

**Complaint - Problems with the Levelling System: Observe Specified Procedure (128/20)**

Model Line: **Cayenne (9YA/9YB)**

Model Year: **As of 2018**

Equipment: **Air suspension with levelling system (I-no. 1BK)**

Subject: **Levelling system**

Information: Problems with the air suspension (levelling system) on Cayenne vehicles. Remedial action and procedure.

Remedial Action: In the event of a customer complaint, perform fault finding and carry out the required repair measure.

**Parts required if necessary**

Parts Info: **Front spring strut**

Part No.	Designation	Qty.
	<b>- Use</b>	
9Y0616039C	⇒ Air-spring strut - front left	1 ea.
9Y0616040C	⇒ Air-spring strut - front right	1 ea.
	<b>Additional parts required</b>	
PAF912603	⇒ Hexagon-head bolt with washer - Front air-spring strut	6 ea.
N 10272202	⇒ Hexagon-head bolt - Front shock absorber fork	2 ea.
N 10106402	⇒ Hexagon collar nut - Front shock absorber fork	2 ea.
N 10784702	⇒ Hexagon flange bolt - Front shock absorber fork	2 ea.
WHT001987	⇒ Hexagon nut - Front shock absorber fork	2 ea.
9A700837900	⇒ Tie-wrap - Front shock absorber fork	2 ea.
N 10665001	⇒ Countersunk screw with internal serration - Dome strut sound absorber	8 ea.

WHT007061	⇒ 12 point socket (I-no. 1P0) – Front connecting link	2 ea.
N 10286110	⇒ Hexagon collar nut (I-no. 1P0) – Front connecting link	2 ea.
	<b>or</b>	
WHT007422	⇒ 12 point socket (I-no. 1P7) – Front connecting link	2 ea.
PAF015081	⇒ Hexagon collar nut (I-no. 1P7) – Front connecting link	2 ea.

**Front level sensor**

<b>Part No.</b>	<b>Designation</b> <b>– Use</b>	<b>Qty.</b>
PAB94128501	⇒ Level sensor with linkage – front left	1 ea.
	<b>or</b>	
PAB94128601	⇒ Level sensor with linkage – front right	1 ea.
	<b>Additional parts required</b>	
N 01508210	⇒ Hexagon collar nut Level sensor	2 ea.

**Rear level sensor**

<b>Part No.</b>	<b>Designation</b> <b>– Use</b>	<b>Qty.</b>
958941309H	⇒ Level sensor – rear left	1 ea.
	<b>or</b>	
958941310H	⇒ Level sensor – rear right	1 ea.
	<b>Additional parts required</b>	
N 10684301	⇒ Hexagon-head bolt – Rear level sensor	1 ea.
N 10508210	⇒ Hexagon collar nut – Rear level sensor	1 ea.

**Compressor**

<b>Part No.</b>	<b>Designation</b> <b>– Use</b>	<b>Qty.</b>
PAB616007	⇒ Compressor – Rear axle	1 ea.

PAB907778	<b>Additional parts required</b> ⇒ Control unit for levelling system - Compressor	1 ea.
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**Rear air spring bellows**

<b>Part No.</b>	<b>Designation</b> <b>- Use</b>	<b>Qty.</b>
N 91236401	⇒ Hexagon-head bolt - Rear spring damper	2 ea.
N 10106403	⇒ Hexagon collar nut - Rear spring damper	2 ea.
PAF912225	⇒ Hexagon-head bolt - Rear spring damper	4 ea.
95851218200	⇒ Fixing clip for stone guard - Rear axle	4 ea.
9Y0616001B	⇒ Air spring bellows - Rear axle, left	1 ea.
9Y0616002B	⇒ Air spring bellows - Rear axle, right	1 ea.

