WMH0 - Re-Programming Various Control Units (Workshop Campaign)

Revision: This bulletin replaces bulletin Group 9 120/21 WMH0, dated August 24, 2021.

Model Year: **As of 2020 up to 2021**

Important: **CRITICAL WARNING** -This campaign includes steps where control unit(s) in the vehicle will be programmed with the PIWIS Tester. The vehicle voltage must be maintained between 13.5 volts and 14.5 volts during this programming. Failure to maintain this voltage could result in damaged control unit(s). Damage caused by inadequate voltage during programming is not a warrantable defect. The technician must verify the actual vehicle voltage in the PIWIS Tester before starting the campaign and also document the actual voltage on the repair order.

Model Line: **Taycan (Y1A)**
Taycan Cross Turismo (Y1B)

Concerns: **Re-program various control units**

Information: **During a data analysis with regard to hardware and software versions in the field and their combinations, we have discovered that there has been a deviation from the defined target status on the affected vehicles.**
As a result, the consistency of the network of hardware and software versions defined and approved by Porsche cannot be guaranteed.

Action required:
- Re-program the control units using the PIWIS Tester with installed software version **40.550.040** (or higher).
- Depending on the software version of the individual control units in the vehicle system, other control units must also be re-programmed or coded.
- **Only** the control units that do not correspond to the defined VR12.1.1 software setpoint level are programmed.

Information

The guided programming sequence during this campaign includes all control units from the corresponding software releases, in addition to those which are to be reprogrammed. In the programming sequence, the following software versions of the individual control units are again compared with the target status of the software release. If the actual status already matches, the programming of the relevant control unit is automatically skipped, and so the scope of the control units may vary depending on the vehicle.

Information

Each vehicle affected by this measure has been assigned **exactly one scope**, which includes the measures required for updating the software.

For details of the exact scope of this campaign that is assigned to each vehicle, see PCSS Vehicle Information.

An overview of the corresponding action required for each scope can be found in the table below.

Scope overview:

Allocation	Model year	Scope of control unit programming
Scope 1:	• **Model year 2020 vehicles**	• **VR8.6** • **VR8.7** • **VR12.1.1 - > Sequence 2**
Scope 2:	• **Model year 2020 vehicles** • **Model year 2021 vehicles**	• **VR12.1.1 - > Sequence 2**
Scope 3:	• **Model year 2020 vehicles**	• **VR12.1.1 - > Sequence 1**
Scope 4:	• **Model year 2020 vehicles** • **Model year 2021 vehicles**	• **VR12.1.1 - > Sequence 3**
Scope 5:	• **Model year 2020 vehicles**	• **VR8.6** • **VR8.7** • **VR12.1.1 - > Sequence 1/2/3**
Scope 6:	• **Model year 2020 vehicles**	• **VR8.7** • **VR12.1.1 - > Sequence 2**

Information

After **each** completed programming session, a working log **must** be created and, after the campaign has been completed, will be uploaded to the quality line using the PIWIS Tester.

Affected Vehicles: Only vehicles assigned to the campaign (see also PCSS Vehicle Information).

Required tools

Information

The Taycan (Y1A/Y1B) is equipped as standard with a **lithium starter battery**.

Lithium starter batteries must only be charged using a **suitable battery charger** that has a current and voltage-controlled charge map.

For further information about the battery chargers to be used, see ⇒*Workshop Manual '270689 Charging battery/vehicle electrical system'*.

Tools:

- Battery charger with a current rating of **at least 90 A** and **also** with a **current and voltage-controlled charge map** for lithium starter batteries, e.g. **VAS 5908 battery charger 90 A**
- **9900 - PIWIS Tester 3** with software version **40.550.040** (or higher) installed.

Preparatory work - all scopes

NOTICE

Fault entry in the fault memory and control unit programming aborted due to undervoltage.

- **Increased current draw during diagnosis or control unit programming can cause a drop in voltage, which can result in one or more fault entries and the abnormal termination of the programming process.**

⇒ **Before starting control unit programming, connect a suitable battery charger with a current rating of at least 90 A to the vehicle.**

NOTICE

Control unit programming will be aborted if the WiFi connection is unstable.

- **An unstable WiFi connection can interrupt communication between the PIWIS Tester and the vehicle communication module (VCI). As a result, control unit programming may be aborted.**

⇒ **During control unit programming, always connect the PIWIS Tester to the vehicle communication module (VCI) via the USB cable.**

NOTICE

Control unit programming will be aborted if the driver's key is not recognized

- **If the driver's key is not recognized in the vehicle, programming cannot be started or will be interrupted.**

⇒ **Position the driver's key with the back facing forward upright between the holding struts in the rear cupholder (emergency start tray) to ensure a permanent radio link between the vehicle and remote control.**

NOTICE

Programming interrupted

- **Malfunctions in control unit**
- **Risk of damage to control unit**

⇒ **Route the line between the vehicle communication module (VCI) and diagnostic socket on the vehicle without tension and make sure that the connector is inserted fully into the diagnostic socket.**

⇒ **Check that the rechargeable battery for the PIWIS Tester is charged sufficiently. Connect the PIWIS Tester to the power supply unit if necessary.**

Information

To carry out the campaign, the PIWIS Tester must be online and logged into the Porsche Partner Network (PPN).

Information

Use the **new** PIWIS Tester data cable to carry out the campaign. The difference between the old ⇒*PIWIS Tester data cable* **-1-** and new ⇒*PIWIS Tester data cable* **-2-** data cable is shown in the illustration.

If the connection between the vehicle and PIWIS Tester is interrupted, check the data cable for the PIWIS Tester for signs of damage. If the data cable is damaged, it **must** be **replaced**. To do this, follow the instructions in the PPN for "Returning faulty USB cable caps" (PPN portal > Dr Ing. h.c. Porsche AG > Aftersales > Workshop > PIWIS > Documents).

PIWIS Tester data cable

Information

The procedure described here is based on the PIWIS Tester 3 software version **40.450.020**.

The PIWIS Tester instructions take precedence and in the event of a discrepancy, these are the instructions that must be followed.
A discrepancy may arise with later software versions for example.

Information

To prevent any excessive and potentially noticeable heating of the charging clamp of the negative cable while charging the 12-volt vehicle electrical system battery using an external battery charger, always check the following points:

- Always connect the charging terminal of the negative cable vertically from above to the ground point for the external power connection. Make sure that the charging clamp cable is routed loosely to prevent the charging clamp from tilting sideways at the ground point.
- When connecting the charging clamp, make sure that it is a sufficient distance away from peripheral parts (e.g. pneumatic supply line for air-spring strut).
- Before raising the vehicle using a lifting platform, always disconnect the battery charger completely from the vehicle in order to prevent the connecting line of the charging terminal from becoming taut and the charging terminal tipping sideways at the ground point as a result.

Information

The state of charge of the high-voltage battery should not be less than 30% or more than 80% for the software update.

Work Procedure:

1 Connect a suitable battery charger, e.g. **Battery charger 90A**, to the jump-start terminals in the luggage compartment and switch it on.

2 **Position the driver's key** with the back facing forward upright between the holding struts in the rear cupholder (**emergency start tray**) to guarantee a permanent radio link between the vehicle and remote control ⇒ *Emergency start tray*.

Emergency start tray

3 **9900 - Connect PIWIS Tester 3** to the vehicle communication module (VCI) via the **USB cable**. Then connect the communication module to the vehicle and switch on the PIWIS Tester.
Operate the PIWIS Tester **through the power supply unit**.

4 Establish operational readiness (switch on ignition).

5 On the PIWIS Tester start screen, call up the **'Diagnostics'** application.

The vehicle type is then read out, the diagnostic application is started and the control unit selection screen is populated.

6 Create Vehicle Analysis Log (VAL) using the PIWIS Tester.
Mark the vehicle analysis log you have just created with the attribute "Initial VAL" and after carrying out the campaign, return it using the PIWIS Tester.

7 Read out and check the fault memory.
Mark the vehicle analysis log you have just created with the attribute **"Initial VAL"** and after carrying out the campaign, return it using the PIWIS Tester.

Then update the control unit according to the scope clearly assigned to the respective vehicle.

The relevant scope assigned to the vehicle can be seen in the PCSS Vehicle Information.

8 Delete the working logs that are currently stored on the Tester.

8.1 Select •F10 “ (‘Logs’) in the **lower** menu bar in the control unit overview and select the **working log**.

8.2 Select and delete the stored working logs.

Allocation	Software	Action required
Scope 1:	• **VR8.6** • **VR8.7** • **VR12.1.1 - > Sequence 2**	⇒ *Technical Information '270689 Re-program various control units - Scope 1'*.
Scope 2:	• **VR12.1.1 - > Sequence 2**	⇒ *Technical Information '270689 Re-program various control units - Scope 2'*.
Scope 3:	• **VR12.1.1 - > Sequence 1**	⇒ *Technical Information '270689 Re-program various control units - Scope 3'*.
Scope 4:	• **VR12.1.1 - > Sequence 3**	⇒ *Technical Information '270689 Re-program various control units - Scope 4'*.
Scope 5:	• **VR8.6** • **VR8.7** • **VR12.1.1 - > Sequence 1 / 2 / 3**	⇒ *Technical Information '270689 Re-program various control units - Scope 5'*.
Scope 6:	• **VR8.7** • **VR12.1.1 - > Sequence 2**	⇒ *Technical Information '270689 Re-program various control units - Scope 6'*

Re-program various control units - Scope 1

WARNING

Electrically moved side windows and rear spoiler

- **Danger of limbs being trapped or severed**
- **Risk of damage to components**

⇒ **Do not reach into the danger area.**

⇒ **Keep third parties away from the danger area.**

⇒ **Do not move components or tools into the danger area.**

NOTICE

Using the software on vehicles that are not assigned to this campaign:

- **Risk of damage to control unit**

⇒ **Use the listed software versions only for the vehicles assigned to the campaign.**

Information

The guided programming sequence during this campaign includes all control units from the corresponding software releases, in addition to those which are to be reprogrammed. In the programming sequence, the following software versions of the individual control units are again compared with the target status of the software release. If the actual status already matches, the programming of the relevant control unit is automatically skipped, and so the scope of the control units may vary depending on the vehicle.

Information

To ensure that no user-specific settings from **cloud-based services (Porsche Connect & My Porsche)** are lost during the update, activate **Privacy mode** before starting the update. When Privacy mode is activated, communication between the vehicle and the Porsche Connect app and My Porsche is disabled. No vehicle-specific information is transferred. As a result, settings cannot be configured on the vehicle using the Porsche Connect app or My Porsche.

When the **instrument cluster** and **central computer** are re-programmed, the **individual settings** implemented **in the vehicle** by the customer will be lost and reset to the **default values** of the country version that applies to the vehicle.

After carrying out the campaign, please inform customers that personal settings they have implemented in the instrument cluster and central display of the central computer will have to be **set again** and provide them with any **help and support** they need for setting the relevant options.

This affects the following settings, for example:

- Individual settings for tubes 1 to 3 of the instrument cluster as well as the extended map view or reduced view of the instrument cluster
- Individual settings of the head-up display (HUD)
- Selected functions of individual tubes in the instrument cluster, e.g. auto zoom, 3D map and satellite map
- Arrangement of tiles in the home screen and MyScreen on the central display
- Individual seat, exterior mirror and ergonomic settings

- Air conditioning settings, such as ventilation and air quality
- Privacy settings
- Frequency setting of the garage door opener (Homelink)

Information

Only control units that are not up-to-date are updated. As a result, programming is aborted if the control units have already been updated.

Work Procedure: 1

Only relevant for vehicles with Scope 1: Start control unit programming of **VR8.6**.

The basic procedure for control unit programming is described in the Workshop Manual ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*

For specific information on control unit programming of VR8.6 during this campaign, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.
Programming code:	**P5P8E**
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.
Programming time (approx):	**Up to 120 minutes**
Software versions programmed during this campaign:	• Over-the-air (OTA) control unit 0861
	• High-voltage power electronics, front and rear 0012
	• High-voltage charger (OBC) control unit 1073
	• High-voltage battery control unit (BMCe) E860
	• Chassis control (PASM) 0896

	• Display and operator control unit in rear center console 0897
	• Instrument cluster 0394
	Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.
Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl " + •L " . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again.
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

2 Create a new working log.

2.1 Once programming is complete, confirm by selecting •F4 " ('Save') in the Campaign menu below.

2.2 Select •F10 " ('Logs').

2.3 Select the log type **Work log**.

2.4 The created working log with the designation of the sequence performed is unnamed and saved.

2.5 Select the working log and press •F10 " ('Displays').

2.6 Select the printer icon in the selection bar at the top right.

2.7 Select printer ('PDF').

2.8 Print the working log. This is stored automatically on the Tester.

3 Then perform software update to software release **VR8.7**.

4 Start control unit programming of **VR8.7**.

The basic procedure for control unit programming is described in the Workshop Manual ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*.

For specific information on control unit programming of VR8.7 during this campaign, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)	
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.	
Programming code:	**V6P8C**	
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.	
Programming time (approx):	**Up to 100 minutes**	
Software versions programmed during this campaign:	• High-voltage power electronics, front and rear	0012
	• High-voltage charger (OBC) control unit	1079
	• High-voltage battery control unit (BMCe)	E870
	• HV voltage converter	0899
	• Brake booster (electric brake booster)	0100
	• High-voltage DC battery charger (booster)	0990
	• Engine electronics (DME)	0014
	• Brake electronics (PSM)	0094

	• Driver's seat and passenger's seat adjustment 0064
	• Assistance systems (zFAS) 0355
	Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.
Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl " + •L " . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again.
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

5 Create a new working log.

5.1 Once programming is complete, confirm by selecting •F4 " ('Save') in the Campaign menu below.

5.2 Select •F10 " ('Logs').

5.3 Select the log type **Work log**.

5.4 The created working log with the designation of the sequence performed is unnamed and saved.

5.5 Select the working log and press •F10 " ('Displays').

5.6 Select the printer icon in the selection bar at the top right.

5.7 Select printer ('PDF').

5.8 Print the working log. This is stored automatically on the Tester.

Information

- **Battery sensor (12-volt vehicle electrical system battery):** An actual voltage of at least 14 volts is required for programming the 12-volt battery sensor. Switching the ignition off and on again after one minute is therefore integrated in the programming sequence. As a result, the voltage of the 12-volt vehicle electrical system battery increases briefly and the programming sequence can be started. Follow the instructions on the PIWIS Tester.
- **Programming must not be performed if the supply voltage has not yet been checked to be 14 volts. This is displayed on the PIWIS Tester before starting programming.**

6 Then perform software update to software release **VR12.1.1**.

Start control unit programming **VR12.1.1 (Sequence 2)**.

For specific information on control unit programming in this sequence, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.
Programming code:	**K4M2S**
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.
Programming time (approx):	**Up to 125 minutes**

Software versions programmed during this campaign:	• Power electronics, front and rear	0012
	• Engine electronics (DME) control unit	0014
	• High-voltage battery control unit (BMCe)	1401
	• High-voltage DC battery charger (booster)	1250
	• HV voltage converter	1230
	• Control unit for chassis control (PASM)	1160
	• Power steering control unit (EPS)	0430
	• Brake electronics (PSM) control unit	0120
	• Control unit for steering column adjustment	0210
	• Control unit for rear axle steering	0962
	• Rear lid control unit	0172
	• Air-conditioning control unit	1160
	• Control unit for rear-differential lock	2021
	• Thermal management control unit (TME)	0323
	• Electric passenger compartment heater (PTC)	0015
	• Gateway control unit	2591
	• Instrument cluster	0595
	• Over-the-air (OTA) control unit	1221
	• OTA partition	1221
	• High-voltage charger (OBC), 11 kW	1083
	• Battery sensor	4174
	• Transmission control unit (EGS)	0250
	Following control unit programming, the software version can be read out of the relevant control unit in	

	the 'Extended identifications' menu using the PIWIS Tester.
Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl“ + •L“ . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again.
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

7 Create a new working log.

7.1 Once programming is complete, confirm by selecting •F4“ ('Save') in the Campaign menu below.

7.2 Select •F10“ (‘Logs’).

7.3 Select the log type **Work log**.

7.4 The created working log with the designation of the sequence performed is unnamed and saved.

7.5 Select the working log and press •F10“ (‘Displays’).

7.6 Select the printer icon in the selection bar at the top right.

7.7 Select printer (‘PDF’).

7.8 Print the working log. This is stored automatically on the Tester.

Concluding work - Scope 1

WARNING

Electrically moved side windows and rear spoiler

- **Danger of limbs being trapped or severed**
- **Risk of damage to components**

⇒ **Do not reach into the danger area.**

⇒ **Keep third parties away from the danger area.**

⇒ **Do not move components or tools into the danger area.**

NOTICE

Movement of the rear wheels by activating the electric motor; vehicle driving off when the wheels are touching the ground

- **Personal injury as a result of wheel or vehicle movement**
- **Material damage to vehicle, drive or brake components**

⇒ **Raise the vehicle on a lifting platform until the drive wheels are free**

⇒ **Press the foot brake during adaptation**

⇒ **Cordon off the work area**

NOTICE

Programming interrupted

- **Malfunctions in control unit**
- **Risk of damage to control unit**

⇒ **Route the line between the vehicle communication module (VCI) and diagnostic socket on the vehicle without tension and make sure that the connector is inserted fully into the diagnostic socket.**

⇒ **Check that the rechargeable battery for the PIWIS Tester is charged sufficiently. Connect the PIWIS Tester to the power supply unit if necessary.**

Work Procedure: 1 Establish bus idle for at least 15 minutes.

