bus undervoltage is caused by unstable output voltage at the battery end, or if there is a disconnection or dropout of the high-voltage line. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
84	控制器过温二级故障 Controller Over-temperature Level 2 Fault	2	控制器温度高于 90°C Controller temperature is higher than 90°C	需检查电控是否发生过载或过流、环境温度是否过高、电控冷却水路是否正常，故障排除后重新上电即可 Check if the electronic control is overloaded or overcurrent, if the ambient temperature is too high, and if the electronic control cooling water circuit is normal. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
85	电机过温二级故障 Motor Over-temperature Level 2 Fault	2	根据电机厂家规定温度配置 Configured according to the motor manufacturer's specified temperature	需检查电机是否发生过载或过流、环境温度是否过高、电机冷却水路是否正常，故障排除后重新上电即可 Check if the motor is overloaded or overcurrent, if the ambient temperature is too high, and if the motor cooling water circuit is normal. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
90	电流检测故障 Current Detection Fault	2	未检测到输出端电流 No output current detected	/
95	CAN 通讯故障 CAN Communication Fault	2	8 秒内模块未接收到报文 No message received by the module within 8 seconds	需检查是否出现了 CAN 线断路，无法正常发送或接收特定的 报文 Check if there is a CAN line disconnection that prevents normal sending or receiving of specific messages.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
96	电机控制器 24v 欠压 Motor Controller 24V Undervoltage	2	24V 平台，弱电电压小于 18V For 24V platform, the weak current voltage is less than 18V	需检查低压整车端低压供电电压是否正常，此外排查低压供电线束是否断线，故障排除后重新上电即可 Check if the low-voltage power supply voltage at the low-voltage vehicle end is normal, and also troubleshoot if there is a disconnection of the low-voltage power supply wiring harness. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
97	电机超速 Motor Over-speed	2	转速大于峰值转速 300rpm 警告，大于峰值转速 500rpm 降功率，大于峰值转速 700rpm 停机 Speed greater than the peak speed by 300rpm for warning, greater than the peak speed by 500rpm for power reduction, and greater than the peak speed by 700rpm for shutdown	需连接上位机检查电机转速：转速大于峰值转速 300rpm 警告，大于峰值转速 500rpm 降功率，大于峰值转速 700rpm 停机 m，检查电机标定参数是否正常，故障排除后重新上电即可 Connect to the upper computer to check the motor speed: warning when the speed is greater than the peak speed by 300rpm, power reduction when greater than the peak speed by 500rpm, and shutdown when greater than the peak speed by 700rpm. Check if the motor

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				calibration parameters are normal. Power on again after troubleshooting the fault.
98	速度偏差过大 Excessively Large Speed Deviation	2	转速大于峰值转速 300rpm 警告，大于峰值转速 500rpm 降功率 Speed greater than the peak speed by 300rpm for warning, greater than the peak speed by 500rpm for power reduction	需连接上位机检查电机转速：转速大于峰值转速 300rpm 警告，大于峰值转速 500rpm 降功率，检查电机标定参数是否正常，故障排除后重新上电即可 Connect to the upper computer to check the motor speed: warning when the speed is greater than the peak speed by 300rpm, and power reduction when greater than the peak

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				speed by 500rpm. Check if the motor calibration parameters are normal. Power on again after troubleshooting the fault.
106	电机温度传感器故障 Motor Temperature Sensor Fault	1	温度传感器出现异常，无法检测温度 The temperature sensor is abnormal and cannot detect temperature	需检查电机温度传感器是否存在断线或者损坏，故障排除后重新上电即可 Check if the motor temperature sensor is disconnected or damaged. Power on again after troubleshooting the fault.

2.6 DCDC 故障诊断

2.6 DCDC Fault Diagnosis

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
161	输出欠压 Output Undervoltage	1	输出电压低于 18V Output voltage is lower than 18V	需检查 DCDC 输入电压是否正常，此外检查 DCDC 模块是否损坏，故障排除后重新上电即可 Check if the DCDC input voltage is normal, and also check if the DCDC module is damaged. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
162	输出过压保护 Output Overvoltage Protection	1	软件过压值设计在 31.5V，过压保护可自恢复；硬件过压保护范围在 32Vdc The software overvoltage value is designed at 31.5V, and overvoltage protection is self-recoverable; the hardware overvoltage protection range is 32Vdc	需连接上位机检查是否软件设置输出电压出现问题，或后端存在其他电源抬高输出电压，故障排除后重新上电即可 Connect to the upper computer to check if there is a problem with the software-set output voltage, or if there is another power supply at the rear end raising the output voltage. Power on again after troubleshooting the fault.
163	输入欠压 Input Undervoltage	1	直流段电压低于 380V DC segment voltage is lower than 380V	需检查 DCDC 模块是否是电池端输出电压不稳导致母线电压欠压、或者是否存在高压线断线掉线情况，故障排除后重新上电即可 Check if the DCDC module's bus undervoltage is caused by unstable output voltage at the battery end, or if there is a disconnection or dropout of the high-voltage line. Power on again after troubleshooting the fault.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
164	输入过压 Input Overvoltage	1	输入电压大于 760V Input voltage is greater than 760V	需检查 DCDC 模块是否发生过载或过流、环境温度是否过高、电控冷却水路是否正常，故障排除后重新上电即可 Check if the DCDC module is overloaded or overcurrent, if the ambient temperature is too high, and if the electronic control cooling water circuit is normal. Power on again after troubleshooting the fault.
165	硬件故障 Hardware Fault	1	内部判断硬件故障 Internal judgment of hardware fault	需检查 DCDC 模块硬件是否出现问题，故障排除后重新上电即可 Check if there is a problem with the DCDC module hardware. Power on again after troubleshooting the fault.
166	过温 Over-temperature	1	控制器温度大于 105℃ Controller temperature is greater than	需检查 DCDC 模块是否发生过载或过流、环境温度是否过高、冷却水路是否正常，故障排除后重新上电即可

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
			105°C	Check if the DCDC module is overloaded or overcurrent, if the ambient temperature is too high, and if the cooling water circuit is normal. Power on again after troubleshooting the fault.
167	短路/过流保护 Short Circuit/Overcurrent Protection	1	可短路保护，连续短路 10 个周期电源 进行锁机保护。 Short circuit protection is available, and the power supply will lock up for protection after 10 consecutive short circuit cycles	需检查 DCDC 模块是否发生短路故障，故障排除后重新上电即可 Check if the DCDC module has a short circuit fault. Power on again after troubleshooting the fault.
168	24V 低压欠压 24V Low-voltage Undervoltage	1	24V 平台，弱电电压小于 18V For 24V platform, the weak current voltage is less than 18V	需检查低压整车端低压供电电压是否正常，此外排查低压供电线束是否断线，故障排除后重新上电即可 Check if the low-voltage power supply voltage at the low-voltage vehicle end is normal, and also troubleshoot if there is a disconnection of the low-voltage power supply wiring harness. Power on again after troubleshooting the fault.

故障代码	故障名称	故障等级	原因分析	维修指南
Fault Code	Name of fault	Fault level	Cause analysis	Maintenance Guide
169	8s 没接收到 VCU 指令 No VCU Command Received for 8s	1	8s 没接收到 VCU 指令 No VCU command received for 8s	需检查是否出现了 CAN 线断路，无法正常发送或接收特定的报文 Check if there is a CAN line disconnection that prevents normal sending or receiving of specific messages.

2.7 TCU 故障诊断

2.7 TCU Fault Diagnosis

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
1	TCU 与 MCU 通讯故障 TCU-MCU Communication Faul	3	50 个周期没有收到 MCU 发送的周期最短的报文 No shortest period message received from MCU for 50 cycles	(1) 通过万用表检测 MCU 和 TCU 之间通讯线束的通断、电阻值是否为 60Ω/120Ω; (2) 通过万用表检测 MCU 物理供电输入值是否在 24V 左右; (3) 检查 MCU 通讯报文周期。 (1) Use a multimeter to check the continuity and resistance value of the communication harness between the MCU and TCU, which should be 60Ω/120Ω. (2) Use a multimeter to check if the physical power supply input value of the MCU is around 24V. (3) Check the communication message cycle of the MCU.
2	TCU 与 VCU 通讯故障	3	50 个周期没有收到 VCU 发送的周期最短的报文	(1) 通过万用表检测 VCU 和 TCU 之间通讯线束的通断、电阻值是否为 60Ω/120Ω;

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
	TCU-VCU Communication Fault		No shortest period message received from VCU for 50 cycles	(2) 通过万用表检测 TCU 物理供电输入值是否在 24V 左右; (3) 检查 VCU 通讯报文周期。 (1) Use a multimeter to check the continuity and resistance value of the communication harness between the MCU and TCU, which should be 60Ω/120Ω. (2) Use a multimeter to check if the physical power supply input value of the MCU is around 24V. (3) Check the communication message cycle of the MCU.
3	TCU 电源电压高 High TCU Supply Voltage	3	TCU 检测到的低电压超过 34V 超过 100ms Detected low voltage exceeding 34V for over 100ms	通过万用表检测 TCU 物理供电线束的通断、电压值是否超过 34V，若是，排查供电电源至 TCU 控制器之间线束的通断及电压值状况。 Use a multimeter to check the continuity and voltage of the physical power supply harness of the TCU. If the voltage exceeds 34V, inspect the continuity and voltage of the harness between the power supply and the TCU controller.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
4	TCU 电源电压低 Low TCU Supply Voltage	3	TCU 检测到的低压电低于 14V 超过 200ms Detected low voltage below 14V for over 200ms	通过万用表检测 TCU 物理供电线束的通断、电压值是否低于 14V，若是，排查供电电源至 TCU 控制器之间线束的通断及电压值状况。 Use a multimeter to check the continuity and voltage of the physical power supply harness of the TCU. If the voltage exceeds 34V, inspect the continuity and voltage of the harness between the power supply and the TCU controller.
5	主箱换挡传感器高于最大值 Main Gearbox Shift Sensor Above Maximum	3	主箱换挡传感器采集电压>4.9V Main gearbox shift sensor voltage > 4.9V	（1）检查主箱/副箱换挡传感器插件部位有无松动； （2）若松动，重新拔插主箱/副箱换挡传感器插件，若无松动，用万用表量主箱/副箱换挡传感器供电电压； （3）若供电电压正常，则需更换主箱/副箱换挡传感器；若供电电压不正常，则排查整车线束供电情况； （4）直至主箱/副箱换挡传感器采集电压在合理范

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				围保持 1s。 (1) Check if the plug-in part of the main box/sub-box gearshift sensor is loose. (2) If it is loose, reinsert the plug-in of the main box/sub-box gearshift sensor. If it is not loose, measure the power supply voltage of the main box/sub-box gearshift sensor with a multimeter. (3) If the power supply voltage is normal, the main box/sub-box gearshift sensor needs to be replaced. If the power supply voltage is abnormal, check the power supply condition of the entire vehicle wiring harness. (4) Until the voltage collected by the main box/sub-box gearshift sensor remains within a reasonable range for 1 second.
5	主箱换挡传感器低于最小值 Main Gearbox Shift Sensor Below Minimum	3	主箱换挡传感器采集电压<0.5V Main gearbox shift sensor voltage < 0.5V	(1) 检查主箱/副箱换挡传感器插件部位有无松动； (2) 若松动，重新拔插主箱/副箱换挡传感器插件，若无松动，用万用量主箱/副箱换挡传感器供电电压；

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				(3) 若供电电压正常, 则需更换主箱/副箱换挡传感器; 若供电电压不正常, 则排查整车线束供电情况; (4) 直至主箱/副箱换挡传感器采集电压在合理范围保持 1s。 (1) Check if the plug-in part of the main box/sub-box gearshift sensor is loose. (2) If it is loose, reinsert the plug-in of the main box/sub-box gearshift sensor. If it is not loose, measure the power supply voltage of the main box/sub-box gearshift sensor with a multimeter. (3) If the power supply voltage is normal, the main box/sub-box gearshift sensor needs to be replaced. If the power supply voltage is abnormal, check the power supply condition of the entire vehicle wiring harness. (4) Until the voltage collected by the main box/sub-box gearshift sensor remains within a reasonable range for 1 second.
105	副箱换挡传感器高于最大值	3	副箱换挡传感器采集电压达>4.9V	(1) 检查主箱/副箱换挡传感器插件部位有无松

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
	Auxiliary Gearbox Shift Sensor Above Max		Auxiliary gearbox shift sensor voltage > 4.9V	动； （2）若松动，重新拔插主箱/副箱换挡传感器插件，若无松动，用万用表量主箱/副箱换挡传感器供电电压； （3）若供电电压正常，则需更换主箱/副箱换挡传感器；若供电电压不正常，则排查整车线束供电情况； （4）直至主箱/副箱换挡传感器采集电压在合理范围保持 1s。 (1) Check whether the plug-in part of the shift sensor in the main box/auxiliary box is loose. (2) If it is loose, re-plug and unplug the main box/auxiliary box shift sensor plug-in. If it is not loose, use a multimeter to measure the supply voltage of the main box/auxiliary box shift sensor. (3) If the supply voltage is normal, the shift sensor of the main box/auxiliary box needs to be replaced. If the

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				power supply voltage is abnormal, check the power supply situation of the entire vehicle's wiring harness. (4) Keep the voltage collected by the shift sensor of the main box/auxiliary box within a reasonable range for 1 second
106	副箱换挡传感器低于最小值 Auxiliary Gearbox Shift Sensor Below Min	3	副箱换挡传感器采集电压<0.5V Auxiliary gearbox shift sensor voltage < 0.5V	(1) 检查主箱/副箱换挡传感器插件部位有无松动; (2) 若松动, 重新拔插主箱/副箱换挡传感器插件, 若无松动, 用万用量表主箱/副箱换挡传感器供电电压; (3) 若供电电压正常, 则需更换主箱/副箱换挡传感器; 若供电电压不正常, 则排查整车线束供电情况; (4) 直至主箱/副箱换挡传感器采集电压在合理范围保持 1s。 (1) Check whether the plug-in part of the shift sensor in the main box/auxiliary box is loose.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				(2) If it is loose, re-plug and unplug the main box/auxiliary box shift sensor plug-in. If it is not loose, use a multimeter to measure the supply voltage of the main box/auxiliary box shift sensor. (3) If the supply voltage is normal, the shift sensor of the main box/auxiliary box needs to be replaced. If the power supply voltage is abnormal, check the power supply situation of the entire vehicle's wiring harness. (4) Keep the voltage collected by the shift sensor of the main box/auxiliary box within a reasonable range for 1 second.
11	主箱换挡机构卡死 Main Gearbox Shift Mechanism Jammed	3	主箱换挡位置停在在档区间和空挡区间之间超过 3s Main gearbox shift position stuck between gear and neutral for >3s	(1) 整车重新上下电, 若换挡机构不是真正卡死, 则 TCU 主动尝试清除故障后可重新运行。 (2) 整车重新上下电, 若 TCU 故障码无法恢复, 则换挡机构卡死, 需拆掉换挡机构进行检查。 (1) Restart the power on and off of the entire vehicle. If the gear shifting mechanism is not truly stuck, the TCU

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				will actively attempt to clear the fault and the vehicle can be restarted. (2) Restart the power on and off of the entire vehicle. If the TCU fault code cannot be restored, the gear shifting mechanism is stuck and needs to be removed for inspection.
111	副箱换挡机构卡死 Auxiliary Gearbox Shift Mechanism Jammed	3	副箱换挡位置停在了在档区间和空挡区间之间超过 3s Auxiliary gearbox shift position stuck between gear and neutral for >3s	(1) 整车重新上下电，若换挡机构不是真正卡死，则 TCU 主动尝试清除故障后可重新运行。 (2) 整车重新上下电，若 TCU 故障码无法恢复，则换挡机构卡死，需拆掉换挡机构进行检查。 (1) Restart the power on and off of the entire vehicle. If the gear shifting mechanism is not truly stuck, the TCU will actively attempt to clear the fault and the vehicle can be restarted. (2) Restart the power on and off of the entire vehicle. If the TCU fault code cannot be restored, the gear shifting mechanism is stuck and needs to be removed for

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				inspection.
13	主箱所有档位均挂档失败 Main Gearbox All Gears Fail to Engage	3	主箱一、二挡均进档失败 2 次 Main gearbox first and second gears fail to engage twice	(1) 若等待 10s 后会未自动消除故障，重新尝试进档，则根据相应的故障码和故障信息，确定故障是否是由整车部件引起，如是，请及时修理； (2) 如果不是整车部件引起的故障，询问车主或驾驶员，搜集有关资料如工作状况，历史故障等，观察检查变速器总成，寻找循环迹象，注意关键部件，如插件部位，安装点或支架、气路； (3) 如确定故障出现在变速器内部，则需要拆解变速器总成，并更换相应换挡机构。 (1) If the fault does not automatically eliminate after waiting for 10 seconds, try shifting back into gear. Then, based on the corresponding fault code and fault information, determine whether the fault is caused by a component of the entire vehicle. If so, please repair it in time. (2) If the fault is not caused by a component of the

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				entire vehicle, ask the car owner or driver, collect relevant information such as working conditions and historical faults, observe and inspect the transmission assembly, look for signs of circulation, and pay attention to key components such as plug-in parts, installation points or brackets, and air lines. (3) If it is determined that the fault occurs inside the transmission, the transmission assembly needs to be disassembled and the corresponding shift mechanism replaced.
113	副箱所有档位均挂档失败 Auxiliary Gearbox All Gears Fail to Engage	3	副箱一、二挡均进档失败 2 次 Auxiliary gearbox first and second gears fail to engage twice	（1）若等待 10s 后会未自动消除故障，重新尝试进档，则根据相应的故障码和故障信息，确定故障是否是由整车部件引起，如是，请及时修理； （2）如果不是整车部件引起的故障，询问车主或驾驶员，搜集有关资料如工作状况，历史故障等，观察检查变速器总成，寻找循环迹象，注意关键部件，如插件部位，安装点或支架、气路；

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				（3）如确定故障出现在变速器内部，则需要拆解变速器总成，并更换相应换挡机构。 (1) If the fault does not automatically eliminate after waiting for 10 seconds, try shifting back into gear. Then, based on the corresponding fault code and fault information, determine whether the fault is caused by a component of the entire vehicle. If so, please repair it in time. (2) If the fault is not caused by a component of the entire vehicle, ask the car owner or driver, collect relevant information such as working conditions and historical faults, observe and inspect the transmission assembly, look for signs of circulation, and pay attention to key components such as plug-in parts, installation points or brackets, and air lines. (3) If it is determined that the fault occurs inside the transmission, the transmission assembly needs to be

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				disassembled and the corresponding shift mechanism replaced.
14	变速箱油温过高 Transmission Oil Overheating	3	中桥变速箱油温大于 130°C Middle bridge transmission oil temperature > 130°C	(1) 询问驾驶员运行工况、及整车负载情况； (2) 查看变速箱油液气味和颜色，判断变速箱油液是否变质，如变质，则需更换变速箱油液； (3) 检查冷却风扇是否有杂物堵塞，影响散热效率； (4) 检查冷却管路是否有泄露、扭曲或压扁。 (1) Inquire about the driver's operating conditions and the overall load of the vehicle; (2) Check the smell and color of the transmission fluid to determine if it has deteriorated. If it has, the transmission fluid needs to be replaced. (3) Check if the cooling fan is blocked by any debris, which may affect the heat dissipation efficiency. (4) Check whether there is any leakage, distortion or flattening in the cooling pipeline.

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
16	输出轴转速信号无效 Invalid Output Shaft Speed Signal	2	车速大于 2 码，电机转速计算的车速，与输出轴转速计算的车速差大于 4km/h，并保持超过 100ms Speed difference >4km/h between motor and output shaft speeds for >100ms	（1）检查输出轴转速传感器接插件是否松动以及传感器附近的线束是否有明显磨损、断裂、烧蚀等痕迹； （2）将驱动轮举起，运行车辆，观察数据流转速信号，若转速始终为零，则可能传感器本身、线路断路；若转速信号波动，则可能传感器接插件接触不良或线路虚接 （3）拔掉输出轴转速传感器，使用万用表测量传感器相关针脚之间的阻值和电压是否正常，若不正常，可更换输出轴转速传感器。 (1) Check whether the connector of the output shaft speed sensor is loose and whether there are obvious signs of wear, breakage, erosion, etc. on the wiring harness near the sensor. (2) Lift the drive wheels, run the vehicle, and observe the data flow speed signal. If the speed remains zero all the time, it may be that the sensor itself or the circuit is

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				open. If the rotational speed signal fluctuates, it may be due to poor contact of the sensor connector or loose connection in the circuit. (3) Unplug the output shaft rotational speed sensor and use a multimeter to measure whether the resistance and voltage between the relevant pins of the sensor are normal. If not, the output shaft rotational speed sensor can be replaced.
17	输出轴转速没有信号 No Output Shaft Speed Signal	2	车速低于 2 码, 电机转速计算的车速大于 4km/h, 输出轴转速计算的车速为 0, 并保持超过 100ms No output shaft speed signal when vehicle speed <2km/h and motor speed >4km/h	(1) 检查输出轴转速传感器接插件是否松动以及传感器附近的线束是否有明显磨损、断裂、烧蚀等痕迹; (2) 将驱动轮举起, 运行车辆, 观察数据流转速信号, 若转速始终为零, 则可能传感器本身、线路断路; 若转速信号波动, 则可能传感器接插件接触不良或线路虚接 (3) 拔掉输出轴转速传感器, 使用万用表测量传感器相关针脚之间的阻值和电压是否正常, 若不正

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				常，可更换输出轴转速传感器。 (1) Check whether the connector of the output shaft speed sensor is loose and whether there are obvious signs of wear, breakage, erosion, etc. on the wiring harness near the sensor. (2) Lift the drive wheels, run the vehicle, and observe the data flow speed signal. If the speed remains zero all the time, it may be that the sensor itself or the circuit is open. If the rotational speed signal fluctuates, it may be due to poor contact of the sensor connector or loose connection in the circuit. (3) Unplug the output shaft rotational speed sensor and use a multimeter to measure whether the resistance and voltage between the relevant pins of the sensor are normal. If not, the output shaft rotational speed sensor can be replaced.
31	空挡输出轴转速异常跳动	2	空挡输出轴转速相邻周期内出现大幅	(1) 连接诊断仪，空挡状态下查看输出轴转速信

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
	Abnormal Neutral Output Shaft Speed		度跳动 Significant speed fluctuations in neutral	号，若为小幅跳动，则真是存在轻微转动的情况，如电机旋变异常；若为大幅、无规律跳动，则可能是信号干扰或传感器本身故障； （2）将驱动轮举起，运行车辆，观察数据流转速信号，若转速始终为零，则可能传感器本身、线路断路；若转速信号波动，则可能传感器接插件接触不良或线路虚接 （3）拔掉输出轴转速传感器，使用万用表测量传感器相关针脚之间的阻值和电压是否正常，若不正常，可更换输出轴转速传感器。 (1) Connect the diagnostic instrument and check the output shaft speed signal in neutral gear. If there is a slight jump, it really indicates a slight rotation, such as abnormal motor rotation. If there is a significant and irregular fluctuation, it may be due to signal interference or a malfunction of the sensor itself. (2) Lift the drive wheels, run the vehicle, and observe

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				the data flow speed signal. If the speed remains zero all the time, it may be that the sensor itself or the circuit is open. If the rotational speed signal fluctuates, it may be due to poor contact of the sensor connector or loose connection in the circuit. (3) Unplug the output shaft rotational speed sensor and use a multimeter to measure whether the resistance and voltage between the relevant pins of the sensor are normal. If not, the output shaft rotational speed sensor can be replaced.
18	变速箱油温偏高 High Transmission Oil Temperature	2	中桥变速箱油温大于 120°C Middle bridge transmission oil temperature > 120°C	(1) 询问驾驶员运行工况、及整车负载情况； (2) 查看变速箱油液气味和颜色，判断变速箱油液是否变质，如变质，则需更换变速箱油液； (3) 检查冷却风扇是否有杂物堵塞，影响散热效率； (4) 检查冷却管路是否有泄露、扭曲或压扁。 (1) Inquire about the driver's operating conditions and

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				the overall load of the vehicle. (2) Check the smell and color of the transmission fluid to determine if it has deteriorated. If it has, the transmission fluid needs to be replaced. (3) Check if the cooling fan is blocked by any debris, which may affect the heat dissipation efficiency. (4) Check whether there is any leakage, distortion or flattening in the cooling pipeline.
19	自学习数据错误 Self-Learning Data Error	1	换挡自学习未做 Shift self-learning not performed	（1）查看变速箱油液气味、颜色及液位，判断变速箱油液是否变质或液位低，若油位或油液较差，则会导致换挡机构动作助力增大，间接导致自学习失败； （2）检查输入/输出轴转速传感器、档位传感器的阻值、电压情况，检查其接插件是否松动、进水、针脚弯曲或接触不良等情况； （3）检查换挡机构是否可以正常工作，测量换挡电机绕组的电阻值，是否存在内部线圈短路或短路情

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				况； （4）检查换挡机构是否存在卡滞情； （5）检查 TCU 的供电电压和搭铁电阻，是否存在虚接导致 TCU 工作异常； （6）最后通过绿控上位机做换挡自学习。 (1) Check the odor, color, and level of the transmission fluid to determine whether it has deteriorated or the level is low. If the fluid level or quality is poor, it will lead to increased assistance in the shifting mechanism's action, indirectly causing self-learning failure; (2) Check the resistance and voltage of the input/output shaft speed sensor and gear position sensor, and inspect their connectors for any looseness, water ingress, bent pins, or poor contact; (3) Check whether the gear-shifting mechanism can work normally, measure the resistance value of the gear-shifting motor winding, and check for internal coil short

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				circuits or open circuits; (4) Check whether the gear shifting mechanism is stuck or not; (5) Check the power supply voltage and grounding resistance of the TCU to see if there is any faulty connection causing abnormal operation of the TCU; (6) Finally, perform gear shift self-learning through the Lvkon host computer.
20	坡道传感器通讯故障 Slope Sensor Communication Fault	1	坡度传感器报文 5s 未收到 No slope sensor message received for 5s	(1) 检查坡道传感器接插件是否松动、进水、针脚弯曲或接触不良等情况; (2) 检查 TCU 到坡道传感器的线束是否磨损、破皮、短路等情况; (3) 使用万用表测量坡道传感器的供电电压、信号电压及接地情况; (4) 检查整车网络通讯是否正常; (5) 如以上均无问题, 可进行更换坡道传感器。 (1) Check the ramp sensor connector for any looseness,

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				water ingress, bent pins, or poor contact; (2) Inspect the wire harness from the TCU to the ramp sensor for any wear, damage, or short circuit; (3) Use a multimeter to measure the supply voltage, signal voltage, and grounding of the ramp sensor; (4) Verify if the vehicle's network communication is functioning properly; (5) If there are no issues identified above, proceed with replacing the ramp sensor.
21	坡道传感器未标定 Slope Sensor Uncalibrated	1	坡度传感器未标定 Slope sensor not calibrated	(1) 将车辆停在零坡度路面上; (2) 将车辆处于 ON 档非 Ready 状态下; (3) 手柄档位及真实档位都处于空挡; (4) 同时完全踩下油门和刹车踏板, 保持 30S; (5) 车辆开始自动标定坡度传感器。 (6) 或通过绿控上位机标定。 (1) Park the vehicle on a road with zero slope; (2) Set the vehicle in the ON position but not in the

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				Ready state; (3) Ensure that both the handle gear and the actual gear are in neutral; (4) Simultaneously press down fully on the accelerator and brake pedals and maintain this position for 30 seconds; (5) The vehicle will start to automatically calibrate the slope sensor. (6) Or calibrate through the Lvkon host computer.
22	坡道传感器故障 Slope Sensor Fault	1	坡道传感器未知故障 Unknown slope sensor fault	(1) 检查坡道传感器接插件是否松动、进水、针脚弯曲或接触不良等情况; (2) 检查 TCU 到坡道传感器的线束是否磨损、破皮、短路等情况; (3) 使用万用表测量坡道传感器的供电电压、信号电压及接地情况; (4) 如以上均无问题, 可进行更换坡道传感器。 (1) Check the ramp sensor connector for looseness,

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				water ingress, bent pins, or poor contact; (2) Check the wire harness from TCU to the ramp sensor for wear, damage, or short circuit; (3) Use a multimeter to measure the power supply voltage, signal voltage, and grounding of the ramp sensor; (4) If there are no issues with the above, replace the ramp sensor.
23	取力器堵转报警 Power Take-Off (PTO) Stall Alarm	1	大扭矩小转速持续 1s High torque, low speed 持续 1s (Note: Translation adjusted for clarity)	(1) 先采取关闭取力器开关或者重新上下电操作，再次打开取力，查看是否功能正常； (2) 检查取力电磁阀接插件是否松动、进水、针脚弯曲或接触不良等情况； (3) 若取力器有气源输入，需查看气源气压是否达到规定值； (4) 查看取力器外部机械连接，若机械连接卡死，则可能会导致取力器堵转。 (1) First, turn off the power takeoff switch or perform a

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				power cycle, then turn on the power takeoff again to check if it functions properly; (2) Check the power takeoff solenoid valve connector for looseness, water ingress, bent pins, or poor contact; (3) If the power takeoff has air source input, check if the air pressure reaches the specified value; (4) Inspect the external mechanical connections of the power takeoff. If the mechanical connections are stuck, it may cause the power takeoff to stall.
24	停车取力有车速报警 PTO Engaged with Vehicle Speed	1	停车取力有 5km/h 以上车速 PTO engaged at speeds >5km/h	(1) 先采取关闭取力器开关或者重新上下电操作，再次打开取力，查看是否功能正常； (2) 确认车辆是否完全停止，没有轻微移动； (3) 变速箱档位是否在空挡； (4) 在车辆停稳且已拉上手刹前提下，使用诊断仪读取总线车速报文是否显示车速，如有需排查车速信号源； (5) 检查车速传感器、输出轴传感器、轮速传感器

