

Customer Complaint - Steering Wheel Vibrating or Out of Line: Help for fault finding (09/17)

Measured result for lateral runout of brake disc with respect to wheel bearing housing

Location	Explanation	Type	Basic value	Tolerance 1	Tolerance 2
Lateral runout of brake disc with respect to wheel bearing housing			500 µm		

General information

Model Line: **Panamera (971)**

Model Year: **As of 2017**

Subject: **Lower control arm joint on wheel bearing housing (lower control arm ball joint and wheel bearing housing taper bushing)**

Concern: **If a customer complains that the steering wheel is shaking/vibrating or out of line, the lower control arm ball joint on the wheel bearing housing may be damaged.**
 This can occur, for example, if the front wheel hits a curb or similar obstacle.



Information

This document is designed to provide help and assistance during fault finding in the event of a customer complaint if the cause or a problem:

- **is not immediately found** or
- and**
- **was not the result of an accident, for example.**
- **Existing damage or defects** should also be **evaluated by an expert.**

Remedial action:

Check lower control arm ball joint on the wheel bearing housing on the affected side of the vehicle:

- Check brake disc
- Check lower control arm ball joint on wheel bearing housing (lower control arm ball joint and wheel bearing housing taper bushing)
- Check axle components and lower control arm
- Perform suspension alignment and if necessary, carry out additional steps for evaluating the problem

Parts Info:

Part No.:	Designation:	Equipment:	Qty.
971.407.151.H	⇒ Lower control arm, complete - left	(I-no. 0J2) (I-no. 0J1)	1 ea.
971.407.151.J	⇒ Lower control arm, complete - left	(I-no. 0J5) (I-no. 0J8)	1 ea.
971.407.152.H	⇒ Lower control arm, complete - right	(I-no. 0J2) (I-no. 0J1)	1 ea.
971.407.152.J	⇒ Lower control arm, complete - right	(I-no. 0J5) (I-no. 0J8)	1 ea.
971.407.245.H	⇒ Wheel bearing housing on front axle, complete - left	(I-no. 0J2) (I-no. 0J1)	1 ea.
971.407.245.J	⇒ Wheel bearing housing on front axle, complete - left	(I-no. 0J5) (I-no. 0J8)	1 ea.
971.407.246.H	⇒ Wheel bearing housing on front axle, complete - left	(I-no. 0J2) (I-no. 0J1)	1 ea.
971.407.246.J	⇒ Wheel bearing housing on front axle, complete - left	(I-no. 0J5) (I-no. 0J8)	1 ea.

Tools:

- **VAS 6079/1 - Dial Gauge Holder for Brake Discs**
- **9229/1 - Puller hook**
- **T10188 - Open-end spanner insert**
- **VAS 6826 - Steering wheel balance**
- **VAS 6918 - Quick-Clamping Unit**
- **9900 - PIWIS Tester 3**
- Wheel alignment computer, e.g. **VAS 6292 - Wheel Alignment Machine**
- Wheel alignment platform, e.g. **RXTISAU Scissor Lift to aide the VAS 6292**
- Torque wrench, 40 – 200 Nm (30 – 148 ftlb.), e.g. **V.A.G 1332 - Torque wrench, 40-200 Nm (30-148 ftlb.)**
- **VAS 6931 - Transmission and Engine Jack**
- **T10187 - Press-out tool**
- Wooden stick – length: approx. 200 mm and diameter: approx. 30 mm

Checking lower control arm and wheel bearing housing and replacing them if necessary

Work Procedure:



Information

- Since the lower control arm and wheel bearing housing are **safety-critical components**, it is important to exercise **extreme care and accuracy when checking** the components.
- If **a problem is found during one of the steps 1 to 3**, the lower control arm and wheel bearing housing on the affected side of the vehicle must be replaced.
- If **no problem** is found during one of the steps 1 to 3, **Step 4** can also be carried out and evaluated. This can provide additional information, but not necessarily in all cases.
- If **in doubt**, the **lower control arm and wheel bearing housing must always be replaced (safety-critical components)**.

