

WC54 - Replacing Hydraulic Valves for Camshaft Control (Workshop Campaign)

Vehicle Type: **Panamera S Hybrid**

Model Year: **2012**

Subject: **Hydraulic valve for camshaft control**

Information: This is to inform you of a voluntary Workshop Campaign on the above-mentioned vehicles.

Because of the previous attachment method, the electric plug connection on the hydraulic valves for camshaft control can become strained to such an extent that the function of the hydraulic valves can no longer be guaranteed over the service life of the vehicle.

Action Required: Replace the hydraulic valves for camshaft control and rework the relevant electric plug connections on the affected vehicles.

Affected vehicles: The VIN(s) can be checked by using PIWIS Vehicle Information link to verify if the campaign affects the vehicle. This campaign is scope specific to the VIN! Failure to verify in PIWIS may result in an improper repair. This campaign affects 1,502 vehicles in North America.

Parts Info: **NOTE:** Do not order parts for this campaign. All parts, **WITH THE EXCEPTION OF THE COMMERCIALLY AVAILABLE FABRIC TAPE**, will be automatically allocated to your dealership.

000.043.303.30	⇒ Repair kit for plug connection for camshaft controller comprising:	1
	Wires with connectors	2
	Insulated cable connection	4
	Shrink-fit hose	4
000.043.110.16	⇒ Actuator for camshaft controller	2
N .912.111.01	⇒ Bolt, M5 x 12	2
N .906.661.01	⇒ Tie-wrap	1

Materials:	...	⇒ Tie-wrap, length approx. 250 mm	2 *
		e.g. N .020.902.2	

...	⇒ Fabric tape, approx. 15 mm wide (commercially available)	Length: 1,000 mm*
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* The WWS Warranty system will automatically add into the "Miscellaneous item" section (sublet) of the claim after the claim has been submitted.

Special tools: **Nr.155-1 - Repair kit for wire harnesses**
Nr.90 Pos.2 - Torque wrench

Work
Procedure: See Attachment "A".

Claim
Submission: See Attachment "B".

Attachment "A": **Work Procedure**

Replace hydraulic valves for camshaft control and the relevant electric plug connections on cylinders 1-3 and cylinders 4-6.



Information

For the **Panamera S Hybrid**, the tasks specified below may only be carried out by an employee who is **at least** qualified as an **electrically instructed person (eip)**. Employees **without the corresponding qualification** must **not** carry out these tasks.

A **High voltage technician (HVT)** is permitted to **isolate the high-voltage vehicle electrical system from the power supply**.

The work must be done under the instruction and supervision of a **high voltage technician (HVT)**.

Observe general warning notes for working on the high-voltage vehicle electrical system ⇒ *Workshop Manual '2X00IN General warning notes for working on the high-voltage electrical system'*.

- 1 Isolate the high-voltage system from the power supply and complete the relevant documentation.
⇒ *Workshop Manual '2X00IN Isolating high-voltage electrical system from power supply/Starting high-voltage electrical system'*
- 2 Disconnect the battery (vehicle electrical system). ⇒ *Workshop Manual '2X00IN Work instructions after disconnecting the battery'*.
- 3 **Remove both hydraulic valves for camshaft control** as described in the **Workshop Manual**
⇒ *Workshop Manual '153719 Removing and installing solenoid/hydraulic valve for camshaft controllers - section on "Removing"*.



Information

The illustrations in Step 4 show the work to be carried out on the **Cayenne** and may therefore be slightly different in some respects.

4 Replace electric plug connection on hydraulic valve for camshaft control, cylinders 1-3.

- 4.1 Remove tie-wrap ⇒ *Figure 1 -item 1-* on the main wire harness ⇒ *Figure 1 -item 2-* to allow better access to the hydraulic valve wires ⇒ *Figure 1 -item 3-*.

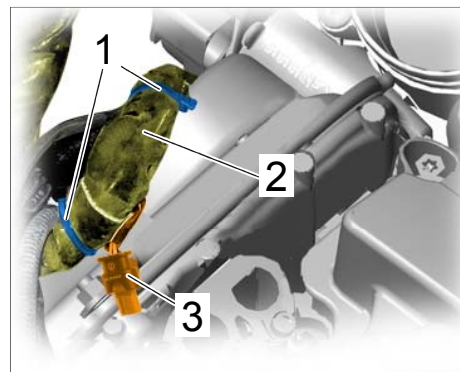


Figure 1

- 4.2 Pull back sleeve ⇒ *Figure 2 -item 1-* on the main wire harness ⇒ *Figure 2 -item 2-* (⇒ *Figure 2 -arrow-*) and expose the main wire harness wires.
- 4.3 Remove binding tape ⇒ *Figure 2 -item 3-* from around the main wire harness ⇒ *Figure 2 -item 2-*.

