General Measures for Macan Electric Diagnosis (89/25)

Model Line: **Macan Electric (XAB)**

Model Year: **As of 2024**

Concerns: **For vehicle diagnostics**

Cause: **General actions for diagnosing the Macan Electric.**
For efficient diagnosis and troubleshooting, please follow the procedure described below. The following process enables systematic fault finding and provides targeted support in the elimination of customer complaints.

Overview of all areas of action:

- **Establish consistent vehicle condition**: Action step 1 ⇒ 1
- **Fault finding in general**: Action step 2 ⇒
- **Fault finding for the focus topic Charging**: Action step 3 ⇒
- **Fault finding for the focus topic Connect / Infotainment**: Action step 4 ⇒
- **Fault finding for the focus topic of driving readiness/performance**: Action step 5 ⇒
- **Fault finding after repair with focus on the Drive and chassis main control unit HCP1 (J1312)**: Action step 6 ⇒
- **Focus topic "Handling accident vehicles"**: Action step 7 ⇒

Work Procedure: 1 **Establish consistent vehicle condition**

1.1 Check whether the customer complaint can be traced.

- **Premise:** The customer complaint and the period (date and time) of the occurrence are clearly known – they were either directly named by the customer or actively requested from the customer.

1.2 Before deleting the fault memory or performing other work on the vehicle, **a pre-VAL must always** be created.

- This is absolutely necessary in order to be able to trace the customer complaint based on the diagnostic data in the next steps – in particular in the event of intermittent faults.

1.3 Check in the PCSS whether there are open campaigns for the vehicle or whether repair recommendations are available in connection with the customer complaint, for example a Technical Information (TI) or symptom-based repair description (SY).

1.4 If applicable, carry out open campaigns or process repair recommendations in accordance with the Technical Information (TI) or symptom-based repair description (SY).

- This is important to ensure that the software statuses of all control units correspond to the required status.

1.5 Erase fault memory.

1.6 Establish bus idle.

- The procedure is described in the Workshop Manual ⇒ *Workshop Manual '033525 for reading out on-board diagnosis and for programming systems'* in the section "Rework".

1.7 Check whether the customer complaint still exists. If this exists and is traceable, another vehicle analysis log (VAL) should be created.

2 **Fault finding in general**

Information

The latest version of the fault finding guide can be called up using the diagnostic tester. The technician is guided step by step through the possible faults. This helps narrow down the cause of the fault.

Select 'All control units' in the control units overview and switch to the 'Fault memory' tab. Then a new '[F3] / Guide' button appears, which can be used to jump to the comprehensive fault finding guide. The fault finding guide is started with the red 'Start' button.

Please note that the **complete and current information** of the fault finding guide can be found in the **diagnostic tester** ('[F3] / Guide' button). **This information is always authoritative and must be observed.**

2.1 **Procedure for actively pending customer complaint (fault symptom)**

Check whether there is a **fault code that matches the customer complaint** - the status (active/passive) is not relevant in the first step.

- If **yes**: Process the actions in Guided Fault Finding (GFF) for the corresponding fault code/codes. Always start with the **active fault codes**. If there are no suitable active fault codes, the **passive fault codes** must be processed.

2.2 **Procedure for a sporadic, not actively pending customer complaint (fault symptom)**

Check whether a **fault code matching the customer complaint exists in the previously created pre-vehicle analysis log (VAL)** - the status (active/passive) is not relevant in the first step. **For this purpose, use the pre-VAL in the PCSS.**

- If **yes**: Process the actions in Guided Fault Finding (GFF) for the corresponding fault code/codes. Always start with the **active fault codes**. If there are no suitable active fault codes, the **passive fault codes** must be processed.

2.3 **Procedure for customer complaints based on warning messages**

- Observe procedure under points 2.1 and 2.2 and carry out the procedure for customer complaints regarding warning messages analogously to the actively pending and not actively applied warning message (customer complaint).
- Check the warning messages in the main Infotainment HCP3 (J794) control unit.

Information

Warnings or messages are no longer stored in the fault memory on Macan Electric, but are recorded as measured values.