**Rear spring damper**

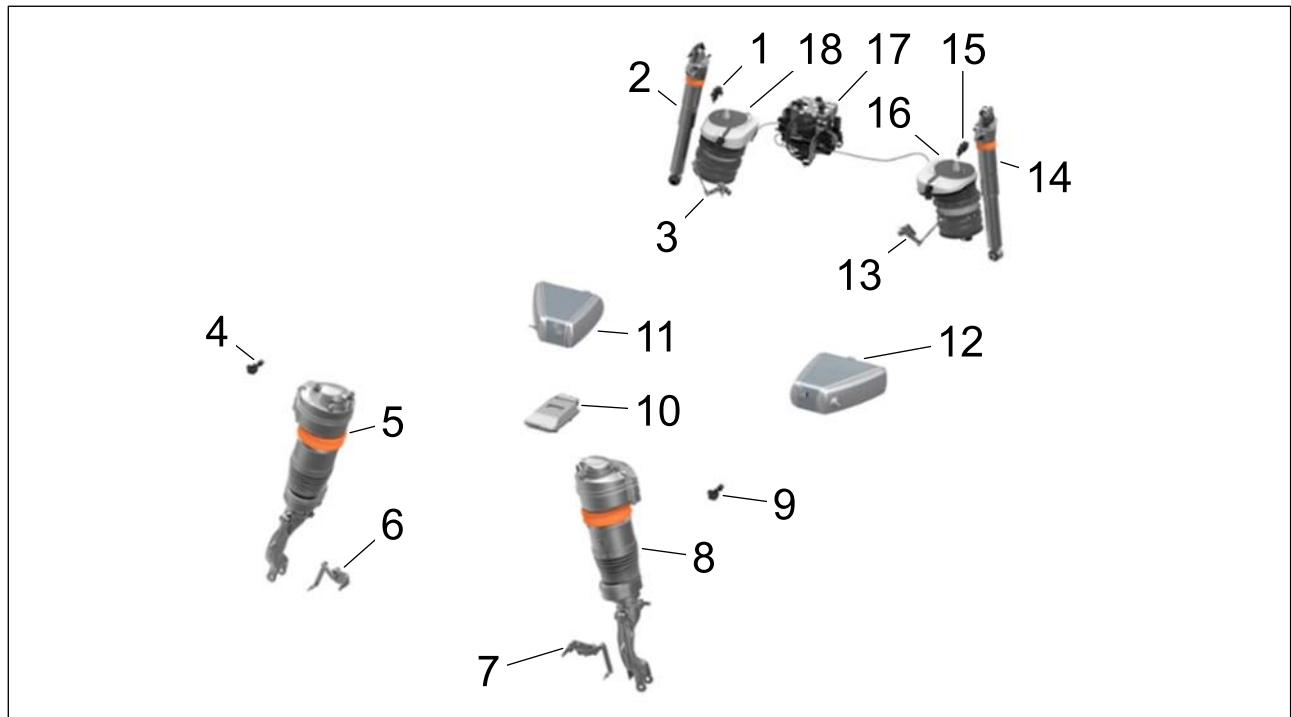
<b>Part No.</b>	<b>Designation</b> <b>- Use</b>	<b>Qty.</b>
9Y0513021E	⇒ Spring damper - rear	2 ea.
N 91236401	⇒ Hexagon-head bolt - Rear spring damper	2 ea.
N 10106403	⇒ Hexagon collar nut - Rear spring damper	2 ea.
PAF912225	⇒ Hexagon-head bolt - Rear spring damper	4 ea.
95851218200	⇒ Fixing clip for stone guard - Rear axle	4 ea.

**Other parts of the levelling system (to be used if necessary)**

<b>Part No.</b>	<b>Designation</b> <b>- Use</b>	<b>Qty.</b>
958616013A	⇒ Valve unit - Rear axle	1 ea.
958616203F	⇒ Pressure accumulator - Rear axle, left	1 ea.