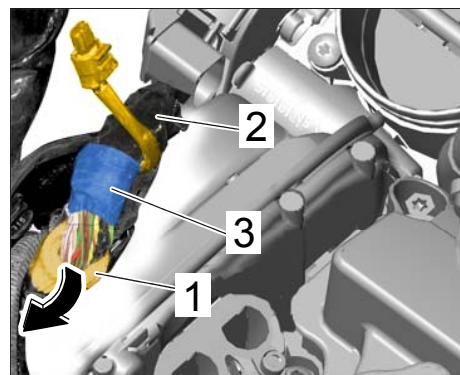


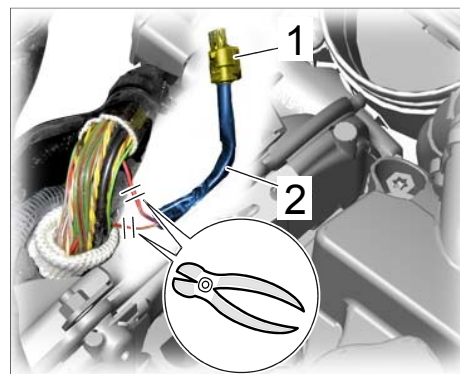
Figure 2

**Information**

- Select a place for the joint where there is enough space to join the individual wires.
- Mark the electric wires if necessary.

4.4 Cut the wires for the hydraulic valve connector ⇒ *Figure 3 -item1-* at an **offset** position in the marked area. Leave an offset of 20 mm so that the connection points will not be lying on top of each other. Then detach and remove the sleeve on the wire ⇒ *Figure 3 -item2-*. The sleeve will be re-used during installation.

4.5 Shorten the wires on the connector from the repair kit in accordance with the lengths of the wires on the connector you have just cut off.

*Figure 3***Information**

Extra care must be used in the individual work steps for stripping insulation from, crimping, and shrinking/insulating the electric wires.

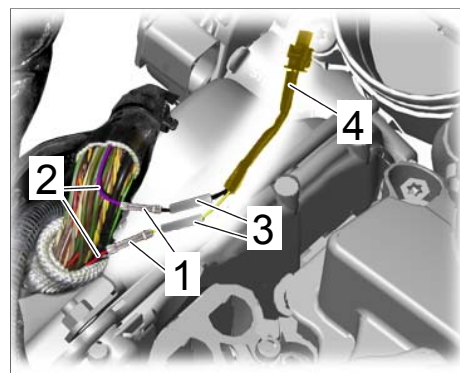
The procedure for stripping insulation from, crimping, and shrinking/insulating the electric wires must be complied with and observed. The procedures are described in detail in the **NR.155-1 - repair kit for wire harnesses**.

4.6 Crimp insulated cable connection ⇒ *Figure 4 -item1-* using the **crimping pliers** from the **Nr.155-1 Pos.1 - cable repair kit** to the main wire harness wires ⇒ *Figure 4 -item2-*.

4.7 Slide the sleeve ⇒ *Figure 4 -item 4-* you removed from the old wire harness onto the wires of the new connector.

4.8 Slide shrink-fit hoses ⇒ *Figure 4 -item 3-* onto the connector wires.

4.9 Crimp connector wires to the insulated cable connections ⇒ *Figure 4 -item 1-* using **crimping pliers**. Check the crimp connection carefully.

*Figure 4***Cable assignment:**

Black wire of the connector to **red/lilac** wire of the main wire harness.

Yellow wire of the connector to **red/green** wire of the main wire harness.

CAUTION

Hot components

- Risk of burns
- ⇒ Let hot components cool down.
- ⇒ Wear personal protective gear.

4.10 Slide shrink-fit hoses ⇒ *Figure 4 -item 3-* over the crimp connection and carefully shrink them using the **hot-air blower and attached reflector**.

4.11 Wrap fabric tape ⇒ *Figure 5 -item 1-* around the main wire harness ⇒ *Figure 5 -item 2-* and connector wires ⇒ *Figure 5 -item 3-* again.
Make sure that the crimps are **offset with respect to each other** so that they are not lying on top of each other.