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				接插件是否松动、进水、针脚弯曲或接触不良等情况产生错误的脉冲信号； （6）检查取力开关到取力控制单元的线路是否有短路、短路情况。 (1) First, turn off the power takeoff switch or perform a power cycle, then turn on the power takeoff again to check if it functions properly; (2) Confirm that the vehicle has completely stopped without any slight movement; (3) Check if the transmission gear is in neutral; (4) With the vehicle stopped and the handbrake applied, use a diagnostic tool to read the bus speed message to see if it displays the vehicle speed. If it does, investigate the source of the speed signal; (5) Check the vehicle speed sensor, output shaft sensor, and wheel speed sensor connectors for loose connections, water ingress, bent pins, or poor contact

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				that may generate incorrect pulse signals; (6) Inspect the wiring from the power takeoff switch to the power takeoff control unit for short circuits or open circuits.
25	取力器反转或转速超速 PTO Reverse or Overspeed	1	电机转速为负或大于取力器最大转速 Negative or excessive motor speed	(1) 先采取关闭取力器开关或者重新上下电操作，再次打开取力，查看是否功能正常； (2) 若仍有取力器反转故障，需拆解或检测取力器内部的机械齿轮是否安装正确； (3) 在车辆停稳且已拉上手刹前提下，使用诊断仪读取总线转速报文是否显示转速，如有需排查转速信号源； (4) 检查取力电磁阀接插件是否松动、进水、针脚弯曲或接触不良等情况产生错误的脉冲信号。 (1) First, turn off the power takeoff switch or perform a power cycle, then turn on the power takeoff again and check if it functions properly; (2) If the power takeoff still reverses, it is necessary to

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				disassemble or inspect whether the mechanical gears inside the power takeoff are installed correctly; (3) With the vehicle stopped and the handbrake applied, use a diagnostic tool to read the bus speed message to see if it displays a speed. If it does, investigate the speed signal source; (4) Check the power takeoff solenoid valve connector for loose connections, water ingress, bent pins, or poor contact that may generate incorrect pulse signals.
26	取力器脱开失败 PTO Disengagement Failure	1	给电磁阀指令无法断开 Solenoid command fails to disconnect	(1) 先采取关闭取力器开关或者重新上下电操作，再次打开取力，查看是否功能正常； (2) 若取力器有气源输入，需查看气源气压是否达到规定值； (3) 在操作取力开关的时候，若能听到清晰的“咔哒”声（电取力电磁阀工作的声音），但取力器无法结合，需排查取力电磁阀的电压（有电压，说明电磁阀损坏，需更换；无电压，需排查线路情况）或取

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				力器内部机械结构有无问题； （4）若取力器系统有保险丝，可检查保险丝是否熔断； （5）使用万用表测量取力开关按下时是否正常导通，排查电压、电阻是否正常； （6）检查取力电磁阀接插件是否松动、进水、针脚弯曲或接触不良等情况。 (1) First, turn off the power takeoff switch or perform a power cycle, then turn on the power takeoff again to check if it functions properly; (2) If the power takeoff has an air source input, check if the air pressure reaches the specified value; (3) When operating the power takeoff switch, if you can hear a clear "click" sound (the sound of the electric power takeoff solenoid valve working), but the power takeoff fails to engage, check the voltage of the power takeoff solenoid valve (if there is voltage, it indicates

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				that the solenoid valve is damaged and needs to be replaced; if there is no voltage, check the wiring) or if there is a problem with the internal mechanical structure of the power takeoff; (4) If the power takeoff system has a fuse, check if the fuse is blown; (5) Use a multimeter to measure if the power takeoff switch is conducting normally when pressed, and check if the voltage and resistance are normal; (6) Check if the power takeoff solenoid valve connector is loose, has water ingress, bent pins, or poor contact.
27	取力器结合失败 PTO Engagement Failure	1	给电磁阀指令无法吸合 Solenoid command fails to engage	(1) 先采取关闭取力器开关或者重新上下电操作，再次打开取力，查看是否功能正常； (2) 若取力器有气源输入，需查看气源气压是否达到规定值； (3) 在操作取力开关的时候，若能听到清晰的“咔哒”声（电取力电磁阀工作的声音），但取力器无法结

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				合，需排查取力电磁阀的电压（有电压，说明电磁阀损坏，需更换；无电压，需排查线路情况）或取力器内部机械结构有无问题； （4）若取力器系统有保险丝，可检查保险丝是否熔断； （5）使用万用表测量取力开关按下时是否正常导通，排查电压、电阻是否正常； （6）检查取力电磁阀接插件是否松动、进水、针脚弯曲或接触不良等情况。 (1) First, turn off the power takeoff switch or perform a power cycle, then turn on the power takeoff again to check if it functions properly; (2) If the power takeoff has an air source input, check if the air pressure reaches the specified value; (3) When operating the power takeoff switch, if you can hear a clear "click" sound (the sound of the electric power takeoff solenoid valve working), but the power

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				takeoff fails to engage, check the voltage of the power takeoff solenoid valve (if there is voltage, it indicates that the solenoid valve is damaged and needs to be replaced; if there is no voltage, check the wiring) or if there is a problem with the internal mechanical structure of the power takeoff; (4) If the power takeoff system has a fuse, check if the fuse is blown; (5) Use a multimeter to measure if the power takeoff switch is conducting normally when pressed, and check if the voltage and resistance are normal; (6) Check if the power takeoff solenoid valve connector is loose, has water ingress, bent pins, or poor contact.
59	取力传感器两路信号异常 PTO Sensor Dual Signal Abnormal	1	有取力反馈信号，但两路信号采集值异常 PTO feedback present but dual signals abnormal	(1) 先采取关闭取力器开关或者重新上下电操作，再次打开取力，查看是否功能正常； (2) 使用万用表测量取力传感器的供电、搭铁、信号电是否正常；

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				(3) 检查取力传感器接插件是否松动、进水、针脚弯曲或接触不良等情况产生错误的脉冲信号; (4) 检查取力传感器到 TCU 的线束是否有磨损、破皮、被压扁的痕迹; 若所有线束检查都正常, 可用功能正常的相同传感器进行替换测试。 (1) First, turn off the power takeoff switch or perform a power cycle, then turn on the power takeoff again to check if it functions properly; (2) Use a multimeter to measure if the power supply, grounding, and signal of the power takeoff sensor are normal; (3) Check if the power takeoff sensor connector is loose, has water ingress, bent pins, or poor contact, which may cause erroneous pulse signals; (4) Inspect the wiring harness from the power takeoff sensor to the TCU for signs of wear, damage, or

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				crushing; if all wiring harness inspections are normal, replace it with a functioning sensor for testing.
28	油温传感器断路 Oil Temperature Sensor Open Circuit	1	变速箱油温传感器未接 Transmission oil temperature sensor disconnected	（1）检查油温传感器接插件是否松动、进水、针脚弯曲或接触不良等情况； （2）检查油温传感器接插件及周边线束是否有磨损、破皮、烧蚀的痕迹； （3）使用万用表测量油温传感器的电压、电阻值是否正常，是否对地/对电源短路； （4）使用万用表测量油温传感器与线束开路，短高，短低，原始输入值超范围/变化率超出范围，物理输入值超出范围/变化率超出范围。 (1) Check the oil temperature sensor connector for any looseness, water ingress, bent pins, or poor contact; (2) Inspect the oil temperature sensor connector and surrounding wiring harness for signs of wear, damage, or ablation; (3) Use a multimeter to measure the voltage and

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				resistance of the oil temperature sensor to ensure they are normal and there is no short circuit to ground/power supply; (4) Use a multimeter to measure the oil temperature sensor and wiring harness for open circuits, short circuits (high or low), original input values exceeding the range, change rates exceeding the range, physical input values exceeding the range, or change rates exceeding the range.
29	油温传感器短路 Oil Temperature Sensor Short Circuit	1	变速箱油温传感器内部/线束短路 Transmission oil temperature sensor shorted internally or in wiring	(1) 检查油温传感器接插件是否松动、进水、针脚弯曲或接触不良等情况; (2) 检查油温传感器接插件及周边线束是否有磨损、破皮、烧蚀的痕迹; (3) 使用万用表测量油温传感器的电压、电阻值是否正常, 是否对地/对电源短路; (4) 使用万用表测量油温传感器与线束开路, 短高, 短低, 原始输入值超范围/变化率超出范围, 物

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				理输入值超出范围/变化率超出范围。 (1) Check the oil temperature sensor connector for any looseness, water ingress, bent pins, or poor contact; (2) Inspect the oil temperature sensor connector and surrounding wiring harness for signs of wear, damage, or ablation; (3) Use a multimeter to measure the voltage and resistance of the oil temperature sensor to ensure they are normal and there is no short circuit to ground/power supply; (4) Use a multimeter to measure the oil temperature sensor and wiring harness for open circuits, short circuits (high or low), original input values exceeding the range, change rates exceeding the range, physical input values exceeding the range, or change rates exceeding the range.
54	整车 can-busoff 故障	1	整车 can-busoff 故障	(1) 检查整车故障表现，确认是整车故障还是个别

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	Vehicle CAN Bus Off Fault		Vehicle CAN bus communication failure	控制器故障； （2）确认故障出现时间，故障出现时的运行工况； （3）检查主要控制器（如 VCU、TCU、IC、GW）的接插件是否松动； （4）检查蓄电池电压是否不稳或过低， （5）检查车辆搭铁是否牢固、无腐蚀； （6）使用万用表测量车辆诊断接口 CAN-H 和 CAN-L 之间的阻值； （7）使用万用表测量车辆诊断接口 CAN-H 和 CAN-L 对地的电压； （8）确定故障所在总线拓扑位置，依次拔掉 CAN 总线插头，并逐一在 obd 接口测量电压和电阻。 (1) Inspect the vehicle for fault manifestations and confirm whether it is a vehicle-wide fault or an individual controller fault; (2) Confirm the time of fault occurrence and the operating conditions at the time of fault occurrence;

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				(3) Check whether the connectors of the main controllers (such as VCU, TCU, IC, GW) are loose; (4) Check whether the battery voltage is unstable or too low; (5) Check whether the vehicle grounding is secure and free from corrosion; (6) Use a multimeter to measure the resistance between the vehicle diagnostic interface CAN-H and CAN-L; (7) Use a multimeter to measure the voltage to ground of the vehicle diagnostic interface CAN-H and CAN-L; (8) Determine the bus topology location of the fault, unplug the CAN bus connectors in sequence, and measure the voltage and resistance at the OBD interface one by one.
55	在档调速 In-Gear Speed Adjustment	2	动态：调速过程中，电机转速和输出轴转速的比例关系与非目标档位一致，保持超过一定时间后认为出现故	（1）重新上下电，看故障能否自己恢复； （2）如果故障不能回复，查看变速箱油液气味、颜色及液位，判断变速箱油液是否变质或液位低，若

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			障 静态：变速箱实际档位不在空档导致大扭矩无法调速 Motor and output shaft speed ratio inconsistent with target gear during adjustment	油位或油液较差，则会导致换挡机构动作助力增大，间接导致调速功能异常； （3）检查输入/输出轴转速传感器信号，是否存在转速持续相差过大的情况； （4）检查换挡机构是否可以正常工作，测量换挡电机绕组的电阻值，是否存在内部线圈短路或短路情况； （5）检查主、副箱是否在空档位置。 (1) Power on and off again to see if the fault can be resolved by itself; (2) If the fault cannot be resolved, check the odor, color, and level of the transmission fluid to determine whether the transmission fluid has deteriorated or the fluid level is low. If the fluid level or quality is poor, it may lead to increased assistance in the shifting mechanism's action, indirectly causing abnormal speed regulation function; (3) Check the input/output shaft speed sensor signal for

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				any persistent large speed difference; (4) Check whether the shifting mechanism can work normally, measure the resistance value of the shifting motor winding, and check for internal coil short circuits or open circuits; (5) Check whether the main and auxiliary transmissions are in neutral position.
57	主箱异常脱档 Main Gearbox Abnormal Disengagement	1	主箱目标档位与当前档位已经一致后（即正常在档状态下），在目标档位不变的情况下，根据机构位置判断出的当前档位发生变化，累计次数大于等于 5 次报异常脱档故障 Current gear does not match target gear despite being engaged	（1）先采取重新上下电并执行挂挡操作，查看故障是否恢复； （2）询问驾驶员是否有频繁换挡情况； （3）查看变速箱油液气味、颜色及液位，判断变速箱油液是否变质或液位低，若油位或油液较差，则会间接导致异常脱档故障的发生； （4）拆掉主箱/副箱换挡机构，检查换挡执行机构是否磨损严重等情况； （5）检查 TCU 到换挡电机的线束是否磨损、破皮、短路等情况；

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				（6）测量换挡电机绕组的电阻值，是否存在内部线圈短路或短路情况。 (1) First, perform a power cycle and engage a gear to check if the fault has been resolved; (2) Ask the driver if there is frequent gear shifting; (3) Check the transmission fluid odor, color, and level to determine if the transmission fluid has deteriorated or the level is low. If the fluid level or quality is poor, it may indirectly cause abnormal gear disengagement faults; (4) Remove the main/auxiliary transmission shifting mechanism and check if the shifting actuator is severely worn; (5) Check the wiring harness from the TCU to the shifting motor for wear, damage, or short circuit; (6) Measure the resistance value of the shifting motor winding to determine if there is an internal coil short

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				circuit or open circuit.
58	副箱异常脱档 Auxiliary Gearbox Abnormal Disengagement	1	副箱目标档位与当前档位已经一致后 (即正常在档状态下), 在目标档位 不变的情况下, 根据机构位置判断出 的当前档位发生变化, 累计次数大于 等于 5 次报异常脱档故障 Similar to main gearbox abnormal disengagement	(1) 先采取重新上下电并执行挂挡操作, 查看故障是否恢复; (2) 询问驾驶员是否有频繁换挡情况; (3) 查看变速箱油液气味、颜色及液位, 判断变速箱油液是否变质或液位低, 若油位或油液较差, 则会间接导致异常脱档故障的发生; (4) 拆掉主箱/副箱换挡机构, 检查换挡执行机构是否磨损严重等情况; (5) 检查 TCU 到换挡电机的线束是否磨损、破皮、短路等情况; (6) 测量换挡电机绕组的电阻值, 是否存在内部线圈短路或短路情况。 (1) First, perform a power cycle and engage a gear to check if the fault has been resolved; (2) Ask the driver if there is frequent gear shifting; (3) Check the transmission fluid odor, color, and level to

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				determine if the transmission fluid has deteriorated or the level is low. If the fluid level or quality is poor, it may indirectly cause abnormal gear disengagement faults; (4) Remove the main/auxiliary transmission shifting mechanism and check if the shifting actuator is severely worn; (5) Check the wiring harness from the TCU to the shifting motor for wear, damage, or short circuit; (6) Measure the resistance value of the shifting motor winding to determine if there is an internal coil short circuit or open circuit.
50	主箱换挡机构温度偏高 High Main Gearbox Shift Mechanism Temp	2	主箱换挡电机温度大于 180℃ Main gearbox shift motor temperature > 180℃	(1) 询问驾驶员是否有频繁换挡情况; (2) 查看变速箱油液气味、颜色及液位, 判断变速箱油液是否变质或液位低, 若油位或油液较差, 则会导致换挡机构动作助力增大, 间接导致换挡机构过热;

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				(3) 检查换挡电机接插件是否松动、进水、针脚弯曲或接触不良等情况； (4) 检查 TCU 到换挡电机的线束是否磨损、破皮、短路等情况； (5) 测量换挡电机绕组的电阻值，是否存在内部线圈短路或短路情况； (6) 检查换挡电机外壳及周边是否有泥土、油污覆盖，影响正常散热， (7) 主箱/副箱换挡电机温度低于 180℃清除。 (1) Ask the driver if there is frequent gear shifting; (2) Check the smell, color, and level of the transmission fluid to determine whether it has deteriorated or the level is low. If the fluid level or quality is poor, it can lead to increased assistance in the gear shifting mechanism's action, indirectly causing the gear shifting mechanism to overheat; (3) Check the gear shifting motor connectors for

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				looseness, water ingress, bent pins, or poor contact; (4) Check the wiring harness from the TCU to the gear shifting motor for wear, damage, or short circuits; (5) Measure the resistance value of the gear shifting motor windings to determine if there is an internal coil short circuit or open circuit; (6) Check the gear shifting motor housing and surroundings for dirt or oil contamination that may affect normal heat dissipation; (7) Clear the temperature of the main/auxiliary transmission gear shifting motor if it is below 180°C.
51	主箱换挡机构温度过高 Overheated Main Gearbox Shift Mechanism	3	主箱换挡电机温度大于 220°C Main gearbox shift motor temperature > 220°C	(1) 询问驾驶员是否有频繁换挡情况; (2) 查看变速箱油液气味、颜色及液位, 判断变速箱油液是否变质或液位低, 若油位或油液较差, 则会导致换挡机构动作助力增大, 间接导致换挡机构过热; (3) 检查换挡电机接插件是否松动、进水、针脚弯

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				曲或接触不良等情况； （4）检查 TCU 到换挡电机的线束是否磨损、破皮、短路等情况； （5）测量换挡电机绕组的电阻值，是否存在内部线圈短路或短路情况； （6）检查换挡电机外壳及周边是否有泥土、油污覆盖，影响正常散热， （7）主箱/副箱换挡电机温度低于 220℃进入过高故障，低于 180℃清除。 (1) Ask the driver if there is frequent gear shifting; (2) Check the smell, color, and level of the transmission fluid to determine whether it has deteriorated or the level is low. If the fluid level or quality is poor, it can lead to increased assistance in the gear shifting mechanism's action, indirectly causing the gear shifting mechanism to overheat; (3) Check the gear shifting motor connectors for

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				looseness, water ingress, bent pins, or poor contact; (4) Check the wiring harness from the TCU to the gear shifting motor for wear, damage, or short circuits; (5) Measure the resistance value of the gear shifting motor windings to determine if there is an internal coil short circuit or open circuit; (6) Check the gear shifting motor housing and surrounding area for soil or oil contamination that may affect normal heat dissipation; (7) The temperature of the main/auxiliary transmission gear shifting motor enters an overtemperature fault when it is below 220°C and clears when it is below 180°C.
52	副箱换挡机构温度偏高 High Auxiliary Gearbox Shift Mechanism Temp	2	副箱换挡电机温度大于 180°C Auxiliary gearbox shift motor temperature > 180°C	(1) 询问驾驶员是否有频繁换挡情况; (2) 查看变速箱油液气味、颜色及液位, 判断变速箱油液是否变质或液位低, 若油位或油液较差, 则会导致换挡机构动作助力增大, 间接导致换挡机构

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				过热； （3）检查换挡电机接插件是否松动、进水、针脚弯曲或接触不良等情况； （4）检查 TCU 到换挡电机的线束是否磨损、破皮、短路等情况； （5）测量换挡电机绕组的电阻值，是否存在内部线圈短路或短路情况； （6）检查换挡电机外壳及周边是否有泥土、油污覆盖，影响正常散热， （7）主箱/副箱换挡电机温度低于 180℃清除。 (1) Ask the driver if there is frequent gear shifting; (2) Check the smell, color, and level of the transmission fluid to determine whether it has deteriorated or the level is low. If the fluid level or quality is poor, it may cause the gear shifting mechanism to require more assistance, indirectly leading to overheating of the gear shifting mechanism;

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				(3) Check the gear shifting motor connectors for looseness, water ingress, bent pins, or poor contact; (4) Check the wiring harness from the TCU to the gear shifting motor for wear, damage, or short circuit; (5) Measure the resistance value of the gear shifting motor windings to determine if there is an internal coil short circuit or open circuit; (6) Check the gear shifting motor housing and surrounding area for dirt or oil contamination that may affect normal heat dissipation; (7) Clear the temperature of the main/auxiliary transmission gear shifting motor if it is below 180°C.
53	副箱换挡机构温度过高 Overheated Auxiliary Gearbox Shift Mechanism	3	副箱换挡电机温度大于 220°C Auxiliary gearbox shift motor temperature > 220°C	(1) 询问驾驶员是否有频繁换挡情况; (2) 查看变速箱油液气味、颜色及液位, 判断变速箱油液是否变质或液位低, 若油位或油液较差, 则会导致换挡机构动作助力增大, 间接导致换挡机构过热;

故障代码	故障名称	故障等级	原因分析	维修指南
Fault Code	Name of fault	Fault level	Cause analysis	Maintenance Guide
				(3) 检查换挡电机接插件是否松动、进水、针脚弯曲或接触不良等情况； (4) 检查 TCU 到换挡电机的线束是否磨损、破皮、短路等情况； (5) 测量换挡电机绕组的电阻值，是否存在内部线圈短路或短路情况； (6) 检查换挡电机外壳及周边是否有泥土、油污覆盖，影响正常散热， (7) 主箱/副箱换挡电机温度低于 220℃进入过高故障，低于 180℃清除。 (1) Ask the driver if there is frequent gear shifting; (2) Check the smell, color, and level of the transmission fluid to determine if it has deteriorated or if the level is low. If the fluid level or quality is poor, it can lead to increased assistance in the gear shifting mechanism's action, indirectly causing the gear shifting mechanism to overheat;

故障代码 Fault Code	故障名称 Name of fault	故障等级 Fault level	原因分析 Cause analysis	维修指南 Maintenance Guide
				(3) Check the gear shifting motor connectors for looseness, water ingress, bent pins, or poor contact; (4) Check the wiring harness from the TCU to the gear shifting motor for wear, damage, or short circuits; (5) Measure the resistance value of the gear shifting motor windings to determine if there is an internal coil short circuit or open circuit; (6) Check if the gear shifting motor housing and surrounding area are covered with dirt or oil, which can affect normal heat dissipation; (7) The temperature of the main/auxiliary transmission gear shifting motor enters an overtemperature fault when it is below 220°C and clears when it is below 180°C.

2.8 EBS 故障诊断

2.8 EBS Fault Diagnosis

SPN	PRI	Blink code	Failedetection Name	故障名称	BBS 灯	BBS 灯	BSC 灯	Repair Guide	维修指南
150	4	0+6	Battery Potential (Voltage), Switched-voltage below normal or shorted low	供电电压, 电压低于正常值或对地短路		亮		- Check the electric supply line "terminal 15" (increased electric resistance ?) - Check the ignition switch (increased electric resistance ?) - Check the terminal 15 line for other voltage drops while ignition is switched on - Does the voltage at "terminal 15" decrease very slowly after ignition off ? (it is not permissible, if the voltage decrease lasts several seconds) - Replace the EBS-centralmodule	*检查钥匙电的供电线路(开路?) *检查点火开关(开路?) *钥匙电上电时检查钥匙电的电压降 *钥匙开关关闭时钥匙电的电压是否降低的很慢?(不允许持续几秒钟的电压下降时间) *更换BBS BCU
241	1	NA	Tire Pressure - data valid, but below normal operation range (most severe level)	轮胎气压 - 数据有效, 但低于正常操作范围(最严重级别)		亮		Check pressure of the tires	*检查轮胎气压
251	9	7+1	Time - abnormal update rate	时间-异常更新率		亮	D	- Check the failure memory of the ECU, that transmits the time & date message and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the relevant ECU	*检查BBS BCU记忆故障, 检查发送的T0报文并排查故障 *检查底盘CAN系统的线束连接以及BBSBCU和相关BCU之间的接插件连接以及线束连接
521	2	7+5	Brake Pedal Position - data erratic, intermittend or incorrect	制动踏板位置, 数据不稳定、间断或错误	亮	亮		- Check, whether the brake pedal is always slightly activated (cannot return to 0-position) - Check, whether the accelerator pedal is always slightly activated (cannot return to 0-position) - Replace the EBS brake-signal transmitter, if the other two items were faultless	*检查制动踏板是否一直轻微触发(不能回到0位) *检查油门踏板是否一直轻微触发(不能回到0位) *如果这两处都没问题, 更换BBS制动信号传输器
620	3	7+6	5 Volts DC Supply - voltage above normal or shorted high	5V直流电源供电-电压高于正常值或对电源短路		亮	亮	- Check the supply-line of the TCV pressure sensor (short circuit to +UB ?) - Replace the EBS-centralmodule	*检查挂车控制阀的压力传感器供电线路(对电源短路?) *更换BBS BCU
620	4	7+6	5 Volts DC Supply - voltage below normal or shorted low	5V直流电源供电电压低于正常值或对地短路		亮	亮	- Check the supply-line of the TCV pressure sensor (short circuit to GND?) - Check the pressure sensor of the TCV (supply current too high ? Internal short circuit to GND?) - Replace the EBS-centralmodule	*检查挂车控制阀的压力传感器供电线路(对地短路?) *检查挂车控制阀的压力传感器(供电电流过高/内部对地短路?) *更换BBS BCU
627	0	0+2	Power Supply - data valid, but above normal operation range (most severe level)	供电电压, 数据有效但高于正常范围(最严重级别)	亮	亮		- Check the voltage supply of the vehicle (battery defect ?voltage governer defect ?)	*检查车辆供电(电源问题?调压器问题?)
627	1	0+1	Power Supply - data valid, but below normal operation range (most severe level)	供电电压, 数据有效但低于正常范围(最严重级别)	亮	亮		- Check the voltage supply of the vehicle (battery defect ?voltage governer defect ?)	*检查车辆供电(电源问题?调压器问题?)
629	12	0+3	Controller #1 - bad intelligent device or component	1#控制器-内部装置或部件损坏	亮	亮		- Replace EBS centralmodule	*更换BBS BCU
630	12	0+3	Calibration Memory - bad intelligent device or component	校准记忆-内部装置或部件损坏	亮	亮		- Replace EBS centralmodule	*更换BBS BCU
639	2	7+1	J1939 Network #1, Primary Vehicle Network (previously SAE J1939 Data Link)-data erratic, intermittend or incorrect	1# J1939网络, 车辆数据主网(SAE J1939数据链路层) - 数据不稳定、间断或错误		亮	D	check the wiring of the chassis CAN data connection and the relating electric connectors between the EBS centralmodule and the other chassis-CAN ECUs	*检查底盘CAN系统的线束连接以及BBSBCU和相关BCU之间的接插件连接以及线束连接
639	9	7+1	J1939 Network #1, Primary Vehicle Network (previously SAE J1939 Data Link)-abnormal update rate	1# J1939网络, 车辆数据主网(SAE J1939数据链路层) - 异常的更新率		亮	D	check the wiring of the chassis CAN data connection and the relating electric connectors between the EBS centralmodule and the other chassis-CAN ECUs	*检查底盘CAN系统的线束连接以及BBSBCU和相关BCU之间的接插件连接以及线束连接
709	0	0+9	Wheel Sensor ABS Axle 1 Left - data valid, but above normal operation range (most severe level)	前桥左侧轮速传感器-数据有效, 但高于正常范围(最严重级别)	亮	亮		-check, whether there are inadmissible oscilation-effects at the relevant foundation brake -check, whether there are inadmissible oscilation-effects at the fixing of the relevant wheel speed sensor -check the isolation of the wheel-speed sensor wiring(high frequencies might be induced) -replace the front-axle modulator(if the other effects were already checked)	*检查对应的轮端制动力矩处是否会产生较大晃动 *检查对应轮速传感器固定支架是否会产生较大晃动 *检查对应轮速传感器线束是否屏蔽(有可能诱发高频信号) *如果以上检查都没问题, 更换前桥模块
709	1	3+2	Wheel Sensor ABS Axle 1 Left - data valid, but below normal operation range (most severe level)	前桥左侧轮速传感器-数据有效, 但低于正常范围(最严重级别)	亮	亮		- Check the relevant wheel speed sensor and its fixing. Is the distance between pole wheel and sensor (airgap) too wide ? - Check the wheel speed sensor for correct voltage output (is voltage output sufficient ?) - Replace the front axle-modulator, if sensor and airgap are correct	*检查对应的轮速传感器及其固定, 齿圈及轮速传感器的间隙是否过大? *检查轮速传感器输出电压是否正常(>0.2V)? *如果轮速传感器及间隙没有问题, 更换前桥模块
709	3	4+2	Wheel Sensor ABS Axle 1 Left - voltage above normal or shorted high	前桥左侧轮速传感器-电压高于正常值或对电源短路	亮	亮		- Check the wiring and the relating electric connectors of the left wheel speed sensor at the front axle (short circuit to UB ?) - Replace the front-axle modulator, if the wiring of the relevant wheel speed sensor is faultless	*检查前桥左侧轮速传感器的接线和对应的电器接插件(是否对电源短路?) *如果轮速传感器和线束都没有问题, 更换前桥模块