1.1 End operational readiness (switch off ignition).

1.2 Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.

1.3 Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).

1.4 Unlock the vehicle again after waiting for at least 15 minutes.

1.5 Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.

2 Place the vehicle onto a lifting platform, but do not raise it yet.
Follow the instructions on the PIWIS Tester for lifting the vehicle during the following sequence.

Information

The **current version** of the onboard Driver's Manual has been **available** online **since 5 March 2021**.

A blank USB storage medium is required for installing the onboard Driver's Manual (approx. 100 MB). If there is already data stored on the USB storage medium, this will be deleted during the procedure.

Information

Before starting sequence 5 (subsequent work), connect the PIWIS Tester to a network to establish an Internet connection. The PIWIS Tester **must** be **connected online** for the subsequent work described below and for installing the onboard Driver's Manual.

Information

- **Component protection:** Component protection must only be taught for the control unit for assistance systems (zFAS). To do this, select component protection for **assistance systems (zFAS)** in the procedure. If the component protection teaching process is aborted, stop sequence 5 and read and follow the additional information provided under ⇒ *Technical Information '9X00IN Additional instructions for the concluding work'*.
- **Enabled functions:** If function activation is aborted, component protection must first be taught again. Then, start sequence 5 again in order to restore the enabled functions.
- **Coding of all control units:** Always allow coding to run to the end of the process. If individual coding routines fail, the relevant control units can be selected manually in the overview afterwards and coded again individually.

3 Start subsequent work for various control units.

Required PIWIS Tester software version:	**40.550.040** (or higher)
Programming code:	**K4M5S**
Expiry:	Read and follow the **information and instructions on the PIWIS Tester** during the guided procedure for the subsequent work. **Do not interrupt the process.**
Programming time (approx):	**Up to 55 minutes**

Subsequent work carried out during this process	• Distance measuring sensor (ACC) - Reset personalization For manual procedure, see ⇒*Workshop Manual '278555 Replacing control unit for distance measuring sensor'*.
	• Air conditioning - Teach servo motors For the manual procedure, see relevant servo motor Workshop Manual 872019**xx**.
	• Commissioning rear-differential lock For manual procedure, see ⇒*Workshop Manual '397555 Replacing rear-differential lock control unit'*.
	• Engine electronics (DME) transmission adaptation For manual procedure, see ⇒*Workshop Manual '247055 Replacing DME control unit'*.
	• Door standardization, front and rear For manual procedure, see • ⇒*Workshop Manual '577355 Replacing front door control unit'* • ⇒*Workshop Manual '587355 Replacing rear door control unit'*
	• Teaching component protection For manual procedure, see ⇒*Workshop Manual '903555 Replace gateway control unit'*Select the control unit for **assistance systems (zFAS)** in the PIWIS Tester procedure.
	• Restoring enabling functions For manual procedure, see ⇒*Workshop Manual '903555 Replace gateway control unit'*.
	• Installing onboard Driver's Manual For manual procedure, see ⇒*Workshop Manual '0X01IN diagnostic system: Performing vehicle handover'*.
	• Automatic coding of all control units

Procedure if the sequence is aborted:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat subsequent work sequence by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl “ + •L “ . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If subsequent work is aborted a second time, end operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again. • In the case of further aborts, the subsequent work must be successively carried out manually.
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

4 Create a new working log.

4.1 Once programming is complete, confirm by selecting •F4 “ ('Save') in the Campaign menu below.

4.2 Select •F10 “ (‘Logs’).

4.3 Select the log type **Work log**.

4.4 The created working log with the designation of the sequence performed is unnamed and saved.

4.5 Select the working log and press •F10 “ (‘Displays’).

4.6 Select the printer icon in the selection bar at the top right.

4.7 Select printer (‘PDF’).

4.8 Print the working log. This is stored automatically on the Tester.

5 Establish bus idle for at least 15 minutes.

5.1 End operational readiness (switch off ignition).

5.2 Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.

5.3 Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).

5.4 Unlock the vehicle again after waiting for at least 15 minutes.

5.5 Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.

6 Teach steering lock settings.

6.1 Select the power steering **'EPS' control unit** in control unit selection (**'Overview'** menu) and press •F12 “ ('Next') to confirm.

6.2 Once the power steering control unit has been found and is displayed in the list, select the **'Maintenance / repairs'** menu.

6.3 Select the **'Commissioning'** function and confirm with •F12 “ ('Next').

6.4 Follow the instructions on the Tester to perform the commissioning process.

6.5 If the left and right steering lock settings are not saved during the procedure, adjust the height and depth of the steering wheel position and repeat the commissioning procedure.

7 **Only relevant for vehicles if fault memory entries are stored for seat adjustment:** Standardize seat adjustment for driver's and passenger's side.

7.1 Select the **'Seat adjustment on front passenger's side'** control unit in the control unit selection screen (**'Overview'** menu) and press •F12 “ ('Next') to confirm your selection.

7.2 Once the seat adjustment on front passenger's side control unit has been found and is displayed in the overview, select the **'Maintenance / repairs'** menu.

7.3 Select the **'Standardize seat motors'** function and press •F12 “ ('Next') to confirm your selection.

7.4 Read the instructions and confirm by pressing •F12 “ ('Next').

7.5 Press •F8 “ ('Start') to run the procedure.

7.6 Once the seat motors on the **passenger's side** have been standardized, also teach the **driver's side**. To do this, select the **'Seat adjustment on front driver's side'** control unit in the control unit selection screen (**'Overview'** menu) and **repeat Steps 6.2 to 6.6**. Then, continue with **Step 2**.

8 Manually retract the rear spoiler, which extended automatically during programming.

8.1 Select the **'Rear spoiler'** control unit in the control unit selection screen (**'Overview'** menu) and press •F12 “ ('Next') to confirm.

8.2 Once the rear spoiler control unit has been found and is displayed in the overview, select the **'Maintenance / repairs'** menu.

8.3 Select the function **'Teach rear spoiler'** and press •F12 “ ('Next') to confirm.

8.4 Read the instructions and confirm by pressing •F12 “ ('Next').

8.5 Meet the displayed conditions that must be checked manually and tick the relevant **'Status'** box.

8.6 Select the **'Teach rear spoiler'** function and press •F8 “ ('Execute') to confirm.

8.7 Once the rear spoiler has been taught and retracted fully, select the **'Overview'** menu to return to the control unit selection screen.

9 Calibration of power electronics at front and rear.

9.1 Select the **'Rear high-voltage power electronics'** control unit in the control unit selection screen (**'Overview'** menu) and confirm with •F12 “ ('Next').

9.2 Once the high-voltage power electronics on rear axle control unit has been found and is displayed in the 'Overview', select the **'Drive links / checks'** menu.

9.3 Select the **'Electric motor – Reset calibration'** function and confirm with •F12 “ ('Next').

9.4 Set the entry to **Basic setting** in the Values column on the **'Parameters'** tab.

9.5 Confirm that **calibration** has been reset with •F8 “ ('Execute').

9.6 Go back to the control unit selection screen (**'Overview'** menu), select the **'Front high-voltage power electronics'** control unit and repeat **Steps 8.2 to 8.4** for the selected control unit.

9.7 After resetting both calibrations, select the two control units **'Front high-voltage power electronics' and 'Rear high-voltage power electronics'** in the control unit selection screen and open the **'Fault memory'** menu.

9.8 Check whether the fault code **'P171900'** is displayed for **both** control units:

- If the fault code **'P171900'** is displayed for the **'Rear high-voltage power electronics'** and **'Front high-voltage power electronics'** control unit, continue with **Step 8.9**.
- The fault code **'P171900'** is **not displayed** or is displayed only for **one of the two control units**. Carry out **Steps 8.1 to 8.6** for the relevant control units again.

9.9 Disconnect the PIWIS Tester from the vehicle.

9.10 Switch off and disconnect the battery charger.

Information

Connect the PIWIS Tester to a network as soon as possible and log into the PPN in order to transfer the backup documentation created during this campaign to the PAG systems.

9.11 Start the calibration drive and complete the following steps.

Information

Resetting the high-voltage power electronics will limit the maximum vehicle speed to 70 km/h (43 mph). The warning message "Reduced speed" will be displayed on the instrument cluster. Any road on which it is possible to accelerate to a speed of at least 60 km/h (38 mph) can be used as the calibration route.

Read and follow safety instructions:

- Only perform calibration on public roads if the road and traffic conditions are conducive to doing so
- The road traffic regulations must always be observed
- Other road users must not be at risk when performing calibration
- Move the vehicle on public roads only if it is roadworthy
- Accelerate the vehicle to at least 60 km/h (38 mph).
- Release the accelerator pedal and allow the vehicle roll in overrun for at least 1 second. Calibration is performed during this overrun phase.
- Switch ignition off and on again to reset the "Reduced speed" warning message.

10 Only relevant if the message "**Tyre pressure monitoring fault - Service necessary**" is displayed: Teach Tyre Pressure Monitoring (TPM) system using the PIWIS Tester.
For instructions, see:
⇒*Workshop Manual '443225 Teach the wheel electronics'*

Information

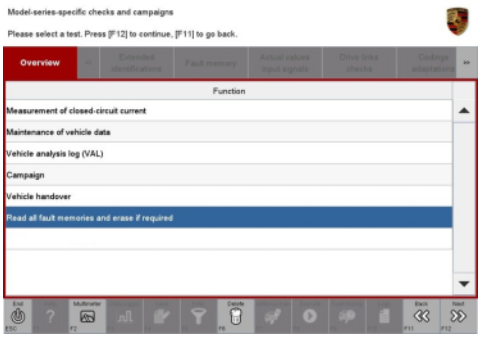
In the menu-guided procedure, check the **'Teach wheel IDs'** menu item after confirming with •F12 “ to make sure that the function **'Teach 2nd wheel IDs without driving'** is selected.
Then, select the function **'2nd wheel IDs unknown'** and continue the procedure according to menu guidance.

11 Read out and erase the fault memories of all control units.

11.1 Press •F7 “ in the control unit selection screen ('Overview' menu) to call up the Additional menu.

11.2 Select the function "Read all fault memories and erase if required" and press •F12 “ ('Next') to confirm⇒*erase fault memory*.

The fault memories of the control units are read out.



erase fault memory

11.3 Once you have read out the fault memories, check the fault memory entries.

Information

If control units are found to have faults that are **not** caused by control unit programming, these must first be **found** and **corrected**. This work **cannot** be invoiced under the workshop campaign number.

11.4 Press •F8 “ to delete fault memory entries.

11.5 Press •F12 “ ('Yes') in response to the question as to whether you really want to delete all fault memory entries.

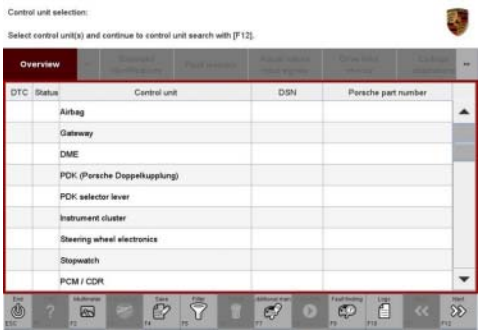
The faults stored in the fault memories of the various control units are deleted.

Information

If fault memory entries for individual control units cannot be deleted, proceed as follows:

- End operational readiness (switch off ignition).
- Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.
- Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).
- Unlock the vehicle again after waiting for at least 15 minutes.
- Restore operational readiness (switch on ignition).
- Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.
- Read out the fault memory again and delete any fault memory entries that are stored.

11.6 Once you have erased the fault memories, select the **'Overview'** menu to return to the control unit selection screen ⇒*Control unit selection*.



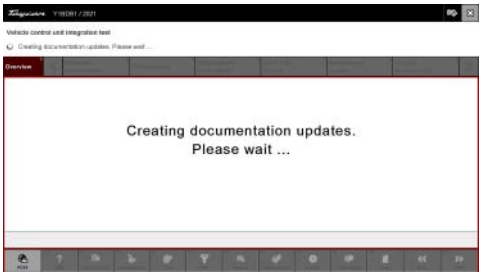
Control unit selection

12 Create Vehicle Analysis Log (VAL) using the PIWIS Tester.
Mark the vehicle analysis log you have just created with the attribute "Final VAL" and after carrying out the campaign, return it using the PIWIS Tester.

13 **Performing system test using the PIWIS Tester**

13.1 First, the service technician carries out his steps as usual.

The system test is started automatically with the backup documentation process at the end of the process. Alternatively, the system test can also be started manually by pressing •F3. “



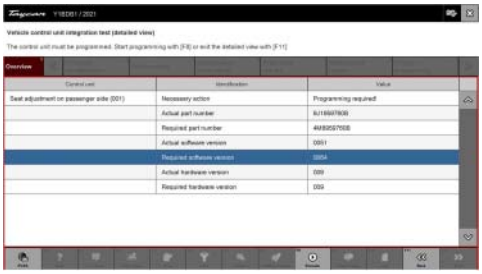
backup documentation

13.2 The result list is displayed to the technician after the check has been completed.
This shows if control units are not yet at the required software version ⇒*Programming required* **or** a hardware check is required in accordance with the Spare Parts Catalogue (PET)⇒*Detailed view of integration test - Hardware*.

Programming required

Hardware check required

13.3 Click on the affected control unit to view further details and start programming ⇒*Detailed view of integration test - software version*. The step-by-step instructions then start.
The hardware check is performed against the Parts Catalogue ⇒*Detailed view of integration test - Hardware*.



Detailed view of integration test - software version

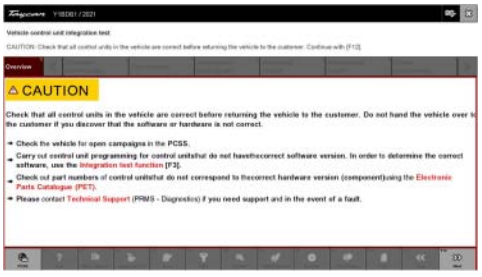
Detailed view of integration test - Hardware

13.4 When programming or hardware testing is complete, backup documentation including the joint test is performed again.
All affected control units should now be re-programmed or checked in the control unit overview and their status. To do this, repeat Steps 2-4 until all control units are free of faults ⇒*Vehicle integration test complete*.

Vehicle integration test complete

Information

The vehicle must not be handed back to the customer until all control units have been checked and the system is thus compliant ⇒*Conformity of the vehicle system*

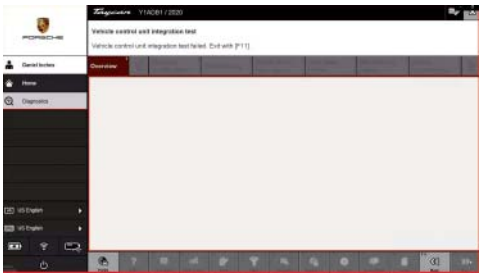


Conformity of the vehicle system

13.5

In the event of a fault - Performance of the integration test

If the integration test fails, this is displayed as a result ⇒ *Vehicle control unit integration test failed*. Then complete the following steps:



Vehicle control unit integration test failed

13.6 In the Additional menu (F7), execute the "Maintenance of vehicle data with PIWIS ONLINE" function and write the current vehicle data record from the online system into the vehicle.

13.7 Carry out the integration test again.

13.8 In the event of a further fault, contact Technical Support.

14 Attach the working log to the PQIS line.

14.1 Select the PCCS button under **Applications** on the PIWIS Tester.

14.2 Log into the PCCS using the PIWIS Tester with the corresponding quality line.

14.3 Select Upload file in the PIWIS Tester.

14.4 Select **Pdf Prints** in the drop-down menu.

14.5 Attach the created work logs to the quality line.

15 End operational readiness (switch off ignition).

16 Disconnect the PIWIS Tester from the vehicle.

Information

Connect the PIWIS Tester to a network as soon as possible and log into the PPN in order to transfer the backup documentation created during this campaign to the PAG systems.