958616204F	⇒ Pressure accumulator - Rear axle, right	1 ea.
958616005G	⇒ Air distribution regulator - Rear axle	1 ea.
958616013A	⇒ Solenoid valve block - Rear axle	1 ea.
9J1616640	⇒ Repair kit for air line (4X0.85)	1 ea.
9J1616640A	⇒ Repair kit for air line (6X1.5)	1 ea.
958616715A	⇒ Air line for pressure accumulator, lilac - left	1 ea.
95861671500	⇒ Air line for pressure accumulator, lilac - right	1 ea.
9Y1616719	⇒ Air line, red - front left	1 ea.
9Y1616720	⇒ Air line, green - front right	1 ea.
9Y0616711A	⇒ Air line, black - rear left	1 ea.
9Y0616712A	⇒ Air line, blue - rear right	1 ea.

Component overview



Component overview

- 1 – Body acceleration sensor, rear right
- 2 – Shock absorber, rear right
- 3 – Level sensor, rear right
- 4 – Front right body acceleration sensor
- 5 – Front right air spring with integrated shock absorber
- 6 – Level sensor, front right
- 7 – Level sensor, front left
- 8 – Front left air spring with integrated shock absorber
- 9 – Wheel acceleration sensor, front left
- 10 – Control unit
- 11 – Pressure accumulator, right
- 12 – Pressure accumulator, left
- 13 – Level sensor, rear left
- 14 – Shock absorber, rear left
- 15 – Wheel acceleration sensor, rear left
- 16 – Rear left air spring
- 17 – Solenoid valve block
- 18 – Rear right air spring

## Work Procedure

## Gradual loss of pressure

Symptom	Fault detection	Possible cause	Repair measure
Gradual loss of pressure – Vehicle lying to one side after a long time – Longer than average regulating times – No reaction to driver's request	Check the levelling system for pressure loss and look for leaks using commercially available leak detection spray, see ⇒ <i>Technical Information 'Checking levelling system for pressure loss'</i>	Leak in air-spring strut	Replace or repair air-spring strut, see ⇒ <i>Workshop Manual '433019 Removing and installing front air-spring strut'</i> ⇒ <i>Workshop Manual '433037 Disassembling and assembling front air-spring strut'</i>
		Leak in air spring bellows	Replace air spring bellows, see ⇒ <i>Workshop Manual '434355 Replacing air spring bellows'</i>
		Leak in air line	Check tightening torque
			Check insertion depth (color marking)
		Check air line and replace it if necessary	

## Vehicle lying to one side

Symptom	Fault detection	Possible cause	Repair measure
Vehicle lying to one side – No leaks in the system	Carry out Guided Fault Finding using the Porsche System Tester	Level sensor faulty	Replace level sensor, see ⇒ <i>Workshop Manual '431855 Replacing front level sensor'</i>
		Level sensor holder/linkage bent	⇒ <i>Workshop Manual '431955 Replacing rear level sensor'</i>

Vehicle is too high

Symptom	Fault detection	Possible cause	Repair measure
Vehicle is too high – Vehicle cannot be lowered	1. Check whether the vehicle has sufficient ground clearance	Vehicle position is raised	Look for signs of damage and check clearance around the air-spring struts/air springs and anti-roll bars
	2. Examine air line and line routing	Air line blocked, kinked or frozen	Replace kinked air lines; carefully blow out frozen and blocked air lines using compressed air
		Air line on front axle not inserted far enough (fault code 284)	Insert air line on front axle as far as it will go; only one marking should be visible
	3. Levelling system: Upper/lower limit value exceeded	Compressor fuse faulty	Replace compressor, see ⇒ <i>Workshop Manual '431519 Removing and installing compressor'</i>
		Air line on front axle not inserted far enough (fault code 284)	Insert air line on front axle as far as it will go; only one marking should be visible
	4. Carry out Guided Fault Finding using the Porsche System Tester	Check relays, plug contacts, wire harness and fuses in the vehicle electrical system	Replace compressor, see ⇒ <i>Workshop Manual '431519 Removing and installing compressor'</i>
		Discharge valve in compressor faulty/leaking/open	
		Discharge valve in compressor/control valves in valve block do not work	
		Valve unit does not work	
	5. Valve unit blocked	Dirt in valve unit	Replace valve unit, see ⇒ <i>Workshop Manual '432355 Replacing valve unit'</i>
6. Compressor/valve block blocked	Dirt in compressor/valve block	Replace compressor, see ⇒ <i>Workshop Manual '431519 Removing and installing compressor'</i>	
7. No defects found after checking	Compressor faulty	Replace compressor, see ⇒ <i>Workshop Manual '431519 Removing and installing compressor'</i>	