SPN	FMI	Blink code	Failed detection Name	故障名称	BBS 红灯	BBS 黄灯	BSC 灯	Repair Guide	维修指南
709	4	4+2	Wheel Sensor ABS Axle 1 Left - voltage below normal or shorted low	前桥左侧轮速传感器-电压低于正常值或接地短路		亮	亮	- Check the wiring and the relating electric connectors of the left wheel speed sensor at the front axle (short circuit to GND ?) - Check the left wheel speed sensor at the front axle (internal short circuit to GND ?) - Replace the front-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查前桥左侧轮速传感器的接线和对应的电器接插件（是否对地短路？） *检查前桥左侧轮速传感器（内部对地短路？） *如果轮速传感器和线束都没问题，更换前桥模块
709	5	4+2	Wheel Sensor ABS Axle 1 Left - current below normal or open circuit	前桥左侧轮速传感器-电流低于正常值或开路		亮	亮	- Check the wiring and the relating electric connectors of the left wheel speed sensor at the front axle (interruption ?) - Check the left wheel speed sensor at the front axle (internal interruption ?) - Replace the front-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查前桥左侧轮速传感器的接线和对应的电器接插件（断路？） *检查前桥左侧轮速传感器（内部断路？） *如果轮速传感器和线束都没问题，更换前桥模块
709	6	4+2	Wheel Sensor ABS Axle 1 Left - current above normal or grounded circuit	前桥左侧轮速传感器-电流高于正常值或接地短路		亮	亮	- Check the wiring and the relating electric connectors of the left wheel speed sensor at the front axle (shorted coil ?) - Check the left wheel speed sensor at the front axle (internal shorted coil ?) - Replace the front-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查前桥左侧轮速传感器的接线和对应的电器接插件（线圈短路？） *检查前桥左侧轮速传感器（内部线圈短路？） *如果轮速传感器和线束都没问题，更换前桥模块
709	7	6+2	Wheel Sensor ABS Axle 1 Left - mechanical system not responding properly or out of adjustment	前桥左侧轮速传感器-机械系统没有正常响应或超出调整范围		亮	亮	- Check the relevant pole-wheel (Is it damaged ? dirty ?)	*检查相关齿圈（损坏+脏？）
709	11	5+2	Wheel Sensor ABS Axle 1 Left - failure mode not identifiable / root cause not known	前桥左侧轮速传感器-故障模式未知/根本原因未知		亮	(1)	If the failure is not sporadic and occurs several times, then the following workshop activity is suitable: - Check the fixing and mounting of the relevant wheel speed sensor (Can vibrations cause chattering ?) - Check the relevant foundation brake for inadmissible vibrations (return spring defect ? brake linings loosened ?)	如果故障不定期发生且发生次数较多，检查项目如下： *检查对应轮速传感器的安装以及固定方式（是否由震动引起？） *检查轮边制动系统是否有异常震动（回位弹簧失效？制动蹄片松动？）
709	14	3+2	Wheel Sensor ABS Axle 1 Left - special instructions	前桥左侧轮速传感器-特殊说明				- Check the relevant pole wheel (is it damaged ?) - Check the relevant wheel-bearing (is it loosened ?)	*检查相关齿圈是否损坏？ *检查相关轴承是否松动？
790	0	0+9	Wheel Sensor ABS Axle 1 Right - data valid, but above normal operation range (most severe level)	前桥右侧轮速传感器-数据有效，但高于正常范围（最严重级别）		亮	亮	- Check, whether there are inadmissible oscillation-effects at the relevant foundation brake - Check, whether there are inadmissible oscillation-effects at the fixing of the relevant wheel speed sensor - Check the isolation of the wheel-speed sensor wiring (high frequencies might be induced) - replace the front axle-modulator (if the other effects were already checked)	*检查对应的轮端制动处是否会产生较大震动 *检查对应轮速传感器固定支架是否会产生较大震动 *检查对应轮速传感器线束是否屏蔽（有可诱发高频信号） *如果以上检查都没问题，更换前桥模块
790	1	3+1	Wheel Sensor ABS Axle 1 Right - data valid, but below normal operation range (most severe level)	前桥右侧轮速传感器-数据有效，但低于正常范围（最严重级别）		亮	亮	- Check the relevant wheel speed sensor and its fixing. Is the distance between pole wheel and sensor (airgap) too wide ? - Check the wheel speed sensor for correct voltage output (is voltage output sufficient ?) - Replace the front axle-modulator, if sensor and airgap are correct	*检查对应的轮速传感器及其固定，齿圈及轮速传感器的间隙是否过大？ *检查轮速传感器输出电压是否正常（>0.2V？） *如果轮速传感器及间隙没问题，更换前桥模块
790	3	4+1	Wheel Sensor ABS Axle 1 Right - voltage above normal or shorted high	前桥右侧轮速传感器-电压高于正常值或对电源短路		亮	亮	- Check the wiring and the relating electric connectors of the right wheel speed sensor at the front axle (short circuit to UB ?) - Replace the front-axle modulator, if the wiring of the relevant wheel speed sensor is faultless	*检查前桥右侧轮速传感器的接线和对应的电器接插件（是否对电源短路？） *如果轮速传感器和线束都没有问题，更换前桥模块
790	4	4+1	Wheel Sensor ABS Axle 1 Right - voltage below normal or shorted low	前桥右侧轮速传感器-电压低于正常值或接地短路		亮	亮	- Check the wiring and the relating electric connectors of the right wheel speed sensor at the front axle (short circuit to GND ?) - Check the right wheel speed sensor at the front axle (internal short circuit to GND ?) - Replace the front-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查前桥右侧轮速传感器的接线和对应的电器接插件（是否对地短路？） *检查前桥右侧轮速传感器（内部对地短路？） *如果轮速传感器和线束都没问题，更换前桥模块
790	5	4+1	Wheel Sensor ABS Axle 1 Right - current below normal or open circuit	前桥右侧轮速传感器-电流低于正常值或开路		亮	亮	- Check the wiring and the relating electric connectors of the right wheel speed sensor at the front axle (interruption ?) - Check the right wheel speed sensor at the front axle (internal interruption ?) - Replace the front-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查前桥右侧轮速传感器的接线和对应的电器接插件（断路？） *检查前桥右侧轮速传感器（内部断路？） *如果轮速传感器和线束都没问题，更换前桥模块
790	6	4+1	Wheel Sensor ABS Axle 1 Right - current above normal or grounded circuit	前桥右侧轮速传感器-电流高于正常值或接地短路		亮	亮	- Check the wiring and the relating electric connectors of the right wheel speed sensor at the front axle (shorted coil ?) - Check the right wheel speed sensor at the front axle (internal shorted coil ?) - Replace the front-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查前桥右侧轮速传感器的接线和对应的电器接插件（线圈短路？） *检查前桥右侧轮速传感器（内部线圈短路？） *如果轮速传感器和线束都没问题，更换前桥模块
790	7	6+1	Wheel Sensor ABS Axle 1 Right - mechanical system not responding properly or out of adjustment	前桥右侧轮速传感器-机械系统没有正常响应或超出调整范围		亮	亮	- Check the relevant pole-wheel (Is it damaged ? dirty ?)	*检查相关齿圈（损坏+脏？）

SPN	FMI	Blink code	Failedetection Name	故障名称	ABS 灯	ESP 灯	ESC 灯	Repair Guide	维修指南
790	11	5+1	Wheel Sensor ABS Axle 1 Right - failure mode not identifiable / root cause not known	前桥左侧轮速传感器-故障模式未知/根本原因未知		亮	(T)	If the failure is not sporadic and occurs several times, then the following workshop action is suitable: - Check the fixing and mounting of the relevant wheel speed sensor (Can vibrations cause chattering ?) - Check the relevant foundation brake for inadmissible vibrations (return spring defect ? brake linings loosened ?)	*如果故障不定期发生且发生次数较多，检查项目如下： *检查对应轮速传感器的安装以及固定方式（是否由震源引起？） *检查轮边制动系统是否有异常震源（回位弹簧失效/制动蹄片松动？）
790	14	3+1	Wheel Sensor ABS Axle 1 Right - special instructions	前桥右侧轮速传感器-特殊说明				- Check the relevant pole wheel (is it damaged ?) - Check the relevant wheel-bearing (is it loosened ?)	*检查相关齿圈是否损坏？ *检查相关桥端轴承是否松动？
791	0	8-10	Wheel Sensor ABS Axle 2 Left - data valid, but above normal operation range (most severe level)	后桥左侧轮速传感器-数据有效，但高于正常范围（最严重级别）		亮	亮	- Check, whether there are inadmissible oscillation-effects at the relevant foundation brake - Check, whether there are inadmissible oscillation-effects at the fixing of the relevant wheel speed sensor - Check the isolation of the wheel-speed sensor wiring (high frequencies might be induced) - replace the rear axle-modulator (if the other effects were already checked)	*检查对应的轮端制动机构处是否会产生较大震动 *检查对应轮速传感器固定支架是否会产生较大震动 *检查对应轮速传感器线束是否屏蔽（有可能诱发高频信号） *如果以上检查都没问题，更换后桥模块
791	1	3+4	Wheel Sensor ABS Axle 2 Left - data valid, but below normal operation range (most severe level)	后桥左侧轮速传感器-数据有效，但低于正常范围（最严重级别）		亮	亮	- Check the relevant wheel speed sensor and its fixing. Is the distance between pole wheel and sensor (airgap) too wide ? - Check the wheel speed sensor for correct voltage output (is voltage output sufficient ?) - Replace the rear axle-modulator, if sensor and airgap are correct	*检查对应的轮速传感器及其固定，齿圈及轮速传感器的间隙是否过大？ *检查轮速传感器输出电压是否正常（>0.2V）？ *如果轮速传感器及间隙没问题的，更换后桥模块
791	3	4+4	Wheel Sensor ABS Axle 2 Left - voltage above normal or shorted high	后桥左侧轮速传感器-电压高于正常值或电源短路		亮	亮	- Check the wiring and the relating electric connectors of the left wheel speed sensor at the rear axle (short circuit to UB ?) - Replace the rear-axle modulator, if the wiring of the relevant wheel speed sensor is faultless	*检查后桥左侧轮速传感器的线束和对应的电器接插件（是否对电源短路？） *如果轮速传感器和线束都没有问题，更换后桥模块
791	4	4+4	Wheel Sensor ABS Axle 2 Left - voltage below normal or shorted low	后桥左侧轮速传感器-电压低于正常值或对地短路		亮	亮	- Check the wiring and the relating electric connectors of the left wheel speed sensor at the rear axle (short circuit to GND ?) - Check the left wheel speed sensor at the rear axle (internal short circuit to GND ?) - Replace the rear-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查后桥左侧轮速传感器的线束和对应的电器接插件（是否对地短路？） *检查后桥左侧轮速传感器（内部对地短路） *如果轮速传感器和线束都没问题，更换后桥模块
791	5	4+4	Wheel Sensor ABS Axle 2 Left - current below normal or open circuit	后桥左侧轮速传感器-电流低于正常值或开路		亮	亮	- Check the wiring and the relating electric connectors of the left wheel speed sensor at the rear axle (interruption ?) - Check the left wheel speed sensor at the rear axle (internal interruption ?) - Replace the rear-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查后桥左侧轮速传感器的线束和对应的电器接插件（断路） *检查后桥左侧轮速传感器（内部断路） *如果轮速传感器和线束都没问题，更换后桥模块
791	6	4+4	Wheel Sensor ABS Axle 2 Left - current above normal or grounded circuit	后桥左侧轮速传感器-电流高于正常值或对地短路		亮	亮	- Check the wiring and the relating electric connectors of the left wheel speed sensor at the rear axle (shorted coil ?) - Check the left wheel speed sensor at the rear axle (internal shorted coil ?) - Replace the rear-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查后桥左侧轮速传感器的线束和对应的电器接插件（线圈短路） *检查后桥左侧轮速传感器（内部线圈短路） *如果轮速传感器和线束都没问题，更换后桥模块
791	7	6+4	Wheel Sensor ABS Axle 2 Left - mechanical system not responding properly or out of adjustment	后桥左侧轮速传感器-机械系统没有正常响应或超出调整范围		亮	亮	- Check the relevant pole-wheel (Is it damaged ? dirty ?)	*检查相关齿圈（损坏/脏）
791	11	5+4	Wheel Sensor ABS Axle 2 Left - failure mode not identifiable / root cause not known	后桥左侧轮速传感器-故障模式未知/根本原因未知		亮	(T)	If the failure is not sporadic and occurs several times, then the following workshop action is suitable: - Check the fixing and mounting of the relevant wheel speed sensor (Can vibrations cause chattering ?) - Check the relevant foundation brake for inadmissible vibrations (return spring defect ? brake linings loosened ?)	如果故障不定期发生且发生次数较多，检查项目如下： *检查对应轮速传感器的安装以及固定方式（是否由震源引起？） *检查轮边制动系统是否有异常震源（回位弹簧失效/制动蹄片松动？）
791	14	3+4	Wheel Sensor ABS Axle 2 Left - special instructions	后桥左侧轮速传感器-特殊说明				- Check the relevant pole wheel (is it damaged ?) - Check the relevant wheel-bearing (is it loosened ?)	*检查相关齿圈是否损坏？ *检查相关桥端轴承是否松动？
792	0	8-10	Wheel Sensor ABS Axle 2 Right - data valid, but above normal operation range (most severe level)	后桥右侧轮速传感器-数据有效，但高于正常范围（最严重级别）		亮	亮	- Check, whether there are inadmissible oscillation-effects at the relevant foundation brake - Check, whether there are inadmissible oscillation-effects at the fixing of the relevant wheel speed sensor - Check the isolation of the wheel-speed sensor wiring (high frequencies might be induced) - replace the rear axle-modulator (if the other effects were already checked)	*检查对应的轮端制动机构处是否会产生较大震动 *检查对应轮速传感器固定支架是否会产生较大震动 *检查对应轮速传感器线束是否屏蔽（有可能诱发高频信号） *如果以上检查都没问题，更换后桥模块

SPN	PMT	Blink code	Failedetection Name	故障名称	RBS 红灯	RBS 黄灯	RSC 灯	Repair Guide	维修指南
792	1	3-3	Wheel Sensor ABS Axle 2 Right - data valid, but below normal operation range (most severe level)	后桥右侧轮速传感器-数据有效, 但低于正常范围 (最严重级别)		亮	亮	- Check the relevant wheel speed sensor and its fixing. Is the distance between pole wheel and sensor (airgap) too wide ? - Check the wheel speed sensor for correct voltage output (is voltage output sufficient ?) - Replace the rear axle-modulator, if sensor and airgap are correct	*检查对应的轮速传感器及其固定, 齿圈及轮速传感器的间隙是否过大? *检查轮速传感器输出电压是否正常 (>=0.2V)? *如果轮速传感器及间隙没问题, 更换后桥模块
792	3	4-3	Wheel Sensor ABS Axle 2 Right - voltage above normal or shorted high	后桥右侧轮速传感器-电压高于正常值或对电源短路		亮	亮	- Check the wiring and the relating electric connectors of the right wheel speed sensor at the rear axle (short circuit to UB ?) - Replace the rear-axle modulator, if the wiring of the relevant wheel speed sensor is faultless	*检查后桥右侧轮速传感器的接线和对应的电器接插件 (是否对电源短路?) *如果轮速传感器和线束都没有问题, 更换后桥模块
792	4	4-3	Wheel Sensor ABS Axle 2 Right - voltage below normal or shorted low	后桥右侧轮速传感器-电压低于正常值或对地短路		亮	亮	- Check the wiring and the relating electric connectors of the right wheel speed sensor at the rear axle (short circuit to GND ?) - Check the right wheel speed sensor at the rear axle (internal short circuit to GND ?) - Replace the rear-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查后桥右侧轮速传感器的接线和对应的电器接插件 (是否对地短路?) *检查后桥右侧轮速传感器 (内部对地短路?) *如果轮速传感器和线束都没问题, 更换后桥模块
792	5	4-3	Wheel Sensor ABS Axle 2 Right - current below normal or open circuit	后桥右侧轮速传感器-电流低于正常值或开路		亮	亮	- Check the wiring and the relating electric connectors of the right wheel speed sensor at the rear axle (interruption ?) - Check the right wheel speed sensor at the rear axle (internal interruption ?) - Replace the rear-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查后桥右侧轮速传感器的接线和对应的电器接插件 (断路?) *检查后桥右侧轮速传感器 (内部断路?) *如果轮速传感器和线束都没问题, 更换后桥模块
792	6	4-3	Wheel Sensor ABS Axle 2 Right - current above normal or grounded circuit	后桥右侧轮速传感器-电流高于正常值或对地短路		亮	亮	- Check the wiring and the relating electric connectors of the right wheel speed sensor at the rear axle (shorted coil ?) - Check the right wheel speed sensor at the rear axle (internal shorted coil ?) - Replace the rear-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查后桥右侧轮速传感器的接线和对应的电器接插件 (线圈短路?) *检查后桥右侧轮速传感器 (内部线圈短路?) *如果轮速传感器和线束都没问题, 更换后桥模块
792	7	6-3	Wheel Sensor ABS Axle 2 Right - mechanical system not responding properly or out of adjustment	后桥右侧轮速传感器-机械系统没有正常响应或超出调整范围		亮	亮	- Check the relevant pole-wheel (Is it damaged ? dirty ?)	*检查相关齿圈 (损坏?脏?)
792	11	5-3	Wheel Sensor ABS Axle 2 Right - failure mode not identifiable / root cause not known	后桥右侧轮速传感器-故障模式未知/根本原因未知		亮	(1)	- If the failure is not sporadic and occurs several times, then the following workshop activity is suitable: - Check the fixing and mounting of the relevant wheel speed sensor (Can vibrations cause chattering ?) - Check the relevant foundation brake for inadmissible vibrations (return spring defect ? brake linings loosened ?)	*如果故障不定期发生且发生次数较多, 检查项目如下: *检查对应轮速传感器的安装以及固定方式 (是否由震颤引起?) *检查轮边制动系统是否有异常震颤 (回位弹簧失效?制动蹄片松动?)
792	14	3-3	Wheel Sensor ABS Axle 2 Right - special instructions	后桥右侧轮速传感器-特殊说明				- Check the relevant pole wheel (is it damaged ?) - Check the relevant wheel-bearing (is it loosened ?)	*检查相关齿圈是否损坏? *检查相关轴承端盖是否松动?
793	0	0-11	Wheel Sensor ABS Axle 3 Left - data valid, but above normal operation range (most severe level)	附加桥左侧轮速传感器-数据有效, 但高于正常范围 (最严重级别)		亮	亮	- Check, whether there are inadmissible oscillation-effects at the relevant foundation brake - Check, whether there are inadmissible oscillation-effects at the fixing of the relevant wheel speed sensor - Check the isolation of the wheel-speed sensor wiring (high frequencies might be induced) - replace the additional axle-modulator (if the other effects were already checked)	*检查对应的轮端制动处是否会产生较大震动 *检查对应轮速传感器固定支架是否会产生较大震动 *检查对应轮速传感器线束是否屏蔽 (有可能诱发高频信号) *如果以上检查都没问题, 更换附加桥模块
793	1	3-6	Wheel Sensor ABS Axle 3 Left - data valid, but below normal operation range (most severe level)	附加桥左侧轮速传感器-数据有效, 但低于正常范围 (最严重级别)		亮	亮	- Check the relevant wheel speed sensor and its fixing. Is the distance between pole wheel and sensor (airgap) too wide ? - Check the wheel speed sensor for correct voltage output (is voltage output sufficient ?) - Replace the additional axle-modulator, if sensor and airgap are correct	*检查对应的轮速传感器及其固定, 齿圈及轮速传感器的间隙是否过大? *检查轮速传感器输出电压是否正常 (>=0.2V)? *如果轮速传感器及间隙没问题, 更换附加桥模块
793	3	4-6	Wheel Sensor ABS Axle 3 Left - voltage above normal or shorted high	附加桥左侧轮速传感器-电压高于正常值或对电源短路		亮	亮	- Check the wiring and the relating electric connectors of the left wheel speed sensor at the additional axle (short circuit to UB ?) - Replace the additional-axle modulator, if the wiring of the relevant wheel speed sensor is faultless	*检查附加桥左侧轮速传感器的接线和对应的电器接插件 (是否对电源短路?) *如果轮速传感器和线束都没有问题, 更换附加桥模块
793	4	4-6	Wheel Sensor ABS Axle 3 Left - voltage below normal or shorted low	附加桥左侧轮速传感器-电压低于正常值或对地短路		亮	亮	- Check the wiring and the relating electric connectors of the left wheel speed sensor at the additional axle (short circuit to GND ?) - Check the left wheel speed sensor at the additional axle (internal short circuit to GND ?) - Replace the additional-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查附加桥左侧轮速传感器的接线和对应的电器接插件 (是否对地短路?) *检查附加桥左侧轮速传感器 (内部对地短路?) *如果轮速传感器和线束都没问题, 更换附加桥模块

SPN	FMI	Blink code	Failure detection Name	故障名称	BBS 灯	BBS 黄灯	BSC 灯	Repair Guide	维修指南
793	5	4+6	Wheel Sensor ABS Axle 3 Left - current below normal or open circuit	附加桥左侧轮速传感器-电流低于正常值或开路		亮	亮	- Check the wiring and the relating electric connectors of the left wheel speed sensor at the additional axle (interruption ?) - Check the left wheel speed sensor at the additional axle (internal interruption ?) - Replace the additional-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查附加桥左侧轮速传感器的接线和对应的电器接插件（断路？） *检查附加桥左侧轮速传感器（内部断路） *如果轮速传感器和线束都没问题，更换附加桥模块
793	6	4+6	Wheel Sensor ABS Axle 3 Left - current above normal or grounded circuit	附加桥左侧轮速传感器-电流高于正常值或对地短路		亮	亮	- Check the wiring and the relating electric connectors of the left wheel speed sensor at the additional axle (shorted coil ?) - Check the left wheel speed sensor at the additional axle (internal shorted coil ?) - Replace the additional-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查附加桥左侧轮速传感器的接线和对应的电器接插件（线圈短路） *检查附加桥左侧轮速传感器（内部线圈短路） *如果轮速传感器和线束都没问题，更换附加桥模块
793	7	6+6	Wheel Sensor ABS Axle 3 Left - mechanical system not responding properly or out of adjustment	附加桥左侧轮速传感器-机械系统没有正常响应或超出调整范围		亮	亮	- Check the relevant pole-wheel (Is it damaged ? dirty ?)	*检查相关齿圈（损坏+脏？）
793	11	5+6	Wheel Sensor ABS Axle 3 Left - failure mode not identifiable / root cause not known	附加桥左侧轮速传感器-故障模式未知 / 根本原因未知		亮	(1)	If the failure is not sporadic and occurs several times, then the following workshop activity is suitable: - Check the fixing and mounting of the relevant wheel speed sensor (Can vibrations cause chattering ?) - Check the relevant foundation brake for inadmissible vibrations (return spring defect ? brake linings loosened ?)	*如果故障不定期发生且发生次数较多，检查项目如下： *检查对应轮速传感器的安装以及固定方式（是否由共振引起？） *检查轮边制动系统是否有异常磨损（回位弹簧失效/制动蹄片松动？）
793	14	3+6	Wheel Sensor ABS Axle 3 Left - special instructions	附加桥左侧轮速传感器-特殊说明				- Check the relevant pole wheel (is it damaged ?) - Check the relevant wheel-bearing (is it loosened ?)	*检查相关齿圈是否损坏 *检查相关轴承是否松动
794	0	8+11	Wheel Sensor ABS Axle 3 Right - data valid, but above normal operation range (most severe level)	附加桥右侧轮速传感器-数据有效，但高于正常范围（最严重级别）		亮	亮	- Check, whether there are inadmissible oscillation-effects at the relevant foundation brake - Check, whether there are inadmissible oscillation-effects at the fixing of the relevant wheel speed sensor - Check the isolation of the wheel-speed sensor wiring (high frequencies might be induced) - replace the additional axle-modulator (if the other effects were already checked)	*检查对应的轮端制动器处是否会产生较大震动 *检查对应轮速传感器固定支架是否会产生较大震动 *检查对应轮速传感器线束是否屏蔽（有可能诱发高频信号） *如果以上检查都没问题，更换附加桥模块
794	1	3+5	Wheel Sensor ABS Axle 3 Right - data valid, but below normal operation range (most severe level)	附加桥右侧轮速传感器-数据有效，但低于正常范围（最严重级别）		亮	亮	- Check the relevant wheel speed sensor and its fixing. Is the distance between pole wheel and sensor (airgap) too wide ? - Check the wheel speed sensor for correct voltage output (is voltage output sufficient ?) - Replace the additional axle-modulator, if sensor and airgap are correct	*检查对应的轮速传感器及其固定，齿圈及轮速传感器的间隙是否过大？ *检查轮速传感器输出电压是否正常（>0.2V）？ *如果轮速传感器及间隙没出问题，更换附加桥模块
794	3	4+5	Wheel Sensor ABS Axle 3 Right - voltage above normal or shorted high	附加桥右侧轮速传感器-电压高于正常值或对电源短路		亮	亮	- Check the wiring and the relating electric connectors of the right wheel speed sensor at the additional axle (short circuit to UB ?) - Replace the additional-axle modulator, if the wiring of the relevant wheel speed sensor is faultless	*检查附加桥右侧轮速传感器的接线和对应的电器接插件（是否对电源短路？） *如果轮速传感器和线束都没有问题，更换附加桥模块
794	4	4+5	Wheel Sensor ABS Axle 3 Right - voltage below normal or shorted low	附加桥右侧轮速传感器-电压低于正常值或对地短路		亮	亮	- Check the wiring and the relating electric connectors of the right wheel speed sensor at the additional axle (short circuit to GND ?) - Check the right wheel speed sensor at the additional axle (internal short circuit to GND ?) - Replace the additional-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查附加桥右侧轮速传感器的接线和对应的电器接插件（是否对地短路？） *检查附加桥右侧轮速传感器（内部对地短路） *如果轮速传感器和线束都没问题，更换附加桥模块
794	5	4+5	Wheel Sensor ABS Axle 3 Right - current below normal or open circuit	附加桥右侧轮速传感器-电流低于正常值或开路		亮	亮	- Check the wiring and the relating electric connectors of the right wheel speed sensor at the additional axle (interruption ?) - Check the right wheel speed sensor at the additional axle (internal interruption ?) - Replace the additional-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查附加桥右侧轮速传感器的接线和对应的电器接插件（断路？） *检查附加桥右侧轮速传感器（内部断路） *如果轮速传感器和线束都没问题，更换附加桥模块
794	6	4+5	Wheel Sensor ABS Axle 3 Right - current above normal or grounded circuit	附加桥右侧轮速传感器-电流高于正常值或对地短路		亮	亮	- Check the wiring and the relating electric connectors of the right wheel speed sensor at the additional axle (shorted coil ?) - Check the right wheel speed sensor at the additional axle (internal shorted coil ?) - Replace the additional-axle modulator, if the relevant wheel speed sensor and its wiring is faultless	*检查附加桥右侧轮速传感器的接线和对应的电器接插件（线圈短路） *检查附加桥右侧轮速传感器（内部线圈短路） *如果轮速传感器和线束都没问题，更换附加桥模块
794	7	6+5	Wheel Sensor ABS Axle 3 Right - mechanical system not responding properly or out of adjustment	附加桥右侧轮速传感器-机械系统没有正常响应或超出调整范围		亮	亮	- Check the relevant pole-wheel (Is it damaged ? dirty ?)	*检查相关齿圈（损坏+脏？）

SPN	PID	Blink code	Failedetection Name	故障名称	BBS 灯	BSC 灯	Repair Guide	维修指南
794	11	5=5	Wheel Sensor ABS Axle 3 Right - failure mode not identifiable / root cause not known	附加桥右侧轮速传感器-故障模式未知 / 根本原因未知	亮	(1)	If the failure is not sporadic and occurs several times, then the following workshop activity is applicable: - Check the fixing and mounting of the relevant wheel speed sensor (Can vibrations cause chattering ?) - Check the relevant foundation brake for inadmissible vibrations (return spring defect ? brake linings loosened ?)	*如果故障不定期发生且发生次数较多, 检查项目如下: *检查对应轮速传感器的安装以及固定方式 (是否由共振引起?) *检查轮边制动系统是否有异常震动 (回位弹簧失效? 制动蹄片松动?)
794	14	3=5	Wheel Sensor ABS Axle 3 Right - special instructions	附加桥右侧轮速传感器-特殊说明			- Check the relevant pole wheel (is it damaged ?) - Check the relevant wheel-bearing (is it loosened ?)	*检查相关齿圈是否损坏? *检查相关桥轴承是否松动?
795	3	2=2	Pressure Modulation Valve ABS Axle 1 Left - voltage above normal or shorted high	前桥左侧ABS电磁阀-电压高于正常值或电源短路	亮	亮	- Check the wiring and the relating electric connectors of the left ABS-valve (short circuit to UB ?) - Replace the EBS-centralmodule, if the wiring of the left ABS valve is faultless	*检查前桥左侧ABS电磁阀线束及相关接插件 (对电源短路?) *如果前桥左侧ABS电磁阀的线束没问题, 更换EBS BCU
795	4	2=2	Pressure Modulation Valve ABS Axle 1 Left - voltage below normal or shorted low	前桥左侧ABS电磁阀-电压低于正常值或接地短路	亮	亮	- Check the wiring and the relating electric connectors of the left ABS-valve (short circuit to GND ?) - Check the left ABS-valve (internal short circuit to GND ?) - Replace the EBS-centralmodule, if the left ABS-valve and its wiring is faultless	*检查前桥左侧ABS电磁阀线束及相关接插件 (对地短路?) *检查前桥左侧ABS电磁阀 (内部对地短路?) *如果前桥左侧ABS电磁阀和线束没问题, 更换EBS BCU
795	5	2=2	Pressure Modulation Valve ABS Axle 1 Left - current below normal or open circuit	前桥左侧ABS电磁阀-电流低于正常值或开路	亮	亮	- Check the wiring and the relating electric connectors of the left ABS-valve (interruption ?) - Check the left ABS-valve (internal interruption ?) - Replace the EBS-centralmodule, if the left ABS-valve and its wiring is faultless	*检查前桥左侧ABS电磁阀线束及相关接插件 (断路?) *检查前桥左侧ABS电磁阀 (内部断路?) *如果前桥左侧ABS电磁阀和线束没问题, 更换EBS BCU
795	14	2=2	Pressure Modulation Valve ABS Axle 1 Left - special instructions	前桥左侧ABS电磁阀-特殊说明	亮	亮	- Check the wiring and the relating electric connectors of the left ABS-valve (short circuits to UB and/or GND ?) - Check the left ABS-valve (internal short circuit to GND ?) - Replace the EBS-centralmodule, if the left ABS-valve and its wiring is faultless	*检查前桥左侧ABS电磁阀线束及相关接插件 (对电源或者对地短路?) *检查前桥左侧ABS电磁阀 (内部对地短路?) *如果前桥左侧ABS电磁阀和线束没问题, 更换EBS BCU
796	3	2=1	Pressure Modulation Valve ABS Axle 1 Right - voltage above normal or shorted high	前桥右侧ABS电磁阀-电压高于正常值或电源短路	亮	亮	- Check the wiring and the relating electric connectors of the right ABS-valve (short circuit to UB ?) - Replace the EBS-centralmodule, if the wiring of the right ABS valve is faultless	*检查前桥右侧ABS电磁阀线束及相关接插件 (对电源短路?) *如果前桥右侧ABS电磁阀线束没问题, 更换EBS BCU
796	4	2=1	Pressure Modulation Valve ABS Axle 1 Right - voltage below normal or shorted low	前桥右侧ABS电磁阀-电压低于正常值或接地短路	亮	亮	- Check the wiring and the relating electric connectors of the right ABS-valve (short circuit to GND ?) - Check the right ABS-valve (internal short circuit to GND ?) - Replace the EBS-centralmodule, if the right ABS-valve and its wiring is faultless	*检查前桥右侧ABS电磁阀线束及相关接插件 (对地短路?) *检查前桥右侧ABS电磁阀 (内部对地短路?) *如果前桥右侧ABS电磁阀和线束没问题, 更换EBS BCU
796	5	2=1	Pressure Modulation Valve ABS Axle 1 Right - current below normal or open circuit	前桥右侧ABS电磁阀-电流低于正常值或开路	亮	亮	- Check the wiring and the relating electric connectors of the right ABS-valve (interruption ?) - Check the right ABS-valve (internal interruption ?) - Replace the EBS-centralmodule, if the right ABS-valve and its wiring is faultless	*检查前桥右侧ABS电磁阀线束及相关接插件 (断路?) *检查前桥右侧ABS电磁阀 (内部断路?) *如果前桥右侧ABS电磁阀和线束没问题, 更换EBS BCU
796	14	2=1	Pressure Modulation Valve ABS Axle 1 Right - special instructions	前桥右侧ABS电磁阀-特殊说明	亮	亮	- Check the wiring and the relating electric connectors of the right ABS-valve (short circuits to UB and/or GND ?) - Check the right ABS-valve (internal short circuit to GND ?) - Replace the EBS-centralmodule, if the right ABS-valve and its wiring is faultless	*检查前桥右侧ABS电磁阀线束及相关接插件 (对电源或者对地短路?) *检查前桥右侧ABS电磁阀 (内部对地短路?) *如果前桥右侧ABS电磁阀和线束没问题, 更换EBS BCU
801	3	7=3	Retarder Control Relay - voltage above normal or shorted high	缓速器控制继电器-电压高于正常值或电源短路	亮		- Check the wiring and the relating electric connectors of the retarder control relay (short circuit to UB ?) - Check the retarder control relay (Internal short circuit to UB ?) - Replace the EBS-centralmodule, if the retarder control relay and the relevant wiring is faultless	*检查缓速器控制继电器线束及相关接插件 (对电源短路?) *检查缓速器控制继电器 (内部对电源短路?) *如果缓速器控制继电器和相关线束没问题, 更换EBS BCU
801	4	7=3	Retarder Control Relay - voltage below normal or shorted low	缓速器控制继电器-电压低于正常值或接地短路	亮		- Check the wiring and the relating electric connectors of the retarder control relay (short circuit to GND ?) - Check the retarder control relay (Internal short circuit to GND ?) - Replace the EBS-centralmodule, if the retarder control relay and the relevant wiring is faultless	*检查缓速器控制继电器线束及相关接插件 (对地短路?) *检查缓速器控制继电器 (内部对地短路?) *如果缓速器控制继电器和相关线束没问题, 更换EBS BCU
801	5	7=3	Retarder Control Relay - current below normal or open circuit	缓速器控制继电器-电流低于正常值或开路	亮		- Check the EOL configuration in the EBS-centralmodule (retarder control relay yes/no) - Check the wiring and the relating electric connectors of the retarder control relay (interruption ?) - Check the retarder control relay (internal interruption ?) - Replace the EBS-centralmodule, if the retarder control relay and the relevant wiring is faultless	*检查EBS BCU中参数设置中是否设置了缓速器控制继电器 (yes/no) *检查缓速器控制继电器线束及相关接插件 (断路?) *检查缓速器控制继电器 (内部断路?) *如果缓速器控制继电器及其线束没问题, 更换EBS BCU