4.12 Pull sleeve ⇒ *Figure 5 -item 4-* back to its original position on the main wire harness ⇒ *Figure 5 -item 2-*.

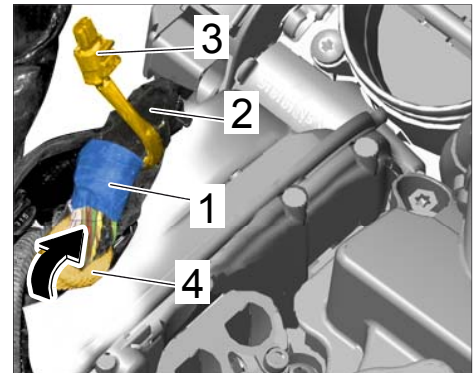


Figure 5

4.13 Secure individual wires routed next to the main wire harness ⇒ *Figure 6 -item 2-* with tie-wraps ⇒ *Figure 6 -item 1-*. Cut off the extra length at the ends of the tie-wraps with side cutters.

4.14 Route connector ⇒ *Figure 6 -item 3-* forward to the hydraulic valve for camshaft control.

5 Replace electric plug connection on hydraulic valve for camshaft control, cylinders 4-6.

5.1 Remove oil filter so that you have better access to the main wire harness ⇒ *Workshop Manual '173019 Removing and installing oil filter - section on "Removing"*.

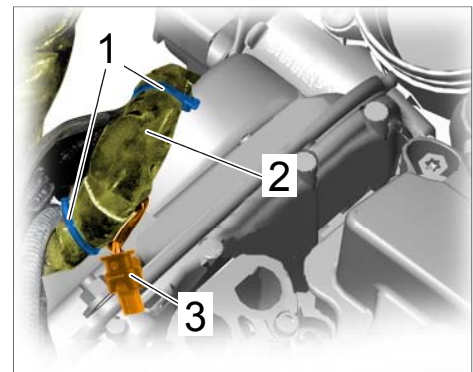


Figure 6

Close off the opening on the oil-filter housing using a suitable stopper or a clean cloth ⇒ *Figure 7 -arrow-*.

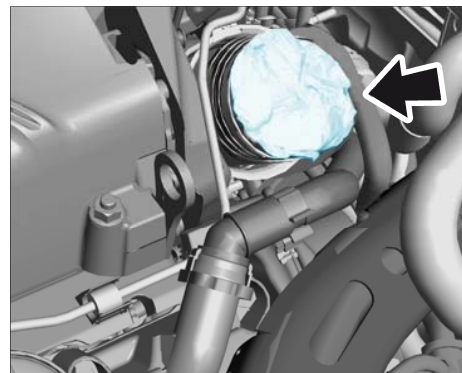


Figure 7

- 5.2 Unclip wire clip ⇒ *Figure 8 -item 1-* on the positive crankcase ventilation line ⇒ *Figure 8 -item 2-*.
- 5.3 Release positive crankcase ventilation line ⇒ *Figure 8 -item 2-* at the cylinder head cover, pull it off and set it aside.

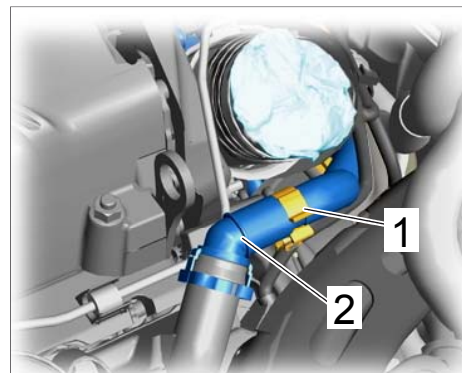


Figure 8

- 5.4 Release plug connections for oxygen sensors ⇒ *Figure 9 -item 1-* with holder ⇒ *Figure 9 -item 2-* at the spring strut mount and set them aside.

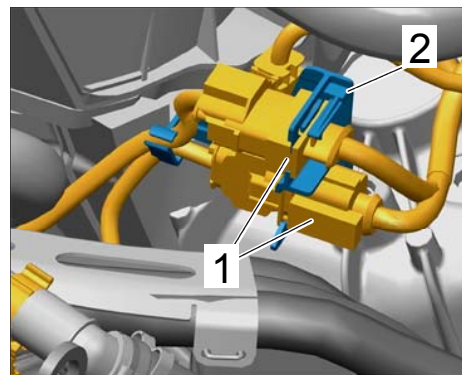


Figure 9

- 5.5 Unclip tie-wrap on the main wire harness ⇒ *Figure 10 -item 1-* close to the holder for the high-voltage wires ⇒ *Figure 10 -item 2-*.
- 5.6 Unclip wire clip on the main wire harness ⇒ *Figure 10 -item 4-* at the coolant line ⇒ *Figure 10 -item 3-*.