1 Check brake disc and brake disc hub.

- 1.1 Carry out a brake test and check for obvious vibrations in the vehicle.
- 1.2 Remove wheel. ⇒ *Workshop Manual '440519 Removing and installing wheel'*
- 1.3 Check lateral runout (brake disc/wheel bearing housing).
 - ⇒ *Workshop Manual '465002 Checking front brake discs (wear assessment)'*
 - ⇒ *Workshop Manual '465102 Checking front PCCB brake discs (wear assessment)'*
 - 1.3.1 Measured result for lateral runout of brake disc with respect to wheel bearing housing greater than: ⇒ **500 µm**
- 1.4 Remove front brake disc.
 - ⇒ *Workshop Manual '465019 Removing and installing front brake disc'*
 - ⇒ *Workshop Manual '465119 Removing and installing front PCCB brake disc'*
- 1.5 Check brake disc hub for fractures
 - ⇒ *Checking brake disc hub.*



Information

Fracture of the brake disc hub can be identified by a loose friction ring on the brake disc.

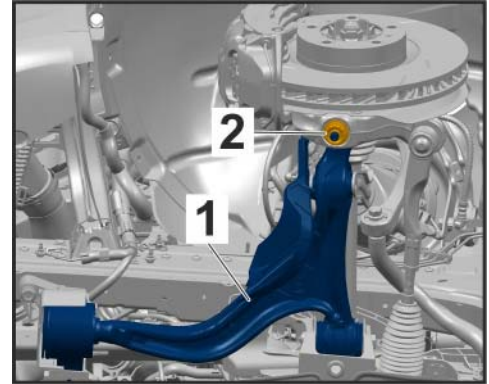


Checking brake disc hub

2 Check lower control arm ball joint on wheel bearing housing (lower control arm ball joint and wheel bearing housing taper bushing).

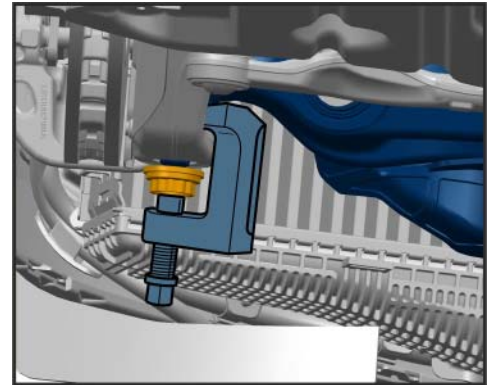
- 2.1 Remove cover for front underbody. ⇒ *Workshop Manual '519219 Removing and installing cover for front underbody'*

- 2.2 Screw off nut ⇒ *Unscrewing nut on lower control arm -2-*.



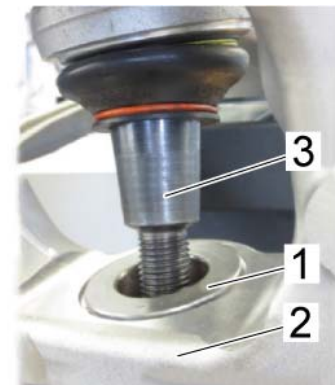
Unscrewing nut on lower control arm

- 2.3 Press off ball joint on the lower control arm ⇒ *Unscrewing nut on lower control arm -1-* using **T10187 - ball joint puller** (⇒ *Pressing off ball joint*).



Pressing off ball joint

- 2.4 Use a wooden stick to tap against the taper bushing **1**, checking that taper bearing **3** is fitted securely in wheel bearing housing **2**.



Checking that taper bearing is fitted securely in wheel bearing housing

- 2.5 Check ball joint on lower control arm ⇒ *Checking that taper bearing is fitted securely in wheel bearing housing -3-* for scratches, notches and deformation.

- 3 Check axle components and lower control arm.

- 3.1 Check axle components for cracks and deformation.
Compare with the opposite side of the vehicle if necessary.

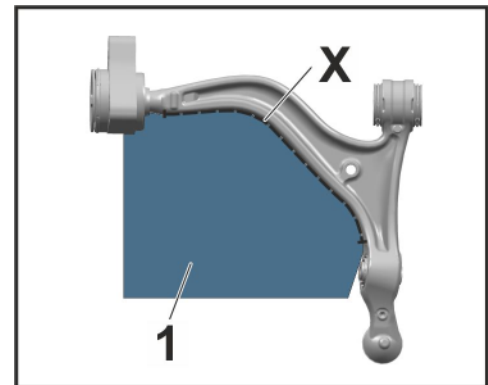
- 3.2 Check for components hitting against each other and check axle components for signs of rubbing or hitting (e.g. connecting link for anti-roll bar hitting against spring strut prongs).
- 3.3 Check lower control arm for deformation. ⇒ *Workshop Manual '401719 Removing and installing lower trailing arm - section on "Replacing"*



Information

Deformation of the control arm can be checked using a printable template.