SPN	FMi	Blinkcode	Failedetection Name	故障名称	BBS 红灯	BBS 黄灯	BSC 灯	Repair Guide	维修指南
001	13	0-4	Retarder Control Relay - out of calibration	缓速器控制继电器-校验异常	亮		亮	- Check EBS-centralmodule for correct EOL-configuration (retarder control relay yes/no) - Is something connected to the relevant retarder control relay pins of the centralmodule ? - Replace the EBS-centralmodule	*检查BBS BCU中参数设置中是否设置了缓速器控制继电器 (yes/no)? *BBS BCU对应的缓速器控制继电器引脚位置是否接了别的零部件? *更换BBS BCU
002	3	0-5	Relay Diagonal 1 - voltage above normal or shorted high	对角线继电器 1 - 电压高于正常值或者对电源短路		亮	亮	- Check the wiring and the relating electric connectors of the left and right ABS-valve (Lowline has short circuit to UB ?) - Replace the EBS-centralmodule, if the wiring of both ABS valves is faultless	*检查左/右ABS电磁阀线束和相应接插件 (线束对电源短路?) *如果两个ABS电磁阀线束都没有问题, 更换BBS BCU
002	4	0-5	Relay Diagonal 1 - voltage below normal or shorted low	对角线继电器 1 - 电压低于正常值或者对地短路			亮	- Check the wiring and the relating electric connectors of the left and right ABS-valve (Lowline has short circuit to GND ?) - Check the left and right ABS-valve (internal short circuit to GND ?) - Replace the EBS-centralmodule, if both ABS-valves and its wiring are faultless	*检查左/右ABS电磁阀线束和相应接插件 (线束对地短路?) *检查左/右ABS电磁阀 (内部是否对地短路?) *如果两个ABS电磁阀和线束都没有问题, 更换BBS BCU
010	2	7-1	Speed Signal Input - data erratic, intermittend or incorrect	速度信号输入 - 数据不稳定、间断或错误			亮	- Check the air gap of all wheel speed sensors (might be too wide) - Check the parameters "wheel diameter" and "pole wheel teeth numbers" (if applicable) - Is the speed signal of the tachograph ECU (on chassis CAN data link) correct ? - Is the speed signal of the tachograph ECU (on chassis CAN data link) not available ?	*检查所有轮速传感器的间隙 (间隙可能太大) *检查BBS BCU中参数“轮胎周长”和“齿圈齿数” *行驶记录仪的车速信号是否准确 (TC01中的车速信号)? *CAN总线中是否有TC01车速信号?
010	9	7-1	Speed Signal Input - abnormal update rate	速度信号输入 - 异常的更新率		亮	D	- Check the failure memory of the tachograph-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the tachograph-ECU	*检查是否有行车记录仪的记忆故障并维修 *检查TC01车速信号接口的更新速率 *检查BBS BCU和行车记录仪的CAN线连接
010	13	7-1	Speed Signal Input - out of calibration	速度信号输入 - 校验异常			亮	a) When tires were changed, the speedometer must be calibrated to the new tire dimensions. - Check the TCO-signal (function of speedometer) - Is the TCO-speed signal correctly calibrated ? - Check the vehicle-specific parameters of the speedometer b) The EBS-centralmodule must have correct parameters - Check the parameters in the EBS-centralmodule (speedometer signal source, tire dimensions) c) The ESC function requires a correct assembly of the ESCmodule - Check the assembly position of the ESC-module (mechanical hardware-coding between ESC-module and vehicle-frame) - Check the correct electric connection of the ESC-module - Check the fixing of the ESC-module	a) 当更换轮胎后, 车速表必须按照新轮胎尺寸进行标定 *检查TC01信号 (车速表的功能) *TC01车速信号是否经过校准? *检查车速仪表的速度信号的定义 b) EBS BCU必须设置正确的参数 *检查BBS BCU中设置的参数 (车速信号源, 轮胎尺寸) c) ESC功能需要ESC模块正确安装 *检查ESC模块的安装位置 (水平安装, 字母正向可读) *检查ESC模块的电气连接的方向是否正确 *检查ESC模块的安装是否牢固
917	9	7-1	High Resolution Total Vehicle Distance - abnormal update rate	高精度车辆总里程 - 异常的更新率		亮	D	- Check the failure memory of the ECU, that transmits the vehicle distance message and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the relevant ECU	*检查BCU故障记录中的车辆里程记忆故障、检查VDR报文的更新速率并排查故障 *检查BBS BCU和相关BCU (行车记录仪)的CAN线连接
924	1	0-8	Auxiliary Output #1 - data valid, but below normal operation range (most severe level)	辅助输出#1 - 数据有效但低于正常范围 (最严重级别)	亮		亮	- Check the supply-line (+UB) of the front axle modulator (increased resistance ? Corroded contacts ?) - Check the supply-line (GND) of the front axle modulator (increased resistance ? Corroded contacts ?) - Replace the front axle modulator	*检查前桥模块电源供电 (开路?接头锈蚀?) *检查前桥模块电路线的“地” (开路?接头锈蚀?) *更换前桥模块
924	3	0-8	Auxiliary Output #1 - voltage above normal or shorted high	辅助输出#1 - 电压高于正常值或者对电源短路			亮	- Check the supply-line of the front axle modulator (permanent short circuit to +UB ?) - Replace the EBS-centralmodule	*检查前桥模块电源供电 (一直对电源短路?) *更换BBS BCU
924	6	0-8	Auxiliary Output #1 - current above normal or grounded circuit	辅助输出#1 - 电流高于正常值或者对地短路		亮	亮	- Check the supply-line of the front axle modulator (short circuit to GND ?) - Check the front axle modulator (supply current too high ? internal short circuit to GND ?) - Replace the EBS-centralmodule	*检查前桥模块电源供电 (对地短路?) *检查前桥模块 (供电电流太高?内部对地短路?) *更换BBS BCU
925	1	0-8	Auxiliary Output #2 - data valid, but below normal operation range (most severe level)	辅助输出#2 - 数据有效但低于正常范围 (最严重级别)		亮	亮	- Check the supply-line (+UB) of the rear axle modulator (increased resistance ? Corroded contacts ?) - Check the supply-line (GND) of the rear axle modulator (increased resistance ? Corroded contacts ?) - Replace the rear axle modulator	*检查后桥模块电源供电 (开路?接头锈蚀?) *检查后桥模块电路线的“地” (开路?接头锈蚀?) *更换后桥模块
925	3	0-8	Auxiliary Output #2 - voltage above normal or shorted high	辅助输出#2 - 电压高于正常值或者对电源短路			亮	- Check the supply-line of the rear axle modulator (permanent short circuit to +UB ?) - Replace the EBS-centralmodule	*检查后桥模块电源供电 (一直对电源短路?) *更换BBS BCU

SPN	FMI	Blink code	Failure detection Name	故障名称	BBS 红灯	BBS 黄灯	BSC 灯	Repair Guide	维修指南
926	1	0-0	Auxiliary Output #3 - data valid, but below normal operation range (most severe level)	辅助输出#3 - 数据有效但低于正常范围 (最严重级别)	亮		亮	- Check the supply-line (+UB) of the additional axle modulator (increased resistance ? Corroded contacts ?) - Check the supply-line (GND) of the additional axle modulator (increased resistance ? Corroded contacts ?) - Replace the additional axle modulator	*检查附加桥模块电源供电 (开路/接头锈蚀?) *检查附加桥模块供电线路的“地” (开路/接头锈蚀?) *更换附加桥模块
926	3	0-0	Auxiliary Output #3 - voltage above normal or shorted high	辅助输出#3 - 电压高于正常值或者对电源短路		亮		- Check the supply-line of the additional axle modulator (permanent short circuit to +UB ?) - Replace the EBS-centralmodule	*检查附加桥模块电源供电 (一直对电源短路?) *更换BBS ECU
926	6	0-0	Auxiliary Output #3 - current above normal or grounded circuit	辅助输出#3 - 电流高于正常值或者对地短路		亮	亮	- Check the supply-line of the additional axle modulator (short circuit to GND ?) - Check the additional axle modulator (supply current too high ? internal short circuit to GND ?) - Replace the EBS-centralmodule	*检查附加桥模块电源供电 (对地短路?) *检查附加桥模块 (供电电流太高/内部对地短路?) *更换BBS ECU
1042	1	9-7	Electronic Tractor/Trailer Interface (ISO 11992) - data valid, but below normal operation range (most severe level)	主/挂车连接接口 (ISO 11992) - 数据有效但低于正常范围 (最严重级别)		亮		- Check wiring and relating connectors between EBScentralmodule and trailer connector (ISO 11992, the CAN Low Line might be faulty) - Check wiring, connectors and ECU within trailer EBS system (ISO 11992, the CAN Low Line might be faulty) - Check EBS-centralmodule	*检查BBS ECU和挂车之间接口的线束连接和相关接插件 (ISO11992 CAN低可能错误) *检查挂车EBS系统的线束和相关接插件 (ISO 11992 CAN低可能错误) *检查BBS ECU
1042	9	9-7	Electronic Tractor/Trailer Interface (ISO 11992) - abnormal update rate	主/挂车连接接口 (ISO 11992) - 异常的更新率		亮		- Check wiring and relating connectors between EBScentralmodule and trailer connector (ISO 11992) - Check wiring, connectors and ECU within trailer EBS system - Check EBS-centralmodule	*检查BBS ECU和挂车接口之间的线束连接和相关接插件 (ISO 11992) *检查挂车EBS系统的线束和相关接插件 (ISO 11992) *检查BBS ECU
1042	11	9-7	Electronic Tractor/Trailer Interface (ISO 11992) - failure mode not identifiable / root cause not known	主/挂车连接接口 (ISO 11992) - 故障模式未知 / 根本原因未知		亮		- Check wiring and relating connectors between EBScentralmodule and trailer connector (ISO 11992) - Check wiring, connectors and ECU within trailer EBS system - Check EBS-centralmodule	*检查BBS ECU和挂车接口之间的线束连接和相关接插件 (ISO 11992) *检查挂车EBS系统的线束和相关接插件 (ISO 11992) *检查BBS ECU
1042	12	9-7	Electronic Tractor/Trailer Interface (ISO 11992) - bad intelligent device or component	主/挂车连接接口 (ISO 11992) - 内部装置或部件损坏		亮		- Check the electronic brake system of the trailer (trailer has sent a failure message to the tractor)	*检查挂车电子制动系统 (挂车发送了一个故障信息给牵引车)
1042	14	9-7	Electronic Tractor/Trailer Interface (ISO 11992) - special instructions	主/挂车连接接口 (ISO 11992) - 特殊说明		亮		- Check wiring and relating connectors between EBScentralmodule and trailer connector (ISO 11992, the CAN High Line might be faulty) - Check wiring, connectors and ECU within trailer EBS system (ISO 11992, the CAN High Line might be faulty) - Check EBS-centralmodule	*检查BBS ECU和挂车接口之间的线束连接和相关接插件 (ISO 11992 CAN高可能错误) *检查挂车EBS系统的线束和相关接插件 (ISO 11992 CAN高可能错误) *检查BBS ECU
1043	3	7-5	Internal Sensor Voltage Supply - voltage above normal or shorted high	内部传感器供电 - 电压高于正常值或对电源短路		亮		- Check the supply-line of the brake signal transmitter (permanent short circuit to +UB ?) - Replace the EBS-centralmodule	*检查制动信号传输器 (脚阀) 的供电线路 (一直对电源短路?) *更换BBS ECU
1043	4	7-5	Internal Sensor Voltage Supply - voltage below normal or shorted low	内部传感器供电 - 电压低于正常值或者对地短路		亮	亮	- Check the supply-line of the brake signal transmitter (short circuit to GND ?) - Check the brake signal transmitter (supply current too high ? internal short circuit to GND ?) - Replace the EBS-centralmodule	*检查制动信号传输器 (脚阀) 的供电线路 (对地短路?) *检查制动信号传输器 (脚阀) (供电电流太高, 内部对地短路?) *更换BBS ECU
1045	4	7-5	Brake Light Switch 1 - voltage below normal or shorted low	制动灯开关1 - 电压低于正常值或者对地短路		亮		- Check the wiring and the relating electric connectors of the EBSBST (short to GND at first switch signal ?) - Check the EBS brake-signal transmitter for correct function of first brake-switch - Replace the centralmodule, if the BST and its wiring is faultless	*检查制动信号传输器 (脚阀) 的线束和相关接插件 (第一回路制动开关对地短路?) *检查制动信号传输器 (脚阀) 的第一回路制动开关功能是否正常? *如果制动信号传输器 (脚阀) 及其线束正常, 更换BBS ECU
1045	5	7-5	Brake Light Switch 1 - current below normal or open circuit	制动灯开关1 - 电流低于正常值或者开路		亮		- Check the wiring and the relating electric connectors of the EBSBST (interruption of first switch signal ?) - Check the EBS brake-signal transmitter for correct function of first brake-switch - Replace the centralmodule, if the BST and its wiring is faultless	*检查制动信号传输器 (脚阀) 的线束和相关接插件 (第一回路制动开关断路?) *检查制动信号传输器 (脚阀) 的第一回路制动开关功能是否正常? *如果制动信号传输器 (脚阀) 及其线束正常, 更换BBS ECU
1046	4	7-5	Brake Light Switch 2 - voltage below normal or shorted low	制动灯开关2 - 电压低于正常值或者对地短路		亮		- Check the wiring and the relating electric connectors of the EBSBST (short to GND at second switch signal ?) - Check the EBS brake-signal transmitter for correct function of second brake-switch - Replace the centralmodule, if the BST and its wiring is faultless	*检查制动信号传输器 (脚阀) 的线束和相关接插件 (第二回路制动开关对地短路?) *检查制动信号传输器 (脚阀) 的第二回路制动开关功能是否正常? *如果制动信号传输器 (脚阀) 及其线束正常, 更换BBS ECU
1046	5	7-5	Brake Light Switch 2 - current below normal or open circuit	制动灯开关2 - 电流低于正常值或者开路		亮		- Check the wiring and the relating electric connectors of the EBSBST (interruption of second switch signal ?) - Check the EBS brake-signal transmitter for correct function of second brake-switch - Replace the centralmodule, if the BST and its wiring is faultless	*检查制动信号传输器 (脚阀) 的线束和相关接插件 (第二回路制动开关断路?) *检查制动信号传输器 (脚阀) 的第二回路制动开关功能是否正常? *如果制动信号传输器 (脚阀) 及其线束正常, 更换BBS ECU

SPN	PID	Blink code	Failedetection Name	故障名称	BBS 红灯	BBS 黄灯	BSC 灯	Repair Guide	维修指南
1047	2	9-3	Electronic Pressure Control Axle 1 - data erratic, intermittend or incorrect	前桥电子压力控制 - 数据不稳定、间断或错误	亮		亮	- Replace front axle modulator - Replace EBS-centralmodule	*检查BBS BCU和前桥模块之间的线路连接以及相关接插件（断路/短路？） *检查/更换前桥模块 *更换BBS BCU
1047	9	9-3	Electronic Pressure Control Axle 1 - abnormal update rate	前桥电子压力控制 - 异常的更新率	亮		亮	- Check the wiring (voltage supply and CAN) and the relating electric connectors between EBS-centralmodule and front axle modulator (interruption ?, short circuit ?) - Replace front axle modulator - Replace EBS-centralmodule	*检查BBS BCU和前桥模块之间的线路连接以及相关接插件（断路/短路？） *更换前桥模块 *更换BBS BCU
1047	11	7-8	Electronic Pressure Control Axle 1 - failure mode not identifiable / root cause not known	前桥电子压力控制 - 故障模式未知/根本原因未知	亮		亮	- Replace front axle modulator - Replace EBS-centralmodule	*检查BBS BCU和前桥模块之间的线路连接以及相关接插件（断路/短路？） *检查/更换前桥模块 *更换BBS BCU
1047	12	7-8	Electronic Pressure Control Axle 1 - bad intelligent device or component	前桥电子压力控制 - 内部装置或部件损坏	亮		亮	- Replace front axle modulator	*检查/更换前桥模块
1047	13	8-4	Electronic Pressure Control Axle 1 - out of calibration	前桥电子压力控制 - 校验异常	亮		亮	- check the correctness of the front axle-modulator version (right number ?) - check the front axle configuration-parameters in the EBScentralmodule (pn, backup, lining-wear-sensors, number of control-circuits 1m/2m, etc.)	*检查前桥模块版本是否正确(零件号正确?) *检查BBS BCU中前桥模块的参数配置(零件号、备压、磨擦指示传感器、控制回路数量等)
1047	19	7-8	Electronic Pressure Control Axle 1 - received network data in error	前桥电子压力控制 - 接收到错误的网络数据	亮		亮	- Replace front axle modulator	*检查BBS BCU和前桥模块之间的线路连接以及相关接插件（断路/短路？） *检查/更换前桥模块
1048	7	2-7	Pneumatic Back-up Pressure Control Axle 1 - mechanical system not responding properly or out of adjustment	前桥备压压力控制 - 机械系统没有正常响应或超出调整范围		亮		- Check, if there is a leakage during brake-pedal activation - Are the pneumatic lines between BST and front axle-modulator blocked ? - Is the supply pressure sensing (front axle circuit) faulty ? - Change the front axle-modulator - Change the Brake signal transmitter (BST)	*踩下制动踏板，检查是否漏气 *制动信号传感器（脚阀）到前桥模块气管堵塞？ *前桥回路供气气压故障（脚阀处或者前桥模块处）？ *更换前桥模块 *更换制动信号传感器（脚阀）
1049	0	7-8	Brake Pressure Sensing Axle 1 - data valid, but above normal operation range (most severe level)	前桥制动力传感器 - 数据有效但高于正常范围（最严重级别）	亮		亮	- Check left and right spring brake chambers at the front axle for internal leakage (check not necessary for normal brake chambers) - Replace the front axle-modulator	*检查前桥左右弹簧制动气室是否内部泄漏（对单腔气室不必检查），检查前桥模块到气室的管路是否堵塞 *更换前桥模块
1049	2	7-8	Brake Pressure Sensing Axle 1 - data erratic, intermittend or incorrect	前桥制动力传感器 - 数据不稳定、间断或错误	亮		亮	- Replace the front axle-modulator	*检查BBS BCU和前桥模块之间的线路连接以及相关接插件（断路/短路？） *检查/更换前桥模块
1049	7	7-8	Brake Pressure Sensing Axle 1 - mechanical system not responding properly or out of adjustment	前桥制动力传感器 - 机械系统没有正常响应或超出调整范围	亮		亮	- Check the supply pressure of the front axle-modulator (supply sensing correct ?) - Check the pneumatic supply lines of the front axle-modulator (blocked ? kinked ?) - Check the pneumatic brake lines of the front axle-modulator (broken ? leaky ?) - Replace the front axle-modulator	*检查前桥模块气压（气压传感器正常） *检查前桥模块的供气管路（堵塞/弯曲） *检查前桥模块的制动管路（破裂/漏气） *更换前桥模块
1049	14	7-8	Brake Pressure Sensing Axle 1 - special instructions	前桥制动力传感器 - 特殊说明	亮		亮	- Check left and right spring brake chambers at the front axle for internal leakage (check not necessary for normal brake chambers) - Check the pneumatic backup brake lines of the front axlemodulator (kinked ? captured or residual brake pressure ?) - Replace front axle-modulator	*检查前桥左右弹簧制动气室是否内部泄漏（对单腔气室不必检查） *检查前桥模块的备压制动管路（弯曲/有残余压力？） *更换前桥模块
1050	2	9-3	Electronic Pressure Control Axle 2 - data erratic, intermittend or incorrect	后桥电子压力控制 - 数据不稳定、间断或错误	亮		亮	- Replace rear axle modulator - Replace EBS-centralmodule	*检查BBS BCU和后桥模块之间的线路连接以及相关接插件（断路/短路？） *检查/更换后桥模块 *更换BBS BCU
1050	9	9-3	Electronic Pressure Control Axle 2 - abnormal update rate	后桥电子压力控制 - 异常的更新率	亮		亮	- Check the wiring (voltage supply and CAN) and the relating electric connectors between EBS-centralmodule and rear axle modulator (interruption ?, short circuit ?) - Replace rear axle modulator - Replace EBS-centralmodule	*检查BBS BCU和后桥模块之间的线路连接以及相关接插件（断路/短路？） *检查/更换后桥模块 *更换BBS BCU
1050	11	7-7	Electronic Pressure Control Axle 2 - failure mode not identifiable / root cause not known	后桥电子压力控制 - 故障模式未知/根本原因未知	亮		亮	- Replace rear axle modulator - Replace EBS-centralmodule	*检查BBS BCU和后桥模块之间的线路连接以及相关接插件（断路/短路？） *检查/更换后桥模块 *更换BBS BCU
1050	12	7-7	Electronic Pressure Control Axle 2 - bad intelligent device or component	后桥电子压力控制 - 内部装置或部件损坏	亮		亮	- Replace rear axle modulator	*检查/更换后桥模块
1050	13	8-4	Electronic Pressure Control Axle 2 - out of calibration	后桥电子压力控制 - 校验异常	亮		亮	- check the correctness of the rear axle-modulator version (right number ?) - check the rear axle configuration-parameters in the EBS-centralmodule(pn, backup, lining-wear-sensors, number of control-circuits 1m/2m, etc.)	*检查后桥模块版本是否正确(零件号正确?) *检查BBS BCU中后桥模块的参数配置(零件号、备压、磨擦指示传感器、控制回路数量等)
1050	19	7-7	Electronic Pressure Control Axle 2 - received network data in error	后桥电子压力控制 - 接收到错误的网络数据	亮		亮	- Replace rear axle modulator	*检查BBS BCU和后桥模块之间的线路连接以及相关接插件（断路/短路？） *检查/更换后桥模块

SPN	FMI	Blink code	Failedetection Name	故障名称	BBS 红灯	BBS 黄灯	Repair Guide	维修指南
1051	7	2-8	Pneumatic Back-up Pressure Control Axle 2 - mechanical system not responding properly or out of adjustment	后桥备压压力控制 - 机械系统没有正常响应或超出调整范围	亮		- Check, if there is a leakage during brake-pedal activation - Are the pneumatic lines between BST and rear axle-modulator blocked ? - Is the supply pressure sensing (rear axle circuit) faulty ? - Change the rear axle-modulator - Change the Brake signal transmitter (BST)	*踩下制动踏板, 检查是否漏气 *听信号传输器 (脚阀) 到后桥模块气管堵塞? *后桥回路供气气压故障 (脚阀处或者后桥模块处)? *更换后桥模块 *更换制动信号传输器 (脚阀)
1052	0	7-7	Brake Pressure Sensing Axle 2 - data valid, but above normal operation range (most severe level)	后桥制动压力传感器 - 数据有效但高于正常范围 (最严重级别)	亮	亮	- Check left spring brake chamber at the rear axle for internal leakage (check not necessary for normal brake chambers) - Replace the rear axle-modulator	*检查后桥左侧弹簧制动室是否内部泄漏 (对单腿气室不必检查) *更换后桥模块
1052	1	7-7	Brake Pressure Sensing Axle 2 - data valid, but below normal operation range (most severe level)	后桥制动压力传感器 - 数据有效但低于正常范围 (最严重级别)	亮	亮	- Check the supply pressure of the rear axle-modulator (supply sensing correct ?) - Check the pneumatic supply line (left channel) of the rear axlemodulator (blocked ? kinked ?) - Check the pneumatic brake line (left channel) of the rear axlemodulator (broken ? leaky ?) - Replace the rear axle-modulator	*检查后桥模块供气压力 (气压传感器正常?) *检查后桥模块左侧通道的供气管路 (堵塞/弯曲?) *检查后桥模块左侧通道的制动管路 (破裂/泄漏?) *更换后桥模块
1052	2	7-7	Brake Pressure Sensing Axle 2 - data erratic, intermittend or incorrect	后桥制动压力传感器 - 数据不稳定、间断或错误	亮		- Replace rear axle-modulator	*检查/更换后桥模块
1052	7	7-7	Brake Pressure Sensing Axle 2 - mechanical system not responding properly or out of adjustment	后桥制动压力传感器 - 机械系统没有正常响应或超出调整范围	亮	亮	- Check the supply pressure of the rear axle-modulator (supply sensing correct ?) - Check the pneumatic supply lines of the rear axle-modulator (blocked kinked ?) - Check the pneumatic brake lines of the rear axle-modulator (broken ? leaky ?) - Replace the rear axle-modulator	*检查后桥模块供气压力 (气压传感器正常?) *检查后桥模块的供气管路 (堵塞/弯曲?) *检查后桥模块的制动管路 (破裂/泄漏?) *更换后桥模块
1052	14	7-7	Brake Pressure Sensing Axle 2 - special instructions	后桥制动压力传感器 - 特殊说明	亮		- Check left spring brake chamber at the rear axle for internal leakage (check not necessary for normal brake chambers) - Check the pneumatic backup brake lines of the rear axlemodulator (kinked ? captured or residual brake pressure ?) - Replace rear axle-modulator	*检查后桥左侧弹簧制动室是否内部泄漏 (对单腿气室不必检查) *检查后桥模块的备压制动管路 (弯曲/有残余压力?) *更换后桥模块
1052	15	7-7	Brake Pressure Sensing Axle 2 - data valid, but above normal operation range (least severe level)	后桥制动压力传感器 - 数据有效但高于正常范围 (最轻级别)	亮	亮	- Check right spring brake chamber at the rear axle for internal leakage (check not necessary for normal brake chambers) - Replace the rear axle-modulator	*检查后桥右侧弹簧制动室是否内部泄漏 (对单腿气室不必检查) *更换后桥模块
1052	16	7-7	Brake Pressure Sensing Axle 2 - data valid, but above normal operation range (moderately severe level)	后桥制动压力传感器 - 数据有效但高于正常范围 (中等级别)	亮		- Check right spring brake chamber at the rear axle for internal leakage (check not necessary for normal brake chambers) - Check the pneumatic backup brake lines of the rear axlemodulator (kinked ? captured or residual brake pressure ?) - Replace rear axle-modulator	*检查后桥右侧弹簧制动室是否内部泄漏 (对单腿气室不必检查) *检查后桥模块的备压制动管路 (弯曲/有残余压力?) *更换后桥模块
1052	17	7-7	Brake Pressure Sensing Axle 2 - data valid, but below normal operation range (least severe level)	后桥制动压力传感器 - 数据有效但低于正常范围 (最轻级别)	亮	亮	- Check the supply pressure of the rear axle-modulator (supply sensing correct ?) - Check the pneumatic supply line (right channel) of the rear axlemodulator (blocked ? kinked ?) - Check the pneumatic brake line (right channel) of the rear axlemodulator (broken ? leaky ?) - Replace the rear axle-modulator	*检查后桥模块供气压力 (气压传感器正常?) *检查后桥模块右侧通道的供气管路 (堵塞/弯曲?) *检查后桥模块右侧通道的制动管路 (破裂/泄漏?) *更换后桥模块
1053	2	9-3	Electronic Pressure Control Axle 3 - data erratic, intermittend or incorrect	附加桥制动压力传感器 - 数据不稳定、间断或错误	亮	亮	- Replace additional axle modulator - Replace EBS-centralmodule	*检查后桥模块和附加桥模块之间的线束及相关的电气接插件 (断路/短路?) *检查/更换附加桥模块 *更换EBS ECU
1053	9	9-3	Electronic Pressure Control Axle 3 - abnormal update rate	附加桥制动压力传感器 - 异常的更新率	亮	亮	- Check the correct configuration of the EBS-centralmodule (EOLparameter:EBS-system-type -> additional axle modulator yes/no) - Check the wiring (voltage supply and CAN) and the relating electric connectors between EBS-centralmodule and additional axle modulator (interruption ?, short circuit ?) - Check the wiring of the Configuration-Pin ("bridge") of the additional axle modulator - Replace additional axle modulator - Replace EBS-centralmodule	*检查EBS ECU中参数是否正确配置 (下线检测参数: EBS系统类型-> 附加桥模块 yes/no) *检查EBS ECU和后桥模块之间的线束及相关的电气接插件 (断路/短路?) *检查后桥模块和附加桥模块之间的线束及相关的电气接插件 (断路/短路?) *更换附加桥模块 *更换EBS ECU
1053	11	7-9	Electronic Pressure Control Axle 3 - failure mode not identifiable / root cause not known	附加桥制动压力传感器 - 故障模式未知 / 根本原因未知	亮	亮	- Replace additional axle modulator - Replace EBS-centralmodule	*检查后桥模块和附加桥模块之间的线束及相关的电气接插件 (断路/短路?) *检查/更换附加桥模块 *更换EBS ECU
1053	12	7-9	Electronic Pressure Control Axle 3 - bad intelligent device or component	附加桥制动压力传感器 - 内部装置或部件损坏	亮	亮	- Replace additional axle modulator	*检查/更换附加桥模块