17 Switch off and disconnect the battery charger.

18 Enter the campaign in the Warranty and Maintenance booklet.
– End of remedial action –

For warranty processing, see **Scope 1** in the ⇒ *Technical Information '443225 Warranty processing section'*

Re-program various control units - Scope 2

WARNING

Electrically moved side windows and rear spoiler

- **Danger of limbs being trapped or severed**
- **Risk of damage to components**

⇒ **Do not reach into the danger area.**

⇒ **Keep third parties away from the danger area.**

⇒ **Do not move components or tools into the danger area.**

NOTICE

Using the software on vehicles that are not assigned to this campaign:

- **Risk of damage to control unit**

⇒ **Use the listed software versions only for the vehicles assigned to the campaign.**

Information

To ensure that no user-specific settings from **cloud-based services (Porsche Connect & My Porsche)** are lost during the update, activate **Privacy mode** before starting the update. When Privacy mode is activated, communication between the vehicle and the Porsche Connect app and My Porsche is disabled. No vehicle-specific information is transferred. As a result, settings cannot be configured on the vehicle using the Porsche Connect app or My Porsche.

When the **instrument cluster** and **central computer** are re-programmed, the **individual settings** implemented **in the vehicle** by the customer will be lost and reset to the **default values** of the country version that applies to the vehicle.

After carrying out the campaign, please inform customers that personal settings they have implemented in the instrument cluster and central display of the central computer will have to be **set again** and provide them with any **help and support** they need for setting the relevant options.

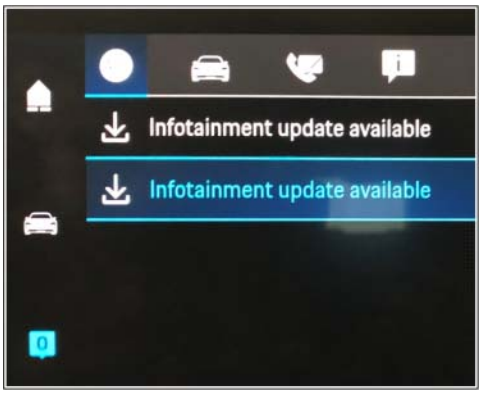
This affects the following settings, for example:

- Individual settings for tubes 1 to 3 of the instrument cluster as well as the extended map view or reduced view of the instrument cluster
- Individual settings of the head-up display (HUD)
- Selected functions of individual tubes in the instrument cluster, e.g. auto zoom, 3D map and satellite map
- Arrangement of tiles in the home screen and MyScreen on the central display
- Individual seat, exterior mirror and ergonomic settings
- Air conditioning settings, such as ventilation and air quality
- Privacy settings
- Frequency setting of the garage door opener (Homelink)

Information

After carrying out the campaign, please inform customers that Infotainment updates are available via the central computer (PCM) and provide them with any help and support they need during installation ⇒*Infotainment update in central display*.

These updates are only available if the customer has logged in on the vehicle using his/her main user credentials (Porsche ID). Several updates are available depending on equipment and these must be installed one after the other in steps. It can take several minutes to install these. New functions can only be used when all updates have been completed and the vehicle has established bus idle for at least 15 minutes.



Infotainment update in central display

Work Procedure:

Information

- **Battery sensor (12-volt vehicle electrical system battery):** An actual voltage of at least 14 volts is required for programming the 12-volt battery sensor. Switching the ignition off and on again after one minute is therefore integrated in the programming sequence. As a result, the voltage of the 12-volt vehicle electrical system battery increases briefly and the programming sequence can be started. Follow the instructions on the PIWIS Tester.
- **Programming must not be performed if the supply voltage has not yet been checked to be 14 volts. This is displayed on the PIWIS Tester before starting programming.**

1 Start control unit programming **VR12.1.1 Sequence 2**.

Only relevant for model year 2020 vehicles.

For specific information on control unit programming in this sequence, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.
Programming code:	**K4M2S**

Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.	
Programming time (approx):	**Up to 125 minutes**	
Software versions programmed during this campaign:	• Power electronics, front and rear	0012
	• Engine electronics (DME) control unit	0014
	• High-voltage battery control unit (BMCe)	1401
	• High-voltage DC battery charger (booster)	1250
	• HV voltage converter	1230
	• Control unit for chassis control (PASM)	1160
	• Power steering control unit (EPS)	0430
	• Brake electronics (PSM) control unit	0120
	• Control unit for steering column adjustment	0210
	• Control unit for rear axle steering	0962
	• Rear lid control unit	0172
	• Air-conditioning control unit	1160
	• Control unit for rear-differential lock	2021
	• Thermal management control unit (TME)	0323
	• Electric passenger compartment heater (PTC)	0015
	• Gateway control unit	2591
	• Instrument cluster	0595

	• Over-the-air (OTA) control unit	1221
	• OTA partition	1221
	• High-voltage charger (OBC), 11 kW	1083
	• Battery sensor	4174
	• Transmission control unit (EGS)	0250
	Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.	
Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl " + •L " . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again.	
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.	

2 Create a new working log.

2.1 Once programming is complete, confirm by selecting •F4 " ('Save') in the Campaign menu below.

2.2 Select •F10 " ('Logs').

2.3 Select the log type **Work log**.

2.4 The created working log with the designation of the sequence performed is unnamed and saved.

2.5 Select the working log and press •F10 " ('Displays').

2.6 Select the printer icon in the selection bar at the top right.

2.7 Select printer ('PDF').

2.8 Print the working log. This is stored automatically on the Tester.

3 Start control unit programming **VR12.1.1 Sequence 2**.

Information

Special features of sequence 2:
After programming the 22kW (OBC) high-voltage charger, the central computer (PCM) settings must be reset to the factory settings.
After carrying out the campaign, therefore, please **inform** your customers that personal settings they have implemented in PCM will have to be **set again** and provide them with any **help and support** they need for setting the relevant options.
This affects the following settings in the Vehicle menu, for example:
- Lowering of exterior mirror on passenger's side during parking manoeuvres
- Locking settings
- Light & Visibility settings
- Units (kilometers/miles, Celsius/Fahrenheit, ...)
- Language

Only relevant for model year 2021 vehicles.

For specific information on control unit programming in this sequence, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.
Programming code:	**K4M2S**
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.
Programming time (approx):	**up to 70 minutes***

Software versions programmed during this sequence:	• Power electronics, front and rear	0012
	• Engine electronics (DME) control unit	0014
	• High-voltage charger (OBC), 11 kW	1083
	or (depending on equipment)	
	• High-voltage charger (OBC), 22 kW	1256
	• High-voltage battery control unit (BMCe)	1441 (H13) or (depending on equipment) 1442 (H14)
	• High-voltage DC battery charger (booster)	1250
	• HV voltage converter	1230
	• Head-up display	1208
	• Instrument cluster	0595
	• Over-the-air (OTA) control unit	1221
	Sequence 2 includes other control units from the software release VR12.1.1, which are only re-coded.	
	Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.	
Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl “ + •L “ . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for approx. 15 minutes	

	(switch off ignition) and repeat the procedure described here again.
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

4 Create a new working log.

4.1 Once programming is complete, confirm by selecting • F4 “ ('Save') in the Campaign menu below.

4.2 Select • F10 “ (‘Logs’).

4.3 Select the log type **Work log**.

4.4 The created working log with the designation of the sequence performed is unnamed and saved.

4.5 Select the working log and press • F10 “ (‘Displays’).

4.6 Select the printer icon in the selection bar at the top right.

4.7 Select printer (‘PDF’).

4.8 Print the working log. This is stored automatically on the Tester.

Concluding work - Scope 2

WARNING

Electrically moved side windows and rear spoiler

- **Danger of limbs being trapped or severed**
- **Risk of damage to components**

⇒ **Do not reach into the danger area.**

⇒ **Keep third parties away from the danger area.**

⇒ **Do not move components or tools into the danger area.**

Work Procedure: 1 Establish bus idle for at least 15 minutes.

1.1 End operational readiness (switch off ignition).

1.2 Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.

1.3 Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).

1.4 Unlock the vehicle again after waiting for at least 15 minutes.

1.5 Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.

2 Resetting PCM to factory settings
Only required for 22kW OBC

2.1 Select the **"Central computer"** control unit in the control unit selection screen (Exterior overview menu) and call up the **"Maintenance / repairs"** area.

2.2 Select the "Reset factory settings" **function** and follow the instructions on the screen.

2 Manually retract the rear spoiler, which extended automatically during programming.

2.1 Select the **'Rear spoiler'** control unit in the control unit selection screen (**'Overview'** menu) and press • F12 " ('Next') to confirm.

2.2 Once the rear spoiler control unit has been found and is displayed in the overview, select the **'Maintenance / repairs'** menu.

2.3 Select the function **'Teach rear spoiler'** and press • F12 " ('Next') to confirm.

2.4 Read the instructions and confirm by pressing • F12 " ('Next').

2.5 Meet the displayed conditions that must be checked manually and tick the relevant **'Status'** box.

2.6 Select the **Teach rear spoiler** function and press • F8 " ('Execute') to confirm.

2.7 Once the rear spoiler has been taught and retracted fully, select the **'Overview'** menu to return to the control unit selection screen.

3 Only relevant if the message **"Tyre pressure monitoring fault - Service necessary"** is displayed: Teach Tyre Pressure Monitoring (TPM) system using the PIWIS Tester. ⇒ *Workshop Manual '443225 Teach the wheel electronics'*

Information

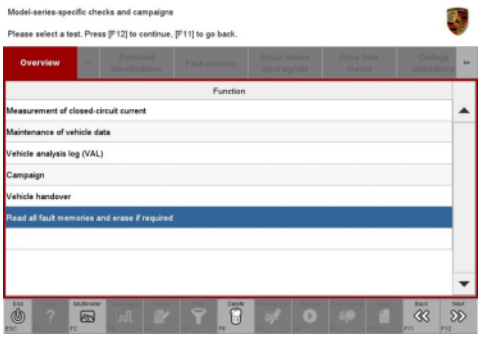
In the menu-guided procedure, check the **'Teach wheel IDs'** menu item after confirming with • F12 " to make sure that the function **'Teach 2nd wheel IDs without driving'** is selected. Then, select the function **'2nd wheel IDs unknown'** and continue the procedure according to menu guidance.

4 Read out and erase the fault memories of all control units.

4.1 Press • F7 " in the control unit selection screen ('Overview' menu) to call up the Additional menu.

4.2 Select the function "Read all fault memories and erase if required" and press •F12 “ ('Next') to confirm⇒*erase fault memory*.

The fault memories of the control units are read out.



erase fault memory

4.3 Once you have read out the fault memories, check the fault memory entries.

Information

If control units are found to have faults that are **not** caused by control unit programming, these must first be **found** and **corrected**. This work **cannot** be invoiced under the workshop campaign number.

4.4 Press •F8 “ to delete fault memory entries.

4.5 Press •F12 “ ('Yes') in response to the question as to whether you really want to delete all fault memory entries.

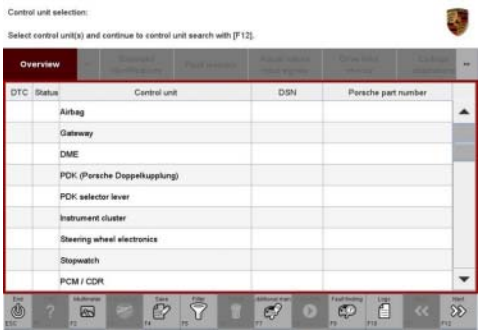
The faults stored in the fault memories of the various control units are deleted.

Information

If fault memory entries for individual control units cannot be deleted, proceed as follows:

- End operational readiness (switch off ignition).
- Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.
- Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).
- Unlock the vehicle again after waiting for at least 15 minutes.
- Restore operational readiness (switch on ignition).
- Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.
- Read out the fault memory again and delete any fault memory entries that are stored.

4.6 Once you have erased the fault memories, select the **'Overview'** menu to return to the control unit selection screen ⇒ *Control unit selection*.



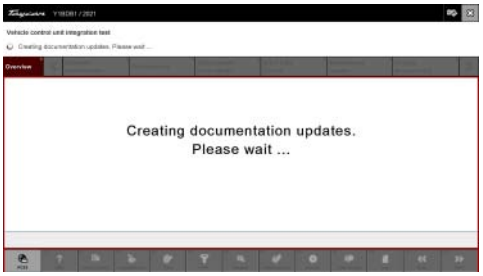
Control unit selection

5 Create Vehicle Analysis Log (VAL) using the PIWIS Tester.
Mark the vehicle analysis log you have just created with the attribute **"Final VAL"** and after carrying out the campaign, return it using the PIWIS Tester.

6 **Performing system test using the PIWIS Tester**

6.1 First, the service technician carries out his steps as usual.

The system test is started automatically with the backup documentation process at the end of the process. Alternatively, the system test can also be started manually by pressing • F3. “



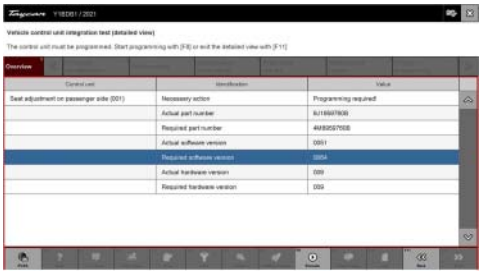
backup documentation

6.2 The result list is displayed to the technician when the check has been completed.
This shows if control units are not yet at the required software version ⇒ *Programming required* **or** a hardware check is required in accordance with the Spare Parts Catalogue (PET) ⇒ *Detailed view of integration test - Hardware*.

Programming required

Hardware check required

6.3 Click on the affected control unit to view further details and start programming ⇒*Detailed view of integration test - software version*. The step-by-step instructions then start.
The hardware check is performed against the Parts Catalogue ⇒*Detailed view of integration test - Hardware*.



Detailed view of integration test - software version

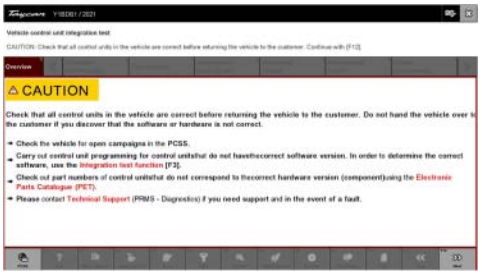
Detailed view of integration test - Hardware

6.4 When programming or hardware testing is complete, backup documentation including the joint test is performed again.
All affected control units should now be re-programmed or checked in the control unit overview and their status. To do this, repeat Steps 2-4 until all control units are free of faults ⇒*Vehicle integration test complete*.

Vehicle integration test complete

Information

The vehicle must not be handed back to the customer until all control units have been checked and the system is thus compliant ⇒*Conformity of the vehicle system*

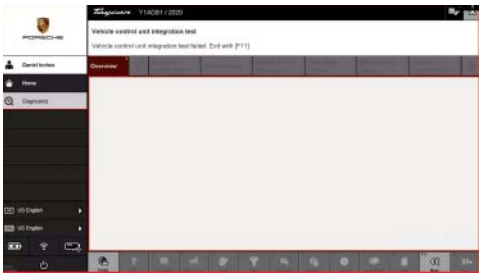


Conformity of the vehicle system

6.5

In the event of a fault - Performance of the integration test

If the integration test fails, this is displayed as a result ⇒ *Vehicle control unit integration test failed*. Then complete the following steps:



Vehicle control unit integration test failed

6.6 In the Additional menu (F7), execute the "Maintenance of vehicle data with PIWIS ONLINE" function and write the current vehicle data record from the online system into the vehicle.

6.7 Carry out the integration test again.

6.8 In the event of a further fault, contact Technical Support.

7 Attach the work log to the PQIS line.

7.1 Select the PCCS button under **Applications** on the PIWIS Tester.

7.2 Log into the PCCS using the PIWIS Tester with the corresponding quality line.

7.3 Select Upload file in the PIWIS Tester.

7.4 Select **Pdf Prints** in the drop-down menu.

7.5 Attach the created work logs to the quality line.

7 End operational readiness (switch off ignition).

8 Disconnect the PIWIS Tester from the vehicle.

Information

Connect the PIWIS Tester to a network as soon as possible and log into the PPN in order to transfer the backup documentation created during this campaign to the PAG systems.

9 Switch off and disconnect the battery charger.

10 Enter the campaign in the Warranty and Maintenance booklet.
– End of remedial action –

For warranty processing, see **Scope 2** in the ⇒ *Technical Information '443225 Warranty processing section'*

Re-program various control units - Scope 3

WARNING

Electrically moved side windows and rear spoiler

- **Danger of limbs being trapped or severed**
- **Risk of damage to components**

⇒ **Do not reach into the danger area.**

⇒ **Keep third parties away from the danger area.**

⇒ **Do not move components or tools into the danger area.**

NOTICE

Using the software on vehicles that are not assigned to this campaign:

- **Risk of damage to control unit**

⇒ **Use the listed software versions only for the vehicles assigned to the campaign.**

Work Procedure: 1 Select Guest account from the central display (PCM) and activate Privacy mode (available in some countries).

