

Vibrating Steering Wheel and Red Warning Message "Electrical System Fault" - Observe Specified Procedure (SY 73/26)

Model Line: **Macan (XAB)**
Cayenne (X1A/X1B)

Concerns:

- **Ground connection for electric power distributor (J1282)**
- **Ground connection for power steering control unit (J500)**

Information: **The customer complains about a vibrating steering wheel while driving from approx. 4 mph (6 km/h) in conjunction with a red warning message Electrical system fault park vehicle safely.**

One of the following fault memory entries is stored in the fault memory of the electric power distributor (J1282):

- **B1BF4F0** - Control unit, power supply for power steering control unit (J500), electrical fault **(000028)**
- **B1BF4F3** - Control unit, power supply for power steering control unit (J500), electrical fault **(000088)**

Cause: The complaint can occur due to an excessive transition resistance of the ground connection of the electric power steering and/or the electric power distributor.
The contact resistance is caused by contamination or an incorrect coating on the ground stud.

Action:

- Check that the ground points are secure.
- Clean contact surfaces of ground connection
- Check electric plug connection of electric power distributor and electric power steering
- Performing 4-conductor measurement
- Perform tester routine for Fault codes, status check



Information

The minimum requirement for the tester routine is the Porsche Tester Software Version: **44.300.000** (or higher).

Required parts:

Parts Info:

Part no.	Designation – Location	Quantity
PAF00692500	> 1 piece(s) welding bolt for ground connection for aluminium body parts (M8) <u>PAF00692500</u> Welding bolt for aluminium body parts M8 Ground point for power steering control unit (J500) - Longitudinal member, inner right - Wheel housing, upper right	2 piece(s)

Required tools:

- > P90999 – Porsche Tester 4th generation
- > VAS 6558A – High-voltage test adapter
- > VAS 6558A/27 – Set of Kelvin clamps and test probes
- Torque wrench 2–10 Nm (1.5–7.5 ft-lb.) e.g. > V.A.G. 1783 – Torque wrench 2–10 Nm (1.5–7.5 ft-lb.)
- Torque wrench 6 – 50 Nm (4.5–37 ft-lb.) e.g. > V.A.G. 1331A – Torque wrench 6–50 Nm (4.5–37 ft-lb.)

Preparatory work

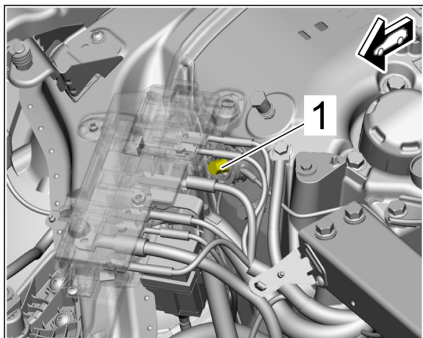
Work Procedure:

- 1 Ensure that the vehicle's readiness for operation has been ended at **least 5 minutes beforehand**.
- 2 Deactivate high-voltage system.
931083 Deactivating and activating high-voltage system
- 3 Remove luggage compartment liner.
501919 Removing and installing luggage compartment liner
- 4 Disconnect vehicle electrical system battery.
For work procedure, see:
27061920 Removing and installing LiFePo (A) vehicle electrical system battery
- 5 Observe additional work procedure:
27061IN Work instructions after disconnecting vehicle electrical system battery
- 6 Remove front cover.
51921900 Removing and installing front cover

Check ground connection for electric power distributor and power steering control unit

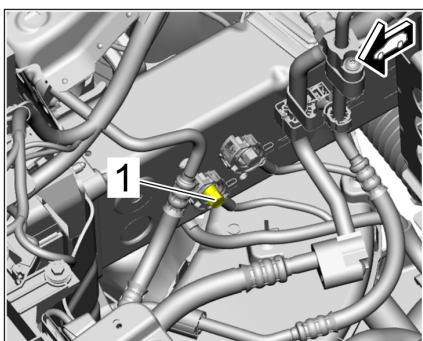
Work Procedure:

- 1 Check that the nut securing the ground point for the electric power distributor (J1282) -1- on the upper right wheel housing is secure and document the result.



Ground point for the electric power distributor (J1282) on the upper right wheel housing (example Cayenne)

- 2 Check that the nut securing the ground point for the power steering control unit (J500) -1- on the front right longitudinal member is secure and document the result.



Ground point for the power steering control unit (J500) on the inner right longitudinal member (example Cayenne)

- 3 Continue with "Reworking contact surfaces on ground points".