SPN	FMI	Blink code	Failedetection Name	故障名称	BBS 灯红	BBS 费灯	BSC 灯	Repair Guide	维修指南
1053	13	8-4	Electronic Pressure Control Axle 3 - out of calibration	附加桥制动力传感器 - 校验异常	亮		亮	- check the correctness of the additional axle-modulator version (right number ?) - check the additional axle configuration-parameters in the EBS-centralmodule (pn, backup, lining-wear-sensors, number of control-circuits 1m/2m, etc.)	*检查附加桥模块版本是否正确(零件号正确?) *检查BBS *BSC/中附加桥模块的参数配置(零件号、备压、磨损指示传感器、控制回路数量等)
1053	14	8-4	Electronic Pressure Control Axle 3 - special instructions	附加桥制动力传感器 - 特殊说明	亮		亮	- Check the correct EOL parameter setting for EBS-system-type - Check the correct axle-modulator type (correct number ? Correct wiring at configuration pin ?)	*检查BBS *BSC参数中EBS系统类型的设置是否正确 *检查桥模块类型(型号是否正确?线束及相应针脚配置是否正确?)
1053	19	7-9	Electronic Pressure Control Axle 3 - received network data in error	附加桥制动力传感器 - 接收到错误的网络数据	亮		亮	- Replace additional axle modulator	*检查后桥模块和附加桥模块之间的线束及相关的电气接插件(断路?短路?) *检查/更换附加桥模块
1054	7	2-9	Pneumatic Back-up Pressure Control Axle 3 - mechanical system not responding properly or out of adjustment	附加桥备压力控制 - 机械系统没有正常响应或超出调整范围		亮		- Check, if there is a leakage during brake-pedal activation - Are the pneumatic lines between BST and additional axlemodule blocked ? - Is the supply pressure sensing (additional axle circuit) faulty ? - Change the additional axle-modulator - Change the Brake signal transmitter (BST)	*踩下制动踏板, 检查是否漏气 *制动信号传输器(脚阀)到附加桥模块气管堵塞? *是否附加桥回路供气压力故障(脚阀处或者后桥模块处)? *更换附加桥模块 *更换制动信号传输器(脚阀)
1055	0	7-9	Brake Pressure Sensing Axle 3 - data valid, but above normal operation range (most severe level)	附加桥制动力传感器 - 数据有效但高于正常范围(最严重级别)	亮		亮	- Valid for 2-channel additional axle modulator: - Check left spring brake chamber at the additional axle for internal leakage (check not necessary for normal brake chambers) - Replace the additional axle-modulator	*对双通道附加桥模块: *检查附加桥左侧弹簧气室是否内部泄漏(对单腔气室不必检查) *更换附加桥模块
1055	1	7-9	Brake Pressure Sensing Axle 3 - data valid, but below normal operation range (most severe level)	附加桥制动力传感器 - 数据有效但低于正常范围(最严重级别)	亮		亮	- Valid for 1-channel additional axle modulator: - Check the supply pressure of the additional axle-modulator (supply sensing correct ?) - Check the pneumatic supply line (left channel) of the additional axle-modulator (blocked ? kinked ?) - Check the pneumatic brake line (left channel) of the additional axle-modulator (broken ? leaky ?) - Replace the additional axle-modulator	*对单通道附加桥模块: *检查附加桥模块供气压力(气压传感器正常?) *检查附加桥模块左侧通道的供气管路(堵塞?弯曲?) *检查附加桥模块左侧通道的制动管路(破裂?泄漏?) *更换附加桥模块
1055	2	7-9	Brake Pressure Sensing Axle 3 - data erratic, intermittent or incorrect	附加桥制动力传感器 - 数据不稳定、间断或错误	亮	亮	亮	- Valid for 2-channel additional axle modulator: - Check the supply pressure of the additional axle-modulator (supply sensing correct ?) - Check the pneumatic supply lines of the additional axlemodule (blocked ? kinked ?) - Check the pneumatic brake lines of the additional axlemodule (broken ? leaky ?) - Replace the additional axle-modulator	*对双通道附加桥模块: *检查附加桥模块供气压力(气压传感器正常?) *检查附加桥模块的供气管路(堵塞?弯曲?) *检查附加桥模块的制动管路(破裂?泄漏?) *更换附加桥模块
1055	7	7-9	Brake Pressure Sensing Axle 3 - mechanical system not responding properly or out of adjustment	附加桥制动力传感器 - 机械系统没有正常响应或超出调整范围	亮		亮	- Check the supply pressure of the additional axle-modulator (supply sensing correct ?) - Check the pneumatic supply lines of the additional axlemodule (blocked ? kinked ?) - Check the pneumatic brake lines of the additional axlemodule (broken ? leaky ?) - Replace the additional axle-modulator	*检查附加桥模块供气压力(气压传感器正常?) *检查附加桥模块的供气管路(堵塞?弯曲?) *检查附加桥模块的制动管路(破裂?泄漏?) *更换附加桥模块

SPN	FMI	Blink code	Failedetection Name	故障名称	BBS 红灯	BSC 黄灯	Repair Guide	维修指南
1055	14	7-9	Brake Pressure Sensing Axle 3 - special instructions	附加制动助力传感器 - 特殊说明	亮 (单 通道 桥模 块)	亮 (双 通道 桥模 块)	Valid for 2-channel additional axle modulator: - Check left spring brake chamber at the additional axle for internal leakage (check not necessary for normal brake chambers) - Check the pneumatic backup brake lines of the additional axlemodulator (kinked ? captured or residual brake pressure ?) - Replace additional axle-modulator Valid for 1-channel additional axle modulator: - Check left and right spring brake chambers at the additional axle for internal leakage (check not necessary for normal brake chambers) - Check the pneumatic backup brake lines of the additional axlemodulator (kinked ? captured or residual brake pressure ?) - Replace additional axle-modulator	>对双通道附加桥模块: *检查附加桥右侧弹簧制动气室是否内部泄漏 (对单腔气室不必检查) *检查附加桥模块的备压制动管路 (弯曲?有残余压力?) *更换附加桥模块 >对单通道附加桥模块: *检查附加桥模块左/右两侧弹簧制动气室是否内部泄漏 (对单腔气室不必检查) *检查附加桥模块的备压制动管路 (弯曲?有残余压力?) *更换附加桥模块;
1055	15	7-9	Brake Pressure Sensing Axle 3 - data valid, but above normal operation range (least severe level)	附加制动助力传感器 - 数据有效但高于正常范围(最轻级别)	亮	亮	Valid for 2-channel additional axle modulator: - Check right spring brake chamber at the additional axle for internal leakage (check not necessary for normal brake chambers) - Replace the additional axle-modulator Valid for 1-channel additional axle modulator: - Check left and right spring brake chambers at the additional axle for internal leakage (check not necessary for normal brake chambers) - Replace the additional axle-modulator	>对双通道附加桥模块: *检查附加桥右侧弹簧制动气室是否内部泄漏 (对单腔气室不必检查) *更换附加桥模块 >对单通道附加桥模块: *检查附加桥模块左/右两侧弹簧制动气室是否内部泄漏 (对单腔气室不必检查) *更换附加桥模块
1055	16	7-9	Brake Pressure Sensing Axle 3 - data valid, but above normal operation range (moderately severe level)	附加制动助力传感器 - 数据有效但高于正常范围(中等级别)	亮 (单 通道 桥模 块)	亮 (双 通道 桥模 块)	Valid for 2-channel additional axle modulator: - Check right spring brake chamber at the additional axle for internal leakage (check not necessary for normal brake chambers) - Check the pneumatic backup brake lines of the additional axlemodulator (kinked ? captured or residual brake pressure ?) - Replace additional axle-modulator Valid for 1-channel additional axle modulator: - Check left and right spring brake chambers at the additional axle for internal leakage (check not necessary for normal brake chambers) - Check the pneumatic backup brake lines of the additional axlemodulator (kinked ? captured or residual brake pressure ?) - Replace additional axle-modulator	>对双通道附加桥模块: *检查附加桥右侧弹簧制动气室是否内部泄漏 (对单腔气室不必检查) *检查附加桥模块的备压制动管路 (弯曲?有残余压力?) *更换附加桥模块 >对单通道附加桥模块: *检查附加桥模块左/右两侧弹簧制动气室是否内部泄漏 (对单腔气室不必检查) *检查附加桥模块的备压制动管路 (弯曲?有残余压力?) *更换附加桥模块
1055	17	7-9	Brake Pressure Sensing Axle 3 - data valid, but below normal operation range (least severe level)	附加制动助力传感器 - 数据有效但低于正常范围(最轻级别)	亮	亮	Valid for 2-channel additional axle modulator: - Check the supply pressure of the additional axle-modulator (supply sensing correct ?) - Check the pneumatic supply line (right channel) of the additional axle-modulator (blocked ? kinked ?) - Check the pneumatic brake line (right channel) of the additional axle-modulator (broken ? leaky ?) - Replace the additional axle-modulator Valid for 1-channel additional axle-modulator: - Check the supply pressure of the additional axle-modulator (supply sensing correct ?) - Check the pneumatic supply lines of the additional axlemodulator (blocked ? kinked ?) - Check the pneumatic brake lines of the additional axlemodulator (broken ? leaky ?) - Replace the additional axle-modulator	>对双通道附加桥模块: *检查附加桥模块供气压力 (气压传感器正常?) *检查附加桥模块右侧通道的供气管路 (堵塞?弯曲?) *检查附加桥模块右侧通道的制动管路 (破裂?泄漏?) *更换附加桥模块 >对单通道附加桥模块: *检查附加桥模块供气压力 (气压传感器正常?) *检查附加桥模块的供气管路 (堵塞?弯曲?) *检查附加桥模块的制动管路 (破裂?泄漏?) *更换附加桥模块
1056	3	7-6	Electronic Pressure Control, Trailer Control - voltage above normal or shorted high	挂车控制阀电子压力控制 - 电压高于正常值或对电源短路	亮	亮	- Check the wiring and the relating electric connectors of the TCV solenoids (short circuit to UB ?) - Check the TCV solenoids (Internal short circuit to UB ?) - Replace the EBS-centralmodule, if the TCV solenoids and the relevant wiring is faultless	*检查挂车控制阀 (TCV) 线束及相关接插件 (对电源短路?) *检查挂车控制阀 (内部对电源短路?) *如果挂车控制阀和相关线束都没问题, 更换EBS ECU
1056	4	7-6	Electronic Pressure Control, Trailer Control - voltage below normal or shorted low	挂车控制阀电子压力控制 - 电压低于正常值或对地短路	亮	亮	- Check the wiring and the relating electric connectors of the TCV solenoids (short circuit to GND ?) - Check the TCV solenoids (Internal short circuit to GND ?) - Replace the EBS-centralmodule, if the TCV solenoids and the relevant wiring is faultless	*检查挂车控制阀 (TCV) 线束及相关接插件 (对地短路?) *检查挂车控制阀 (内部对地短路?) *如果挂车控制阀和相关线束都没问题, 更换EBS ECU

SPN	FMI	Blink code	Failedetection Name	故障名称	BBS 红灯	BBS 黄灯	BSC 灯	Repair Guide	维修指南
1056	5	7+6	Electronic Pressure Control, Trailer Control - current below normal or open circuit	挂车控制阀电子压力控制 - 电流低于正常值或开路			亮	亮 - Check the EOL configuration in the EBS-centralmodule (parameter TCV yes/no) - Check the wiring and the relating electric connectors of the TCV solenoids (interruption ?) - Check the TCV solenoids (internal interruption ?) - Replace the EBS-centralmodule, if the TCV solenoids and the relevant wiring is faultless	*检查BBS BCU的参数是否设置了挂车控制阀 (TCV) ? *检查挂车控制阀 (TCV) 线束及相关接插件 (中断?) *检查挂车控制阀 (TCV) (内部断路?) *如果挂车控制阀及相关线路没问题, 更换BBS BCU
1056	7	7+6	Electronic Pressure Control, Trailer Control - mechanical system not responding properly or out of adjustment	挂车控制阀电子压力控制 - 机械系统没有正常响应或超出调整范围			亮	亮 - Check the supply pressure of the trailer-control (insufficient supply pressure during driving ?) - Check the pneumatic supply lines of the trailer-control (blocked ? kinked ?) - Check the pneumatic brake lines of the trailer-control (broken ? leaky ?) - Replace the trailer-control-valve	*检查挂车控制阀供气气压 (供应气压低?) *检查挂车控制阀的供气管路 (堵塞/弯曲?) *检查挂车控制阀的制动管路 (破裂/泄漏?) *更换挂车控制阀
1056	13	8+4	Electronic Pressure Control, Trailer Control - out of calibration	挂车控制阀电子压力控制 - 校验异常			亮	亮 - Check EBS-centralmodule for correct EOL-configuration (TCV yes/no) - Is something connected to the relevant TCV-pins of the centralmodule ? - Replace the EBS-centralmodule	*检查BBS BCU的参数是否设置了挂车控制阀 (TCV) ? *是不是有别的零部件接到BBS BCU上的挂车控制阀的针脚位置? *更换BBS BCU
1057	7	2+11	Pneumatic Back-up Pressure Control, Trailer Control - mechanical system not responding properly or out of adjustment	挂车控制阀备压压力控制 - 机械系统没有正常响应或超出调整范围			亮	- Check, if there is a leakage during brake-pedal activation - Are the pneumatic lines between BST and Trailer-control valve blocked ? - Is the supply pressure sensing (3rd circuit trailer) faulty ? - Change the trailer control valve - Change the Brake signal transmitter (BST)	*踩下制动踏板, 检查是否漏气 *制动信号传输器 (脚阀) 到挂车控制阀管路堵塞? *是否挂车供气回路压力感应不正常? *更换挂车控制阀 *更换制动信号传输器 (脚阀)
1058	0	7+6	Brake Pressure Sensing, Trailer Control - data valid, but above normal operation range (most severe level)	挂车控制阀制动力传感器 - 数据有效但高于正常范围 (最严重级别)			亮	亮 - Check the relevant pneumatic brake lines (trailer control) for captured or residual brake pressure - Check the wiring and the relating connectors between centralmodule and trailer control valve - Check the pressure sensor of the trailer control valve - Replace EBS-centralmodule	*检查挂车控制阀相关制动管路是否有残余制动力 *检查BBS BCU及挂车控制阀之间线束连接及相关接插件 *检查挂车控制阀的压力传感器 *更换BBS BCU
1058	3	7+6	Brake Pressure Sensing, Trailer Control - voltage above normal or shorted high	挂车控制阀制动力传感器 - 电压高于正常值或对电源短路			亮	亮 - Check the wiring and the relating electric connectors of the TCV pressure sensor (interruption ? short circuits ?) - Check the TCV pressure sensor (correct electric function ? correct output signal ?) - Replace the EBS-centralmodule, if the TCV sensor and its wiring is faultless	*检查挂车控制阀压力传感器线束及相关接插件 (断路/短路?) *检查挂车控制阀压力传感器 (电气功能正确/信号输出正确?) *如果挂车控制阀传感器及其线束没问题, 更换BBS BCU
1058	4	7+6	Brake Pressure Sensing, Trailer Control - voltage below normal or shorted low	挂车控制阀制动力传感器 - 电压低于正常值或对地短路			亮	亮 - Check the EBS centralmodule for correct EOL configuration (parameter: TCV yes/no) - Check the wiring and the relating electric connectors of the TCV pressure sensor (interruption ? short circuits ?) - Check the TCV pressure sensor (correct electric function ? correct output signal ?) - Replace the EBS-centralmodule, if the TCV sensor and its wiring is faultless	*检查BBS BCU的参数是否设置了挂车控制阀 (TCV) ? *检查挂车控制阀压力传感器线束及其相关接插件 (断路/短路?) *检查挂车控制阀压力传感器 (传感器信号正常/输出信号正确?) *如果挂车控制阀传感器及其线束没问题, 更换BBS BCU
1060	3	10+2	Lining Wear Sensor Axle 1 Left - voltage above normal or shorted high	前桥左侧摩擦片磨损传感器 - 电压高于正常值或对电源短路			亮	- Check the wiring and the relating electric connectors of the left lining wear sensor at the front axle (interruption ? short circuits ?) - Check the left lining wear sensor at the front axle (output voltage signal too high ?) - Replace the front axle-modulator, if the relevant lining wear sensor and its wiring is faultless	*检查前桥左侧摩擦片磨损传感器线束及相关接插件 (断路/短路?) *检查前桥左侧摩擦片磨损传感器 (输出电压信号太高?) *如果摩擦片磨损传感器及其线束没问题, 更换前桥模块
1060	4	10+2	Lining Wear Sensor Axle 1 Left - voltage below normal or shorted low	前桥左侧摩擦片磨损传感器 - 电压低于正常值或对地短路			亮	- Check the wiring and the relating electric connectors of the left lining wear sensor at the front axle (interruption ? short circuits ?) - Check the left lining wear sensor at the front axle (output voltage signal too low ?) - Replace the front axle-modulator, if the relevant lining wear sensor and its wiring is faultless	*检查前桥左侧摩擦片磨损传感器线束及相关接插件 (断路/短路?) *检查前桥左侧摩擦片磨损传感器 (输出电压信号太低?) *如果摩擦片磨损传感器及其线束没问题, 更换前桥模块
1061	3	10+1	Lining Wear Sensor Axle 1 Right - voltage above normal or shorted high	前桥右侧摩擦片磨损传感器 - 电压高于正常值或对电源短路			亮	- Check the wiring and the relating electric connectors of the right lining wear sensor at the front axle (interruption ? short circuits ?) - Check the right lining wear sensor at the front axle (output voltage signal too high ?) - Replace the front axle-modulator, if the relevant lining wear sensor and its wiring is faultless	*检查前桥右侧摩擦片磨损传感器线束及相关接插件 (断路/短路?) *检查前桥右侧摩擦片磨损传感器 (输出电压信号太高?) *如果摩擦片磨损传感器及其线束没问题, 更换前桥模块

SPN	PRI	Blink code	Failedetection Name	故障名称	BBS 红灯	BBS 黄灯	Repair Guide	维修指南
1061	4	10-1	Lining Wear Sensor Axle 1 Right - voltage below normal or shorted low	前桥右侧摩擦片磨损传感器 - 电压低于正常值或对地短路		亮	- Check the wiring and the relating electric connectors of the right lining wear sensor at the front axle (interruption ?, short circuits ?) - Check the right lining wear sensor at the front axle (output voltage signal too low ?) - Replace the front axle-modulator, if the relevant lining wear sensor and its wiring is faultless	*检查前桥右侧摩擦片磨损传感器线束及相关接插件 (断路?短路?) *检查前桥右侧摩擦片磨损传感器 (输出电压信号太低?) *如果摩擦片磨损传感器及其线束没问题, 更换前桥模块
1062	3	10-5	Lining Wear Sensor Axle 2 Left - voltage above normal or shorted high	后桥左侧摩擦片磨损传感器 - 电压高于正常值或对电源短路		亮	- Check the wiring and the relating electric connectors of the left lining wear sensor at the rear axle (interruption ?, short circuits ?) - Check the left lining wear sensor at the rear axle (output voltage signal too high ?) - Replace the rear axle-modulator, if the relevant lining wear sensor and its wiring is faultless	*检查后桥左侧摩擦片磨损传感器线束及相关接插件 (断路?短路?) *检查后桥左侧摩擦片磨损传感器 (输出电压信号太高?) *如果摩擦片磨损传感器及其线束没问题, 更换后桥模块
1062	4	10-5	Lining Wear Sensor Axle 2 Left - voltage below normal or shorted low	后桥左侧摩擦片磨损传感器 - 电压低于正常值或对地短路		亮	- Check the wiring and the relating electric connectors of the left lining wear sensor at the rear axle (interruption ?, short circuits ?) - Check the left lining wear sensor at the rear axle (output voltage signal too low ?) - Replace the rear axle-modulator, if the relevant lining wear sensor and its wiring is faultless	*检查后桥左侧摩擦片磨损传感器线束及相关接插件 (断路?短路?) *检查后桥左侧摩擦片磨损传感器 (输出电压信号太低?) *如果摩擦片磨损传感器及其线束没问题, 更换后桥模块
1063	3	10-4	Lining Wear Sensor Axle 2 Right - voltage above normal or shorted high	后桥右侧摩擦片磨损传感器 - 电压高于正常值或对电源短路		亮	- Check the wiring and the relating electric connectors of the right lining wear sensor at the rear axle (interruption ?, short circuits ?) - Check the right lining wear sensor at the rear axle (output voltage signal too high ?) - Replace the rear axle-modulator, if the relevant lining wear sensor and its wiring is faultless	*检查后桥右侧摩擦片磨损传感器线束及相关接插件 (断路?短路?) *检查后桥右侧摩擦片磨损传感器 (输出电压信号太高?) *如果摩擦片磨损传感器及其线束没问题, 更换后桥模块
1063	4	10-4	Lining Wear Sensor Axle 2 Right - voltage below normal or shorted low	后桥右侧摩擦片磨损传感器 - 电压低于正常值或对地短路		亮	- Check the wiring and the relating electric connectors of the right lining wear sensor at the rear axle (interruption ?, short circuits ?) - Check the right lining wear sensor at the rear axle (output voltage signal too low ?) - Replace the rear axle-modulator, if the relevant lining wear sensor and its wiring is faultless	*检查后桥右侧摩擦片磨损传感器线束及相关接插件 (断路?短路?) *检查后桥右侧摩擦片磨损传感器 (输出电压信号太低?) *如果摩擦片磨损传感器及其线束没问题, 更换后桥模块
1064	3	10-8	Lining Wear Sensor Axle 3 Left - voltage above normal or shorted high	附加桥左侧摩擦片磨损传感器 - 电压高于正常值或对电源短路		亮	- Check the wiring and the relating electric connectors of the left lining wear sensor at the additional axle (interruption ?, short circuits ?) - Check the left lining wear sensor at the additional axle (output voltage signal too high ?) - Replace the additional axle-modulator, if the relevant lining wear sensor and its wiring is faultless	*检查附加桥左侧摩擦片磨损传感器线束及相关接插件 (断路?短路?) *检查附加桥左侧摩擦片磨损传感器 (输出电压信号太高?) *如果摩擦片磨损传感器及其线束没问题, 更换附加桥模块
1064	4	10-8	Lining Wear Sensor Axle 3 Left - voltage below normal or shorted low	附加桥左侧摩擦片磨损传感器 - 电压低于正常值或对地短路		亮	- Check the wiring and the relating electric connectors of the left lining wear sensor at the additional axle (interruption ? short circuits ?) - Check the left lining wear sensor at the additional axle (output voltage signal too low ?) - Replace the additional axle-modulator, if the relevant lining wear sensor and its wiring is faultless	*检查附加桥左侧摩擦片磨损传感器线束及相关接插件 (断路?短路?) *检查附加桥左侧摩擦片磨损传感器 (输出电压信号太低?) *如果摩擦片磨损传感器及其线束没问题, 更换附加桥模块
1065	3	10-7	Lining Wear Sensor Axle 3 Right - voltage above normal or shorted high	附加桥右侧摩擦片磨损传感器 - 电压高于正常值或对电源短路		亮	- Check the wiring and the relating electric connectors of the right lining wear sensor at the additional axle (interruption ?, short circuits ?) - Check the right lining wear sensor at the additional axle (output voltage signal too high ?) - Replace the additional axle-modulator, if the relevant lining wear sensor and its wiring is faultless	*检查附加桥右侧摩擦片磨损传感器线束及相关接插件 (断路?短路?) *检查附加桥右侧摩擦片磨损传感器 (输出电压信号太高?) *如果摩擦片磨损传感器及其线束没问题, 更换附加桥模块
1065	4	10-7	Lining Wear Sensor Axle 3 Right - voltage below normal or shorted low	附加桥右侧摩擦片磨损传感器 - 电压低于正常值或对地短路		亮	- Check the wiring and the relating electric connectors of the right lining wear sensor at the additional axle (interruption ?, short circuits ?) - Check the right lining wear sensor at the additional axle (output voltage signal too low ?) - Replace the additional axle-modulator, if the relevant lining wear sensor and its wiring is faultless	*检查附加桥右侧摩擦片磨损传感器线束及相关接插件 (断路?短路?) *检查附加桥右侧摩擦片磨损传感器 (输出电压信号太低?) *如果摩擦片磨损传感器及其线束没问题, 更换附加桥模块
1066	2	7+5	Brake Signal Transmitter - data erratic, intermittend or incorrest	制动信号传输器 (脚阀) - 数据不稳定、间断或错误		亮	- Check / replace the EBS brake-signal-transmitter (Are both sensor signals identical when applying the brake ?) - Replace the EBS-centralmodule, if both sensor-signals of BST are correct	*检查/更换EBS制动信号传输器 (脚阀) (踩制动时两传感器信号是否相同) *如果两个传感器信号都没问题, 更换EBS BCU