Information

To ensure that no user-specific settings from **cloud-based services (Porsche Connect & My Porsche)** are lost during the update, activate **Privacy mode** before starting the update. When Privacy mode is activated, communication between the vehicle and the Porsche Connect app and My Porsche is disabled. No vehicle-specific information is transferred. As a result, settings cannot be configured on the vehicle using the Porsche Connect app or My Porsche.

When the **instrument cluster** and **central computer** are re-programmed, the **individual settings** implemented **in the vehicle** by the customer will be lost and reset to the **default values** of the country version that applies to the vehicle.

After carrying out the campaign, please inform customers that personal settings they have implemented in the instrument cluster and central display of the central computer will have to be **set again** and provide them with any **help and support** they need for setting the relevant options.

This affects the following settings, for example:

- Individual settings for tubes 1 to 3 of the instrument cluster as well as the extended map view or reduced view of the instrument cluster
- Individual settings of the head-up display (HUD)
- Selected functions of individual tubes in the instrument cluster, e.g. auto zoom, 3D map and satellite map
- Arrangement of tiles in the home screen and MyScreen on the central display
- Individual seat, exterior mirror and ergonomic settings
- Air conditioning settings, such as ventilation and air quality
- Privacy settings
- Frequency setting of the garage door opener (Homelink)

Information

- **Distance measuring sensor control unit (ACC):** Programming is performed in two stages because of the high data volume. First, the bootloader ACC is programmed and an error message is displayed. This error message in step 5 can be ignored and you can continue with the campaign. Follow the instructions on the PIWIS Tester.
- **Airbag control unit:** Manual intermediate steps are required after programming the central control unit for assistance systems (zFAS). For safety reasons, the airbag is unlocked during a guided procedure prior to coding and is then locked again when coding is complete. Follow the instructions on the PIWIS Tester. If the guided airbag procedure is aborted, the airbag must be locked again manually after completion of sequence 1. For instructions, see: ⇒*Workshop Manual '695355 Replacing airbag control unit'*
- **Rear-end electronics control unit (BCM 2):** If the driver's key is not detected in the vehicle, programming of the rear-end electronic cannot be started or will be interrupted. You must therefore position the **driver's key** with the back facing forward upright between the holding struts in the rear cupholder (**emergency start tray**) to guarantee a permanent radio link between the vehicle and remote control.

2 Start control unit programming **VR12.1.1 Sequence 1**.

The basic procedure for control unit programming is described in the Workshop Manual ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*.

Sequence 1:

For specific information on control unit programming in this sequence, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.
Programming code:	**K4M1S**
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.
Programming time (approx):	**Up to 125 minutes**

Software versions programmed during this sequence:	• Distance measuring sensor control unit (ACC)	0496
	• Front-end electronics control unit (BCM1)	0712
	• Rear-end electronics (BCM2) control unit	0565
	• Radar sensor for front corner radar, left and right	0485
	• Lane Change Assist control unit, left and right	0486
	• Central control unit for assistance systems (zFAS)	0365
	• Airbag control unit	3303
	Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.	
Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl “ + •L “ . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again.	
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.	

3 Create a new working log.

3.1 Once programming is complete, confirm by selecting • F4 “ ('Save') in the Campaign menu below.

3.2 Select • F10 “ (‘Logs’).

3.3 Select log type **Work log**.

3.4 Rename and save the working log created with the designation of the sequence performed.

3.5 Select the working log and press • F10 “ (‘Displays’).

3.6 Select the printer icon in the selection bar at the top right.

3.7 Select printer (‘PDF’).

3.8 Print the working log. This is stored automatically on the Tester.

Concluding work - Scope 3

WARNING

Electrically moved side windows and rear spoiler

- **Danger of limbs being trapped or severed**
- **Risk of damage to components**

⇒ **Do not reach into the danger area.**

⇒ **Keep third parties away from the danger area.**

⇒ **Do not move components or tools into the danger area.**

NOTICE

Programming interrupted

- **Malfunctions in control unit**
- **Risk of damage to control unit**

⇒ **Route the line between the vehicle communication module (VCI) and diagnostic socket on the vehicle without tension and make sure that the connector is inserted fully into the diagnostic socket.**

⇒ **Check that the rechargeable battery for the PIWIS Tester is charged sufficiently. Connect the PIWIS Tester to the power supply unit if necessary.**

Work Procedure: 1 Establish bus idle for at least 15 minutes.

1.1 End operational readiness (switch off ignition).

1.2 Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.

1.3 Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).

1.4 Unlock the vehicle again after waiting for at least 15 minutes.

1.5 Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.

2 Distance measuring sensor (ACC) - Reset personalization
For manual procedure, see: ⇒*Workshop Manual '278555 Replacing control unit for distance measuring sensor'*

3 Teach component protection.
For manual procedure, see: ⇒*Workshop Manual '903555 Replace gateway control unit'*Select the **Assistance systems (zFAS)** control unit in the PIWIS Tester procedure.

3.1 Restoring enabling functions
For manual procedure, see: ⇒*Workshop Manual '903555 Replace gateway control unit'*.

4 Automatic coding of all control units

5 Manually retract the rear spoiler, which extended automatically during programming.

5.1 Select the **'Rear spoiler'** control unit in the control unit selection screen (**'Overview'** menu) and press •F12 “ ('Next') to confirm.

5.2 Once the rear spoiler control unit has been found and is displayed in the overview, select the **'Maintenance / repairs'** menu.

5.3 Select the function **'Teach rear spoiler'** and press •F12 “ ('Next') to confirm.

5.4 Read the instructions and confirm by pressing •F12 “ ('Next').

5.5 Meet the displayed conditions that must be checked manually and tick the relevant **'Status'** box.

5.6 Select the **'Teach rear spoiler'** function and press •F8 “ ('Execute') to confirm.

5.7 Once the rear spoiler has been taught and retracted fully, select the **'Overview'** menu to return to the control unit selection screen.

6 Only relevant if the message "**Tyre pressure monitoring fault - Service necessary**" is displayed:
Teach Tyre Pressure Monitoring (TPM) system using the PIWIS Tester.
For instructions, see:
⇒*Workshop Manual '443225 Teach the wheel electronics'*

Information

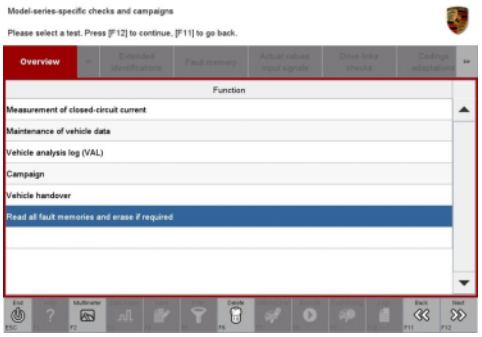
In the menu-guided procedure, check the **'Teach wheel IDs'** menu item after confirming with •F12 “ to make sure that the function **'Teach 2nd wheel IDs without driving'** is selected.
Then, select the function **'2nd wheel IDs unknown'** and continue the procedure according to menu guidance.

7 Read out and erase the fault memories of all control units.

7.1 Press •F7 “ in the control unit selection screen ('Overview' menu) to call up the Additional menu.

7.2 Select the function "Read all fault memories and erase if required" and press •F12 “ ('Next') to confirm⇒*erase fault memory*.

The fault memories of the control units are read out.



erase fault memory

7.3 Once you have read out the fault memories, check the fault memory entries.

Information

If control units are found to have faults that are **not** caused by control unit programming, these must first be **found** and **corrected**. This work **cannot** be invoiced under the workshop campaign number.

7.4 Press •F8 “ to delete fault memory entries.

7.5 Press •F12 “ ('Yes') in response to the question as to whether you really want to delete all fault memory entries.

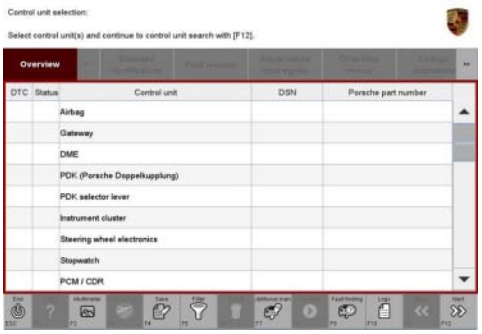
The faults stored in the fault memories of the various control units are deleted.

Information

If fault memory entries for individual control units cannot be deleted, proceed as follows:

- End operational readiness (switch off ignition).
- Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.
- Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).
- Unlock the vehicle again after waiting for at least 15 minutes.
- Restore operational readiness (switch on ignition).
- Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.
- Read out the fault memory again and delete any fault memory entries that are stored.

7.6 Once you have erased the fault memories, select the **'Overview'** menu to return to the control unit selection screen ⇒*Control unit selection*.



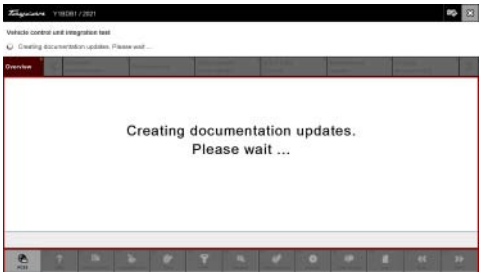
Control unit selection

8 Create Vehicle Analysis Log (VAL) using the PIWIS Tester.
Mark the vehicle analysis log you have just created with the attribute "Final VAL" and after carrying out the campaign, return it using the PIWIS Tester.

9 **Performing system test using the PIWIS Tester**

9.1 First, the service technician carries out his steps as usual.

The system test is started automatically with the backup documentation process at the end of the process. Alternatively, the system test can also be started manually by pressing •F3. “



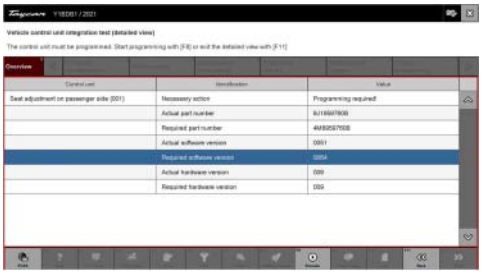
backup documentation

9.2 The result list is displayed to the technician after the check has been completed.
This shows if control units are not yet at the required software version ⇒*Programming required* **or** a hardware check is required in accordance with the Spare Parts Catalogue (PET)⇒*Detailed view of integration test - Hardware*.

Programming required

Hardware check required

9.3 Click on the affected control unit to view further details and start programming ⇒*Detailed view of integration test - software version*. The step-by-step instructions then start.
The hardware check is performed against the Parts Catalogue ⇒*Detailed view of integration test - Hardware*.



Detailed view of integration test - software version

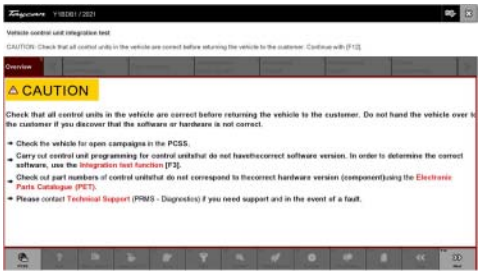
Detailed view of integration test - Hardware

9.4 When programming or hardware testing is complete, backup documentation including the joint test is performed again.
All affected control units should now be re-programmed or checked in the control unit overview and their status. To do this, repeat Steps 2-4 until all control units are free of faults ⇒*Vehicle integration test complete*.

Vehicle integration test complete

Information

The vehicle must not be handed back to the customer until all control units have been checked and the system is thus compliant ⇒*Conformity of the vehicle system*

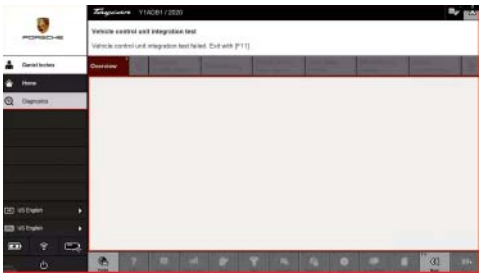


Conformity of the vehicle system

9.5

In the event of a fault - Performance of the integration test

If the integration test fails, this is displayed as a result ⇒ *Vehicle control unit integration test failed*. Then complete the following steps:



Vehicle control unit integration test failed

9.6 In the Additional menu (F7), execute the "Maintenance of vehicle data with PIWIS ONLINE" function and write the current vehicle data record from the online system into the vehicle.

9.7 Carry out the integration test again.

9.8 In the event of a further fault, contact Technical Support.

10 Attach the working log to the PQIS line.

10.1 Select the PCCS button under **Applications** on the PIWIS Tester.

10.2 Log into the PCCS using the PIWIS Tester with the corresponding quality line.

10.3 Select Upload file in the PIWIS Tester.

10.4 Select **Pdf Prints** in the drop-down menu.

10.5 Attach the created work logs to the quality line.

11 End operational readiness (switch off ignition).

12 Disconnect the PIWIS Tester from the vehicle.

Information

Connect the PIWIS Tester to a network as soon as possible and log into the PPN in order to transfer the backup documentation created during this campaign to the PAG systems.

13 Switch off and disconnect the battery charger.

14 Enter the campaign in the Warranty and Maintenance booklet.
– End of remedial action –

For warranty processing, see **Scope 3** in the ⇒ *Technical Information '443225 Warranty processing section'*

Re-program various control units - Scope 4

WARNING

Electrically moved side windows and rear spoiler

- **Danger of limbs being trapped or severed**
- **Risk of damage to components**

⇒ **Do not reach into the danger area.**

⇒ **Keep third parties away from the danger area.**

⇒ **Do not move components or tools into the danger area.**

NOTICE

Using the software on vehicles that are not assigned to this campaign:

- **Risk of damage to control unit**

⇒ **Use the listed software versions only for the vehicles assigned to the campaign.**

Work Procedure: 1 Select Guest account from the central display (PCM) and activate Privacy mode (available in some countries).

Information

- The new software version of the **additional instrument (stopwatch)** and **multifunction steering wheel** is only shown after restarting these components. This restart takes place in bus idle during the concluding work.

2 Start control unit programming **VR12.1.1 Sequence 3**.

Only for model year 2020:

For specific information on control unit programming in this sequence, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.
Programming code:	**K4M3S**
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.
Programming time (approx):	**Up to 130 minutes**

Software versions programmed during this campaign:	• Multifunction steering wheel	0091
	• Seat adjustment control unit, front	0064
	• Additional instrument control unit (stopwatch)	0015
	• Door control unit, front and rear	0390
	• Control unit for exterior acoustics (eSound)	0100
	• Control unit for interior acoustics (iSound)	0290
	• Display and operator control unit in rear center console	1170
	• Connect control unit	0236 or 0237 or 0238 or 0239 or 0245 or 0247
	Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.	

Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl " + •L " . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again.
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

3 Create a new working log.

3.1 Once programming is complete, confirm by selecting •F4 " ('Save') in the Campaign menu below.

3.2 Select •F10 " ('Logs').

3.3 Select the log type **Work log**.

3.4 The created working log with the designation of the sequence performed is unnamed and saved.

3.5 Select the working log and press •F10 " ('Displays').

3.6 Select the printer icon in the selection bar at the top right.

3.7 Select printer ('PDF').

3.8 Print the working log. This is stored automatically on the Tester.

4 Start control unit programming **VR12.1.1 Sequence 3**.

Only for model year 2021.

For specific information on control unit programming in this sequence, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.
Programming code:	**K4M3S**
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.
Programming time (approx):	**up to 30 minutes**
Software version programmed during this sequence:	• Door control unit, front and rear 0390 Sequence 3 includes other control units from the software release VR12.1.1, which are only re-coded.
	Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.
Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl " + •L " . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again.
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

5 Create a new working log.

5.1 Once programming is complete, confirm by selecting • F4 “ ('Save') in the Campaign menu below.

5.2 Select • F10 “ (‘Logs’).

5.3 Select the log type **Work log**.

5.4 The created working log with the designation of the sequence performed is unnamed and saved.

5.5 Select the working log and press • F10 “ (‘Displays’).

5.6 Select the printer icon in the selection bar at the top right.

5.7 Select printer (‘PDF’).

5.8 Print the working log. This is stored automatically on the Tester.

6 Standardize front and rear doors consecutively.

6.1 Select all four **door control units** in the control unit selection screen (**'Overview'** menu) and press • F12 “ ('Next') to confirm your selection.

6.2 Once the door control units have been found and are displayed in the overview, select the **'Maintenance / repairs'** menu.

6.3 Select the **'Standardization run'** function for the first of the four door control units and press • F12 “ ('Next') to confirm.

6.4 Read the instructions and confirm by pressing • F12 “ ('Next').

6.5 Meet the displayed conditions that must be checked manually, tick the relevant **'Status'** box, and press • F12 “ ('Next') to confirm.