## Vehicle is too low

Symptom	Fault detection	Possible cause	Repair measure
Vehicle is too low – Vehicle cannot be raised or can only be raised very slowly	1. Examine air line and line routing	Air line blocked, kinked or frozen	Replace kinked air lines; carefully blow out frozen and blocked air lines using compressed air
	2. Valve unit blocked	Dirt in valve unit	Replace valve unit, see ⇒ <i>Workshop Manual '432355 Replacing valve unit'</i>
	3. Compressor/valve block blocked	Dirt in compressor/valve block	Replace compressor, see ⇒ <i>Workshop Manual '431519 Removing and installing compressor'</i>
	4. Carry out Guided Fault Finding using the Porsche System Tester	Check relays, plug contacts, wire harness and fuses in the vehicle electrical system	Replace compressor, see ⇒ <i>Workshop Manual '431519 Removing and installing compressor'</i>
		Discharge valve in compressor faulty/leaking/open	
		Discharge valve in compressor/control valves in valve block do not work	
5. No defects found after checking	Compressor faulty	Replace compressor, see ⇒ <i>Workshop Manual '431519 Removing and installing compressor'</i>	

## Rapid loss of pressure

Symptom	Fault detection	Possible cause	Repair measure
Rapid loss of pressure	Vehicle lying to the left or right; when you try to switch to a different level, you can hear air coming from the faulty air spring	Air-spring strut defective	Replace or repair air-spring strut, see ⇒ <i>Workshop Manual '433019 Removing and installing front air-spring strut'</i> ⇒ <i>Workshop Manual '433037 Disassembling and assembling front air-spring strut'</i>



	Air spring bellows defective	Replace air spring bellows, see ⇒ <i>Workshop Manual '434355 Replacing air spring bellows'</i>
	Air line torn off	Replace air line

**Insufficient damping**

Symptom	Fault detection	Possible cause	Repair measure
Insufficient damping	Test drive: Adjust the damping level while driving. You should feel a significant change in the damping effect when driving on uneven road surfaces. Also listen for rumbling noises	Damping adjustment valve faulty	Replace air-spring strut, see ⇒ <i>Workshop Manual '433019 Removing and installing front air-spring strut'</i>
			Replace rear shock absorber, see ⇒ <i>Workshop Manual '436655 Replacing rear spring damper'</i>
		Air-spring strut worn Air line system dirty Shock absorbers worn	Replace air-spring strut, see ⇒ <i>Workshop Manual '433019 Removing and installing front air-spring strut'</i>
			Clean air line system ⇒ <i>Technical Information '433019 Cleaning air line system'</i>
			Replace rear shock absorber, see ⇒ <i>Workshop Manual '436655 Replacing rear spring damper'</i>
Error message "PASM failure" with significant inward/outward spring motion – Error message disappears after switching the ignition off and on again	Fault code 322, 323, 324 or 325 stored in the fault memory	Front level sensor holder/linkage bent	Replace level sensor, see ⇒ <i>Workshop Manual '431855 Replacing front level sensor'</i>

## Checking levelling system for pressure loss

Work Procedure: 1 Measure the pressure.



### Information

Take measurements under the following conditions:

- The vehicle must be standing on a level surface.
- The vehicle must be cold and must not be moved during the check.
- The room temperature should be between 10 °C and 30 °C and must not fluctuate to any great extent.