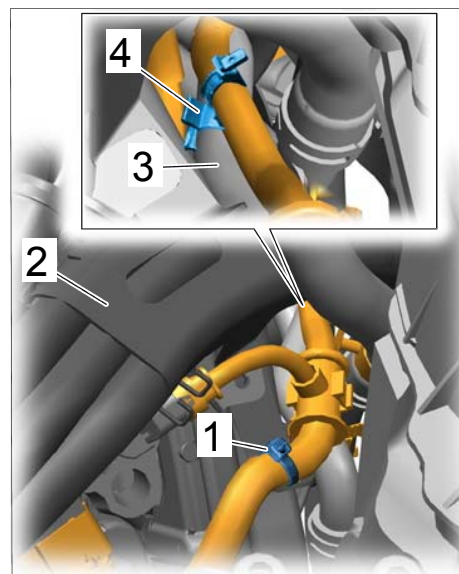


Figure 10

- 5.7 Unscrew fastening screws ⇒ *Figure 11 -item 1-* and remove connecting piece of holder for the high-voltage wires ⇒ *Figure 11 -item 2-*.

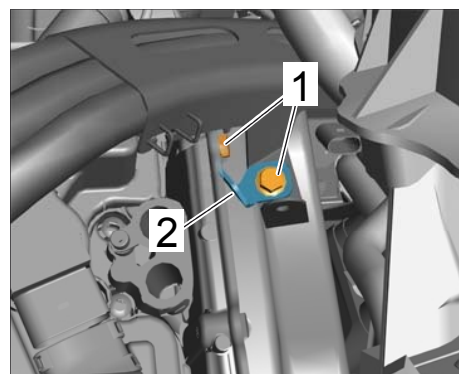


Figure 11

- 5.8 Unscrew fastening screws ⇒ *Figure 12 -item 1-* and release electric plug connections on the ignition coils ⇒ *Figure 12 -item 2-*.
- 5.9 Unscrew fastening screw ⇒ *Figure 12 -item 3-* on the ground strap ⇒ *Figure 12 -item 4-* at the right on the cylinder head housing.
- 5.10 Unclip retaining clip ⇒ *Figure 12 -item 5-* on the cylinder head cover.

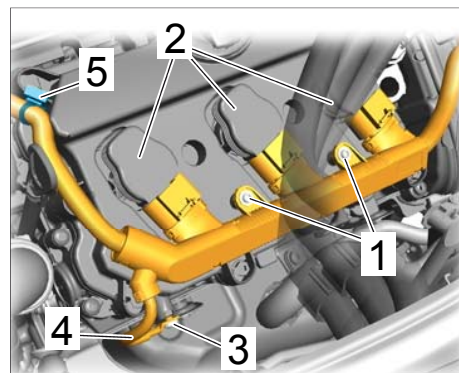


Figure 12

- 5.11 Pull the main wire harness ⇒ *Figure 13* **-item 1-** through under the holder for the high-voltage wires ⇒ *Figure 13* **-item 2-** until the hydraulic valve connector ⇒ *Figure 13* **-item 3-** is easily accessible as shown.

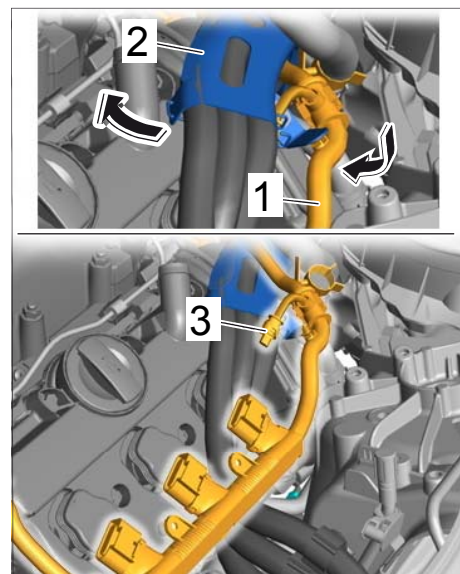


Figure 13

- 5.12 Open and remove junction ⇒ *Figure 10* **-item 1-** on the main wire harness ⇒ *Figure 14* **-item 3-**.
- 5.13 Remove sleeve on the wire ⇒ *Figure 14* **-item 2-** at the connector. The sleeve will be re-used during installation.