6.6 Select the **Door \ Power window standardization** function and press • F8 “ ('Execute') to start the procedure.

6.7 Standardize the other three door control units in succession.

To do this, repeat **Steps 5.3 - 5.6** for the relevant door control units.

6.8 Once all four door control units have been coded, select the **'Overview'** menu to return to the control unit selection screen.

Concluding work - Scope 4

WARNING

Electrically moved side windows and rear spoiler

- **Danger of limbs being trapped or severed**
- **Risk of damage to components**

⇒ **Do not reach into the danger area.**

⇒ **Keep third parties away from the danger area.**

⇒ **Do not move components or tools into the danger area.**

Work Procedure: 1 Establish bus idle for at least 15 minutes.

1.1 End operational readiness (switch off ignition).

1.2 Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.

1.3 Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).

1.4 Unlock the vehicle again after waiting for at least 15 minutes.

1.5 Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.

2 Manually retract the rear spoiler, which extended automatically during programming.

2.1 Select the **'Rear spoiler'** control unit in the control unit selection screen (**'Overview'** menu) and press •F12 “ ('Next') to confirm.

2.2 Once the rear spoiler control unit has been found and is displayed in the overview, select the **'Maintenance / repairs'** menu.

2.3 Select the function **'Teach rear spoiler'** and press •F12 “ ('Next') to confirm.

2.4 Read the instructions and confirm by pressing •F12 “ ('Next').

2.5 Meet the displayed conditions that must be checked manually and tick the relevant **'Status'** box.

2.6 Select the **Teach rear spoiler** function and press •F8 “ ('Execute') to confirm.

2.7 Once the rear spoiler has been taught and retracted fully, select the **'Overview'** menu to return to the control unit selection screen.

3 Only relevant if the message **"Tyre pressure monitoring fault - Service necessary"** is displayed: Teach Tyre Pressure Monitoring (TPM) system using the PIWIS Tester. ⇒*Workshop Manual '443225 Teach the wheel electronics'*

Information

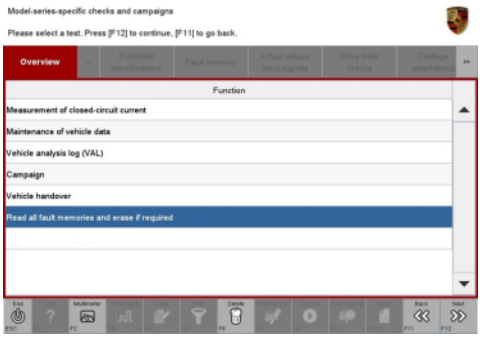
In the menu-guided procedure, check the **'Teach wheel IDs'** menu item after confirming with •F12 “ to make sure that the function **'Teach 2nd wheel IDs without driving'** is selected. Then, select the function **'2nd wheel IDs unknown'** and continue the procedure according to menu guidance.

4 Read out and erase the fault memories of all control units.

4.1 Press •F7 “ in the control unit selection screen ('Overview' menu) to call up the Additional menu.

4.2 Select the function "Read all fault memories and erase if required" and press •F12 “ ('Next') to confirm.

The fault memories of the control units are read out.



erase fault memory

4.3 Once you have read out the fault memories, check the fault memory entries.

Information

If control units are found to have faults that are **not** caused by control unit programming, these must first be **found** and **corrected**. This work **cannot** be invoiced under the workshop campaign number.

4.4 Press •F8 “ to delete fault memory entries.

4.5 Press •F12 “ ('Yes') in response to the question as to whether you really want to delete all fault memory entries.

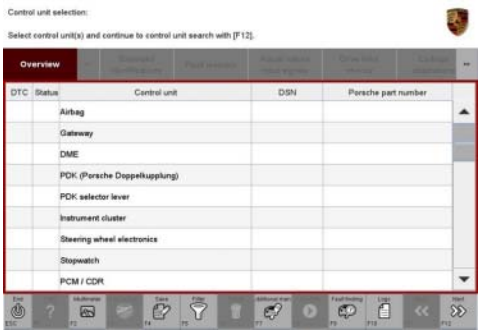
The faults stored in the fault memories of the various control units are deleted.

Information

If fault memory entries for individual control units cannot be deleted, proceed as follows:

- End operational readiness (switch off ignition).
- Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.
- Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).
- Unlock the vehicle again after waiting for at least 15 minutes.
- Restore operational readiness (switch on ignition).
- Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.
- Read out the fault memory again and delete any fault memory entries that are stored.

4.6 Once you have erased the fault memories, select the **'Overview'** menu to return to the control unit selection screen .



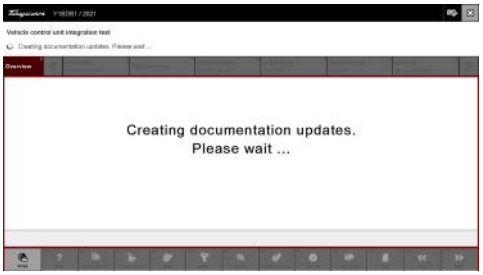
Control unit selection

5 Create Vehicle Analysis Log (VAL) using the PIWIS Tester.
Mark the vehicle analysis log you have just created with the attribute **"Final VAL"** and after carrying out the campaign, return it using the PIWIS Tester.

6 **Performing system test using the PIWIS Tester**

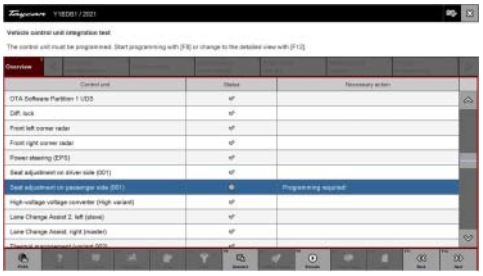
6.1 First, the service technician carries out his steps as usual.

The system test is started automatically with the backup documentation process at the end of the process. Alternatively, the system test can also be started manually by pressing •F3. “



backup documentation

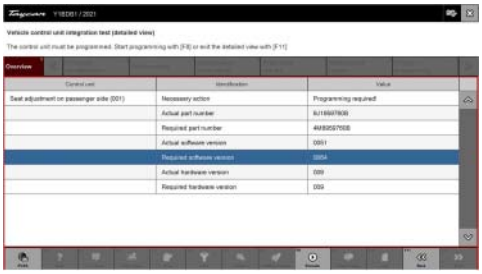
6.2 The result list is displayed to the technician after the check has been completed.
This shows if control units are not yet at the required software version ⇒*Programming required* **or** a hardware check is required in accordance with the Spare Parts Catalogue (PET)⇒*Detailed view of integration test - Hardware*.



Programming required

Hardware check required

6.3 Click on the affected control unit to view further details and start programming ⇒*Detailed view of integration test - software version*. The step-by-step instructions then start.
The hardware check is performed against the Parts Catalogue ⇒*Detailed view of integration test - Hardware*.



Detailed view of integration test - software version

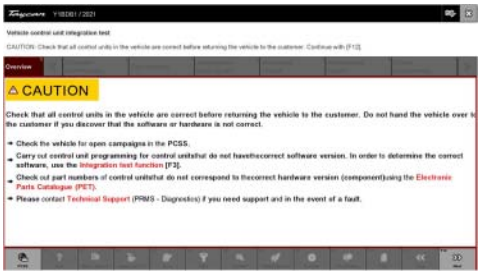
Detailed view of integration test - Hardware

6.4 When programming or hardware testing is complete, backup documentation including the joint test is performed again.
All affected control units should now be re-programmed or checked in the control unit overview and their status. To do this, repeat Steps 2-4 until all control units are free of faults ⇒*Vehicle integration test complete*.

Vehicle integration test complete

Information

The vehicle must not be handed back to the customer until all control units have been checked and the system is thus compliant ⇒*Conformity of the vehicle system*

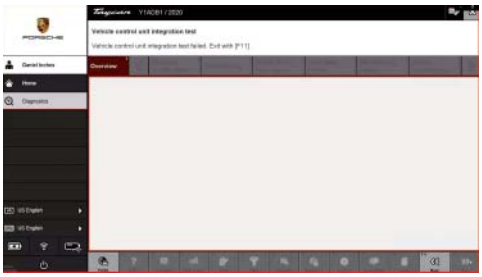


Conformity of the vehicle system

6.5

In the event of a fault - Performance of the integration test

If the integration test fails, this is displayed as a result ⇒ *Vehicle control unit integration test failed*. Then complete the following steps:



Vehicle control unit integration test failed

6.6 In the Additional menu (F7), execute the "Maintenance of vehicle data with PIWIS ONLINE" function and write the current vehicle data record from the online system into the vehicle.

6.7 Carry out the integration test again.

6.8 In the event of a further fault, contact Technical Support.

7 Attach the working log to the PQIS line.

7.1 Select the PCCS button under **Applications** on the PIWIS Tester.

7.2 Log into the PCCS using the PIWIS Tester with the corresponding quality line.

7.3 Select Upload file in the PIWIS Tester.

7.4 Select **Pdf Prints** in the drop-down menu.

7.5 Attach the created work logs to the quality line.

8 End operational readiness (switch off ignition).

9 Disconnect the PIWIS Tester from the vehicle.

Information

Connect the PIWIS Tester to a network as soon as possible and log into the PPN in order to transfer the backup documentation created during this campaign to the PAG systems.

10 Switch off and disconnect the battery charger.

11 Enter the campaign in the Warranty and Maintenance booklet.
– End of remedial action –

For warranty processing, see **Scope 4** in the ⇒ *Technical Information '443225 Warranty processing section'*

Re-program various control units - Scope 5

WARNING

Electrically moved side windows and rear spoiler

- **Danger of limbs being trapped or severed**
- **Risk of damage to components**

⇒ **Do not reach into the danger area.**

⇒ **Keep third parties away from the danger area.**

⇒ **Do not move components or tools into the danger area.**

NOTICE

Using the software on vehicles that are not assigned to this campaign:

- **Risk of damage to control unit**

⇒ **Use the listed software versions only for the vehicles assigned to the campaign.**

Work Procedure: 1 **Only relevant for vehicles with Scope 5:** Start control unit programming of **VR8.6**.

The basic procedure for control unit programming is described in the Workshop Manual ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*

For specific information on control unit programming of VR8.6 during this campaign, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.
Programming code:	**P5P8E**
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.
Programming time (approx):	**Up to 120 minutes**

Software versions programmed during this campaign:	• Over-the-air (OTA) control unit	0861
	• High-voltage power electronics, front and rear	0012
	• High-voltage charger (OBC) control unit	1073
	• High-voltage battery control unit (BMCe)	E860
	• Chassis control (PASM)	0896
	• Display and operator control unit in rear center console	0897
	• Instrument cluster	0394
	Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.	
Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl“ + •L“ . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again.	
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.	

2 Create a new working log.

2.1 Once programming is complete, confirm by selecting •F4“ ('Save') in the Campaign menu below.

2.2 Select • F10 “ (‘Logs’).

2.3 Select log type **Work log**.

2.4 Rename and save the working log created with the designation of the sequence performed.

2.5 Select the working log and press • F10 “ (‘Displays’).

2.6 Select the printer icon in the selection bar at the top right.

2.7 Select printer (‘PDF’).

2.8 Print the working log. This is stored automatically on the Tester.

3 Then perform software update to software release **VR8.7**.

4 Start control unit programming of **VR8.7**.

The basic procedure for control unit programming is described in the Workshop Manual ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*.

For specific information on control unit programming of VR8.7 during this campaign, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.
Programming code:	**V6P8C**
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.
Programming time (approx):	**Up to 100 minutes**

Software versions programmed during this campaign:	• High-voltage power electronics, front and rear	0012
	• High-voltage charger (OBC) control unit	1079
	• High-voltage battery control unit (BMCe)	E870
	• HV voltage converter	0899
	• Brake booster (electric brake booster)	0100
	• High-voltage DC battery charger (booster)	0990
	• Engine electronics (DME)	0014
	• Brake electronics (PSM)	0094
	• Driver's seat and passenger's seat adjustment	0064
	• Assistance systems (zFAS)	0355
	Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.	
Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl " + •L " . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for	

	approx. 15 minutes (switch off ignition) and repeat the procedure described here again.
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

5 Create a new working log.

5.1 Once programming is complete, confirm by selecting • F4 “ ('Save') in the Campaign menu below.

5.2 Select • F10 “ (‘Logs’).

5.3 Select the log type **Work log**.

5.4 Rename and save the working log created with the designation of the sequence performed.

5.5 Select the working log and press • F10 “ (‘Displays’).

5.6 Select the printer icon in the selection bar at the top right.

5.7 Select printer (‘PDF’).

5.8 Print the working log. This is stored automatically on the Tester.

6 Then carry out **VR12.1.1 sequences 1 - 3**.

7 Select Guest account from the central display (PCM) and activate Privacy mode (available in some countries).

Information

To ensure that no user-specific settings from **cloud-based services (Porsche Connect & My Porsche)** are lost during the update, activate **Privacy mode** before starting the update. When Privacy mode is activated, communication between the vehicle and the Porsche Connect app and My Porsche is disabled. No vehicle-specific information is transferred. As a result, settings cannot be configured on the vehicle using the Porsche Connect app or My Porsche.

When the **instrument cluster** and **central computer** are re-programmed, the **individual settings** implemented **in the vehicle** by the customer will be lost and reset to the **default values** of the country version that applies to the vehicle.

After carrying out the campaign, please inform customers that personal settings they have implemented in the instrument cluster and central display of the central computer will have to be **set again** and provide them with any **help and support** they need for setting the relevant options.

This affects the following settings, for example:

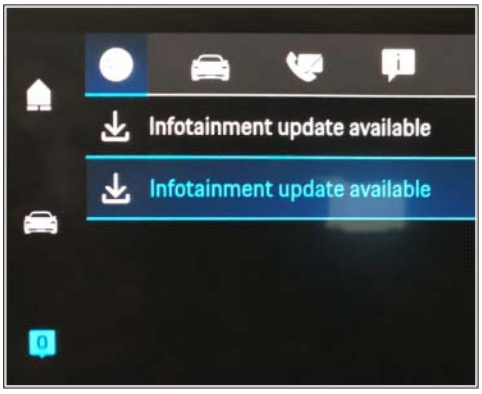
- Individual settings for tubes 1 to 3 of the instrument cluster as well as the extended map view or reduced view of the instrument cluster
- Individual settings of the head-up display (HUD)

- Selected functions of individual tubes in the instrument cluster, e.g. auto zoom, 3D map and satellite map
- Arrangement of tiles in the home screen and MyScreen on the central display
- Individual seat, exterior mirror and ergonomic settings
- Air conditioning settings, such as ventilation and air quality
- Privacy settings
- Frequency setting of the garage door opener (Homelink)

Information

After carrying out the campaign, please inform customers that Infotainment updates are available via the central computer (PCM) and provide them with any help and support they need during installation ⇒*Infotainment update in central display*.

These updates are only available if the customer has logged in on the vehicle using his/her main user credentials (Porsche ID). Several updates are available depending on equipment and these must be installed one after the other in steps. It can take several minutes to install these. New functions can only be used when all updates have been completed and the vehicle has established bus idle for at least 15 minutes.



Infotainment update in central display

Information

- **Distance measuring sensor control unit (ACC):** Programming is performed in two stages because of the high data volume. First, the bootloader ACC is programmed and an error message is displayed. This error message in step 5 can be ignored and you can continue with the campaign. Follow the instructions on the PIWIS Tester.
- **Airbag control unit:** Manual intermediate steps are required after programming the central control unit for assistance systems (zFAS). For safety reasons, the airbag is unlocked during a guided procedure prior to coding and is then locked again when coding is complete. Follow the instructions on the PIWIS Tester. If the guided airbag procedure is aborted, the airbag must be locked again manually after completion of sequence 1. For instructions, see: ⇒*Workshop Manual '695355 Replacing airbag control unit'*
- **Rear-end electronics control unit (BCM 2):** If the driver's key is not detected in the vehicle, programming of the rear-end electronic cannot be started or will be interrupted. You must therefore position the **driver's key** with the back facing forward upright between the holding struts in the rear cupholder (**emergency start tray**) to guarantee a permanent radio link between the vehicle and remote control.

8 Start control unit programming **VR12.1.** Start **sequence 1**.

The basic procedure for control unit programming is described in the Workshop Manual ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*.

Sequence 1:

For specific information on control unit programming in this sequence, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)	
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.	
Programming code:	**K4M1S**	
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.	
Programming time (approx):	**Up to 125 minutes**	
Software versions programmed during this sequence:	• Distance measuring sensor control unit (ACC)	0496
	• Front-end electronics control unit (BCM1)	0712
	• Rear-end electronics (BCM2) control unit	0565
	• Radar sensor for front corner radar, left and right	0485
	• Lane Change Assist control unit, left and right	0486
	• Central control unit for assistance systems (zFAS)	0365
	• Airbag control unit	3303
	Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.	

Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl " + •L " . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again.
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

9 Create a new working log.

9.1 Once programming is complete, confirm by selecting •F4 " ('Save') in the Campaign menu below.

9.2 Select •F10 " ('Logs').

9.3 Select the log type **Work log**.

9.4 Rename and save the working log created with the designation of the sequence performed.

9.5 Select the working log and press •F10 " ('Displays').

9.6 Select the printer icon in the selection bar at the top right.

9.7 Select printer ('PDF').

9.8 Print the working log. This is stored automatically on the Tester.

Information

- **Battery sensor (12-volt vehicle electrical system battery):** An actual voltage of at least 14 volts is required for programming the 12-volt battery sensor. Switching the ignition off and on again after one minute is therefore integrated in the programming sequence. As a result, the voltage of the 12-volt vehicle electrical system battery increases briefly and the programming sequence can be started. Follow the instructions on the PIWIS Tester.
- **Programming must not be performed if the supply voltage has not yet been checked to be 14 volts. This is displayed on the PIWIS Tester before starting programming.**

10 Start control unit programming **VR12.1.1 Sequence 2**.

For specific information on control unit programming in this sequence, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)	
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.	
Programming code:	**K4M2S**	
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.	
Programming time (approx):	**Up to 125 minutes**	
Software versions programmed during this campaign:	• Power electronics, front and rear	0012
	• Engine electronics (DME) control unit	0014
	• High-voltage battery control unit (BMCe)	1401
	• High-voltage DC battery charger (booster)	1250
	• HV voltage converter	1230
	• Control unit for chassis control (PASM)	1160

	• Power steering control unit (EPS)	0430
	• Brake electronics (PSM) control unit	0120
	• Control unit for steering column adjustment	0210
	• Control unit for rear axle steering	0962
	• Rear lid control unit	0172
	• Air-conditioning control unit	1160
	• Control unit for rear-differential lock	2021
	• Thermal management control unit (TME)	0323
	• Electric passenger compartment heater (PTC)	0015
	• Gateway control unit	2591
	• Instrument cluster	0595
	• Over-the-air (OTA) control unit	1221
	• OTA partition	1221
	• High-voltage charger (OBC), 11 kW	1083
	• Battery sensor	4174
	• Transmission control unit (EGS)	0250
	Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.	

Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl “ + •L “ . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again.
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

11 Create a new working log.

11.1 Once programming is complete, confirm by selecting •F4 “ ('Save') in the Campaign menu below.

11.2 Select •F10 “ (‘Logs’).

11.3 Select the log type **Work log**.

11.4 Rename and save the working log created with the designation of the sequence performed.

11.5 Select the working log and press •F10 “ (‘Displays’).

11.6 Select the printer icon in the selection bar at the top right.

11.7 Select printer (‘PDF’).

11.8 Print the working log. This is stored automatically on the Tester.

Information

- The new software version of the **additional instrument (stopwatch)** and **multifunction steering wheel** is only shown after restarting these components. This restart takes place in bus idle during the concluding work.

12 Start control unit programming **VR12.1.1 Sequence 3**.

For specific information on control unit programming in this sequence, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)	
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.	
Programming code:	**K4M3S**	
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.	
Programming time (approx):	**Up to 130 minutes**	
Software versions programmed during this campaign:	• Multifunction steering wheel	0091
	• Seat adjustment control unit, front	0064
	• Additional instrument control unit (stopwatch)	0015
	• Door control unit, front and rear	0390
	• Control unit for exterior acoustics (eSound)	0100
	• Control unit for interior acoustics (iSound)	0290
	• Display and operator control unit in rear center console	1170
	• Connect control unit	0236 or 0237 or 0238 or 0239

	or 0245 or 0247 Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.
Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl “ + •L “ . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again.
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

13 Create a new working log.

13.1 Once programming is complete, confirm by selecting •F4 “ ('Save') in the Campaign menu below.

13.2 Select •F10 “ (‘Logs’).

13.3 Select the log type **Work log**.

13.4 Rename and save the working log created with the designation of the sequence performed.

13.5 Select the working log and press •F10 “ (‘Displays’).

13.6 Select the printer icon in the selection bar at the top right.

13.7 Select printer ('PDF').

13.8 Print the working log. This is stored automatically on the Tester.

Concluding work - Scope 5

WARNING

Electrically moved side windows and rear spoiler

- **Danger of limbs being trapped or severed**
- **Risk of damage to components**

⇒ **Do not reach into the danger area.**

⇒ **Keep third parties away from the danger area.**

⇒ **Do not move components or tools into the danger area.**

NOTICE

Movement of the rear wheels by activating the electric motor; vehicle driving off when the wheels are touching the ground

- **Personal injury as a result of wheel or vehicle movement**
- **Material damage to vehicle, drive or brake components**

⇒ **Raise the vehicle on a lifting platform until the drive wheels are free**

⇒ **Press the foot brake during adaptation**

⇒ **Cordon off the work area**

NOTICE

Programming interrupted

- **Malfunctions in control unit**
- **Risk of damage to control unit**

⇒ **Route the line between the vehicle communication module (VCI) and diagnostic socket on the vehicle without tension and make sure that the connector is inserted fully into the diagnostic socket.**

⇒ **Check that the rechargeable battery for the PIWIS Tester is charged sufficiently. Connect the PIWIS Tester to the power supply unit if necessary.**

Work Procedure: 1 Establish bus idle for at least 15 minutes.

1.1 End operational readiness (switch off ignition).

1.2 Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.

1.3 Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).

1.4 Unlock the vehicle again after waiting for at least 15 minutes.

1.5 Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.

2 Place the vehicle onto a lifting platform, but do not raise it yet.
Follow the instructions on the PIWIS Tester for lifting the vehicle during the following sequence.

Information

The **current version** of the onboard Driver's Manual has been **available** online **since 5 March 2021**.

A blank USB storage medium is required for installing the onboard Driver's Manual (approx. 100 MB). If there is already data stored on the USB storage medium, this will be deleted during the procedure.

Information

Before starting sequence 5 (subsequent work), connect the PIWIS Tester to a network to establish an Internet connection. The PIWIS Tester **must** be **connected online** for the subsequent work described below and for installing the onboard Driver's Manual.

Information

- **Component protection:** Component protection must only be taught for the control unit for assistance systems (zFAS). To do this, select component protection for **assistance systems (zFAS)** in the procedure. If the component protection teaching process is aborted, stop sequence 5 and read and follow the additional information provided under ⇒ *Technical Information '9X00IN Additional instructions for the concluding work'*.
- **Enabled functions:** If function activation is aborted, component protection must first be taught again. Then, start sequence 5 again in order to restore the enabled functions.
- **Coding of all control units:** Always allow coding to run to the end of the process. If individual coding routines fail, the relevant control units can be selected manually in the overview afterwards and coded again individually.

3 Start subsequent work for various control units (**sequence 5**).

Required PIWIS Tester software version:	**40.550.040** (or higher)
Programming code:	**K4M5S**

Expiry:	Read and follow the **information and instructions on the PIWIS Tester** during the guided procedure for the subsequent work. **Do not interrupt the process.**
Programming time (approx):	**Up to 55 minutes**
Subsequent work carried out during this process	• Distance measuring sensor (ACC) - Reset personalization For manual procedure, see ⇒*Workshop Manual '278555 Replacing control unit for distance measuring sensor'*.
	• Air conditioning - Teach servo motors For the manual procedure, see relevant servo motor Workshop Manual 872019**xx**.
	• Commissioning rear-differential lock For manual procedure, see ⇒*Workshop Manual '397555 Replacing rear-differential lock control unit'*.
	• Engine electronics (DME) transmission adaptation For manual procedure, see ⇒*Workshop Manual '247055 Replacing DME control unit'*.
	• Door standardization, front and rear For manual procedure, see • ⇒*Workshop Manual '577355 Replacing front door control unit'* • ⇒*Workshop Manual '587355 Replacing rear door control unit'*
	• Teaching component protection For manual procedure, see ⇒*Workshop Manual '903555 Replace gateway control unit'*Select the control unit for **assistance systems (zFAS)** in the PIWIS Tester procedure.
	• Restoring enabling functions

	For manual procedure, see ⇒*Workshop Manual '903555 Replace gateway control unit'*.
	• Installing onboard Driver's Manual For manual procedure, see ⇒*Workshop Manual '0X01IN diagnostic system: Performing vehicle handover'*.
	• Automatic coding of all control units
Procedure if the sequence is aborted:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒*Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat subsequent work sequence by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl“ + •L“. • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If subsequent work is aborted a second time, end operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again. • In the case of further aborts, the subsequent work must be successively carried out manually.
Procedure in the event of error messages appearing during the programming sequence:	⇒*Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

4 Create a new working log.

4.1 Once programming is complete, confirm by selecting •F4“ ('Save') in the Campaign menu below.

4.2 Select •F10 “ (‘Logs’).

4.3 Select the log type **Work log**.

4.4 Rename and save the working log created with the designation of the sequence performed.

4.5 Select the working log and press •F10 “ (‘Displays’).

4.6 Select the printer icon in the selection bar at the top right.

4.7 Select printer (‘PDF’).

4.8 Print the working log. This is stored automatically on the Tester.

5 Establish bus idle for at least 15 minutes.

5.1 End operational readiness (switch off ignition).

5.2 Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.

5.3 Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).

5.4 Unlock the vehicle again after waiting for at least 15 minutes.

5.5 Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.

6 Teach steering lock settings.

6.1 Select the power steering **'EPS' control unit** in control unit selection (**'Overview'** menu) and press •F12 “ ('Next') to confirm.

6.2 Once the power steering control unit has been found and is displayed in the list, select the **'Maintenance / repairs'** menu.

6.3 Select the **'Commissioning'** function and confirm with •F12 “ ('Next').

6.4 Follow the instructions on the Tester to perform the commissioning process.

6.5 If the left and right steering lock settings are not saved during the procedure, adjust the height and depth of the steering wheel position and repeat the commissioning procedure.

7 **Only relevant for vehicles with Scope 5 or if fault memory entries are stored for seat adjustment:** Standardize seat adjustment for driver's and passenger's side.

7.1 Select the **'Seat adjustment on front passenger's side'** control unit in the control unit selection screen (**'Overview'** menu) and press •F12 “ ('Next') to confirm your selection.

7.2 Once the seat adjustment on front passenger's side control unit has been found and is displayed in the overview, select the **'Maintenance / repairs'** menu.

7.3 Select the **'Standardize seat motors'** function and press •F12 “ ('Next') to confirm your selection.

7.4 Read the instructions and confirm by pressing •F12 “ ('Next').

7.5 Press • F8 “ ('Start') to run the procedure.

7.6 Once the seat motors on the **passenger's side** have been standardized, also teach the **driver's side**. To do this, select the **'Seat adjustment on front driver's side'** control unit in the control unit selection screen (**'Overview'** menu) and **repeat Steps 6.2 to 6.6**. Then, continue with **Step 2**.

8 Manually retract the rear spoiler, which extended automatically during programming.

8.1 Select the **'Rear spoiler'** control unit in the control unit selection screen (**'Overview'** menu) and press • F12 “ ('Next') to confirm.

8.2 Once the rear spoiler control unit has been found and is displayed in the overview, select the **'Maintenance / repairs'** menu.

8.3 Select the function **'Teach rear spoiler'** and press • F12 “ ('Next') to confirm.

8.4 Read the instructions and confirm by pressing • F12 “ ('Next').

8.5 Meet the displayed conditions that must be checked manually and tick the relevant **'Status'** box.

8.6 Select the **'Teach rear spoiler'** function and press • F8 “ ('Execute') to confirm.

8.7 Once the rear spoiler has been taught and retracted fully, select the **'Overview'** menu to return to the control unit selection screen.

9 Calibration of power electronics at front and rear.

9.1 Select the **'Rear high-voltage power electronics'** control unit in the control unit selection screen (**'Overview'** menu) and confirm with • F12 “ ('Next').

9.2 Once the high-voltage power electronics on rear axle control unit has been found and is displayed in the 'Overview', select the **'Drive links / checks'** menu.

9.3 Select the **'Electric motor – Reset calibration'** function and confirm with • F12 “ ('Next').

9.4 Set the entry to **Basic setting** in the Values column on the **'Parameters'** tab.

9.5 Confirm that **calibration** has been reset with • F8 “ ('Execute').

9.6 Go back to the control unit selection screen (**'Overview'** menu), select the **'Front high-voltage power electronics'** control unit and repeat **Steps 8.2 to 8.4** for the selected control unit.

9.7 After resetting both calibrations, select the two control units **'Front high-voltage power electronics' and 'Rear high-voltage power electronics'** in the control unit selection screen and open the **'Fault memory'** menu.

9.8 Check whether the fault code **'P171900'** is displayed for **both** control units:

- If the fault code **'P171900'** is displayed for the **'Rear high-voltage power electronics'** and **'Front high-voltage power electronics'** control unit, continue with **Step 8.9**.

- The fault code **'P171900'** is **not displayed** or is displayed only for **one of the two control units**. Carry out **Steps 8.1 to 8.6** for the relevant control units again.

9.9 Disconnect the PIWIS Tester from the vehicle.

9.10 Switch off and disconnect the battery charger.

Information

Resetting the high-voltage power electronics will limit the maximum vehicle speed to 70 km/h (43 mph). The warning message "Reduced speed" will be displayed on the instrument cluster. Any road on which it is possible to accelerate to a speed of at least 60 km/h (38 mph) can be used as the calibration route.

Read and follow safety instructions:

- Only perform calibration on public roads if the road and traffic conditions are conducive to doing so
- The road traffic regulations must always be observed
- Other road users must not be at risk when performing calibration
- Move the vehicle on public roads only if it is roadworthy

9.11 Start the calibration drive and complete the following steps.

Information

Resetting the high-voltage power electronics will limit the maximum vehicle speed to 70 km/h (43 mph). The warning message "Reduced speed" will be displayed on the instrument cluster. Any road on which it is possible to accelerate to a speed of at least 60 km/h (38 mph) can be used as the calibration route.

Read and follow safety instructions:

- Only perform calibration on public roads if the road and traffic conditions are conducive to doing so
- The road traffic regulations must always be observed
- Other road users must not be at risk when performing calibration
- Move the vehicle on public roads only if it is roadworthy
- Accelerate the vehicle to at least 60 km/h (38 mph).
- Release the accelerator pedal and allow the vehicle roll in overrun for at least 1 second. Calibration is performed during this overrun phase.
- Switch ignition off and on again to reset the "Reduced speed" warning message.

10 Only relevant if the message "**Tyre pressure monitoring fault - Service necessary**" is displayed: Teach Tyre Pressure Monitoring (TPM) system using the PIWIS Tester.
For instructions, see:
⇒ *Workshop Manual '443225 Teach the wheel electronics'*

Information

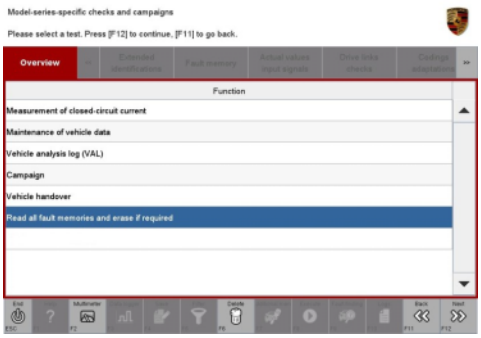
In the menu-guided procedure, check the **'Teach wheel IDs'** menu item after confirming with •F12 “ to make sure that the function **'Teach 2nd wheel IDs without driving'** is selected. Then, select the function **'2nd wheel IDs unknown'** and continue the procedure according to menu guidance.

11 Read out and erase the fault memories of all control units.

11.1 Press •F7 “ in the control unit selection screen ('Overview' menu) to call up the Additional menu.

11.2 Select the function "Read all fault memories and erase if required" and press •F12 “ ('Next') to confirm⇒*erase fault memory*.

The fault memories of the control units are read out.



erase fault memory

11.3 Once you have read out the fault memories, check the fault memory entries.

Information

If control units are found to have faults that are **not** caused by control unit programming, these must first be **found** and **corrected**. This work **cannot** be invoiced under the workshop campaign number.

11.4 Press •F8 “ to delete fault memory entries.

11.5 Press •F12 “ ('Yes') in response to the question as to whether you really want to delete all fault memory entries.

The faults stored in the fault memories of the various control units are deleted.

Information

If fault memory entries for individual control units cannot be deleted, proceed as follows:

- End operational readiness (switch off ignition).
- Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.
- Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).
- Unlock the vehicle again after waiting for at least 15 minutes.
- Restore operational readiness (switch on ignition).
- Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.

- Read out the fault memory again and delete any fault memory entries that are stored.

11.6 Once you have erased the fault memories, select the **'Overview'** menu to return to the control unit selection screen ⇒*Control unit selection*.