1.1 Connect battery charger, see ⇒ *Workshop Manual '2X00IN Trickle charging 12-volt lithium-ion battery'*.

1.2 Connect the **PIWIS Tester** to the vehicle and switch on the **PIWIS Tester**.

1.3 Establish operational readiness.

1.4 Start diagnostics.

1.5 Select '**Chassis control PASM**' control unit.

1.6 Select the '**Drive links/checks**' tab.

1.7 Select '**Pressure measurement**' in the menu and continue with •F12" .

1.8 Press •F8" to start.

1.8.1 Check the pressure values of the individual control circuits.

1.8.2 Adjust the air pressure if it differs from the required value.

1.8.3 Take a screenshot for documentation purposes.

1.8.4 Check the pressure values again after 2, 4, 6 hours or longer.



### Information

If the vehicle is lying at an angle, there is a leak at the wheel suspension with the greatest difference between the first and second measurement.

Use commercially available leak detection spray to check the affected air-spring strut/air spring and the relevant air line one after the other.

If there is no difference after 2, 4, 6 hours, take measurements again after 24 hours.

The following components must also be checked:

- Air line connections
- Air-spring strut/air spring
- Valve unit

1.8.5 If there is pressure loss, take another screenshot.

1.9 End operational readiness.

1.10 **Disconnect the PIWIS Tester** from the vehicle.

2 Look for the leak.



**Information**

If the air-spring strut is defective, oil from the air-spring strut may have leaked into the air supply system.

To ensure that the air spring system works perfectly, it is absolutely essential that you clean the system after a fault is found and replace other components.

- Screw off the affected line on the air-spring strut/air spring and solenoid valve block.
- Blow out the line several times until it is clean using compressed air by introducing the compressed air at the end of the line at the solenoid valve block.
- Check whether oil from the air-spring strut has leaked into the solenoid valve block.
- If there is oil from the air-spring strut in the valve unit, the valve unit must be replaced.
- Check the internal line from the compressor to the solenoid valve block.
- If there is oil in the line between the compressor and pressure accumulator, the line and the pressure accumulator must be replaced.
- If there is oil in the internal line, the compressor must be replaced.

**Invoicing**

Invoicing: For documentation and warranty invoicing, enter the labor operations used for the relevant repair work, the PQIS coding and the relevant part numbers in the warranty claim:

APOS	Labour operation	I No.
43910101	Checking pressure line (front left)	
43910102	Checking pressure line (front right)	
43910103	Checking pressure line (rear left)	
43910104	Checking pressure line (rear right)	
43915503	Replacing pressure line (rear left)	
43915504	Replacing pressure line (rear right)	
43012901	Cleaning levelling system	
43151900	Removing and installing compressor for levelling system	
43181901	Replacing front level sensor (left)	
43181902	Replacing front level sensor (right)	
43195501	Replacing rear level sensor (left)	

APOS	Labour operation	I No.
43195502	Replacing rear level sensor (right)	
43235500	Replacing valve unit	
43302000	Removing and installing 2 front air-spring struts	
43303850	Disassembling and assembling 2 front air-spring struts	
43435650	Replacing 2 air spring bellows (rear)	
43665650	Replacing rear spring damper	

PQIS coding:

<b>Location (FES5)</b>	43010	Levelling system
<b>Damage type (SA4)</b>	5021	Air leak

Parts Info: **Front spring strut**

Part No.	Designation	Qty.
	<b>– Use</b>	
9Y0616039C	Air-spring strut – front left	1 ea.
	<b>or</b>	
9Y0616040C	Air-spring strut – front right	1 ea.
	<b>Additional parts required</b>	
PAF912603	Hexagon-head bolt with washer – Front air-spring strut	6 ea.
N 10272202	Hexagon-head bolt – Front shock absorber fork	2 ea.
N 10106402	Hexagon collar nut – Front shock absorber fork	2 ea.
N 10784702	Hexagon flange bolt – Front shock absorber fork	2 ea.
WHT001987	Hexagon nut – Front shock absorber fork	2 ea.
9A700837900	Tie-wrap – Front shock absorber fork	2 ea.
N 10665001	Countersunk screw with internal serration – Dome strut sound absorber	8 ea.
WHT007061	12 point socket (I-no. 1P0) – Front connecting link	2 ea.
N 10286110	Hexagon collar nut (I-no. 1P0) – Front connecting link	2 ea.