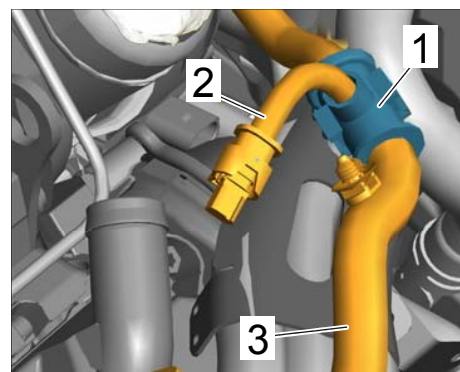


Figure 14

- 5.14 Cut the wires for the connector ⇒ *Figure 15* **-item 1-** at an **offset** position in the marked area.

Cut the yellow/lilac wire flush with the connector.

Cut the red/green wire 20 mm below the connector.

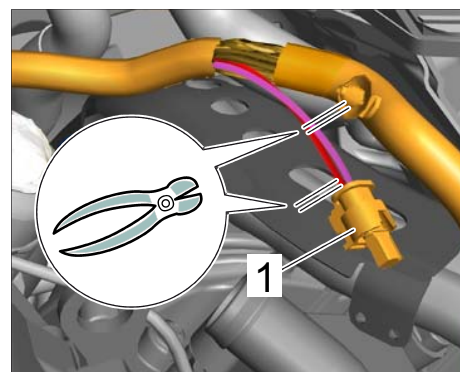


Figure 15

- 5.15 Remove tie-wrap ⇒ *Figure 16 -item 1-* and fabric tape ⇒ *Figure 16 -item 2-* on the main wire harness.
- 5.16 Open the sleeve ⇒ *Figure 16 -item 3-* on the main wire harness as shown.
- 5.17 **Shorten** connector **wires** from the repair kit at offset positions in accordance with the measurements specified below.

Cut the yellow wire from the repair kit **300 mm** below the connector.

Cut the black wire from the repair kit **320 mm** below the connector.

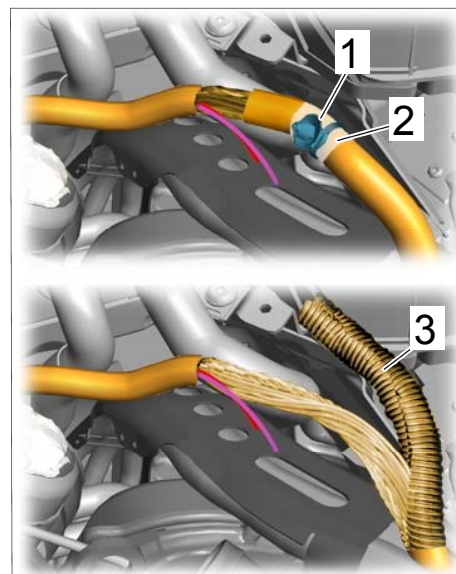


Figure 16



Information

Extra care must be used in the individual work steps for stripping insulation from, crimping, and shrinking/insulating the electric wires.

The procedure for stripping insulation from, crimping, and shrinking/insulating the electric wires must be complied with and observed. The procedures are described in detail in the **NR.155-1 - repair kit for wire harnesses**.

- 5.18 Crimp insulated cable connection ⇒ *Figure 17 -item 1-* using the **crimping pliers** from the **Nr.155-1 Pos.1 - cable repair kit** to the wires of the connector ⇒ *Figure 17 -item 4-* from the repair kit.
- 5.19 Slide shrink-fit hoses ⇒ *Figure 17 -item 3-* onto the connector wires ⇒ *Figure 17 -item 4-*.
- 5.20 Crimp connector wires ⇒ *Figure 17 -item 4-* to the main wire harness wires ⇒ *Figure 17 -item 2-* using the **crimping pliers**. Check the crimp connection carefully.

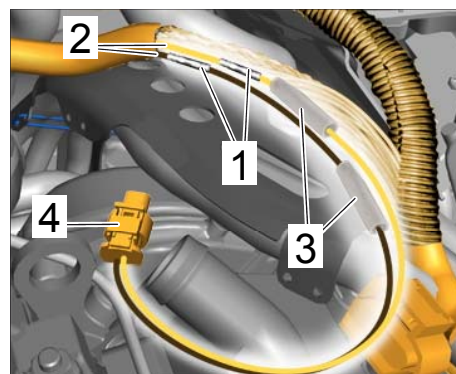


Figure 17

Cable assignment:

Black wire of the connector to **red/green** wire of the main wire harness.