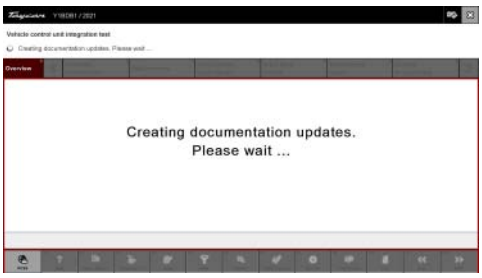
Control unit selection

12 Create Vehicle Analysis Log (VAL) using the PIWIS Tester.
Mark the vehicle analysis log you have just created with the attribute "Final VAL" and after carrying out the campaign, return it using the PIWIS Tester.

13 **Performing system test using the PIWIS Tester**

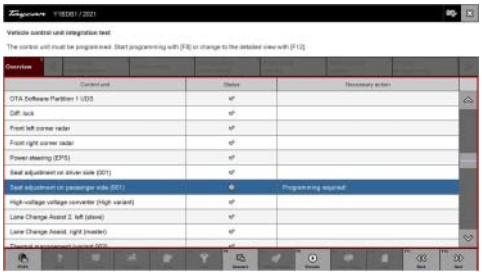
13.1 First, the service technician carries out his steps as usual.

The system test is started automatically with the backup documentation process at the end of the process. Alternatively, the system test can also be started manually by pressing •F3. “



backup documentation

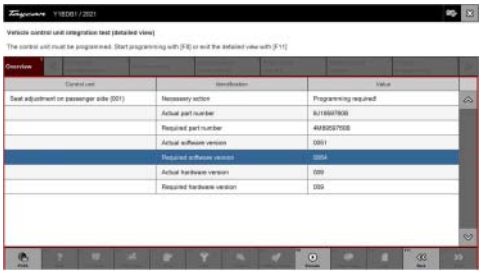
13.2 The result list is displayed to the technician after the check has been completed.
This shows if control units are not yet at the required software version ⇒*Programming required* **or** a hardware check is required in accordance with the Spare Parts Catalogue (PET)⇒*Detailed view of integration test - Hardware*.



Programming required

Hardware check required

13.3 Click on the affected control unit to view further details and start programming ⇒*Detailed view of integration test - software version*. The step-by-step instructions then start.
The hardware check is performed against the Parts Catalogue ⇒*Detailed view of integration test - Hardware*.



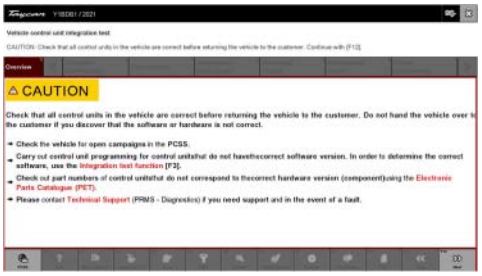
Detailed view of integration test - software version

Detailed view of integration test - Hardware

13.4 When programming or hardware testing is complete, backup documentation including the joint test is performed again.
All affected control units should now be programmed or checked afterwards in the control unit overview and their status. To do this, repeat Steps 2-4 until all control units are free of faults ⇒*Vehicle integration test complete*.

Vehicle integration test complete

Information
The vehicle must not be handed back to the customer until all control units have been checked and the system is thus compliant ⇒*Conformity of the vehicle system*

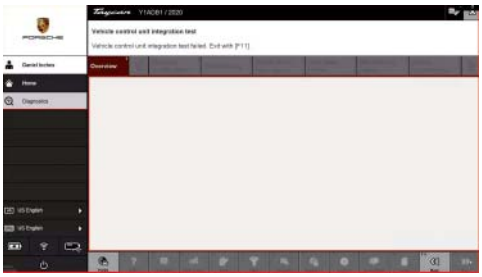


Conformity of the vehicle system

13.5

In the event of a fault - Performance of the integration test

If the integration test fails, this is displayed as a result ⇒ *Vehicle control unit integration test failed*. Then complete the following steps:



Vehicle control unit integration test failed

13.6 In the Additional menu (F7), execute the "Maintenance of vehicle data with PIWIS ONLINE" function and write the current vehicle data record from the online system into the vehicle.

13.7 Carry out the integration test again.

13.8 In the event of a further fault, contact Technical Support.

14 Attach the working log to the PQIS line.

14.1 Select the PCCS button under **Applications** on the PIWIS Tester.

14.2 Log into the PCCS using the PIWIS Tester with the corresponding quality line.

14.3 Select Upload file in the PIWIS Tester.

14.4 Select **Pdf Prints** in the drop-down menu.

14.5 Attach the created work logs to the quality line.

15 End operational readiness (switch off ignition).

16 Disconnect the PIWIS Tester from the vehicle.

Information

Connect the PIWIS Tester to a network as soon as possible and log into the PPN in order to transfer the backup documentation created during this campaign to the PAG systems.

17 Switch off and disconnect the battery charger.

18 Enter the campaign in the Warranty and Maintenance booklet.
– End of remedial action –

For warranty processing, see **Scope 5** in the ⇒ *Technical Information '443225 Warranty processing section'*

Re-program various control units - Scope 6

WARNING

Electrically moved side windows and rear spoiler

- **Danger of limbs being trapped or severed**
- **Risk of damage to components**

⇒ **Do not reach into the danger area.**

⇒ **Keep third parties away from the danger area.**

⇒ **Do not move components or tools into the danger area.**

NOTICE

Using the software on vehicles that are not assigned to this campaign:

- **Risk of damage to control unit**

⇒ **Use the listed software versions only for the vehicles assigned to the campaign.**

Information

The guided programming sequence as part of this campaign includes all control units from the corresponding software releases. During the programming sequence, the software versions of the individual control units listed below are compared with the required versions of software release. If the actual versions already correspond to the required versions, programming of the relevant control unit will be automatically skipped, which means that the number of control units programmed in addition to the control unit for the high-voltage charger can vary.

Information

To ensure that no user-specific settings from **cloud-based services (Porsche Connect & My Porsche)** are lost during the update, activate **Privacy mode** before starting the update. When private mode is activated, communication between the vehicle and the Porsche Connect App and My Porsche is blocked. No vehicle-specific information is transferred. As a result, settings cannot be configured on the vehicle using the Porsche Connect app or My Porsche.

When the **instrument cluster** and **central computer** are re-programmed, the **individual settings** implemented **in the vehicle** by the customer will be lost and reset to the **default values** of the country version that applies to the vehicle.

After carrying out the campaign, please inform customers that personal settings they have implemented in the instrument cluster and central display of the central computer will have to be **set again** and provide them with any help and **support** they need for setting the relevant options.

This affects the following settings, for example:

- Individual settings for tubes 1 to 3 of the instrument cluster as well as the extended map view or reduced view of the instrument cluster
- Individual settings of the head-up display (HUD)
- Selected functions of individual tubes in the instrument cluster, e.g. auto zoom, 3D map and satellite map
- Arrangement of tiles in the home screen and MyScreen on the central display

- Individual seat, exterior mirror and ergonomic settings
- Air conditioning settings, such as ventilation and air quality
- Privacy settings
- Frequency setting of the garage door opener (Homelink)

Information

Only control units that are not up-to-date are updated. If these control units are already updated, hard programming will be aborted.

Work Procedure: 1 **Only relevant for vehicles with Scope 6:** Start control unit programming of **VR8.7**.

2 Start control unit programming of **VR8.7**.

The basic procedure for control unit programming is described in the Workshop Manual ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*.

For specific information on control unit programming of VR8.7 during this campaign, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.
Programming code:	**V6P8C**
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.
Programming time (approx):	**Up to 100 minutes**

Software versions programmed during this campaign:	• High-voltage power electronics, front and rear	0012
	• High-voltage charger (OBC) control unit	1079
	• High-voltage battery control unit (BMCe)	E870
	• HV voltage converter	0899
	• Brake booster (electric brake booster)	0100
	• High-voltage DC battery charger (booster)	0990
	• Engine electronics (DME)	0014
	• Brake electronics (PSM)	0094
	• Driver's seat and passenger's seat adjustment	0064
	• Assistance systems (zFAS)	0355
	Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.	
Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl " + •L " . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for	

	approx. 15 minutes (switch off ignition) and repeat the procedure described here again.
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

3 Create a new working log.

3.1 Once programming is complete, confirm by selecting • F4 “ ('Save') in the Campaign menu below.

3.2 Select • F10 “ (‘Logs’).

3.3 Select log type **Work log**.

3.4 The created working log with the designation of the sequence performed is unnamed and saved.

3.5 Select the working log and press • F10 “ (‘Displays’).

3.6 Select the printer icon in the selection bar at the top right.

3.7 Select printer (‘PDF’).

3.8 Print the working log. This is stored automatically on the Tester.

Information

- **Battery sensor (12-volt vehicle electrical system battery):** An actual voltage of at least 14 volts is required for programming the 12-volt battery sensor.
- **Programming must not be carried out if the supply voltage is 14 volts and the voltage has not been checked beforehand. This is displayed in the PIWIS Tester before starting programming.**
- The battery charger **must** be set to **U: 14.8 V** and **Uehl: 14.4** must be set.
- After programming, the charger **must** return to **U: 14.4V** and **Uehl: 13.8 V** must be set.

4 Then perform software update to software release **VR12.1.1**.

Start control unit programming **VR12.1.1 (Sequence 2)**.

For specific information on control unit programming in this sequence, see the table below:

Required PIWIS Tester software version:	**40.550.040** (or higher)
Type of control unit programming:	Control unit programming using the **'Campaign' function in the Additional menu** on the PIWIS Tester by entering a programming code.

Programming code:	**K4M2S**
Programming sequence:	Read and follow the **information and instructions on the PIWIS Tester** during the guided programming sequence. **Do not interrupt programming and coding.** A backup documentation process for the re-programmed software versions starts as soon as programming and coding is complete.
Programming time (approx):	**Up to 125 minutes**
Software versions programmed during this campaign:	• Power electronics, front and rear 0012
	• Engine electronics (DME) control unit 0014
	• High-voltage battery control unit (BMCe) 1401
	• High-voltage DC battery charger (booster) 1250
	• HV voltage converter 1230
	• Control unit for chassis control (PASM) 1160
	• Power steering control unit (EPS) 0430
	• Brake electronics (PSM) control unit 0120
	• Control unit for steering column adjustment 0210
	• Control unit for rear axle steering 0962
	• Rear lid control unit 0172
	• Air-conditioning control unit 1160
	• Control unit for rear-differential lock 2021
	• Thermal management control unit (TME) 0323
	• Electric passenger compartment heater (PTC) 0015
	• Gateway control unit 2591

	• Instrument cluster	0595
	• Over-the-air (OTA) control unit	1221
	• OTA partition	1221
	• High-voltage charger (OBC), 11 kW	1083
	• Battery sensor	4174
	• Transmission control unit (EGS)	0250
	Following control unit programming, the software version can be read out of the relevant control unit in the 'Extended identifications' menu using the PIWIS Tester.	
Procedure in the event of abnormal termination of control unit programming:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat control unit programming by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl“ + •L“ . • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If control unit programming is aborted a second time, stop operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again.	
Procedure in the event of error messages appearing during the programming sequence:	⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.	

5 Create a new working log.

5.1 Once programming is complete, confirm by selecting •F4“ ('Save') in the Campaign menu below.

5.2 Select •F10“ (‘Logs’).

5.3 Select the log type **Work log**.

5.4 The created working log with the designation of the sequence performed is unnamed and saved.

5.5 Select the working log and press •F10 “ (‘Displays’).

5.6 Select the printer icon in the selection bar at the top right.

5.7 Select printer (‘PDF’).

5.8 Print the working log. This is stored automatically on the Tester.

Concluding work - Scope 6

WARNING

Electrically moved side windows and rear spoiler

- **Danger of limbs being trapped or severed**
- **Risk of damage to components**

⇒ **Do not reach into the danger area.**

⇒ **Keep third parties away from the danger area.**

⇒ **Do not move components or tools into the danger area.**

NOTICE

Movement of the rear wheels by activating the electric motor; vehicle driving off when the wheels are touching the ground

- **Personal injury as a result of wheel or vehicle movement**
- **Material damage to vehicle, drive or brake components**

⇒ **Raise the vehicle on a lifting platform until the drive wheels are free**

⇒ **Press the foot brake during adaptation**

⇒ **Cordon off the work area**

NOTICE

Programming interrupted

- **Malfunctions in control unit**
- **Risk of damage to control unit**

⇒ **Route the line between the vehicle communication module (VCI) and diagnostic socket on the vehicle without tension and make sure that the connector is inserted fully into the diagnostic socket.**

⇒ **Check that the rechargeable battery for the PIWIS Tester is charged sufficiently. If required, operate the PIWIS Tester through the power supply unit.**

Work Procedure: 1 Establish bus idle for at least 15 minutes.

1.1 End operational readiness (switch off ignition).

1.2 Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.

1.3 Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).

1.4 Unlock the vehicle again after waiting for at least 15 minutes.

1.5 Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.

2 Place the vehicle onto a lifting platform, but do not raise it yet.
Follow the instructions on the PIWIS Tester for lifting the vehicle during the following sequence.

Information

The **current version** of the onboard Driver's Manual has been **available** online **since 5 March 2021**.

A blank USB storage medium is required for installing the onboard Driver's Manual (approx. 100 MB). If there is already data stored on the USB storage medium, this will be deleted during the procedure.

Information

Before starting sequence 5 (subsequent work), connect the PIWIS Tester to a network to establish an Internet connection. The PIWIS Tester **must** be **connected online** for the subsequent work described below and for installing the onboard Driver's Manual.

Information

- **Component protection:** Component protection must only be taught for the control unit for assistance systems (zFAS). To do this, select component protection for **assistance systems (zFAS)** in the procedure. If the component protection teaching process is aborted, stop sequence 5 and read and follow the additional information ⇒ *Technical Information '9X00IN Additional instructions for concluding work'*.
- **Enabled functions:** If the function activation is aborted, component protection must be taught again first. Then, start sequence 5 again in order to restore the enabled functions.
- **Coding of all control units:** Always allow coding to run to the end of the process. If individual coding routines fail, the relevant control units can be selected manually in the overview afterwards and coded again individually.

3 Start subsequent work for various control units.

Required PIWIS Tester software version:	**40.550.040** (or higher)
Programming code:	**K4M5S**

Expiry:	Read and follow the **information and instructions on the PIWIS Tester** during the guided procedure for the subsequent work. **Do not interrupt the process.**
Programming time (approx):	**Up to 55 minutes**
Subsequent work carried out during this process	• Distance measuring sensor (ACC) - Reset personalization For manual procedure, see ⇒*Workshop Manual '278555 Replacing control unit for distance measuring sensor'*.
	• Air conditioning - Teach servo motors For the manual procedure, see relevant servo motor Workshop Manual 872019**xx**.
	• Commissioning rear-differential lock For manual procedure, see ⇒*Workshop Manual '397555 Replacing rear-differential lock control unit'*.
	• Engine electronics (DME) transmission adaptation For manual procedure, see ⇒*Workshop Manual '247055 Replacing DME control unit'*.
	• Door standardization, front and rear For manual procedure, see • ⇒*Workshop Manual '577355 Replacing front door control unit'* • ⇒*Workshop Manual '587355 Replacing rear door control unit'*
	• Teaching component protection For manual procedure, see ⇒*Workshop Manual '903555 Replace gateway control unit'*Select the control unit for **assistance systems (zFAS)** in the PIWIS Tester procedure.
	• Restoring enabling functions

	For manual procedure, see ⇒*Workshop Manual '903555 Replace gateway control unit'*.
	• Installing onboard Driver's Manual For manual procedure, see ⇒*Workshop Manual '0X01IN diagnostic system: Performing vehicle handover'*.
	• Automatic coding of all control units
Procedure if the sequence is aborted:	• End and restore operational readiness (switch ignition off and then on again). • Reading out and erasing fault memories ⇒*Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*. • Repeat subsequent work sequence by entering the programming code again, whereby extended logging must be started using the key combination •Ctrl“ + •L“. • Extended logging records diagnostic software data, particularly vehicle communication data, which is required for analysing the issues that caused programming to be aborted. • If subsequent work is aborted a second time, end operational readiness for approx. 15 minutes (switch off ignition) and repeat the procedure described here again. • In the case of further aborts, the subsequent work must be successively carried out manually.
Procedure in the event of error messages appearing during the programming sequence:	⇒*Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester - section on "Fault finding"'*.

4 Create a new working log.

4.1 Once programming is complete, confirm by selecting •F4“ ('Save') in the Campaign menu below.

4.2 Select • F10 “ (‘Logs’).

4.3 Select the log type **Work log**.

4.4 The created working log with the designation of the sequence performed is unnamed and saved.

4.5 Select the working log and press • F10 “ (‘Displays’).

4.6 Select the printer icon in the selection bar at the top right.

4.7 Select printer (‘PDF’).

4.8 Print the working log. This is stored automatically on the Tester.

5 Establish bus idle for at least 15 minutes.

5.1 End operational readiness (switch off ignition).

5.2 Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.