	<b>or</b>	
WHT007422	12 point socket (I-no. 1P7)	2 ea.
	– Front connecting link	
PAF015081	Hexagon collar nut (I-no. 1P7)	2 ea.
	– Front connecting link	

**Front level sensor**

PAB94128501	Level sensor with linkage	1 ea.
	– front left	

**or**

PAB94128601	Level sensor with linkage	1 ea.
	– front right	

**Additional parts required**

N 01508210	Hexagon-head bolt	2 ea.
	– Rear level sensor	

**Rear level sensor**

958941310H	Level sensor	1 ea.
	– rear right	

**or**

958941309H	Level sensor	1 ea.
	– rear left	

**Additional parts required**

N 10684301	Hexagon-head bolt	1 ea.
	– Rear level sensor	

N 01508210	Hexagon collar nut	1 ea.
	– Rear level sensor	

**Compressor**

PAB616007	Compressor	1 ea.
	– Rear axle	

**Additional parts required**

PAB907778	Control unit for levelling system	1 ea.
	– Compressor	

**Rear spring damper**

9Y0513021E	Spring damper	2 ea.
	– rear	

N 91236401	Hexagon-head bolt	2 ea.
	– Rear spring damper	

N 10106403	Hexagon collar nut – Rear spring damper	2 ea.
PAF912225	Hexagon-head bolt – Rear spring damper	4 ea.
95851218200	Fixing clip for stone guard – Rear axle	4 ea.

**Rear air spring bellows**

9Y0616001B	Air spring bellows – Rear axle, left	1 ea.
9Y0616002B	Air spring bellows – Rear axle, right	1 ea.
N 91236401	Hexagon-head bolt – Rear spring damper	2 ea.
N 10106403	Hexagon collar nut – Rear spring damper	2 ea.
PAF912225	Hexagon-head bolt – Rear spring damper	4 ea.
95851218200	Fixing clip for stone guard – Rear axle	4 ea.

**Other parts of the levelling system (to be used if necessary)**

958616013A	Valve unit – Rear axle	1 ea.
958616203F	Pressure accumulator – Rear axle, left	1 ea.
958616204F	Pressure accumulator – Rear axle, right	1 ea.
958616005G	Air distribution regulator – Rear axle	1 ea.
958616013A	Solenoid valve block – Rear axle	1 ea.
9J1616640	Repair kit for air line (4X0.85)	1 ea.
9J1616640A	Repair kit for air line (6X1.5)	1 ea.
958616715A	Air line for pressure accumulator, lilac – left	1 ea.
95861671500	Air line for pressure accumulator, lilac – right	1 ea.
9Y1616719	Air line, red – front left	1 ea.
9Y1616720	Air line, green – front right	1 ea.

9Y0616711A	Air line, black – rear left	1 ea.
9Y0616712A	Air line, blue – rear right	1 ea.

- References:
- ⇒ *Workshop Manual '431519 Removing and installing compressor'*
  - ⇒ *Workshop Manual '431855 Replacing front level sensor'*
  - ⇒ *Workshop Manual '432355 Replacing valve unit'*
  - ⇒ *Workshop Manual '433019 Removing and installing front air-spring strut'*
  - ⇒ *Workshop Manual '433037 Disassembling and assembling front air-spring strut'*
  - ⇒ *Workshop Manual '434355 Replacing air spring bellows'*
  - ⇒ *Workshop Manual '436655 Replacing rear spring damper'*

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