Yellow wire of the connector to **yellow/lilac** wire of the main wire harness.

- 5.21 Slide shrink-fit hoses $\Rightarrow$ *Figure 17 -item 3-* over the crimp connection and carefully shrink them using the **hot-air blower and attached reflector**.
- 5.22 Guide the connector wires $\Rightarrow$ *Figure 18 -item 1-* in a **loop** around the main wire harness $\Rightarrow$ *Figure 18 -item 2-* as shown and route them to the junction for the connector.

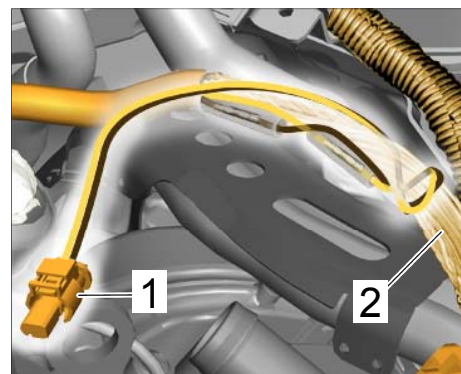


Figure 18

- 5.23 Bind the main wire harness $\Rightarrow$ *Figure 19 -item 1-* and the connector wires $\Rightarrow$ *Figure 19 -item 2-* with fabric tape $\Rightarrow$ *Figure 19 -item 3-*.
Make sure that the crimps are **offset with respect to each other** so that they are not lying on top of each other.

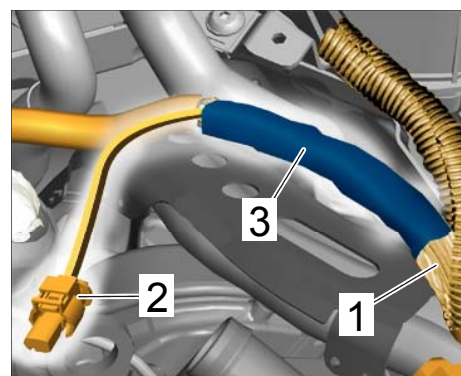


Figure 19

- 5.24 Re-fit sleeve $\Rightarrow$ *Figure 20 -item 1-* on the main wire harness $\Rightarrow$ *Figure 20 -item 2-* and wrap fabric tape $\Rightarrow$ *Figure 20 -item 3-* around it.
- 5.25 Re-fit sleeve $\Rightarrow$ *Figure 20 -item 4-* on the connector wires $\Rightarrow$ *Figure 20 -item 5-* and wrap fabric tape $\Rightarrow$ *Figure 20 -item 3-* around part of it.

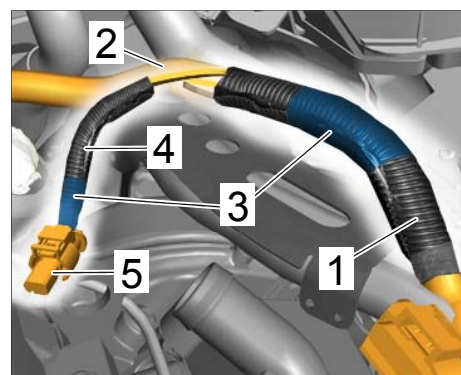


Figure 20

- 5.26 Fit junction on the main wire harness ⇒ *Figure 21* -**item 1**- to the connector ⇒ *Figure 21* -**item 2**-. Make sure that the two sleeves ⇒ *Figure 21* -**item 3**- are secured in the junction.

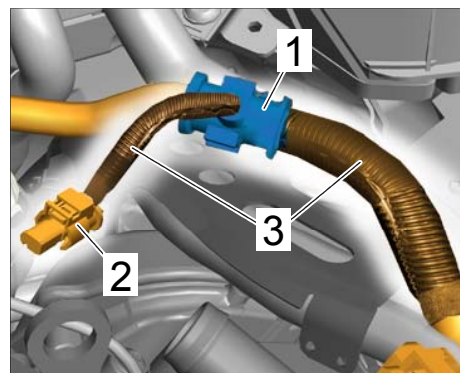


Figure 21

- 5.27 Route the main wire harness ⇒ *Figure 22* -**item 1**- under the holder for the high-voltage wires ⇒ *Figure 22* -**item 2**- again and align it.