The '**instrument cluster warning messages**' can be found in the Infotainment HCP3 (J794) main control unit – instrument cluster. The last 20 warnings and messages of the instrument cluster are displayed there with their warning ID and the associated fault text and time stamp. These texts can also be found in the VAL. Main Infotainment control unit HCP3 (J794) – instrument cluster > actual values/input signals> instrument cluster warning message.

- If a **warning or message** is present in the HCP3 control unit, the **period** for **further fault finding** can be narrowed down. To do this, use the extended view in the vehicle analysis log (VAP) in the PCSS.

2.4 Check the **fault memory** for the **period previously narrowed down based on the customer complaint** and proceed as described below.

- The **fault codes that occurred in the previously narrowed down period** must be processed using Guided Fault Finding (GFF). Processing must be carried out according to the stated priority (levels 1 to 6) - starting with priority 1.
- If there are too many fault memory entries in the previously narrowed down period (complex fault patterns): Start fault tree with F12 .

3 **Fault finding for the focus topic Charging**

Information

The basic prerequisite for the further procedure is that a charging attempt was previously carried out in the Porsche Center.

3.1 **Perform a charging attempt** and test both charging sockets (left and right).

- If the **charging attempt is successful**, the fault is not on to the vehicle, but on the charging infrastructure used by the customer.

3.2 **Verify cause of fault**: Check the following control units for faults that indicate infrastructure problems:

- Charging communication control unit 1 (J1245)
- Charging communication control unit 2 (J1246)
- Main control unit for gateway HCP5 (J1273)
- High-voltage central box (JX6)

PCSS / SOLID can be used to further narrow down the infrastructure fault.

3.3 If the charging attempt is **not successful**, please proceed according to the table:

Situation	Action
No form of charging possible	There is a higher-level problem in the high-voltage system. Check the main control unit for gateway HCP5 (J1273) for fault memory to the high-voltage coordinator and process according to Guided Fault Finding.
Only DC charging not possible	Check for fault memories in the following control units and process according to Guided Fault Finding: ▪ Charging communication control unit 1 (J1245) - charging socket 1 (UX4). ▪ Gateway main control unit HCP5 (J1273) - high-voltage coordinator ▪ High-voltage battery control unit (J1120)
Only AC charging not possible	Check whether both or only one charging socket is affected.
Charging not possible at both charging sockets (UX4 / UX5)	There is a higher-level problem in the high-voltage system. Check for fault memories in the following control units and process according to Guided Fault Finding: ▪ Gateway main control unit HCP5 (J1273) - high-voltage coordinator ▪ High-voltage central box (JX6) ▪ High-voltage battery control unit (J1120)
Charging only not possible at charging socket 2 (UX5)	Check for fault memories in the following control units and process according to Guided Fault Finding: ▪ Charging communication control unit 2 (J1246) for vehicles with Combo charging standard
Charging only not possible at charging socket 1 (UX4)	Check charging communication control unit 1 (J1245) for fault memories and process according to Guided Fault Finding

4 **Fault finding for the focus topic Connect / Infotainment**

In this area, a distinction is made between complaints for the following systems/functions:

- Main control unit for infotainment HCP3 (J794) and main control unit for infotainment HCP3 (J794) – instrument cluster malfunction sporadically
- Apple CarPlay / Android Auto cannot be paired
- Mobile online services are reduced

Complaint	**Action**
Main control unit for infotainment HCP3 (J794) and instrument cluster display (J285) malfunction sporadically	▪ Ensure that all actions and repairs (TI or SY) have been processed on the topic mentioned. ▪ Carry out integration test and ensure that the vehicle software status is up-to-date. ▪ If the customer complaint continues to exist after the measures mentioned have been carried out, the respective control unit can be replaced.
Apple CarPlay / Android Auto cannot be paired	▪ Check whether software versions in the vehicle and smartphone are up-to-date. The correct function of Apple CarPlay and Android Auto depends on the compatibility of the software versions in the smartphone and in the vehicle ▪ If the software network in the vehicle is up-to-date, it can be assumed that it is attributable to the operating system of the customer's smartphone: Inform customer of smartphone operating system update.
Mobile online services restricted	▪ Check whether fault memory is present in the external communication control unit (J949): - If **YES**: Process Guided Fault Finding actions. - If **NO**: Remove external communication control unit (J949), incl. battery for emergency call module (backup battery) ▪ If the vehicle was excluded as a source of fault, then check the backend status for this vehicle in SOLID.