SPN	PW	Blink code	Failedetection Name	故障名称	BBS 灯	BSC 灯	Repair Guide	维修指南
1066	8	7+5	Brake Signal Transmitter - abnormal frequency, pulse width or period	制动信号传输器 (脚阀) - 异常频率、脉宽或周期	亮	亮	- Check the wiring and the relating electric connectors of the EBS brake-signal transmitter (interruption ? short circuits ?) - Check the EBS brake-signal transmitter for correct function - Replace the EBS-centralmodule, if the BST and its wiring is faultless	*检查BBS制动信号传输器 (脚阀) 线束及其相关接插件 (断路?短路?) *检查BBS制动信号传输器 (脚阀) 功能是否正常? *如果BST及其线束没问题, 更换BBS BCU
1066	12	7+5	Brake Signal Transmitter - bad intelligent device or component	制动信号传输器 (脚阀) - 内部装置或部件损坏	亮	亮	- Check / replace the EBS brake-signal-transmitter (Are both sensor signals identical when applying the brake ?) - Replace the EBS-centralmodule, if both sensor-signals of BST are correct	*检查/更换BBS制动信号传输器 (脚阀) (踩制动时两路传感器信号是否相同) *如果两个传感器信号都没问题, 更换BBS BCU
1067	0	7+5	Brake Signal Sensor 1 - data valid, but above normal operation range (most severe level)	制动信号传感器1 - 数据有效但高于正常范围 (最严重级别)	亮	亮	- Check the EBS brake-signal transmitter for correct function of first sensor-signal (too high in unbraked condition ?) - Replace the centralmodule, if the BST is faultless	*检查BBS制动信号传输器 (脚阀) 第一回路传感器信号功能是否正常 (在非制动状态信号太高?) *如果BBS制动信号传输器 (脚阀) 没问题, 更换BBS BCU
1067	2	7+5	Brake Signal Sensor 1 - data erratic, intermittend or incorrect	制动信号传感器1 - 数据不稳定、间断或错误	亮	亮	- Check the wiring and the relating electric connectors of the EBSBST (interruptions or short circuits in first circuit ?) - Check the EBS brake-signal transmitter for correct function of first sensor-signal - Replace the centralmodule, if the BST and its wiring is faultless	*检查BBS制动信号传输器 (脚阀) 的线束及其相关接插件 (第一回路断路?短路?) *检查BBS制动信号传输器 (脚阀) 第一回路传感器信号功能是否正常 *如果BBS制动信号传输器 (脚阀) 和其线束没问题, 更换BBS BCU
1067	4	7+5	Brake Signal Sensor 1 - voltage below normal or shorted low	制动信号传感器1 - 电压低于正常值或对地短路	亮	亮	- Check the wiring and the relating electric connectors of the EBSBST (interruptions or short circuits in first circuit ?) - Check the EBS brake-signal transmitter for correct function of first sensor-signal - Replace the centralmodule, if the BST and its wiring is faultless	*检查BBS制动信号传输器 (脚阀) 的线束及其相关接插件 (第一回路断路?短路?) *检查BBS制动信号传输器 (脚阀) 第一回路传感器信号功能是否正常 *如果BBS制动信号传输器 (脚阀) 和其线束没问题, 更换BBS BCU
1068	0	7+5	Brake Signal Sensor 2 - data valid, but above normal operation range (most severe level)	制动信号传感器2 - 数据有效但高于正常范围 (最严重级别)	亮	亮	- Check the EBS brake-signal transmitter for correct function of second sensor-signal (too high in unbraked condition ?) - Replace the centralmodule, if the BST is faultless	*检查BBS制动信号传输器 (脚阀) 第二回路传感器信号功能是否正常 (在非制动状态信号太高?) *如果BBS制动信号传输器 (脚阀) 没问题, 更换BBS BCU
1068	2	7+5	Brake Signal Sensor 2 - data erratic, intermittend or incorrect	制动信号传感器2 - 数据不稳定、间断或错误	亮	亮	- Check the wiring and the relating electric connectors of the EBSBST (interruptions or short circuits in second circuit ?) - Check the EBS brake-signal transmitter for correct function of second sensor-signal - Replace the centralmodule, if the BST and its wiring is faultless	*检查BBS制动信号传输器 (脚阀) 的线束及其相关接插件 (第二回路断路?短路?) *检查BBS制动信号传输器 (脚阀) 第二回路传感器信号功能是否正常 *如果BBS制动信号传输器 (脚阀) 和其线束没问题, 更换BBS BCU
1068	4	7+5	Brake Signal Sensor 2 - voltage below normal or shorted low	制动信号传感器2 - 电压低于正常值或对地短路	亮	亮	- Check the wiring and the relating electric connectors of the EBSBST (interruptions or short circuits in second circuit ?) - Check the EBS brake-signal transmitter for correct function of second sensor-signal - Replace the centralmodule, if the BST and its wiring is faultless	*检查BBS制动信号传输器 (脚阀) 的线束及其相关接插件 (第二回路断路?短路?) *检查BBS制动信号传输器 (脚阀) 第二回路传感器信号功能是否正常 *如果BBS制动信号传输器 (脚阀) 和其线束没问题, 更换BBS BCU
1069	11	9+4	Tire Dimension Supervision - failure mode not identifiable / root cause not known	胎压监测 - 故障模式未知 / 根本原因未知	亮	亮	- Check all tires of the vehicle concerning correct size - Check the EOL-parameters of the EBS-centralmodule (tire circumference, pole wheel teeth numbers)	*检查车辆所有轮胎尺寸是否正确 *检查BBS BCU的参数设置 (轮胎周长、齿圈齿数)
1070	7	9+6	Vehicle Deceleration Control - mechanical system not responding properly or out of adjustment	车辆减速控制 - 机械系统没有正常响应或超出调整范围	亮	亮	- unfavourable way of driving (fading-effect) ? - control line to the trailer (e.g. yellow coupling head) not connected ? - faulty foundation brakes in the towing vehicle - faulty foundation brakes in the trailer - wrong parameters inside centralmodule (limit values, characteristics of foundation brake, ...)?	*不好的驾驶习惯 (制动力性能衰退)? *挂车控制管 (比如黄色连接头) 没接? *主车制动蹄器有问题? *挂车制动蹄器有问题? *EBS BCU中参数设置错误 (限制值、基础制动力特性...)
1079	3	10+3	Sensor Supply Voltage 1 (+5V DC) - voltage above normal or shorted high	传感器供电电压1 (+5V DC) - 电压高于正常值或对电源短路	亮	亮	- Check the wiring and the relating electric connectors of the left and right lining wear sensor at the front axle (short circuits ?) - Replace the front axle-modulator, if the wiring of the relevant lining wear sensors is faultless	*检查前桥左/右两侧摩擦片磨损传感器的线束及其相关接插件 (短路?) *如果摩擦片磨损传感器线束和接插件没问题, 更换前桥模块
1079	4	10+3	Sensor Supply Voltage 1 (+5V DC) - voltage below normal or shorted low	传感器供电电压1 (+5V DC) - 电压低于正常值或对地短路	亮	亮	- Check the wiring and the relating electric connectors of the left and right lining wear sensor at the front axle (short circuits ?) - Check the left and right lining wear sensor at the front axle (supply current too high? internal short circuits ?) - Replace the front axle-modulator, if the relevant lining wear sensors and their wiring are faultless	*检查前桥左/右两侧摩擦片磨损传感器的线束及其相关接插件 (短路?) *检查前桥左/右两侧摩擦片磨损传感器 (供电电流太高?内部短路?) *如果摩擦片磨损传感器线束和接插件没问题, 更换前桥模块
1000	3	10+6	Sensor Supply Voltage 2 (+5V DC) - voltage above normal or shorted high	传感器供电电压2 (+5V DC) - 电压高于正常值或对电源短路	亮	亮	- Check the wiring and the relating electric connectors of the left and right lining wear sensor at the rear axle (short circuits ?) - Replace the rear axle-modulator, if the wiring of the relevant lining wear sensors is faultless	*检查后桥左/右两侧摩擦片磨损传感器的线束及其相关接插件 (短路?) *如果摩擦片磨损传感器线束和接插件没问题, 更换后桥模块
1000	4	10+6	Sensor Supply Voltage 2 (+5V DC) - voltage below normal or shorted low	传感器供电电压2 (+5V DC) - 电压低于正常值或对地短路	亮	亮	- Check the wiring and the relating electric connectors of the left and right lining wear sensor at the rear axle (short circuits ?) - Check the left and right lining wear sensor at the rear axle (supply current too high? internal short circuits ?) - Replace the rear axle-modulator, if the relevant lining wear sensors and their wiring are faultless	*检查后桥左/右两侧摩擦片磨损传感器的线束及其相关接插件 (短路?) *检查后桥左/右两侧摩擦片磨损传感器 (供电电流太高?内部短路?) *如果摩擦片磨损传感器线束和接插件没问题, 更换后桥模块

SPN	故障代码	Failure detection Name	故障名称	BBS 灯	BBS 灯	BSC 灯	Repair Guide	维修指南
1090	9	7-1	Air Suspension Supply Pressure - abnormal update rate 空气悬挂气压 - 异常的更新率		亮	D	- Check the failure memory of the ECU, that transmits the AIR1 message and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the relevant ECU	*检查BCU的记忆故障, 检查AIR1报文的发送信息以及更新频率并排查故障 *检查BBS BCU和相关BCU的接插件连接以及CAN线连接
1099	1	10-2	Brake Lining Remaining, Front Axle, Left Wheel - data valid, but below normal operation range (most severe level) 前桥左轮摩擦片剩余 - 数据有效但低于正常范围 (最严重级别)		亮		- The relevant brake lining might be worn out - Replace the relevant brake lining	*对应的摩擦片可能磨完 *更换对应的摩擦片
1100	1	10-1	Brake Lining Remaining, Front Axle, Right Wheel - data valid, but below normal operation range (most severe level) 前桥右轮摩擦片剩余 - 数据有效但低于正常范围 (最严重级别)		亮		- The relevant brake lining might be worn out - Replace the relevant brake lining	*对应的摩擦片可能磨完 *更换对应的摩擦片
1101	1	10-5	Brake Lining Remaining, Rear Axle #1, Left Wheel - data valid, but below normal operation range (most severe level) 后桥左轮摩擦片剩余 - 数据有效但低于正常范围 (最严重级别)		亮		- The relevant brake lining might be worn out - Replace the relevant brake lining	*对应的摩擦片可能磨完 *更换对应的摩擦片
1102	1	10-4	Brake Lining Remaining, Rear Axle #1, Right Wheel - data valid, but below normal operation range (most severe level) 后桥右轮摩擦片剩余 - 数据有效但低于正常范围 (最严重级别)		亮		- The relevant brake lining might be worn out - Replace the relevant brake lining	*对应的摩擦片可能磨完 *更换对应的摩擦片
1103	1	10-8	Brake Lining Remaining, Rear Axle #2, Left Wheel - data valid, but below normal operation range (most severe level) 附加桥左轮摩擦片剩余 - 数据有效但低于正常范围 (最严重级别)		亮		- The relevant brake lining might be worn out - Replace the relevant brake lining	*对应的摩擦片可能磨完 *更换对应的摩擦片
1104	1	10-7	Brake Lining Remaining, Rear Axle #2, Right Wheel - data valid, but below normal operation range (most severe level) 附加桥右轮摩擦片剩余 - 数据有效但低于正常范围 (最严重级别)		亮		- The relevant brake lining might be worn out - Replace the relevant brake lining	*对应的摩擦片可能磨完 *更换对应的摩擦片
1230	2	9-3	Current Data Link - data erratic, intermittend or incorrect 当前数据连接 - 数据不稳定、间断或错误		亮	亮	- Replace rear axle modulator - Replace additional axle modulator	*检查/更换后桥模块 *检查/更换附加桥模块
1230	19	9-3	Current Data Link - received network data in error 当前数据连接 - 接收到错误的网络数据		亮	亮	- Replace front axle modulator - Replace rear axle modulator	*检查/更换前桥模块 *检查/更换后桥模块
1430	12	7-4	ABS/EBS Amber Warning Signal (Powered Vehicle) - bad intelligent device or component ABS/SBS 黄色报警信号 - 内部装置或部件损坏				- Check EBS-centralmodule for correct EOL configuration (parameter "amber lamp" yes/no) - Check the wiring and the relating electric connectors of the amber failure lamp (interruption ? short circuits ?) - Check the amber failure lamp (faulty ?) - Replace the EBS-centralmodule, if the amber-lamp and the wiring is faultless	*检查BBS BCU参数设置中是否设置了黄色报警灯 *检查黄色报警灯的线束及其相关接插件 (断路/短路?) *检查黄色报警灯 (失效?) *如果黄色报警灯及其线束没问题, 更换BBS BCU
1439	12	7-4	EBS Red Warning Signal - bad intelligent device or component SBS 红报警信号 - 内部装置或部件损坏		亮		- Check EBS-centralmodule for correct EOL configuration (parameter "red lamp" yes/no) - Check the wiring and the relating electric connectors of the red failure lamp (interruption ? short circuits ?) - Check the red failure lamp (faulty ?) - Replace the EBS-centralmodule, if the red-lamp and the wiring is faultless	*检查BBS BCU参数设置中是否设置了红色报警灯 *检查红色报警灯的线束及其相关接插件 (断路/短路?) *检查红色报警灯 (失效?) *如果红色报警灯及其线束没问题, 更换BBS BCU
1482	8	7-1	Source Address of Controlling Device for Transmission Control - abnormal frequency, pulse width or period 变速箱控制装置源地址 - 异常频率、脉宽或周期		亮	D	- Check the failure memory of the transmission-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the transmission-ECU	*检查记忆故障中的变速箱控制装置故障并排查故障 *检查变速箱控制装置相关报文信息 *检查BBS BCU和相关 (变速箱) BCU的接插件连接以及CAN线连接
1482	9	7-1	Source Address of Controlling Device for Transmission Control - abnormal update rate 变速箱控制装置源地址 - 异常的更新率		亮	D	- Check the failure memory of the transmission-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the transmission-ECU	*检查记忆故障中的变速箱控制装置故障并排查故障 *检查变速箱控制装置相关报文信息 *检查BBS BCU和相关 (变速箱) BCU的接插件连接以及CAN线连接
1482	10	7-1	Source Address of Controlling Device for Transmission Control - abnormal rate of change 变速箱控制装置源地址 - 异常的更新率		亮	D	- Check the failure memory of the transmission-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the transmission-ECU	*检查记忆故障中的变速箱控制装置故障并排查故障 *检查变速箱控制装置相关报文信息 *检查BBS BCU和相关 (变速箱) BCU的接插件连接以及CAN线连接
1482	19	7-1	Source Address of Controlling Device for Transmission Control - received network data in error 变速箱控制装置源地址 - 接收到错误的网络数据		亮	D	- Check the failure memory of the transmission-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the transmission-ECU	*检查记忆故障中的变速箱控制装置故障并排查故障 *检查变速箱控制装置相关报文信息 *检查BBS BCU和相关 (变速箱) BCU的接插件连接以及CAN线连接

SPN	PID	Blink code	Failedetection Name	故障名称	BBS 红灯	BSC 黄灯	Repair Guide	维修指南
1483	8	7-1	Source Address of Controlling Device for Engine Control - abnormal frequency, pulse width or period	发动机控制装置源地址 - 异常频率、脉宽或周期	亮	D	- Check the failure memory of the engine-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the engine-ECU	*检查记忆故障中的发动机控制装置的故障并排查故障 *检查发动机控制装置相关报文信息 *检查BBS ECU和相关 (发动机 ECU) 的接插件连接以及CAN线连接
1483	9	7-1	Source Address of Controlling Device for Engine Control - abnormal update rate	发动机控制装置源地址 - 异常的更新率	亮	D	- Check the failure memory of the engine-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the engine-ECU	*检查记忆故障中的发动机控制装置的故障并排查故障 *检查发动机控制装置相关报文信息 *检查BBS ECU和相关 (发动机 ECU) 的接插件连接以及CAN线连接
1483	10	7-1	Source Address of Controlling Device for Engine Control - abnormal rate of change	发动机控制装置源地址 - 异常更新率	亮	D	- Check the failure memory of the engine-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the engine-ECU	*检查记忆故障中的发动机控制装置的故障并排查故障 *检查发动机控制装置相关报文信息 *检查BBS ECU和相关 (发动机 ECU) 的接插件连接以及CAN线连接
1542	1	8-6	ECU Power Supply Voltage #2 - data valid, but below normal operation range (most severe level)	ECU 供电#2 - 数据有效但低于正常范围 (最严重级别)	亮	亮	- Check the relevant fuse at terminal 30a (might be blown) - Check the electric supply line "terminal 30a" (broken ? increased electric resistance ?) - Check the terminal 30a line for other voltage drops - Replace EBS-centralmodule	*检查常电30a的保险丝 (可能烧了) *检查常电30a的供电线路 (损坏/断路?) *检查30a线路的电压降 *更换BBS ECU
1542	4	8-6	ECU Power Supply Voltage #2 - voltage below normal or shorted low	ECU 供电#2 - 电压低于正常值或地对地短路	亮	亮	- Check the relevant fuse at terminal 30a (might be blown) - Check the electric supply line "terminal 30a" (broken ? increased electric resistance ?) - Check the terminal 30a line for other voltage drops - Replace EBS-centralmodule	*检查常电30a的保险丝 (可能烧了) *检查常电30a的供电线路 (损坏/断路?) *检查30a线路的电压降 *更换BBS ECU
1543	1	8-6	ECU Power Supply Voltage #3 - data valid, but below normal operation range (most severe level)	ECU 供电#3 - 数据有效但低于正常范围 (最严重级别)	亮	亮	- Check the relevant fuse at terminal 30b (might be blown) - Check the electric supply line "terminal 30b" (broken ? increased electric resistance ?) - Check the terminal 30b line for other voltage drops - Check the voltage supply lines to the rear axle-modulator and the additional-axe modulator (there might be short circuits to ground) - Check the rear axle-modulator and the additional-axe modulator (there might be internal short circuits of the voltage supply to ground potential) - Replace the EBS-centralmodule	*检查常电30b的保险丝 (可能烧了) *检查常电30b的供电线路 (损坏/断路?) *检查30b线路的电压降 *检查后桥模块和附加桥模块的供电线路 (可能对地短路?) *检查后桥模块和附加桥模块 (可能内部供电对地短路) *更换BBS ECU
1543	4	8-6	ECU Power Supply Voltage #3 - voltage below normal or shorted low	ECU 供电#3 - 电压低于正常值或地对地短路 (最严重级别)	亮	亮	- Check the relevant fuse at terminal 30b (might be blown) - Check the electric supply line "terminal 30b" (broken ? increased electric resistance ?) - Check the terminal 30b line for other voltage drops - Check the voltage supply lines to the rear axle-modulator and the additional-axe modulator (there might be short circuits to ground) - Check the rear axle-modulator and the additional-axe modulator (there might be internal short circuits of the voltage supply to ground potential) - Replace the EBS-centralmodule	*检查常电30b的保险丝 (可能烧了) *检查常电30b的供电线路 (损坏/断路?) *检查30b线路的电压降 *检查后桥模块和附加桥模块的供电线路 (可能对地短路?) *检查后桥模块和附加桥模块 (可能内部供电对地短路) *更换BBS ECU
1743	2	8-7	Lift Axle 1 Position - data erratic, intermittend or incorrect	提升桥1位置-数据不稳定、间断或错误	亮	亮	It is not necessary to repair the EBS-System (ESC is switched off, because the front axle has a high level / air suspension)	*无需维修BBS系统 (ESC功能已经关闭, 因为前轴空气悬架在比较高的位置)
1743	7	8-7	Lift Axle 1 Position - mechanical system not responding properly or out of adjustment	提升桥1位置 - 机械系统没有正常响应或超出调整范围	亮	亮	- Check, if airgap at wheelspeed sensors (additional axle) is too high - Check, that ECAS sends correct ASC1 liftaxle info	*检查 (附加桥) 轮速传感器间隙是否太大 *检查BCAS发送的 "ASC1" 报文中的提升桥信息是否正确
1743	8	8-7	Lift Axle 1 Position - abnormal frequency, pulse width or period	提升桥1位置 - 异常频率、脉宽或周期	亮	D	- Check the failure memory of the ECAS-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and ECAS-ECU	*检查BBS ECU中存储的关于BCAS的记忆故障并维修 *检查BCAS的相关报文信息 *检查BBS ECU和相关 (BCAS) ECU的接插件连接以及CAN线连接
1743	9	8-7	Lift Axle 1 Position - abnormal update rate	提升桥1位置 - 异常的更新率	亮	D	- Check the failure memory of the ECAS-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and ECAS-ECU	*检查BCAS的相关报文信息 *检查BBS ECU和相关 (BCAS) ECU的接插件连接以及CAN线连接
1743	10	8-7	Lift Axle 1 Position - abnormal rate of change	提升桥1位置 - 异常更新率	亮	D	- Check the failure memory of the ECAS-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and ECAS-ECU	*检查BBS ECU中存储的关于BCAS的记忆故障并维修 *检查BCAS的相关报文信息 *检查BBS ECU和相关 (BCAS) ECU的接插件连接以及CAN线连接
1793	12	7-4	ATC/ASR Information Signal - bad intelligent device or component	ATC/ASR 信息信号 - 内部装置或部件损坏	亮	亮	- Check the traction control lamp and its connectors and wiring - Check blinkcode tip-switch and its wiring (optional) - Was blinkcode tip-switch depressed, when vehicle was not in standstill ? (this is not permitted)	*检查ASR/ATC指示灯和它的线束及接插件 *检查闪烁开关及其线束 (可能的) *车辆在非静止状态下按了闪烁开关? (这是不允许的)
1807	0	2-5	Steering Wheel Angle - data valid, but above normal operation range (most severe level)	方向盘转角 - 数据有效但高于正常范围 (最严重级别)	亮	亮	- Check EOL-parameter for mounting-direction (SAS) - Check the mechanical steering elements at the front axle (defect, twisted, faulty assembly, etc.) - Check the mounting position of the steering angle sensor on the steering shaft (cranky, faulty assembly, etc.) - Replace the steering angle sensor	*检查BBS ECU参数设置中关于转向角度传感器的安装方向的设置 *检查前桥转向机构的机械部件 (缺陷、扭曲、装配错误等) *检查转向角度传感器在转向管柱上的安装位置 (扭曲、装配错误等) *更换转向角度传感器

SPN	FM	Blink code	Failure detection Name	故障名称	EBS 红灯	EBS 黄灯	ESC 灯	Repair Guide	维修指南
1007	1	2-5	Steering Wheel Angle - data valid, but below normal operation range (most severe level)	方向盘转角 - 数据有效但低于正常范围 (最严重级别)			亮	- Check the wiring and connectors (voltage supply) to the steering wheel sensor	*检查转向角度传感器的供电线路及接插件
1007	2	2-5	Steering Wheel Angle - data erratic, intermittent or incorrect	方向盘转角 - 数据不稳定、间断或错误			亮	- Check the EBS-centralmodule concerning correct EOLparameter (steering ratio, wheelbase, wheel diameter, etc.) - Check, whether the SAS is correctly assembled - Replace the steering angle sensor	*检查EBS ECU中的参数设置(转向比、轴距、轮胎周长等) *检查转向角度传感器的装配是否正确 *更换转向角度传感器
1007	7	2-5	Steering Wheel Angle - mechanical system not responding properly or out of adjustment	方向盘转角 - 机械系统没有正常响应或超出调整范围			亮	- Check the EBS-centralmodule concerning correct EOLparameter (steering ratio, wheelbase, wheel diameter, etc.) - Check, whether the SAS is correctly assembled - Replace the steering angle sensor	*检查EBS ECU中的参数设置(转向比、轴距、轮胎周长等) *检查转向角度传感器的装配是否正确 *更换转向角度传感器
1007	8	9-3	Steering Wheel Angle - abnormal frequency, pulse width or period	方向盘转角 - 异常频率、脉宽或周期			亮	- Check the wiring (CAN) to the steering wheel sensor. Failure is detected by the steering wheel sensor. - Check / replace the steering wheel sensor	*检查转向角度传感器的CAN线连接, 故障由转向角度传感器发现 *检查/更换转向角度传感器
1007	9	9-3	Steering Wheel Angle - abnormal update rate	方向盘转角 - 异常的更新率			亮	- Check centralmodule for correct EOL-configuration (steering wheel sensor yes/no) - Check the wiring between EBS-centralmodule and steering wheel sensor - Check the steering wheel sensor / replace the steering wheel sensor	*检查EBS ECU参数设置中是否设置了转向角度传感器 *检查EBS ECU和转向角度传感器之间的线束连接 *检查/更换转向角度传感器
1007	10	2-5	Steering Wheel Angle - abnormal rate of change	方向盘转角 - 异常的更新率			亮	- Check, if SAS is mechanically connected to the steering-column (does it rotate ?) - Check and replace steering angle sensor	*转向角度传感器是否正常连接到转向管柱 (能否正常随转向管柱转动?) *检查/更换转向角度传感器
1007	11	2-5	Steering Wheel Angle - failure mode not identifiable / root cause not known	方向盘转角 - 故障模式未知/根本原因未知			亮	- Check, if the correct SAS-type is assembled	*检查是否正确安装了正确的转向角度传感器?
1007	12	2-5	Steering Wheel Angle - bad intelligent device or component	方向盘转角 - 内部装置或部件损坏			亮	- Replace steering angle sensor	*检查转向角度传感器 *更换转向角度传感器
1007	13	0-4	Steering Wheel Angle - out of calibration	方向盘转角 - 校验异常			亮	- Check the EBS-centralmodule concerning correct EOLparameters of the steering wheel sensor - SAS assembled (yes/no) - SAS type	*检查EBS ECU中是否正确设置了转向角度传感器的相关参数 (转向角度传感器类型) *检查转向角度传感器的安装, 转向角度传感器与转向管柱之间是否正确连接 *更换转向角度传感器
1007	14	2-5	Steering Wheel Angle - special instructions	方向盘转角 - 特殊说明			亮	- Check the EBS-centralmodule concerning correct EOLparameter (steering wheel sensor type) - Check, whether the correct SAS type is assembled at the vehicle - Check the steering angle sensor / replace the steering angle sensor - Check the centralmodule / replace the centralmodule	*检查EBS ECU中是否正确设置了转向角度传感器的相关参数 (转向角度传感器类型) *检查安装在车上的转向角度传感器类型是否正确 *检查/更换EBS ECU
1007	17	2-5	Steering Wheel Angle - data valid, but below normal operation range (least severe level)	方向盘转角 - 数据有效但低于正常范围 (最轻级别)			亮	If this failure is only active for a short time frame after ignition on, no repair is necessary. If this failure stays active for a long time during driving, the following repair is necessary: - check the mechanical assembly of the SAS and check the correct connection between SAS and steering-shaft - replace SAS	如果故障只是在点火后短暂出现, 没必要维修 如果在行车中长时间出现此故障, 有必要做如下检查: *检查转向角度传感器的安装, 转向角度传感器与转向管柱之间是否正确连接 *更换转向角度传感器
1007	18	2-5	Steering Wheel Angle - data valid, but below normal operation range (moderately severe level)	方向盘转角 - 数据有效但低于正常范围 (中等级别)			亮	- Check the mechanical connection between steering angle sensor and steering shaft (loosened ?) - Replace the steering angle sensor	*检查转向角度传感器和转向管柱之间的连接 (松动?) *更换转向角度传感器
1007	19	9-3	Steering Wheel Angle - received network data in error	方向盘转角 - 接收到错误的网络数据			亮	- Check the EOL-Parameter "SAS Type" - Check the steering wheel sensor / replace the steering wheel sensor	*检查EBS ECU中设置的转向角度传感器类型 *检查/更换转向角度传感器
1007	31	0-4	Steering Wheel Angle - condition exists	方向盘转角 - 条件存在			亮	- Perform calibration procedure of SAS - If SAS cannot be calibrated, replace SAS	*进行转向角度传感器标定程序 *如果转向角度传感器无法标定, 更换转向角度传感器
1008	0	2-4	Yaw Rate - data valid, but above normal operation range (most severe)	横摆角速度 - 数据有效但高于正常范围 (最严重级别)			亮	- Replace ESC-module	*检查ESC模块安装以及ESC模块和ECU之间的线束及相关的电气接插件 *检查/更换ESC模块
1008	1	2-4	Yaw Rate - data valid, but below normal operation range (most severe)	横摆角速度 - 数据有效但低于正常范围 (最严重级别)			亮	- Replace ESC-module	*检查ESC模块安装以及ESC模块和ECU之间的线束及相关的电气接插件 *检查/更换ESC模块
1008	2	2-4	Yaw Rate - data erratic, intermittent or incorrect	横摆角速度 - 数据不稳定、间断或错误			亮	- Replace ESC-module	*检查ESC模块安装以及ESC模块和ECU之间的线束及相关的电气接插件 *检查/更换ESC模块
1008	7	2-4	Yaw Rate - mechanical system not responding properly or out of adjustment	横摆角速度 - 机械系统没有正常响应或超出调整范围			亮	- Check EOL-parameters for mounting-direction (ESC-module, SAS) - Check correct mounting direction (assembly position) of ESCModule - Check correct mounting direction of steering angle sensor - Replace ESC-module	*检查EBS ECU参数设置中设置的ESC模块和转向角度传感器的安装方向 *检查ESC模块的安装方向是否正确 *检查转向角度传感器的安装方向是否正确 *更换ESC模块
1008	11	2-4	Yaw Rate - failure mode not identifiable / root cause not known	横摆角速度 - 故障模式未知/根本原因未知			亮	- Check / replace ESC-module - Check / replace steering angle sensor	*检查/更换ESC模块 *检查/更换转向角度传感器