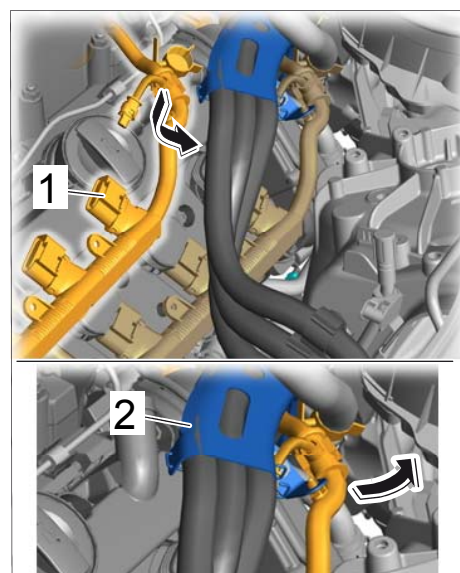


Figure 22

- 5.28 Secure retaining clip $\Rightarrow$ *Figure 23 -item 5-* on the main wire harness at the cylinder head cover.
- 5.29 Secure the ground strap $\Rightarrow$ *Figure 23 -item 4-* at the right on the cylinder head housing with the fastening screw $\Rightarrow$ *Figure 23 -item 3-*. **Tightening torque 10 Nm (7.5 ftlb.)**
- 5.30 Plug in electric plug connections on the ignition coils $\Rightarrow$ *Figure 23 -item 2-* until the connectors engage with an audible click.
- 5.31 Secure cable guide with the fastening screws $\Rightarrow$ *Figure 23 -item 1-*. **Tightening torque 5 Nm (3.5 ftlb.)**
- 5.32 Position connecting piece of holder for the high-voltage wires $\Rightarrow$ *Figure 24 -item 2-* on the cylinder head cover and secure with the fastening screws $\Rightarrow$ *Figure 24 -item 1-*. **Tightening torque 10 Nm (7.5 ftlb.)**

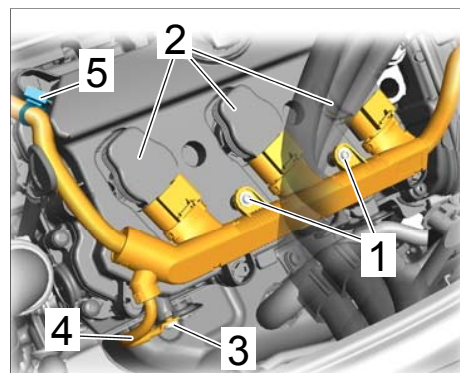


Figure 23

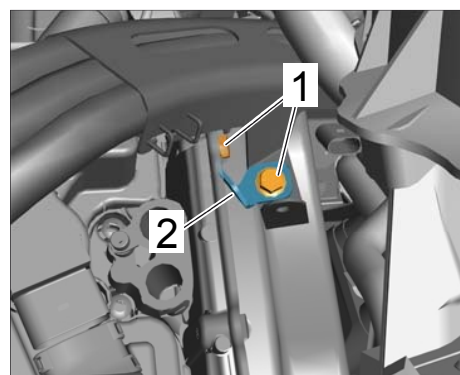


Figure 24

- 5.33 Secure the main wire harness with the wire clip ⇒ *Figure 25 -item 1-* to the coolant line ⇒ *Figure 25 -item 2-*.
- 5.34 Clip in new tie-wrap ⇒ *Figure 25 -item 3-*, Part No. **N.906.661.01**, used to secure the main wire harness close to the high-voltage wires ⇒ *Figure 25 -item 4-*.
- 5.35 Secure main wire harness using the tie-wrap ⇒ *Figure 25 -item 3-*.

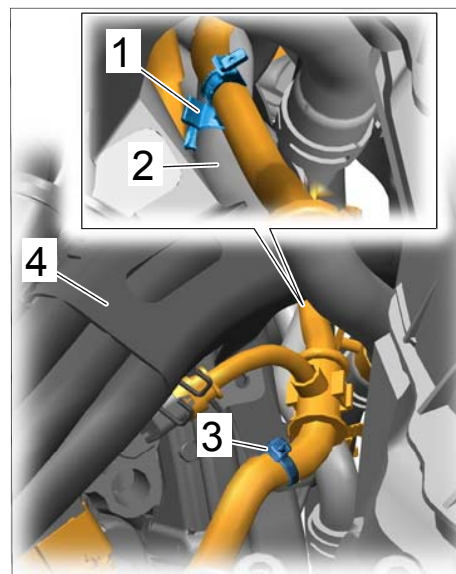


Figure 25

- 5.36 Fit plug connections for oxygen sensors ⇒ *Figure 26 -item 1-* with the holder ⇒ *Figure 26 -item 2-* at the spring strut mount.