Reworking contact surfaces on ground points

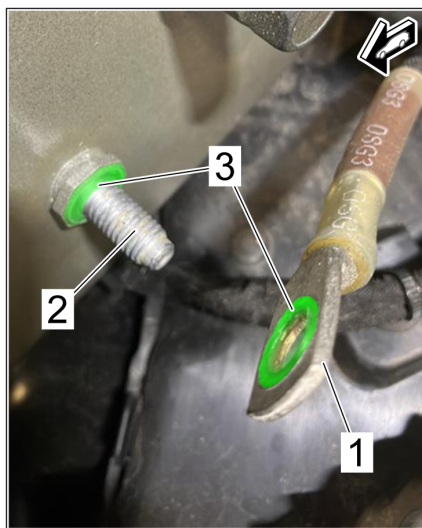
Work Procedure:



Information

The reworking of the grounding points is illustrated using one grounding point as an example. The procedure is identical for both grounding points.

- 1 Reworking contact surfaces -3- on ground point.



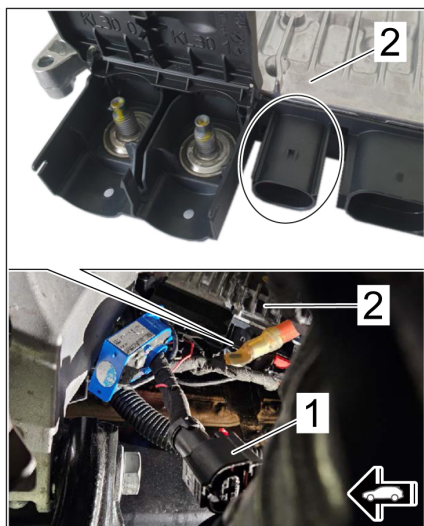
Cleaning ground point

- 1.1 Unscrew nut on ground point.
- 1.2 Pull cable lug of ground line -1- off ground stud and -2- clean it using suitable aids on contact surfaces -3-.
- 1.3 Fit **new** ground point nut and tighten.
 - > 1. Tightening torque 3 Nm (2.2 ft lb)
 - > 2. Rotation angle 45 °
- 2 Continue with **Checking electric plug connections on electric power distributor (J1282) and power steering control unit (J500).**

Electric plug connections on electric power distributor (J1282) and power steering control unit (J500)

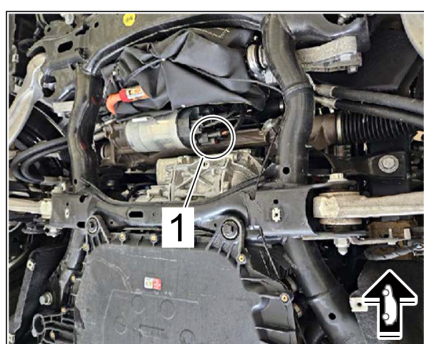
Work Procedure:

- 1 Check electric plug connection -1- on electric power distributor (J1282) -2-.



Checking electric plug connection on electric power distributor (J1282)

- 1.1 Release and pull off electric plug connection -1-.
 - 1.2 Check the pins of the electric plug connection -1- for damage, widening and correct fit.
 - 1.3 Document and repair any detected damage to the locking mechanism and/or pins.
- 2 -1-Check electric plug connection on the power steering control unit (J500) -2-.



Checking electric plug connection on power steering control unit (J500).

- 2.1 Release and pull off electric plug connection -1-.
 - 2.2 Check the pins of the electric plug connection -1- for damage, widening and correct fit.
 - 2.3 Document and repair any detected damage to the locking mechanism and/or pins.
- 3 Continue with "Perform 4-conductor measurement".

Performing 4-conductor measurement



Information

For the measurements described, there is a **temporary** requirement for 2 pins of a **MAK-12 connector** to connect to the Kelvin clamps from the [VAS 6558A/27 – Kelvin clamp and test probe set](#) to the corresponding lines.

Alternatively, the affected pins can be depinned for the measurements.

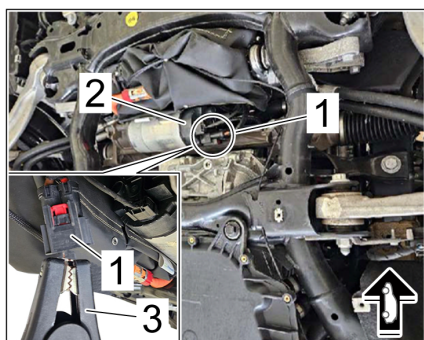
Work Procedure:

- 1 Prepare measuring equipment accordingly for the 4-conductor measurement.