SPN	FMI	Link code	Failed detection Name	故障名称	BBS 红灯	BBS 黄灯	BSC 灯	Repair Guide	维修指南	
1000	12	2+4	Yaw Rate - bad intelligent device or component	横摆角速度 - 内部装置或部件损坏			亮	- Replace ESC-module	*检查ESC模块安装以及ESC模块和BCU之间的线束及相关的电气接插件 *检查/更换ESC模块	
1000	13	2+4	Yaw Rate - out of calibration	横摆角速度 - 校验异常			亮	- Check EOL-parameter for mounting-direction of ESC-module - Check correct mounting direction (assembly position) of ESCmodule - Check and replace ESC-module - Check and replace steering angle sensor	*检查BBS BCU参数设置中设置的ESC模块安装方向 *检查ESC模块的安装方向是否正确 *检查/更换ESC模块 *检查/更换转向角度传感器	
1000	14	2+4	Yaw Rate - special instructions	横摆角速度 - 特殊说明			亮	- Check the EBS-centralmodule concerning correct EOLparameter (steering ratio, wheelbase, wheel diameter, etc.) - Check, whether the ESC-module is assembled in correct position - Replace the ESC-module	*检查BBS BCU相关参数设置是否正确(转向比、轴距、轮胎周长等) *检查ESC模块安装位置是否正确 *更换ESC模块	
1000	15	2+4	Yaw Rate - data valid, but above normal operation range (least severe level)	横摆角速度 - 数据有效但高于正常范围(最轻级别)			亮	- Replace ESC-module	*检查ESC模块安装以及ESC模块和BCU之间的线束及相关的电气接插件 *检查/更换ESC模块	
1000	16	2+4	Yaw Rate - data valid, but above normal operation range (moderately severe level)	横摆角速度 - 数据有效但高于正常范围(中等级别)			亮	- Replace ESC-module	*检查ESC模块安装以及ESC模块和BCU之间的线束及相关的电气接插件 *检查/更换ESC模块	
1000	17	2+4	Yaw Rate - data valid, but below normal operation range (least severe level)	横摆角速度 - 数据有效但低于正常范围(最轻级别)			亮	- Check EOL-parameter for mounting-direction of ESC-module - Check correct mounting direction (assembly position) of ESCmodule - Replace ESC-module	*检查BBS BCU参数设置中设置的ESC模块安装方向 *检查ESC模块的安装方向是否正确 *更换ESC模块	
1000	19	2+4	Yaw Rate - received network data in error	横摆角速度 - 接收到错误的网络数据			亮	- Check / replace ESC-module	*检查ESC模块安装以及ESC模块和BCU之间的线束及相关的电气接插件 *检查/更换ESC模块	
1009	1	2+4	Lateral Acceleration - data valid, but below normal operation range (most severe level)	横向加速度 - 数据有效但低于正常范围(最严重级别)			亮	- Replace ESC-module	*检查ESC模块安装以及ESC模块和BCU之间的线束及相关的电气接插件 *检查/更换ESC模块	
1009	2	2+4	Lateral Acceleration - data erratic, intermittend or incorrect	横向加速度 - 数据不稳定、间断或错误			亮	- Replace ESC-module	*检查ESC模块安装以及ESC模块和BCU之间的线束及相关的电气接插件 *检查/更换ESC模块	
1009	7	2+4	Lateral Acceleration - mechanical system not responding properly or out of adjustment	横向加速度 - 机械系统没有正常响应或超出调整范围			亮	- Check EOL-parameters for mounting-direction (ESC-module, SAS) - Check correct mounting direction (assembly position) of ESCmodule - Check correct mounting direction of steering angle sensor - Replace ESC-module	*检查BBS BCU参数设置中设置的ESC模块和转向角度传感器的安装方向 *检查ESC模块的安装方向是否正确 *检查转向角度传感器安装方向是否正确 *更换ESC模块	
1009	12	2+4	Lateral Acceleration - bad intelligent device or component	横向加速度 - 内部装置或部件损坏			亮	- Replace ESC-module	*检查ESC模块 *更换ESC模块	
1009	14	2+4	Lateral Acceleration - special instructions	横向加速度 - 特殊说明			亮	- Check the EBS-centralmodule concerning correct EOLparameter (steering ratio, wheelbase, wheel diameter, etc.) - Check, whether the ESC-module is assembled in correct position - Replace the ESC-module	*检查BBS BCU相关参数设置是否正确(转向比、轴距、轮胎周长等) *检查ESC模块安装位置是否正确 *更换ESC模块	
1009	15	2+4	Lateral Acceleration - data valid, but above normal operation range (least severe level)	横向加速度 - 数据有效但高于正常范围(最轻级别)			亮	- Check EOL-parameter for mounting-direction of ESC-module - Check correct mounting direction (assembly position) of ESCmodule - Replace ESC-module	*检查BBS BCU参数设置中设置的ESC模块安装方向 *检查ESC模块的安装方向是否正确 *更换ESC模块	
1009	16	2+4	Lateral Acceleration - data valid, but above normal operation range (moderately severe level)	横向加速度 - 数据有效但高于正常范围(中等级别)			亮	- Check EOL-parameter for mounting-direction of ESC-module - Check correct mounting direction (assembly position) of ESCmodule - Replace ESC-module	*检查BBS BCU参数设置中设置的ESC模块安装方向 *检查ESC模块的安装方向是否正确 *更换ESC模块	
1009	17	2+4	Lateral Acceleration - data valid, but below normal operation range (least severe level)	横向加速度 - 数据有效但低于正常范围(最轻级别)			亮	- Check EOL-parameter for mounting-direction of ESC-module - Check correct mounting direction (assembly position) of ESCmodule - Replace ESC-module	*检查BBS BCU参数设置中设置的ESC模块安装方向 *检查ESC模块的安装方向是否正确 *更换ESC模块	
1011	7	2+5	Steering Wheel Turn Counter - mechanical system not responding properly or out of adjustment	方向盘转向计数器 - 机械系统没有正常响应或超出调整范围			亮	- Check EOL-parameter for mounting-direction (SAS) - Check the mechanical steering elements at the front axle (defect, twisted, faulty assembly, etc.) - Check the mounting position of the steering angle sensor on the steering shaft (cranky, faulty assembly, etc.) - Replace the steering angle sensor	*检查BBS BCU参数设置中设置的转向角度传感器的安装方向 *检查前桥转向机构的机械部件(缺陷、扭曲、装配错误等) *检查转向角度传感器在转向管柱上的安装位置(扭曲、装配错误等) *更换转向角度传感器	
2000	8	7+1	Source Address 0 (engine #1) - abnormal frequency, pulse width or period	源地址 0 (发动机 #1) - 异常频率、脉宽或周期			亮	D	- Check the failure memory of the CCVS-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the CCVS-ECU	*检查BBS BCU中存储的关于CCVS的记忆故障并排查故障 *检查BBS BCU和相关BCU的接插件连接以及CAN线连接
2000	9	7+1	Source Address 0 (engine #1) - abnormal update rate	源地址 0 (发动机 #1) - 异常的更新率			亮	D	- Check the failure memory of the engine-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the engine-ECU	*检查BBS BCU中存储的关于发动机ECU的记忆故障并排查故障 *检查BBS BCU和发动机ECU的接插件连接以及CAN线连接

SPN	FM	Blinks code	Failedetection Name	故障名称	BSB 灯	BSC 灯	Repair Guide	维修指南
2015	9	7-1	Source Address 15 (engine retarder ?) - abnormal update rate	源地址15 (发动机缓速器?) - 异常的更新率	亮	D	- Check the failure memory of the engine-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the engine-ECU	*检查BSB ECU中存储的关于发动机ECU的记忆故障并排查故障 *检查BSB ECU和发动机ECU的接插件连接以及CAN线连接
2015	10	7-1	Source Address 15 (engine retarder ?) - abnormal rate of change	源地址15 (发动机缓速器?) - 异常的更新率	亮	D	- Check the failure memory of the engine-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the engine-ECU	*检查BSB ECU中存储的关于发动机ECU的记忆故障并排查故障 *检查BSB ECU和发动机ECU的接插件连接以及CAN线连接
2016	9	7-1	Source Address 16 (driveline retarder ?) - abnormal update rate	源地址16 (传动系统缓速器?) - 异常的更新率	亮	D	- Check the failure memory of the driveline retarder ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the driveline retarder ECU	*检查BSB ECU中存储的关于传动系统缓速器ECU的记忆故障并排查故障 *检查BSB ECU和传动系统缓速器ECU的接插件连接以及CAN线连接
2016	10	7-1	Source Address 16 (driveline retarder ?) - abnormal rate of change	源地址16 (传动系统缓速器?) - 异常的更新率	亮	D	- Check the failure memory of the driveline retarder ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the driveline retarder ECU	*检查BSB ECU中存储的关于传动系统缓速器ECU的记忆故障并排查故障 *检查BSB ECU和传动系统缓速器ECU的接插件连接以及CAN线连接
2041	9	7-1	Source Address 41 (exhaust retarder ?) - abnormal update rate	源地址41 (排气制动?) - 异常的更新率	亮	D	- Check the failure memory of the exhaust retarder ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the exhaust retarder ECU	*检查BSB ECU中存储的关于排气制动ECU的记忆故障并维修 *检查BSB ECU和排气制动ECU的接插件连接以及CAN线连接
2041	10	7-1	Source Address 41 (exhaust retarder ?) - abnormal rate of change	源地址41 (排气制动?) - 异常的更新率	亮	D	- Check the failure memory of the exhaust retarder ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the exhaust retarder ECU	*检查BSB ECU中存储的关于排气制动ECU的记忆故障并维修 *检查BSB ECU和排气制动ECU的接插件连接以及CAN线连接
2047	9	7-1	Source Address 47 - abnormal update rate	源地址47 - 异常的更新率	亮	D	- Check the failure memory of the ECU, that transmits the vehicle weight message and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the relevant ECU	*检查BSB ECU中存储的关于整车重量信息传输的记忆故障并排查故障 *检查BSB ECU和相关ECU的接插件连接以及CAN线连接
2622	9	9+8	EB1_x CAN Message / HillholderSystem - Haltbrake - abnormal update rate	EB1_x报文/坡道起步辅助系统/驻车制动 - 异常的更新率	亮	D	- Check the failure memory of the halbrake ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the halbrake ECU (send EB1_x message)	*检查BSB ECU中存储的关于驻车制动的记忆故障并排查故障 *检查BSB ECU和相关 (发送EB1_x报文) ECU的接插件连接以及CAN线连接
2927	2	7-10	Actual Inner wheel steering angle - data erratic, intermitten or incorrect	实测的内部转向角度 - 数据不稳定、间断或错误	亮		- Check EBS-system for correct parameters concerning steer axle function (3rd axle) - Check the sensing of the steering-system. Possible causes are: a) Failure of sensing by defect sensor or broken wiring etc. or b) De-adjustment of sensor by external influences or loosened screws - Check steering wheel angle sensing / replace SAS if necessary	*检查BSB系统关于转向功能相关设置是否正确 (附加桥) *检查附加转向系统传感器的感应信号, 可能的原因有: a) 传感器故障或者传感器线束损坏导致感应故障 b) 外部原因或者螺栓松动造成的传感器感应故障 *检查转向角度传感器感应信号/如有必要更换SAS
2927	9	7-10	Actual Inner wheel steering angle - abnormal update rate	实测的内部转向角度 - 异常的更新率	亮	D	- Check the failure memory of the ESC-ECU (steering system, 3rd axle) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the ESC-ECU (steering system, 3rd axle)	*检查BSB ECU中的关于ESC的记忆故障 (附加转向的转向信号ESC1) 并排查故障 *检查BSB ECU和ESC ECU (转向系统, 附加桥) 的接插件连接以及CAN线连接
3509	3	2+6	Sensor supply voltage 1 - voltage above normal or shorted high	传感器供电电压1 - 电压高于正常值或对电源短路	亮		- Check the supply-line of the ESC-module (permanent short circuit to +UB ?) - Replace the EBS-centralmodule	*检查ESC模块供电线路 (一直对电源短路?) *更换BSB ECU
3509	4	2+6	Sensor supply voltage 1 - voltage below normal or shorted low	传感器供电 1 - 电压低于正常值或对地短路	亮		- Check the supply-line of the ESC-module (short circuit to GND ?) - Check the ESC-module (supply current too high ? internal short circuit to GND ?) - Replace the EBS-centralmodule	*检查ESC模块供电线路 (是否对地短路?) *检查ESC模块 (供电电流太高?内部对地短路?) *更换BSB ECU
3510	3	2+6	Sensor supply voltage 2 - voltage above normal or shorted high	传感器供电 2 - 电压高于正常值或对电源短路	亮		- Check the supply-line of the steering angle sensor (permanent short circuit to +UB ?) - Replace the EBS-centralmodule	*检查转向角度传感器供电线路 (一直对电源短路?) *更换BSB ECU
3510	4	2+6	Sensor supply voltage 2 - voltage below normal or shorted low	传感器供电 2 - 电压低于正常值或对地短路	亮		- Check the supply-line of the steering angle sensor (short circuit to GND ?) - Check the steering angle sensor (supply current too high ? internal short circuit to GND ?) - Replace the EBS-centralmodule	*检查转向角度传感器供电线路 (是否对地短路?) *检查转向角度传感器 (供电电流太高?内部对地短路?) *更换BSB ECU
3511	3	10+9	Sensor supply voltage 3 - voltage above normal or shorted high	传感器供电 3 - 电压高于正常值或对电源短路	亮		- Check the wiring and the relating electric connectors of the left and right lining wear sensor at the additional axle (short circuits ?) - Replace the additional axle-modulator, if the wiring of the relevant lining wear sensors is faultless	*检查附加桥左右摩擦片磨损传感器线束和相关接插件 (短路?) *如果摩擦片磨损传感器及其线束没问题, 更换附加桥模块

SPN	FMI	Blink code	Failed detection Name	故障名称	BBS 灯	BBS 灯	BBS 灯	Repair Guide	维修指南
3511	4	10+9	Sensor supply voltage 3 - voltage below normal or shorted low	传感器供电 3 - 电压低于正常值或短路		亮		- Check the wiring and the relating electric connectors of the left and right lining wear sensor at the additional axle (short circuits ?) - Check the left and right lining wear sensor at the additional axle (supply current too high? internal short circuits ?) - Replace the additional axle-modulator, if the relevant lining wear sensors and their wiring are faultless	*检查附加桥左右摩擦片磨损传感器线束和相关接插件(短路?) *检查附加桥左右摩擦片磨损传感器(供电电流太高?内部短路?) *如果摩擦片磨损传感器及其线束没问题, 更换附加桥模块
3541	12	9+9	Brake Light Relay - bad intelligent device or component	制动灯继电器 - 内部装置或部件损坏		亮		- Check EBS-centralmodule for correct EOL-configuration (brakelight relay yes/no) - Check the wiring and the relating electric connectors of the brake-light relay (interruption, short circuits ?) - Check the brake-light relay (Internal interruption or short circuits ?) - Replace the EBS-centralmodule, if the brake-light relay and the relevant wiring is faultless	*检查BBS BCU中参数设置中是否设置了制动灯继电器 (yes/no?) *检查制动灯继电器线束及相关接插件(断路, 短路?) *检查制动灯继电器(内部断路或短路?) *如果制动灯继电器及相关线束没问题, 更换BBS BCU
3541	13	8+4	Brake Light Relay - out of calibration	制动灯继电器 - 校验异常		亮	亮	- Check EBS-centralmodule for correct EOL-configuration (brakelight relay yes/no) - Is something connected to the relevant brake-light relay pins of the centralmodule ? - Replace the EBS-centralmodule	*检查BBS BCU中参数设置中是否设置了制动灯继电器 (yes/no?) *BBS BCU对应的制动灯继电器针脚位置是否接了别的零部件? *更换BBS BCU
3839	0	2+10	Brake Temperature Warning - data valid, but above normal operation range (most severe level)	制刹器温度报警 - 数据有效但高于正常范围(最严重级别)		亮		- was the vehicle operated on long distance slopes ? - unfavourable way of driving or an insufficient use of retarders ? - wrong parameters inside centralmodule (limit values, characteristics of foundation brake, ...)?	*车辆在长下坡环境下行驶? *不好的驾驶习惯或者没有充分利用缓速器? *BBS BCU中参数设置错误(限值值、基础制刹特征值...)?
3839	15	2+10	Brake Temperature Warning - data valid, but above normal operation range (least severe level)	制刹器温度报警 - 数据有效但高于正常范围(最轻级别)		亮		- was the vehicle operated on long distance slopes ? - unfavourable way of driving or an insufficient use of retarders ? - wrong parameters inside centralmodule (limit values, characteristics of foundation brake, ...)?	*车辆在长下坡环境下行驶? *不好的驾驶习惯或者没有充分利用缓速器? *BBS BCU中参数设置错误(限值值、基础制刹特征值...)?
500205	13	8+4	EBS system/module compatibility (centralmodule) - out of calibration	BBS系统/BBS BCU - 校验异常		亮	亮	- For a correct EBS-function, a right combination of EBScentralmodule, front-axle modulator, rear-axle modulator, additional-axle modulator (optional) and ESC-module (optional) must be assembled in the vehicle. Please read the numbers of all these components and check them for compatibility against each other.	*为了保证BBS功能正常, 正确组合的BBSBCU、前桥模块、后桥模块、附加桥模块(可选)及ESC模块(可选)等必须安装在车辆上。 *在装车后读取各部件产品型号并检查它们互相之间是否兼容
500206	13	8+4	EBS system/module compatibility (front axle modulator) - out of calibration	BBS系统/前桥模块 - 校验异常		亮	亮	- For a correct EBS-function, a right combination of EBScentralmodule, front-axle modulator, rear-axle modulator, additional-axle modulator (optional) and ESC-module (optional) must be assembled in the vehicle. Please read the numbers of all these components and check them for compatibility against each other.	*为了保证BBS功能正常, 正确组合的BBSBCU、前桥模块、后桥模块、附加桥模块(可选)及ESC模块(可选)等必须安装在车辆上。 *在装车后读取各部件产品型号并检查它们互相之间是否兼容
500207	13	8+4	EBS system/module compatibility (rear axle modulator) - out of calibration	BBS系统/后桥模块 - 校验异常		亮	亮	- For a correct EBS-function, a right combination of EBScentralmodule, front-axle modulator, rear-axle modulator, additional-axle modulator (optional) and ESC-module (optional) must be assembled in the vehicle. Please read the numbers of all these components and check them for compatibility against each other.	*为了保证BBS功能正常, 正确组合的BBSBCU、前桥模块、后桥模块、附加桥模块(可选)及ESC模块(可选)等必须安装在车辆上。 *在装车后读取各部件产品型号并检查它们互相之间是否兼容
500208	13	8+4	EBS system/module compatibility (additional axle modulator) - out of calibration	BBS系统/附加桥模块 - 校验异常		亮	亮	- For a correct EBS-function, a right combination of EBScentralmodule, front-axle modulator, rear-axle modulator, additional-axle modulator (optional) and ESC-module (optional) must be assembled in the vehicle. Please read the numbers of all these components and check them for compatibility against each other.	*为了保证BBS功能正常, 正确组合的BBSBCU、前桥模块、后桥模块、附加桥模块(可选)及ESC模块(可选)等必须安装在车辆上。 *在装车后读取各部件产品型号并检查它们互相之间是否兼容
500210	2	2+4	ESC-module - data erratic, intermittend or incorrect	ESC模块 - 数据不稳定、间断或错误			亮	- Replace ESC-module - Replace rear axle modulator	*检查ESC模块安装和后桥模块安装 *更换ESC模块 *更换后桥模块
500210	9	9+3	ESC-module - abnormal update rate	ESC模块 - 异常的更新率			亮	- Check centralmodule for correct EOL-configuration (ESC yes/no) - Check the wiring between EBS-centralmodule and ESC-module - Check the ESC-module / replace ESC-module (correct assembly position of ESP-module is important)	*检查BBS BCU参数设置中ESC相关参数是否正确(yes/no) *检查BBS BCU和ESC模块之间的线束连接 *检查ESC模块是否正确安装(正确的安装位置很重要) *更换ESC模块
500210	10	2+4	ESC-module - abnormal rate of change	ESC模块 - 异常交换速率			亮	- Check and replace the ESC module (correct CAN data block counter ?)	*检查ESC模块(CAN数据块计数器是否正确?) *更换ESC模块
500210	11	2+4	ESC-module - failure mode not identifiable / root cause not known	ESC模块 - 故障模式未知/根本原因未知			亮	- Check / Replace ESC-module - Check / Replace EBS-centralmodule	*检查ESC模块安装以及ESC模块和BCU之间的线束及相关的电气接插件 *检查/更换ESC模块 *检查/更换BBS BCU
500210	12	2+4	ESC-module - bad intelligent device or component	ESC模块 - 内部装置或部件损坏			亮	- Check the assembly position, the lateral inclination and correct fixing of the ESC-module - Check and replace the ESC module (correct assembly position is important)	*检查ESC模块安装位置是否正确、是否有侧向倾斜、固定是否正确牢靠 *检查/更换ESC模块(正确的安装位置很重要)
500210	13	8+4	ESC-module - out of calibration	ESC模块 - 校验异常		亮		- Check the EBS-centralmodule concerning correct ESC specific EOL parameters	*检查BBS BCU参数设置中存储的BBS的参数是否正确

SPN	FMI	Blink code	FailureDetection Name	故障名称	BBS 红灯	BBS 黄灯	BSC 灯	Repair Guide	维修指南
S00210	14	9+3	ESC-module - special instructions	BSC模块 - 特殊说明			亮	- Replace ESC-module - Replace additional axle modulator	*检查ESC模块安装和附加桥模块安装 *更换BSC模块 *更换附加桥模块
S00210	19	9+3	ESC-module - received network data in error	BSC模块 - 接收到错误的网络数据			亮	- Replace ESC-module - Replace EBS-centralmodule	*检查ESC模块安装以及BSC模块和BCU之间的线束及相关的电气接插件 *检查/更换ESC模块 *更换BBS/BCU
S00211	13	9+4	EBS system/module compatibility (ESC module) - out of calibration	BBS系统/BSC模块兼容性 - 校验异常			亮	- For a correct EBS-function, a right combination of EBS-Centralmodule, front-axle modulator, rear-axle modulator, additional-axle modulator (optional) and ESC-module (optional) must be assembled in the vehicle. Please read the numbers of all these components and check them for compatibility against each other.	*为了保证EBS功能正常, 正确组合的BBS/BCU、前桥模块、后桥模块、附加桥模块(可选)及ESC模块(可选)等必须安装在车辆上。 *在装车后读取各部件产品型号并检查它们互相之间是否兼容
S00213	31	2+4	ESC-Calibration Procedure - condition exists	BSC-标定程序 - 条件存在			亮	The ESC calibration procedure was started by diagnosis The ESC calibration-procedure must be executed by use of the diagnostic documentation. Remark: If the ESC calibration procedure cannot be finished in time, please check the failure memory for other active ESC failures.	已经开始通过诊断软件进行ESC标定流程 ESC标定流程必须按照诊断文档进行标定 备注: 如果ESC标定流程不能按时完成, 请检查记忆故障中ESC的其它当前故障
S00214	0	2+5	Steering Angle Ratio - data valid, but above normal operation range (most severe level)	转向比 - 数据有效但高于正常范围			亮	- Check the assembly of the steering angle sensor (was the sensor rotated several times before connected to the steering shaft ?) - Check, if the steering ratio EOL parameters (if available) are correct	*检查转向角度传感器的安装(传感器是不是在安装到转向管柱之前转了几次?) *检查BBS/BCU参数设置中转向比的参数设置是否正确
S00214	2	2+5	Steering Angle Ratio - data erratic, intermittend or incorrect	转向比 - 数据不稳定、间断或错误			亮	- Has the driver executed normal driving-maneuvres since the last ESC calibration phase ? If not, the ESC calibration-phase must be repeated and the driver must drive in a normal way (not too aggressive) in the following period. Remark: If the way of driving is too aggressive, then the calibration-values are not determined within an admissible time. - Check the EBS-centralmodule concerning correct ESC specific EOL parameters (e.g. wheel base, pole-wheel teeth-numbers, tire-circumference, ...) - Is the vehicle damaged at the front axle ? - check / replace the ESC module - check / replace the steering wheel sensor	*驾驶员在上一次的ESC标定流程中的驾驶方式正确吗? 如果不正确, 需要重新进行ESC标定流程的操作, 驾驶员接下来必须正常驾驶(驾驶不要太激烈) 备注: 如果驾驶员太激烈, 标定的值将无法在规定时间内学习完成 *检查BBS/BCU参数设置中ESC相关参数是否正确(轴距、齿圈齿数、轮胎周长等) *车辆前桥损坏? *检查/更换 ESC模块 *检查/更换转向角度传感器
S00215	31	2+4	ESC Function is Temporary Not Available - condition exists	BSC功能暂时不可用 - 条件存在			亮	- The ESC function was temporary not available (e.g. invalid ommission external CAN-data / engine, steeringssystem, trailer, etc.) - Repair EMAS system or EMAS signal line (if assembled at the vehicle) - Repair faulty external system Remark: It is not necessary to repair the EBS/ESC-System in the towing vehicle, if no other failures are stored in the EBS-failure memory	*ESC功能暂时不可用(比如: 发动机、转向系统、挂车等外部CAN数据丢失或者不正确) *检修EMAS系统或者EMAS信号线(若已安装) *维修外部系统的故障 备注: 如果牵引车的BBS/BCU中没有记忆故障信息, 则没必要去检修牵引车的BBS/ESC系统
S00216	31		ESC function is reduced (trailer ABS not OK) - condition exists	ESC功能受限(挂车ABS不正常) - 条件存在				- Check Brakesystem of the trailer	*检查挂车制动系统
S00217	31		ESC function is reduced (tire pressure not OK) - condition exists	ESC功能受限(轮胎压力不正常) - 条件存在				- Check Tire Pressures	*检查轮胎气压
S00225	3	9+11	External Brake Demand System (XBR, Source 4) - data erratic, intermittend or incorrect	外部制动请求系统(XBR, 来源 4) - 数据不稳定、间断或错误			亮 D	- Check the XBR-electronic device (Source # 4) and replace it, if necessary - Check the EBS-Centralmodule and replace it, if necessary	*检查/更换XBR电子设备(来源#4) *检查/更换BBS/BCU
S00225	9	9+11	External Brake Demand System (XBR, Source 4) - abnormal update rate	外部制动请求系统(XBR, 来源 4) - 异常的更新率			亮 D	- Check the failure memory of the XBR-ECU (Source # 4) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the XBR-ECU	*检查BBS/BCU中存储的XBR(来源#4)的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及BBS/BCU和XBR(来源#4)的ECU的接插件连接以及线束连接
S00225	10	9+11	External Brake Demand System (XBR, Source 4) - abnormal rate of change	外部制动请求系统(XBR, 来源 4) - 异常的更新率			亮 D	- Check the failure memory of the XBR-ECU (Source # 4) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the XBR-ECU	*检查BBS/BCU中存储的XBR(来源#4)的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及BBS/BCU和XBR(来源#4)的ECU的接插件连接以及线束连接
S00226	2	9+11	External Brake Demand System (XBR, Source 5) - data erratic, intermittend or incorrect	外部制动请求系统(XBR, 来源 5) - 数据不稳定、间断或错误			亮 D	- Check the XBR-electronic device (Source # 5) and replace it, if necessary - Check the EBS-Centralmodule and replace it, if necessary	*检查/更换XBR电子设备(来源#5) *检查/更换BBS/BCU
S00226	9	9+11	External Brake Demand System (XBR, Source 5) - abnormal update rate	外部制动请求系统(XBR, 来源 5) - 异常的更新率			亮 D	- Check the failure memory of the XBR-ECU (Source # 5) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the XBR-ECU	*检查BBS/BCU中存储的XBR(来源#5)的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及BBS/BCU和XBR(来源#5)的ECU的接插件连接以及线束连接
S00226	10	9+11	External Brake Demand System (XBR, Source 5) - abnormal rate of change	外部制动请求系统(XBR, 来源 5) - 异常的更新率			亮 D	- Check the failure memory of the XBR-ECU (Source # 5) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the XBR-ECU	*检查BBS/BCU中存储的XBR(来源#5)的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及BBS/BCU和XBR(来源#5)的ECU的接插件连接以及线束连接

SPN	PMI	Blink code	Failedetection Name	故障名称	BBS 红灯	BBS 黄灯	BBS 灯	Repair Guide	维修指南
S00227	2	9-11	External Brake Demand System (XBR, Source 6) - data erratic, intermittend or incorrect	外部制动请求系统 (XBR, 来源 6) - 数据不稳定、间断或错误	亮		D	- Check the XBR-electronic device (Source # 6) and replace it, if necessary - Check the EBS-Centralmodule and replace it, if necessary	*检查/更换XBR电子设备 (来源#6) *检查/更换EBS ECU
S00227	9	9-11	External Brake Demand System (XBR, Source 6) - abnormal update rate	外部制动的请求系统 (XBR, 来源 6) - 异常的更新率	亮		D	- Check the failure memory of the XBR-ECU (Source # 6) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the XBR-ECU	*检查EBS ECU中存储的XBR (来源#6) 的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及EBSBCU和XBR (来源#6) BCU的接插件连接以及线束连接
S00227	10	9-11	External Brake Demand System (XBR, Source 6) - abnormal rate of change	外部制动的请求系统 (XBR, 来源 6) - 异常的更新率	亮		D	- Check the failure memory of the XBR-ECU (Source # 6) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the XBR-ECU	*检查EBS ECU中存储的XBR (来源#6) 的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及EBSBCU和XBR (来源#6) BCU的接插件连接以及线束连接
S00235	3	7-2	ASR switch-off valve tag-axle - voltage above normal or shorted high	随动桥ASR关断阀 - 电压高于正常值或对电源短路	亮			- Check the wiring and the relating electric connectors of the ASRValve/Difflock-Relay (short circuit to UB ?) - Check the ASR-Valve/Difflock-Relay (Internal short circuit to UB ?) - Replace the EBS-centralmodule, if the ASR-Valve/Difflock- Relay and the relevant wiring is faultless	*检查ASR电磁阀/差速锁继电器的线束及其相关接插件 (对电源短路?) *检查ASR电磁阀/差速锁继电器 (内部对电源短路?) *如果ASR电磁阀/差速锁继电器和相关线束没问题, 更换EBS ECU
S00235	4	7-2	ASR switch-off valve tag-axle - voltage below normal or shorted low	随动桥ASR关断阀 - 电压低于正常值或对地短路	亮			- Check the wiring and the relating electric connectors of the ASRValve/Difflock-Relay (short circuit to GND ?) - Check the ASR-Valve/Difflock-Relay (Internal short circuit to GND ?) - Replace the EBS-centralmodule, if the ASR-Valve/Difflock- Relay and the relevant wiring is faultless	*检查ASR电磁阀/差速锁继电器的线束及其相关接插件 (对地短路?) *检查ASR电磁阀/差速锁继电器 (内部对地短路?) *如果ASR电磁阀/差速锁继电器和相关线束没问题, 更换EBS ECU
S00235	5	7-2	ASR switch-off valve tag-axle - current below normal or open circuit	随动桥ASR关断阀 - 电流低于正常值或开路	亮			- Check the EOL configuration in the EBS-centralmodule (ASRValve/Difflock-Relay yes/no) - Check the wiring and the relating electric connectors of the ASRValve/Difflock-Relay (interruption ?) - Check the ASR-Valve/Difflock-Relay (internal interruption ?) - Replace the EBS-centralmodule, if the ASR-Valve/Difflock- Relay and the relevant wiring is faultless	*检查EBS ECU参数设置中ASR电磁阀/差速锁继电器的参数设置是否正确 *检查ASR电磁阀/差速锁继电器的线束及其相关接插件 (断路?) *检查ASR电磁阀/差速锁继电器 (内部断路?) *如果ASR电磁阀/差速锁继电器和相关线束没问题, 更换EBS ECU
S00235	13	8-4	ASR switch-off valve tag-axle - out of calibration	随动桥ASR关断阀 - 校验异常	亮	亮		- Check EBS-centralmodule for correct EOL-configuration (ASRValve/Difflock-Relay yes/no) - Is something connected to the relevant ASR-Valve/Difflock- Relay pins of the centralmodule ? - Replace the EBS-centralmodule	*检查EBS ECU参数设置中ASR电磁阀/差速锁继电器的参数设置是否正确 *EBS ECU对应的ASR电磁阀/差速锁继电器针脚位置是否接了别的零部件? *更换EBS ECU
S00237	12	7-4	Additional Display (ATC2 / Brake Lining) - bad intelligent device or component	附加显示 (ATC2/制动蹄片) - 内部装置或部件损坏	亮			- Check EBS-centralmodule for correct EOL configuration (parameter "lamp D" yes/no) - Check the wiring and the relating electric connectors of lamp D (interruption ? short circuits ?) - Check the lamp D (faulty ?) - Replace the EBS-centralmodule, if the lamp D and the wiring is faultless	*检查EBS ECU参数设置中D指示灯参数设置是否正确 *检查D指示灯线束及其相关接插件 (断路/短路?) *检查D指示灯 (故障?) *如果D指示灯和相关线束没问题, 更换EBS ECU
S00241	2	9-11	External Brake Demand System (XBR, Source 3, Customer Specific System) - data erratic, intermittend or incorrect	外部制动请求系统 (XBR, 来源 3, 客户定义的系统) - 数据不稳定、间断或错误	亮		D	- Check the XBR-electronic device (Customer specific system) and replace it, if necessary - Check the EBS-Centralmodule and replace it, if necessary	*检查/更换XBR电子设备 (来源#3, 客户定义的系统) *检查/更换EBS ECU
S00241	9	9-11	External Brake Demand System (XBR, Source 3, Customer Specific System) - abnormal update rate	外部制动请求系统 (XBR, 来源 3, 客户定义的系统) - 异常的更新率	亮		D	- Check the failure memory of the XBR-ECU (Customer specific system) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the XBR-ECU	*检查EBS ECU中存储的XBR (来源#3, 客户定义的系统) 的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及EBSBCU和XBR (来源#3) BCU的接插件连接以及线束连接
S00241	10	9-11	External Brake Demand System (XBR, Source 3, Customer Specific System) - abnormal rate of change	外部制动的请求系统 (XBR, 来源 3, 客户定义的系统) - 异常的更新率	亮		D	- Check the failure memory of the XBR-ECU (Customer specific system) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the XBR-ECU	*检查EBS ECU中存储的XBR (来源#3, 客户定义的系统) 的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及EBSBCU和XBR (来源#3) BCU的接插件连接以及线束连接
S00242	2	9-11	External Brake Demand System (XBR, Source 1, ACC, etc.) - data erratic, intermittend or incorrect	外部制动请求系统 (XBR, 来源 1, ACC等) - 数据不稳定、间断或错误	亮		D	- Check the XBR-electronic device (ACC system) and replace it, if necessary - Check the EBS-Centralmodule and replace it, if necessary	*检查/更换XBR电子设备 (来源#1, ACC系统) *检查/更换EBS ECU
S00242	9	9-11	External Brake Demand System (XBR, Source 1, ACC, etc.) - abnormal update rate	外部制动请求系统 (XBR, 来源 1, ACC等) - 异常的更新率	亮		D	- Check the failure memory of the XBR-ECU (ACC) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the XBR-ECU	*检查EBS ECU中存储的XBR (来源#1, ACC系统) 的记忆故障并维修 *检查底盘CAN系统的线束连接以及EBSBCU和XBR (来源#1) BCU的接插件连接以及线束连接