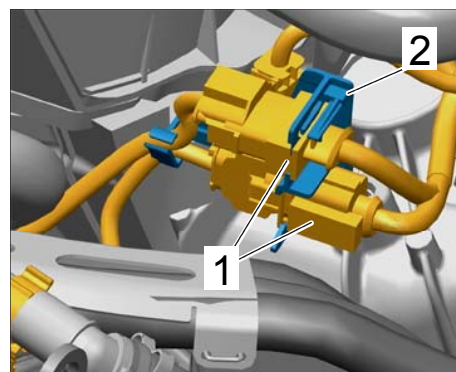


Figure 26

- 5.37 Connect and lock positive crankcase ventilation line ⇒ *Figure 27 -item 2-* on the cylinder head cover.
- 5.38 Clip in wire clip ⇒ *Figure 27 -item 1-* on the positive crankcase ventilation line ⇒ *Figure 27 -item 2-*.

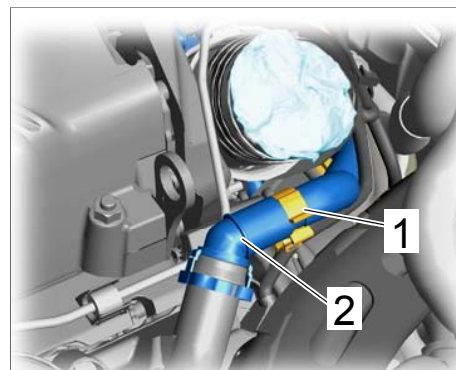


Figure 27

- 5.39 Remove stopper from the oil-filter housing ⇒ *Figure 28 -arrow-* and re-install the oil filter you removed earlier ⇒ *Workshop Manual '173019 Removing and installing oil filter - section on "Installing"*.



Figure 28

- 6 **New** hydraulic valves for camshaft control, Part No. **000.043.110.16**, with new bolts, Part No. **N.912.111.01** can now be installed ⇒ *Workshop Manual '153719 Removing and installing solenoid/hydraulic valve for camshaft controller - section on "Installing"*.
- 7 Connect the battery (vehicle electrical system) ⇒ *Workshop Manual '2X00IN Work instructions after disconnecting the battery'*
- 8 Start the high-voltage system and complete the relevant documentation. ⇒ *Workshop Manual '2X00IN Isolating high-voltage electrical system from power supply/Starting high-voltage electrical system'*.
- 9 Enter the workshop campaign in the Warranty and Maintenance booklet.

Attachment "B" **Claim Submission** - Workshop Campaign WC54
 Warranty claims should be submitted via WWS/PQIS.
 Open campaigns may be checked by using either the PIWIS Vehicle Information system or through PQIS Job Creation.
 Labor, parts, and sublet will be automatically inserted when Technician is selected in WWS/PQIS. If necessary, the required part numbers will need to be manually entered into warranty system by the dealer administrator.

Scope 1: **Only relevant for the Cayenne (92A)** – see Technical Information for this vehicle type.

Scope 2: **Replace hydraulic valves for camshaft control**

Working time:

Replacing hydraulic valves for camshaft control

Labor time: **170 TU**

Includes:

- Disconnecting and connecting battery
- Isolating high-voltage electrical system from power supply/starting high-voltage electrical system
- Removing and installing engine cover
- Removing and installing oil filter
- Reworking electric plug connections

Parts required:

000.043.303.30	Repair kit for plug connection for camshaft controller	1
000.043.110.16	Actuator for camshaft controller	2
N.912.111.01	Bolt, M5 x 12	2
N.906.661.01	Tie-wrap	1
WC540000001 *	Accessories *	1 *
(For warranty invoicing only)		

* The WWS Warranty system will automatically add into the "Miscellaneous item" section (sublet) of the claim after the claim has been submitted.

⇒ **Damage Code WC54 066 000 2**

- References:
- ⇒ *Workshop Manual '2X00IN General warning notes for working on the high-voltage electrical system'*
 - ⇒ *Workshop Manual '2X00IN Isolating high-voltage electrical system from power supply/Starting high-voltage electrical system'*
 - ⇒ *Workshop Manual '2X00IN Work instructions after disconnecting the battery'*
 - ⇒ *Workshop Manual '108319 Removing and installing engine cover (design cover)'*
 - ⇒ *Workshop Manual '173019 Removing and installing oil filter'*
 - ⇒ *Workshop Manual '153719 Removing and installing hydraulic valve for camshaft control'*

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