5.3 Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).

5.4 Unlock the vehicle again after waiting for at least 15 minutes.

5.5 Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.

6 Teach steering lock settings.

6.1 Select the power steering **'EPS' control unit** in control unit selection (**'Overview'** menu) and press • F12 “ ('Next') to confirm.

6.2 Once the power steering control unit has been found and is displayed in the list, select the **'Maintenance / repairs'** menu.

6.3 Select the **'Commissioning'** function and confirm with • F12 “ ('Next').

6.4 Follow the instructions on the Tester to perform the commissioning process.

6.5 If the left and right steering lock settings are not saved during the procedure, adjust the height and depth of the steering wheel position and repeat the commissioning procedure.

7 **Only relevant for vehicles if fault memory entries are stored for seat adjustment:** Standardize seat adjustment for driver's and passenger's side.

7.1 Select the **'Seat adjustment on front passenger's side'** control unit in the control unit selection screen (**'Overview'** menu) and press • F12 “ ('Next') to confirm your selection.

7.2 Once the seat adjustment on front passenger's side control unit has been found and is displayed in the overview, select the **'Maintenance / repairs'** menu.

7.3 Select the **'Standardize seat motors'** function and press • F12 “ ('Next') to confirm your selection.

7.4 Read the instructions and confirm by pressing •F12 “ ('Next').

7.5 Press •F8 “ ('Start') to run the procedure.

7.6 Once the seat motors on the **passenger's side** have been standardized, also teach the **driver's side**. To do this, select the **'Seat adjustment on front driver's side'** control unit in the control unit selection screen (**'Overview'** menu) and **repeat Steps 6.2 to 6.6**. Then, continue with **Step 2**.

8 Manually retract the rear spoiler, which extended automatically during programming.

8.1 Select the **'Rear spoiler'** control unit in the control unit selection screen (**'Overview'** menu) and press •F12 “ ('Next') to confirm.

8.2 Once the rear spoiler control unit has been found and is displayed in the overview, select the **'Maintenance / repairs'** menu.

8.3 Select the function **'Teach rear spoiler'** and press •F12 “ ('Next') to confirm.

8.4 Read the instructions and confirm by pressing •F12 “ ('Next').

8.5 Meet the displayed conditions that must be checked manually and tick the relevant **'Status'** box.

8.6 Select the **'Teach rear spoiler'** function and press •F8 “ ('Execute') to confirm.

8.7 Once the rear spoiler has been taught and retracted fully, select the **'Overview'** menu to return to the control unit selection screen.

9 Calibration of power electronics at front and rear.

9.1 Select the **'Rear high-voltage power electronics'** control unit in the control unit selection screen (**'Overview'** menu) and confirm with •F12 “ ('Next').

9.2 Once the high-voltage power electronics on rear axle control unit has been found and is displayed in the 'Overview', select the **'Drive links / checks'** menu.

9.3 Select the **'Electric motor – Reset calibration'** function and confirm with •F12 “ ('Next').

9.4 Set the entry to **Basic setting** in the Values column on the **'Parameters'** tab.

9.5 Confirm that **calibration** has been reset with •F8 “ ('Execute').

9.6 Go back to the control unit selection screen (**'Overview'** menu), select the **'Front high-voltage power electronics'** control unit and repeat **Steps 8.2 to 8.4** for the selected control unit.

9.7 After resetting both calibrations, select the two control units **'Front high-voltage power electronics' and 'Rear high-voltage power electronics'** in the control unit selection screen and open the **'Fault memory'** menu.

9.8 Check whether the fault code **'P171900'** is displayed for **both** control units:

- If the fault code **'P171900'** is displayed for the **'Rear high-voltage power electronics'** and **'Front high-voltage power electronics'** control unit, continue with **Step 8.9**.
- The fault code **'P171900'** is **not displayed** or is displayed only for **one of the two control units**. Carry out **Steps 8.1 to 8.6** for the relevant control units again.

9.9 Disconnect the PIWIS Tester from the vehicle.

9.10 Switch off and disconnect the battery charger.

Information

Connect the PIWIS Tester to a network as soon as possible and log into the PPN in order to transfer the backup documentation created during this campaign to the PAG systems.

9.11 Start the calibration drive and complete the following steps.

Information

Resetting the high-voltage power electronics limits the maximum vehicle speed to 70 km/h. The warning message "Reduced speed" will be displayed on the instrument cluster. Any road on which it is possible to accelerate to a speed of at least 60 km/h (38 mph) can be used as the calibration route.

Read and follow safety instructions:

- Only perform calibration on public roads if the road and traffic conditions are conducive to doing so
- The road traffic regulations must always be observed
- Other road users must not be at risk when performing calibration
- Move the vehicle on public roads only if it is roadworthy
- Accelerate the vehicle to at least 60 km/h (38 mph).
- Release the accelerator pedal and allow the vehicle roll in overrun for at least 1 second. Calibration is performed during this overrun phase.
- Switch ignition off and on again to reset the "Reduced speed" warning message.

10 Only relevant if the message "**Tyre pressure monitoring fault - Service necessary**" is displayed:
Teach Tyre Pressure Monitoring (TPM) system using the PIWIS Tester.
For instructions, see:
⇒ *Workshop Manual '443225 Teach the wheel electronics'*

Information

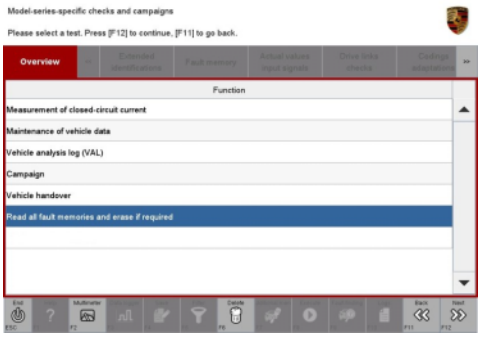
In the menu-guided procedure, check the **'Teach wheel IDs'** menu item after confirming with • F12 " to make sure that the function **'2. Teach wheel IDs without driving'** is selected.
Then, select the function **'2. Wheel IDs unknown'** and continue the procedure according to menu guidance.

11 Read out and erase the fault memories of all control units.

11.1 Press •F7 “ in the control unit selection screen ('Overview' menu) to call up the Additional menu.

11.2 Select the function "Read all fault memories and erase if required" and press •F12 “ ('Next') to confirm⇒*erase fault memory*.

The fault memories of the control units are read out.



erase fault memory

11.3 Once you have read out the fault memories, check the fault memory entries.

Information

If control units are found to have faults that are **not** caused by control unit programming, these must first be **found** and **corrected**. This work **cannot** be invoiced under the workshop campaign number.

11.4 Press •F8 “ to delete fault memory entries.

11.5 Press •F12 “ ('Yes') in response to the question as to whether you really want to delete all fault memory entries.

The faults stored in the fault memories of the various control units are deleted.

Information

If fault memory entries for individual control units cannot be deleted, proceed as follows:

- End operational readiness (switch off ignition).
- Disconnect the PIWIS Tester diagnostic connector from the diagnostic socket.
- Lock the vehicle using the driver's key and remove the driver's key from the proximity of the vehicle (approx. 10 meter/ 32.8 ft).
- Unlock the vehicle again after waiting for at least 15 minutes.
- Restore operational readiness (switch on ignition).
- Plug the PIWIS Tester diagnostic connector into the diagnostic socket again and restore communication with the vehicle.
- Read out the fault memory again and delete any fault memory entries that are stored.

11.6 Once you have erased the fault memories, select the **'Overview'** menu to return to the control unit selection screen ⇒ *Control unit selection*.

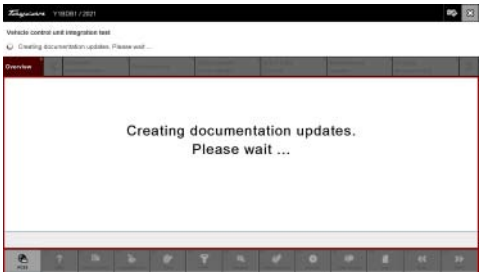
Control unit selection

12 Create Vehicle Analysis Log (VAL) using the PIWIS Tester.
Mark the vehicle analysis log you have just created with the attribute "Final VAL" and after carrying out the campaign, return it using the PIWIS Tester.

13 **Performing system test using the PIWIS Tester**

13.1 First, the service technician carries out his steps as usual.

The system test is started automatically with the backup documentation process at the end of the process. Alternatively, the system test can also be started manually by pressing •F3. “



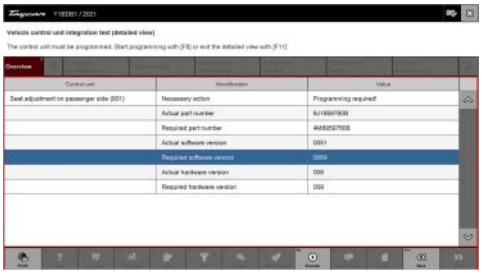
backup documentation

13.2 The result list is displayed to the technician after the check has been completed.
This shows if control units are⇒ *Programming required* not yet at the required software version **or** a hardware check is required in accordance with the Spare Parts Catalogue (PET) ⇒ *Detailed view of integration test - Hardware*.

Programming required

Hardware check required

13.3 Click on the affected control unit to view further details and start programming ⇒*Detailed view of integration test - software version*. The step-by-step instructions then start.
The hardware check is performed against the Parts Catalogue ⇒*Detailed view of integration test - Hardware*.



Detailed view of integration test - software version

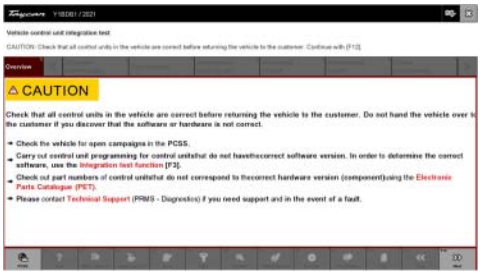
Detailed view of integration test - Hardware

13.4 When programming or hardware testing is complete, backup documentation including the joint test is performed again.
All affected control units should now be re-programmed or checked in the control unit overview and their status. To do this, repeat Steps 2-4 until all control units are free of faults ⇒*Vehicle integration test complete*.

Vehicle integration test complete

Information

The vehicle must not be handed back to the customer until all control units have been checked and the system is thus compliant ⇒*Conformity of the vehicle system*

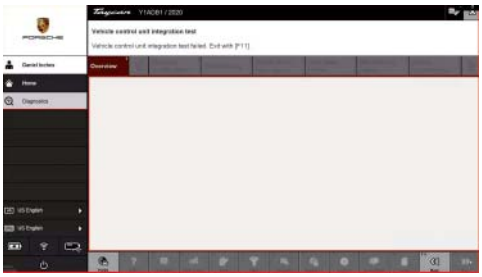


Conformity of the vehicle system

13.5

In the event of a fault - Performance of the integration test

If the integration test fails, this is displayed as a result ⇒ *Vehicle control unit integration test failed*. Then complete the following steps:



Vehicle control unit integration test failed

13.6 In the Additional menu (F7), execute the "Maintenance of vehicle data with PIWIS ONLINE" function and write the current vehicle data record from the online system into the vehicle.

13.7 Carry out the integration test again.

13.8 In the event of a further fault, contact Technical Support.

14 Attach the working log to the PQIS line.

14.1 Select the PCCS button under **Applications** on the PIWIS Tester.

14.2 Log into the PCCS using the PIWIS Tester with the corresponding quality line.

14.3 Select Upload file in the PIWIS Tester.

14.4 Select **Pdf Prints** in the drop-down menu.

14.5 Attach the created work logs to the quality line.

15 End operational readiness (switch off ignition).

16 Disconnect the PIWIS Tester from the vehicle.

Information

Connect the PIWIS Tester to a network as soon as possible and log into the PPN in order to transfer the backup documentation created during this campaign to the PAG systems.

17 Switch off and disconnect the battery charger.

18 Enter the campaign in the Warranty and Maintenance booklet.
– End of remedial action –

For warranty processing, see **Scope 6** in the ⇒ *Technical Information '443225 Warranty processing section'*

Warranty processing

Information

The specified working time was determined specifically for carrying out this campaign and includes all necessary preliminary and subsequent work.
The working time may differ from the working times published in the Labor Operation List in the PCSS.

Information

Information on the working time:

Generally, the working time includes all work that requires the active participation of the service technician.
This also covers all required preliminary work and subsequent work.

The working time includes the following activities during control unit programming:

- All required steps for starting or finishing programming
- Required interaction during a programming sequence
- Waiting times until programming starts
- Random check of programming status

If no further interaction by the service technician is required once control unit programming has started because programming is performed automatically, there is no need for the service technician to remain at the vehicle for the entire programming time.
These waiting times are not included in the working time if the total programming time is more than 15 minutes.
If programming takes up to 15 minutes, the full waiting time is included in the working time.

Scope 1: **Re-program various control units**

Working time:

Re-program various control units — Labor time: **208 TU**

Includes:
- Connecting and disconnecting battery charger
- Connecting and disconnecting PIWIS Tester
- Re-program various control units to software version VR8.6
- Re-program various control units to software version VR8.7
- Various control units on software version VR12.1.1 ->
- Re-programming sequence 2
- Power steering commissioning
- Retract the spoiler manually
- Standardize seat adjustment for driver's and passenger's side
- Calibration of high-voltage power electronics (front and rear axle)
- Reading out and erasing fault memories
- Create Vehicle Analysis Logs (VALs) before and after the campaign
- Create work logs and attach them to the quality line

⇒ **Damage code WMP0 066 000 1**

Scope 2: **Re-program various control units**

Working time:

Re-program various control units — Labor time: **158 TU**

Includes:
- Connecting and disconnecting battery charger
- Connecting and disconnecting PIWIS Tester
- Various control units on software version VR12.1.1 ->
- Re-programming sequence 2
- Power steering commissioning
- Retract the spoiler manually
- Standardize seat adjustment for driver's and passenger's side
- Calibration of high-voltage power electronics (front and rear axle)
- Teaching Tyre Pressure Monitoring (TPM) system
- Reading out and erasing fault memories
- Create Vehicle Analysis Logs (VALs) before and after the campaign
- Create work logs and attach them to the quality line

⇒ **Damage code WMP0 066 000 1**

Scope 3: **Re-program various control units**

Working time:

Re-program various control units — Labor time: **101 TU**

Includes:
- Connecting and disconnecting battery charger
- Connecting and disconnecting PIWIS Tester
- Various control units on software version VR12.1.1 ->
- Re-program sequence 1
- Retract the spoiler manually
- Teaching Tyre Pressure Monitoring (TPM) system
- Reading out and erasing fault memories
- Create Vehicle Analysis Logs (VALs) before and after the campaign
- Create work logs and attach them to the quality line

⇒ **Damage code WMP0 066 000 1**

Scope 4: **Re-program various control units**

Working time:

Re-program various control units — Labor time: **130 TU**

Includes:
- Connecting and disconnecting battery charger
- Connecting and disconnecting PIWIS Tester
- Various control units on software version VR12.1.1 ->
- Re-program sequence 3
- Retract the spoiler manually
- Reading out and erasing fault memories
- Create Vehicle Analysis Logs (VALs) before and after the campaign
- Create work logs and attach them to the quality line

⇒ **Damage code WMP0 066 000 1**

Scope 5: **Re-program various control units**

Working time:

Re-program various control units — Labor time: **255 TU**

Includes:
- Connecting and disconnecting battery charger
- Connecting and disconnecting PIWIS Tester
- Re-program various control units to software version VR8.6
- Re-program various control units to software version VR8.7
- Various control units on software version VR12.1.1 ->
- Re-programming sequence 1/2/3
- Power steering commissioning
- Retract the spoiler manually
- Standardize seat adjustment for driver's and passenger's side
- Calibration of high-voltage power electronics (front and rear axle)
- Reading out and erasing fault memories
- Create Vehicle Analysis Logs (VALs) before and after the campaign
- Create work logs and attach them to the quality line

⇒ **Damage code WMP0 066 000 1**

Scope 6: **Re-program various control units**

Working time:

Re-program various control units — Labor time: **175 TU**

Includes:
- Connecting and disconnecting battery charger
- Connecting and disconnecting PIWIS Tester
- Re-program various control units to software version VR8.7
- Various control units on software version VR12.1.1 ->
- Re-programming sequence 2
- Power steering commissioning
- Retract the spoiler manually
- Standardize seat adjustment for driver's and passenger's side
- Calibration of high-voltage power electronics (front and rear axle)
- Reading out and erasing fault memories
- Create Vehicle Analysis Logs (VALs) before and after the campaign
- Create work logs and attach them to the quality line

⇒ **Damage code WMP0 066 000 1**