SPN	FMI	blinks code	Failedetection Name	故障名称	BBS 灯	BSC 灯	Repair Guide	维修指南
S20242	10	9+11	External Brake Demand System (XBR, Source 1, ACC, etc.) - abnormal rate of change	外部制动请求系统 (XBR, 来源 1, ACC 等) - 异常交换速率	亮	D	- Check the failure memory of the XBR-ECU (ACC) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the XBR-ECU	*检查BBS ECU中存储的XBR (来源#1, ACC系统) 的记忆故障并维修 *检查底盘CAN系统的线束连接以及BBS ECU和XBR (来源#1) ECU的接插件连接以及线束连接
S20243	2	9+11	External Brake Demand System (XBR, Source 2, EPH, AEB, etc.) - data erratic, intermittent or incorrect	外部制动请求系统 (XBR, 来源 2, EPH, AEB, etc.) - 数据不稳定、间断或错误	亮	D	- Check the XBR-electronic device (EPH / AEB) and replace it, if necessary - Check the EBS-Centralmodule and replace it, if necessary	*检查/更换XBR电子设备 (来源#2, EPH/AEB等) *检查/更换BBS ECU
S20243	9	9+11	External Brake Demand System (XBR, Source 2, EPH, AEB, etc.) - abnormal update rate	外部制动请求系统 (XBR, 来源 2, EPH, AEB, etc.) - 异常的更新率	亮	?	- Check the failure memory of the XBR-ECU (EPH / AEB) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the XBR-ECU	*检查BBS ECU中存储的XBR (来源#2, EPH/AEB等) 的记忆故障并维修 *检查底盘CAN系统的线束连接以及BBS ECU和XBR (来源#2) ECU的接插件连接以及线束连接
S20243	10	9+11	External Brake Demand System (XBR, Source 2, EPH, AEB, etc.) - abnormal rate of change	外部制动请求系统 (XBR, 来源 2, EPH, AEB, etc.) - 异常的更新率	亮	D	- Check the failure memory of the XBR-ECU (EPH / AEB) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the XBR-ECU	*检查BBS ECU中存储的XBR (来源#2, EPH/AEB等) 的记忆故障并维修 *检查底盘CAN系统的线束连接以及BBS ECU和XBR (来源#2) ECU的接插件连接以及线束连接
S20245	31	9+10	Failure Memory Bit (Yellow) - condition exists	黄色记忆位故障 - 条件存在	亮		- Check and repair all failures stored in failure-memory - After repair clear the failure memory and reset the failurememorybit Remark: Memorybit can be resetted e.g. by diagnostic command.	*检查且维修记忆故障中的所有故障 *维修结束后清除记忆故障并重置一下故障记忆位 备注: 记忆位可以通过例如诊断软件命令重置
S20246	31	9+10	Failure Memory Bit (Red) - condition exists	红色记忆位故障 - 条件存在	亮		- Check and repair all failures stored in failure-memory - After repair clear the failure memory and reset the failurememorybit Remark: Memorybit can be resetted e.g. by diagnostic command.	*检查且维修记忆故障中的所有故障 *维修结束后清除记忆故障并重置一下故障记忆位 备注: 记忆位可以通过例如诊断软件命令重置
S20247	31	9+10	Failure Memory Bit (ESC) - condition exists	BSC记忆位故障 - 条件存在	亮		- Check and repair all failures stored in failure-memory - After repair clear the failure memory Remark: ESC-Memorybit might not be erasable by diagnostic command. To delete the memory-bit, it is necessary to drive approx. 100 m straight on and then turn the steering wheel by min. 180°.	*检查且维修记忆故障中的所有故障 *维修结束后清除记忆故障 备注: ESC记忆位有时不能通过诊断软件命令删除, 为了清除记忆位, 至少要直线行驶100米, 再转向方向盘至少180°
S20250	31		Wheel Speed Sensing, Failure Memory - condition exists	轮速检测 - 故障记忆 - 条件存在	亮	亮	- Check and repair all wheel speed sensor failures stored in failure-memory - After repair clear the failure memory	*检查BBS ECU中存储的轮速传感器的记忆故障并维修 *维修结束后清除记忆故障
S20261	13	8+4	EOL Parameter StOp-Function - out of calibration	BBS ECU参数StOp功能 - 校验异常	亮	亮	- Check the correct EOL parameter setting for STOP function (stability optimization) - If these EOL-parameters are correct, replace EBS centralmodule	*检查BBS ECU参数设置中StOp (稳定性优化) 的功能参数是否正确 *如果相关参数设置正确, 检查/更换BBS ECU
S20262	13	8+4	EOL Parameter ARB-Function - out of calibration	BBS ECU参数ARB功能 - 校验异常	亮	亮	- Check the correct EOL parameter setting for ARB function (halt brake, anti roll brake) - If these EOL-parameters are correct, replace EBS centralmodule	*检查BBS ECU参数设置中ARB (停车制动/坡道起步辅助) 功能参数是否正确 *如果相关参数设置正确, 检查/更换BBS ECU
S20263	13	8+4	EOL Parameter RAG-Function - out of calibration	BBS ECU参数RAG功能 - 校验异常	亮	亮	- Check the correct EOL parameter setting for RAG function (wheel speed calibration function) - If these EOL-parameters are correct, replace EBS centralmodule	*检查BBS ECU参数设置中RAG (轮速校准功能) 功能参数是否正确 *如果相关参数设置正确, 检查/更换BBS ECU
S20264	13	8+4	EOL Parameter ZC3F-Function - out of calibration	BBS ECU参数ZC3F功能 - 校验异常	亮	亮	- Check the correct EOL parameter setting for speedometeradjustment function - If these EOL-parameters are correct, replace EBS centralmodule	*检查BBS ECU参数设置中车速自动校准功能参数是否正确 *如果相关参数设置正确, 检查/更换BBS ECU
S20265	13	8+4	EOL Parameter KENN-Function - out of calibration	BBS ECU参数KENN功能 - 校验异常	亮	亮	- Check the correct EOL parameter setting for KENN function (brake feeling curve) - If these EOL-parameters are correct, replace EBS centralmodule	*检查BBS ECU参数设置中KENN (制动踏板感变曲线) 功能参数是否正确 *如果相关参数设置正确, 检查/更换BBS ECU
S20266	13	8+4	EOL Parameter SPGV-VFunction - out of calibration	BBS ECU参数SPGV功能 - 校验异常	亮	亮	- Check the correct EOL parameter setting for SPGV function (voltage supply) - If these EOL-parameters are correct, replace EBS centralmodule	*检查BBS ECU参数设置中SPGV (供电电压) 功能参数是否正确 *如果相关参数设置正确, 检查/更换BBS ECU
S20267	13	8+4	EOL Parameter END-Function - out of calibration	BBS ECU参数END功能 - 校验异常	亮	亮	- Check the correct EOL parameter setting for END function (valve activation) - If these EOL-parameters are correct, replace EBS centralmodule	*检查BBS ECU参数设置中END (阀驱动) 功能参数是否正确 *如果相关参数设置正确, 检查/更换BBS ECU
S20268	13	8+4	EOL Parameter EEFU-Function - out of calibration	BBS ECU参数EEFU功能 - 校验异常	亮	亮	- Check the correct EOL parameter setting for EEFU function (general configuration) - If these EOL-parameters are correct, replace EBS centralmodule	*检查BBS ECU参数设置中EEFU (基本配置) 功能参数是否正确 *如果相关参数设置正确, 检查/更换BBS ECU
S20269	13	8+4	EOL Parameter XBR-Function - out of calibration	BBS ECU参数XBR功能 - 校验异常	亮	亮	- Check the correct EOL parameter setting for XBR function (external brake function) - If these EOL-parameters are correct, replace EBS centralmodule	*检查BBS ECU参数设置中XBR (外部制动请求) 功能参数是否正确 *如果相关参数设置正确, 检查/更换BBS ECU

SPN	FM	Blink code	Failedetection Name	故障名称	BBS 灯	BBS 灯	BSC 灯	Repair Guide	维修指南
500270	13	0-4	EOL Parameter ESC-Function (Group 1 / General Configuration Parameters) - out of calibration	BBS ECU参数 ESC功能(组1/ 常规配置参数) - 校验异常		亮		Check the correct EOL parameter setting for ESC function (Group 1 / General Configuration Parameters): - EBS vehicle model - ESC config - Vehicle Type - All Wheel Drive - SAS type - RSC limitation - RSC/TC control speed limitation	*检查BBS ECU参数设置中关于ESC功能的参数是否正确(组1: 基本配置参数): - BBS 车辆种类 - ESC 配置 - 车辆驱动类型 - 是否全轮驱动 - SAS 类型 - RSC 限制 - RSC/TC 控制速度限制
500271	13	0-4	EOL Parameter ESC-Function (Group 2 / Axle Parameters - Geometry, Configuration) - out of calibration	BBS ECU参数 ESC功能(组2/ 车桥参数-几何形状, 配置) - 校验异常		亮		Check the correct EOL parameter setting for ESC function (Group 2 / Axle Parameters - Geometry, Configuration): - Vehicle Type - Lift option axles 1, ... - Axle tire type - Wheelbase (FA1 to FA2) - Wheelbase (FA1 to RA1) - Wheelbase (RA1 to RA2) - Locking Speed 1 and 2 (PA, TA) - Steering Plausibility Offset (PA, TA) - Steering Sensing Type (PA, TA) - Steering Force (PA, TA)	*检查BBS ECU参数设置中关于ESC功能的参数是否正确(组2: 车桥参数 - 几何尺寸, 配置): - 车辆驱动类型 - 1桥选择提升设置 ... - 轮胎类型 - 轴距 (FA1 to FA2) - 轴距 (FA1 to RA1) - 轴距 (RA1 to RA2) - 锁止速度 1 和 2 (PA, TA) - 转向合理性补偿 (PA, TA) - 转向传感器类型 (PA, TA) - 转向力 (PA, TA)
500272	13	0-4	EOL Parameter ESC-Function (Group 3 / Steering Ratio Parameters) - out of calibration	BBS ECU参数 ESC功能(组3 / 转向比参数) - 校验异常		亮		Check the correct EOL parameter setting for ESC function (Group 3 / Steering Ratio Parameters): - Steering angle inner/outer left/right - Steering ratio inner/outer left/right - Mode of Steering ratio Determination	*检查BBS ECU参数设置中关于ESC功能的参数是否正确(组3: 转向比参数) - 转向角度 内/外 左/右 - 转向比 内/外 左/右 - 转向比模式的确定
500273	13	0-4	EOL Parameter ESC-Function (Group 4 / Roll Stability Control Parameters) - out of calibration	BBS ECU参数 ESC功能(组4/ 横向稳定性控制参数) - 校验异常		亮		Check the correct EOL parameter setting for ESC function (Group 4 / Roll Stability Control Parameters): - RSC characteristic - RSC Speed characteristic - Only optional: Trailer pulse function	*检查BBS ECU参数设置中关于ESC功能的参数是否正确(组4: 横向稳定性控制参数) - RSC 特征值 - RSC 速度特征值 - 可选: 挂车脉冲控制功能
500274	13	0-4	EOL Parameter ESC-Function (Group 5 / Additional Geometry Parameters) - out of calibration	BBS ECU参数 ESC功能(组5/ 附件的几何参数) - 校验异常		亮		Check the correct EOL parameter setting for ESC function (Group 5 / Additional Geometry Parameters): - track width front/drive axle - Wheelbase between AM-FA/AM-RA/AM-AA - Sensor distance to reference axle	*检查BBS ECU参数设置中关于ESC功能的参数是否正确(组5: 附加的几何参数): - 前桥和驱动桥的轴距 - 各个桥之间的轴距 - BSC模块到参考轴的距离
500279	13	0-4	EOL Parameter AEB-Function - out of calibration	BBS ECU参数 AEB功能 - 校验异常	亮	亮		Check the correct EOL parameter setting for AEB function (autonomous emergency brake system) - If these EOL-parameters are correct, replace EBS centralmodule	*检查BBS ECU参数设置中关于AEB (自动紧急制动系统) 功能的参数是否正确 *如果相关参数正确, 检查/更换BBS ECU
500281	31	0-4	PowerOff Delay Circuit Cannot be Switched On - condition exists	失断延迟, 无法开启 - 条件存在	亮			- Replace EBS centralmodule	*更换BBS ECU
500282	31	0-3	PowerOff Delay Circuit Cannot be Switched Off - condition exists	失断延迟, 无法关闭 - 条件存在	亮			- Replace EBS centralmodule	*更换BBS ECU
500283	31	0-4	Faulty Parameter Setting for Generic Purpose Inputs - condition exists	通用输入信息的参数设置错误 - 条件存在	亮	亮		- Check the EOL-parameters for GPI (generic purpose input).	*检查BBS ECU参数设置中关于通用输入信息的设置是否正确
500284	31	0-4	Faulty Parameter Setting for Generic Purpose Outputs - condition exists	通用输出信息的参数设置错误 - 条件存在	亮	亮		- Check the EOL-parameters for GPO (generic purpose output).	*检查BBS ECU参数设置中关于通用输出信息的设置是否正确
500286	13	0-4	EOL Parameter BMM-Function - out of calibration	BBS ECU参数- BMM功能 - 校验异常	亮	亮		Check the correct EOL parameter setting for BMM function (brakemanagement) - If these EOL-parameters are correct, replace EBS centralmodule	*检查BBS ECU参数设置中BMM (制动管理) 功能的设置是否正确 *如果相关参数正确, 检查ECU的相关连接/更换BBS ECU
500291	2	0-0	EHS (Easy Hill Start) - data erratic, intermittend or incorrect	BHS (简易坡道起步) - 数据不稳定、间断或错误	亮			- Check, whether the EHS-demand signal is active during driving because of a failure (e.g. defect EHS-ECU, faulty EHS-wiring, ...)	*检查BBS请求信号是否在驾驶过程中由于故障激活 (比如BBS-ECU失效、BBS线束问题...)
500291	9	0-0	EHS (Easy Hill Start) - abnormal update rate	BHS (简易坡道起步) - 异常的更新率	亮			- Check the failure memory of the EHS-ECU and repair all failures - Check the wiring of the SAE J 1939 data connection and the relating electric connectors between EBS-centralmodule and the EHS-ECU	*检查BBS ECU中存储的关于BHS的故障并排查故障 *检查BBS ECU和BHS ECU之间的线束连接及其相关接插件连接
500292	9	7-1	SAE J 1939 Datalink (EBC4_X-message) - abnormal update rate	SAB J 1939 数据连接 (EBC4_X报文) - 异常的更新率	亮	D		- Check the failure memory of the ECU (which transmits EBC4_X message) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the ECU (which transmits EBC4_X message)	*检查BBS ECU中存储的关于发送EBC4_X报文的ECU的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及BBS ECU和发送EBC4_X报文的ECU的接插件连接以及线束连接
500293	9	7-1	SAE J 1939 Datalink (AEB-messages) - abnormal update rate	SAB J 1939 数据连接 (AEB报文) - 异常的更新率	亮	D		- Check the failure memory of the AEB-ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the AEB-ECU	*检查BBS ECU中存储的关于发送AEB报文的ECU的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及BBS ECU和发送AEB报文的ECU的接插件连接以及线束连接

SPN	FMI	Blinks code	Failure detection Name	故障名称	BBS 红灯	BBS 黄灯	BSC 灯	Repair Guide	维修指南
520299	14	7-1	Controlling Device for Engine Control (E-Motor #4) - special instructions	发动机控制装置 (电机#4) - 特殊说明		亮	D	- Check the failure memory of the engine-ECU (E-engine #4) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the engine-ECU	*检查SBS ECU中存储的关于发动机ECU (电机#4) 的记忆故障并排查故障 *检查SBS3_BM4报文是否正常发送 *检查底盘CAN系统的线束连接以及SBS ECU和相关发动机ECU的接插件连接以及线束连接
520299	19	7-1	Controlling Device for Engine Control (E-Motor #4) - received network data in error	发动机控制装置 (电机#4) - 接收到错误的网络数据		亮	D	- Check the failure memory of the engine-ECU (E-engine #4) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the engine-ECU	*检查SBS ECU中存储的关于发动机ECU (电机#4) 的记忆故障并排查故障 *检查CPQ_BM4报文是否正常发送 *检查底盘CAN系统的线束连接以及SBS ECU和相关发动机ECU的接插件连接以及线束连接
520300	9	7-1	Controlling Device for Transmission Control #2 - abnormal update rate	变速箱控制装置 #2 - 异常的更新率		亮	D	- Check the failure memory of the transmission-ECU (#2) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the transmission-ECU	*检查SBS ECU中存储的关于BCAS ECU (来源 #2) 的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及SBS ECU和相关BCAS的ECU (来源#2) 的接插件连接以及线束连接
520302	8	8-7	Controlling Device for Air Suspension Control #2 - abnormal frequency, pulse width or period	空气悬挂控制装置 #2 - 异常频率、脉宽或周期		亮	D	- Check the failure memory of the ECAS-ECU (source #2) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and ECAS-ECU (source #2)	*检查SBS ECU中存储的关于BCAS ECU (来源 #2) 的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及SBS ECU和相关BCAS的ECU (来源#2) 的接插件连接以及线束连接
520302	9	8-7	Controlling Device for Air Suspension Control #2 - abnormal rate of change	空气悬挂控制装置 #2 - 异常的更新率		亮	D	- Check the failure memory of the ECAS-ECU (source #2) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and ECAS-ECU (source #2)	*检查SBS ECU中存储的关于BCAS ECU (来源 #2) 的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及SBS ECU和相关BCAS的ECU (来源#2) 的接插件连接以及线束连接
520302	10	8-7	Controlling Device for Air Suspension Control #2 - abnormal rate of change	空气悬挂控制装置 #2 - 异常的更新率		亮	D	- Check the failure memory of the ECAS-ECU (source #2) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and ECAS-ECU (source #2)	*检查SBS ECU中存储的关于BCAS ECU (来源 #2) 的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及SBS ECU和相关BCAS的ECU (来源#2) 的接插件连接以及线束连接
520302	19	7-1	Controlling Device for Air Suspension Control #2 - received network data in error	空气悬挂控制装置 #2 - 接收到错误的网络数据		亮	D	- Check the failure memory of the ECAS-ECU, that transmits the vehicle weight message (source #2) and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the relevant ECU	*检查SBS ECU中存储的发送整车重量信息的BCAS的ECU (来源 #2) 的记忆故障并排查故障 *检查底盘CAN系统的线束连接以及SBS ECU和相关BCAS的ECU (来源#2) 的接插件连接以及线束连接
520303	2		WABCO Trailer Information - data erratic, intermittent or incorrect	WABCO挂车信息-数据不稳定、中断或不正确		亮	D	- Check the failure memory of the WTRL ECU and repair all failures	*检查SBS ECU中存储的关于WTRL (挂车信息报文) 的记忆故障并排查故障
520303	9		WABCO Trailer Information - abnormal update rate	WABCO挂车信息-异常的更新率		亮	D	- Check the failure memory of the WTRL ECU and repair all failures - Check the wiring of the chassis-CAN data connection and the relating electric connectors between EBS-centralmodule and the WTRL ECU	*检查SBS ECU中存储的关于WTRL (挂车信息报文) 的记忆故障并维修 *检查底盘CAN系统的线束连接以及SBS ECU和发送WTRL的ECU的接插件连接以及线束连接
520307	31		Trailer Braking Compatibility Violation - condition exists	拖车制动协调性-条件存在		亮		- Check the parameter setting concerning truck-trailer braking characteristic - Check the brakes of the truck (defect ?) - Check the brakes of the trailer (defect ?)	*检查相关卡车-挂车制动特性的参数设置 *检查卡车的制动器 (不足?) *检查挂车的制动器 (不足?)

3 软件升级 Software Upgrade

3.1 目的

3.1 Purpose

本文档为指导售后服务人员软件离线升级。

This document provides guidance for after-sales service personnel on offline software upgrades.

3.2 工具

3.2 Tools

1) 装有徐工汽车售后诊断系统软件的电脑，登陆账号经服务部门授权；

1) A computer equipped with XCMG automotive after-sales diagnostic system software, with login account authorized by the service department;

2) TESTBASE-VCi V60A Pro 硬件一套。

2) A set of TESTBASE-VCi V60A Pro hardware.

3.3 操作步骤

3.3 Operation steps

3.3.1 硬件连接

3.3.1 Hardware Connection

硬件设备连接时请确保连接口大端与小段的对齐，具体连接方式请参照下图：

When connecting hardware devices, please ensure that the large end of the connection port is aligned with the small section. For specific connection methods, please refer to the following figure:



图 诊断设备

Figure Diagnostic equipment



图 诊断设备连接

Figure Connection of Diagnostic Equipment

余下的两个接口黑色的为 USB 接口与电脑连接，蓝色的为 16 针 OBD 公头接口与车辆上的 OBD 母头接口相连接。

The remaining two interfaces, the black one for connecting to a computer via USB, and the blue one for

connecting to the 16 pin OBD male connector and the OBD female connector on the vehicle.

3.3.2 软件登陆

3.3.2 Software login

双击电脑桌面“徐工汽车售后诊断系统系统”图标，打开软件，点击软件左侧“未登陆”，弹出登陆界面，输入用户名和密码，然后选择“登陆”。正确登陆后，左侧“未登陆”变成登陆用户名。

Double click the "XCMG Automotive After sales Diagnostic System" icon on the computer desktop, open the software, click on "Not logged in" on the left side of the software, a login interface will pop up, enter your username and password, and then select "Login". After logging in correctly, the "not logged in" on the left becomes the login username.



图 售后诊断系统软件图标

Figure Software icon of after-sales diagnostic system



图 售后诊断登陆界面

Figure After sales diagnosis login interface

3.3.3 VCI 连接

3.3.3 VCI Connection

点击主界面右下角的“设备管理”按钮，将弹出 VCI 连接管理界面，用户可查看、配置当前连接的 VCI 设备，原型图如下左图所示，点击列表中的  按钮，将弹出 VCI 设置界面，连接方式选择“USB”，然

后点击“应用”，操作界面如下右图所示。

Click the "Device Management" button in the bottom right corner of the main interface to bring up the VCI connection management interface. Users can view and configure the currently connected VCI devices. The prototype image is shown in the left figure. Click the button in the list to bring up the VCI settings interface. Select "USB" as the connection method, and then click "Apply". The operation interface is shown in the right figure below.



图 设备连接

Figure Equipment Connection

3.3.4 车辆诊断

3.3.4 Vehicle Diagnosis

点击“车辆诊断”按钮后，系统进入输入 VIN 界面，输入后选择“手动模式”软件将展示工程包内所有软件节点。

After clicking the "Vehicle Diagnosis" button, the system enters the VIN input interface. After entering, select "Manual Mode" and the software will display all software nodes in the engineering package.



图 VIN 码刷入
Figure VIN code flashing



图 控制器节点

Figure Controller Node

点击需要诊断的控制器并确认即可，在弹出的“是否执行 XXX 控制器诊断？”对话框，选择“是”即可，如下图所示：

Click on the controller that needs to be diagnosed and confirm. Then, in the pop-up message "Do you want to perform XXX controller diagnosis?" In the dialog box, select "Yes" as shown in the following figure:



图 刷写控制器选择

Figure Selection of flashing controller

然后再选择“是”，继续下一步；

Then select 'Yes' and proceed to the next step;

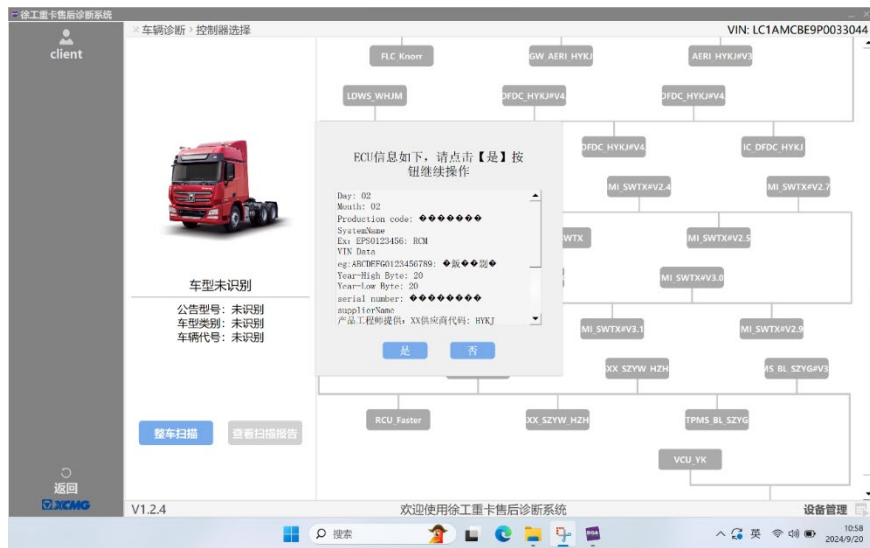


图 诊断界面

Figure Diagnostic Interface

3.3.5 控制器刷写

3.3.5 Controller flashing

选择需要刷写的控制器 RCM，如上图，选择“是”即可，然后进入该控制器的全部诊断功能，左侧为功能清单。

Select the controller RCM that needs to be flashed, as shown in the figure above, select "Yes", and then enter all diagnostic functions of the controller. The function list is on the left.

1) Read ECU information

Click on 'Read ECU Information' on the left to read the current controller software version number: V3.2.4
20240913;

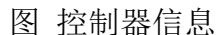


Figure Controller Information

2) ECU 程序刷写

2) ECU program flashing

选择“ECU 程序刷写”，右侧界面变成如下，选择控制器刷写驱动文件以及要更新的应用文件，确认车辆状态是否符合测试准备要求，然后点击“开始刷写”；右侧提示刷写进度；

Select "ECU program flashing", the right-hand interface will become as follows, select the controller to flash the driver file and the application file to be updated, confirm whether the vehicle status meets the test preparation requirements, and then click "start flashing"; The prompt on the right shows the progress of flashing;



图 控制器刷写软件选择

Figure Controller flashing software selection



图 刷写过程

Figure Brushing process

刷写完成进度 100%，提示刷写成功。

The progress of flashing is 100%, indicating successful flashing.

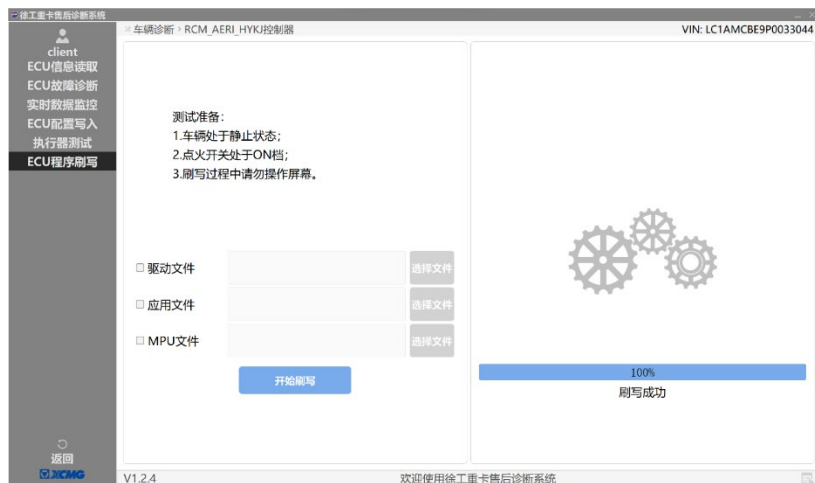


图 刷写完成

Figure Brushing completed

3) 更新后软件版本读取

3) Read the updated software version

更新完成后，选择 ECU 信息读取，可以查看软件版本号是否变更，如果变更成需要的版本号，说明软件刷写成功。

After the update is completed, select ECU information reading to check if the software version number has been changed. If it has been changed to the required version number, it indicates that the software flashing has been successful.