For work procedure, see:

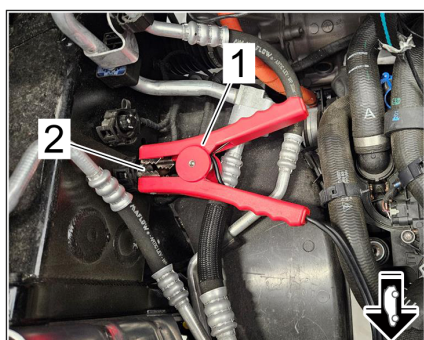
93160300 Measuring potential equalisation, general

- 2 **Connect the brown line (-)** of the electric plug connection -1- on the power steering control unit (J500) -2- to one of the two Kelvin clamps -3-.



Electric plug connections on the power steering control unit (J500)

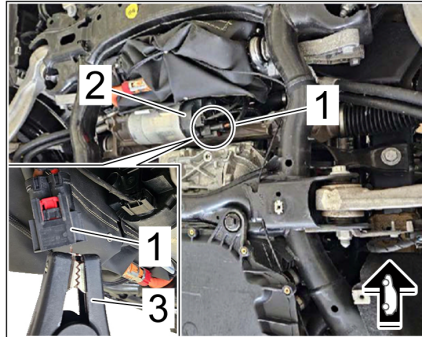
- 3 **Connect the second Kelvin clamp -1- to the ground point for the power steering control unit (J500) -2- on the inner right longitudinal member.**



Ground point for the power steering control unit (J500) on the inner right longitudinal member

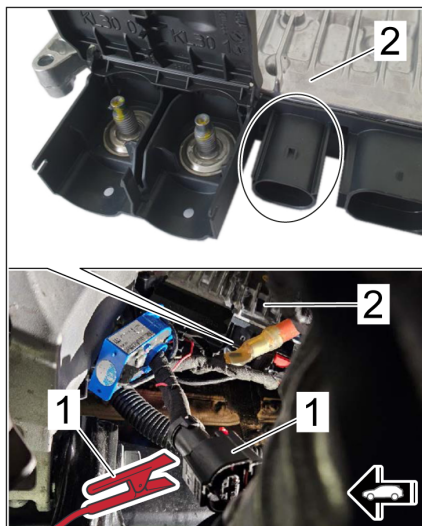
- 4 Measurement result on [P90999 – Porsche_Tester_4th_generation](#), save and write down if necessary.

- 5 Connect the red line (-) of the electric plug connection -1- on the power steering control unit (J500) -2- to one of the two Kelvin clamps -3-.**



Electric plug connections on the power steering control unit (J500)

- 6 Connect the red line (+) of the electric plug connection -1- on the electric power distributor (J1282) -2- to the second Kelvin clamp -3-.**



Electric plug connection on electric power distributor (J1282)

- 7 Measurement result on > P90999 - Porsche Tester 4th generation, save, write down if necessary and assess results.**

Assessment	Action
(?) Both lines have a resistance of 12 mΩ or less.	Lines OK. Reassemble the vehicle again and continue with Tester routine for Fault codes, status check.
(?) A line has a resistance of more than 12 mΩ.	Affected line not OK. Continue troubleshooting. After repairs, reassemble the vehicle again and continue with Tester routine for Fault codes, status check.

Perform tester routine for Fault codes, status check



Information

Before carrying out this routine, the grounding points must have been cleaned and the supply lines correctly checked and, if necessary, repaired.

This routine resets internal counters and fault states of the electrical power distributor (J1282) and reinitialises the affected functions.

Work Procedure:

- 1** Perform tester routine for Fault codes status check.
 - 1.1** Connect P90999?_Porsche_Tester_4th_generation to the vehicle.
 - 1.2** Position the vehicle **freely** on level ground.
 - 1.3** Establish readiness for operation.
 - 1.4** Select **Electric power distributor (J1282)** control unit.
 - 1.4.1** Select the **Drive links/checks** menu.
 - 1.4.2** Select **the Fault codes, status check** function.
 - 1.5** Operate the brake pedal and keep it pressed during the entire procedure.
 - 1.6** Establish readiness for operation and engage gear (D or R).
 - 1.7** Perform steering movement.
 - 1.8** Read off the measured values.
 - Power consumption (currently) during steering movement $I > 10\text{ A}$
 - Total resistance (maximum) during steering movement $R < 12\text{ m}\Omega$
 - 1.9** If the measured values are OK, start the routine via **F8**.
 - 1.10** Activate the parking brake.
 - 1.11** Create final VAL.
- End of action.**

Labor position and PCSS encryption

Labor position:

Rework ground points, perform 4-conductor measurement and tester routine

PCSS encryption:

Electric power distributor (J1282)

loose contact, contact error

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