5 **Fault finding for the focus topic of driving readiness/performance**

In this area, a distinction is made between the following topics.

- **Topic of driving readiness:** The vehicle can no longer be started/driven
- **Driving performance topic:** The vehicle is still drivable, but has no/little propulsion (power).

In both cases, the following prerequisite applies:

- **The immobiliser** for **all** vehicle components **must be taught correctly**.
- Please note that the **complete and current information** of the fault finding guide can be found in the **diagnostic tester** ('F3 / Guide' button). **This information is always authoritative and must be observed.**

5.1 **Topic of driving readiness:** The vehicle can no longer be started/driven

Information

The basic prerequisite for the further procedure / further queries is that no high-voltage charging plug may be plugged into one of the two high-voltage charging sockets.

Inspection / Situation	Action
1. Check readiness for driving	Engage gear D or R. If not possible, continue with inspection step 2.
2. No gear can be engaged	Check whether the vehicle wrongly detects an inserted high-voltage charging plug. **To do this, please check the plug status using the following measured values:** ▪ Main control unit for gateway HCP5 (J1273): High-voltage system >Automatic verification of isolation from power supply > Status Charging plug ▪ Charging communication control unit 1 (J1245): Locking mechanism motor for charging plug 1 (F498) > Status: Charging infrastructure ▪ Charging communication control unit 2 (J1246): Locking mechanism motor for charging plug 2 (F499) > Status: Charging infrastructure
2.1 The plug status does **not** match the real status	SY 9356 Charging socket (motor locking mechanism) for detecting plug defects – process locking issues with the charging plug during charging (SY 82/25)

2.2 The plug status matches the real status	Perform the following tests in the specified order: ▪ Check shift console (E313) for relevant fault memories and process in accordance with Guided Fault Finding. ▪ Check that the brake is functioning correctly: Press brake, brake light must come on. If necessary, check additional measured value / fault memory. You can find the measured value here: Brake electronics control unit (J104) > Actual values > Brake light switching status ▪ Check whether the following fault memory is stored in the **front** high-voltage pulse inverter (**JX4**) and, if yes, process it in accordance with Guided Fault Finding: "P0A2F00 (010626) - Front electric machine (VX89), stator, temperature too high" **or** "P0A2F00 (010627) Front electric machine (VX89), rotor, temperature too high" ▪ Check whether the following fault memory is stored in the **rear** high-voltage pulse inverter (**JX1**) and, if yes, process it in accordance with Guided Fault Finding: "P0A904B (0A904B) - Rear electric machine (VX90), stator, temperature too high" **or** "P0A9098 (0A9098) - Rear electric machine (VX90), rotor, temperature too high"
3. None of the above actions help	Start individual fault finding.

5.2 **Driving performance topic:** Readiness for driving can be established, but the vehicle has little / no propulsion

Test	**Action**
Check the charge state of the high-voltage battery	The charge state of the high-voltage battery must be **higher than 10%**: If below 10%, charge the vehicle first.

Search for relevant fault memory entries (with reference to power restriction) in the high-voltage battery control unit (J1120)	If relevant fault memory entries are available, process them according to Guided Fault Finding.
Search for relevant fault memory entries (regarding the rotational ability of the wheels) in the brake electronics control unit (J104)	If relevant fault memory entries are available, process them according to Guided Fault Finding.
Search for the following fault memory entries in the rear high-voltage pulse inverter control units (JX1) and front high-voltage pulse inverter (JX4): ▪ Control unit, rotor position calibration faulty ▪ Control unit, temperature too high ▪ Control unit, temperature sensor, electrical fault	If the above-mentioned fault memory entries are available, process them according to Guided Fault Finding.
None of the above actions help	Start individual fault finding.

6 **Fault finding after repair with focus on the Drive and chassis main control unit HCP1 (J1312)**

The following initial position exists in this area:
The Drive and chassis main control unit HCP1 (J1312) is often displayed as a fault source within the comprehensive fault memory, but the cause is often in another control unit.
Known causes are described below.

Situation	**Action**
1. **Software status** of all control units is **not up–to-date** (especially after replacing a control unit).	▪ Carry out integration test and ensure that the vehicle software status is up-to-date. When testing, pay particular attention to the following control units: - Drive and chassis main control unit HCP1 (J1312) - Airbag (J234) - Brake electronics (J104)

2. **Calibration of the combination sensor** in the airbag is **faulty**.	▪ Check whether one of the following fault memories is stored in the **Drive and chassis main control unit** HCP1 (J1312): - C051D00 (0007BE / 6007BE) – Sensors for driving dynamics, airbag control unit (J234), no default setting ▪ Then check in the **airbag** (J234) whether the following fault memory entry is stored: - C115E54 (515E54) – Control unit - internal combination sensor, not taught ▪ Perform function “Teaching the combination sensor (J234)” in the **airbag** control unit (J234): Teach airbag (J234) > Maintenance and repairs > Combination sensor (J234) **If trying to teach** the combination sensor and level sensors **fails**, perform the following action: Additional menu F7 >Perform special function > Enter action code: CombiSenso_J234 Continue with F12 and perform action to the end. ▪ Then teach level sensors in the **Drive and chassis main control unit** HCP1 (J1312) and combination sensor in the **airbag** (J234) via the **service / repair** procedures
3. There is a **cross-exchange** or **incorrect coding**.	▪ Check whether one of the following fault memories is stored in the **Drive and chassis main control unit** HCP1 (J1312): - B1AECF0 (00051C / 60051C) – Cross-exchange protection or faulty coding Measured value “Initialization: Status” ▪ Measured value shows "**not** initialised": Perform integration test and check measured value again. If not OK, the HCP1 must be replaced. ▪ Measured value shows "**initialised**" : Read the measured value "Gear formation, parking lock (V682), counter for wear limit: Check status". Write down the value read out.

	- The value is greater than / equal to **1**: OK The value is **0**: Set parking locks wear counter to 1 via the following routine: “Write parking lock > wear limit counter>“
4. The **level sensors cannot be taught**	Check the following and adjust if necessary: ▪ **Software status** of all control units is **not up–to-date** (especially after replacing a control unit): Carry out integration test and ensure that the vehicle software status is up-to-date. ▪ Teaching anti-theft function (VKMS) Note: All control units must be taught. ▪ Perform function “Teaching the combination sensor (J234)” in the **airbag** control unit (J234). Important: No active faults for the combination sensor must be entered in the airbag. **If teaching fails**: Perform step 2 again. ▪ The car jack mode in the PCM must not have been activated (by the driver). If yes: deactivate. ▪ All doors and rear lid must be closed. ▪ The vehicle must stand on movable floating plates of a wheel alignment platform, see Workshop Manual.

7 **Focus topic "Handling accident vehicles"**

The following steps describe the handling of accident vehicles. This procedure will also be available in detail as a Workshop Manual in the future

7.1 **Check and repair vehicle.**

WARNING

Working on high-voltage accident vehicles involved

- **Accident**

⇒ **Before working on accident vehicles, observe the instructions and procedure in the document ““Workshop procedure for high-voltage vehicles” (see standard documents).**

Information

Deactivation of high-voltage system only after complete safety check

Before you perform a deactivation procedure, you must ensure that the vehicle has been fully inspected for damage and defects and professionally repaired.

The following systems must be checked in particular:

- Vehicle electrical system 12V / 48V
- High-voltage system and both charging electrical sockets
- Airbag system incl. all sensors and ignition elements
- Chassis system
- All fluid-guided circuits (e.g. cooling system, brakes, chassis hydraulics, drive oil cooling, washer fluid)

Information

Main control units may only be replaced if necessary (e.g. in the event of a defect) and only after successful repair of all relevant systems.

Information

In the event of repairs to the high-voltage battery, the special instructions must be observed.
⇒*Technical Information '0001IN Safety and repair instructions information'*

7.2 **Resetting accident detection using the Porsche Tester**. Please work through the following Workshop Manual: ⇒*Workshop Manual '695325 Programming airbag control unit to reset accident detection'*