- The template can be found in the PIWIS information system under Workshop Manual - **4017 Lower control arm template**.
- Print the template, check printout based on the control dimension, copy the template to a piece of cardboard and cut it out in accordance with specifications.
- If the contour of the control arm in the measuring area ⇒ *Template for checking deformation -X-* deviates from the contour of the template ⇒ *Template for checking deformation -1-*, the trailing arm must be replaced.

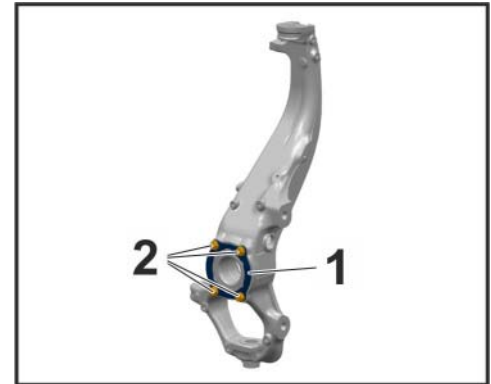


Template for checking deformation

- 4 **If no damage/problems were found in steps 1 to 3 or if in doubt:**

- 4.1 Check gap dimensions of the wheel hub plate
 ⇒ *Checking gap dimensions of wheel hub plate -1-* with respect to the wheel bearing housing.
 Compare with the opposite side of the vehicle if necessary and check for differences.

- 4.2 Check tire and rim for damage.
- 4.3 Perform suspension alignment on the front axle as required and adjust the vehicle if necessary. ⇒ *Workshop Manual '449503 Performing front and rear suspension alignment'*



Checking gap dimensions of wheel hub plate

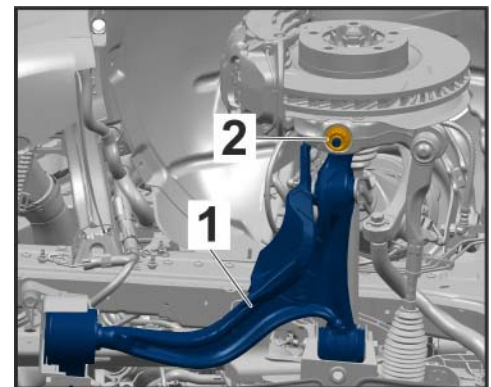
During suspension alignment, current adjustment values and adjustment values assigned to the relevant vehicle type must always be used. ⇒ *Workshop Manual '4495TW Adjustment values for suspension alignment'*

- 4.3.1 Check front-axle camber.
- 4.3.2 Check front-axle toe.

- 5 **Only if damage/problems were found in steps 1 to 3 or if in doubt:**
 Replace lower control arm and wheel bearing housing.
 ⇒ *Workshop Manual '405019 Removing and installing wheel bearing housing'*
 ⇒ *Workshop Manual '401719 Removing and installing lower trailing arm'*

- 6 **Only if no damage/problems were found:**
 Complete the vehicle.

- 6.1 Screw on and tighten nut ⇒ *Screwing on and tightening nut for control arm -2-*.
Tightening torque 130 Nm (96 ftlb.)
- 6.2 Install cover for front underbody. ⇒ *Workshop Manual '519219 Removing and installing cover for front underbody'*
- 6.3 Install front brake disc.
 ⇒ *Workshop Manual '465019 Removing and installing front brake disc'*
 ⇒ *Workshop Manual '465119 Removing and installing front PCCB brake disc'*
- 6.4 Install wheel. ⇒ *Workshop Manual '440519 Removing and installing wheel'*



Screwing on and tightening nut for control arm

- 6.5 Perform suspension alignment on the front axle as required and adjust the vehicle if necessary. ⇒ *Workshop Manual '449503 Performing front and rear suspension alignment'*
 During suspension alignment, current adjustment values and adjustment values assigned to the relevant vehicle type must always be used. ⇒ *Workshop Manual '4495TW Adjustment values for suspension alignment'*

Invoicing: For invoicing and documentation using PQIS, enter the following coding:

Location (FES5)	40170	Lower control arm
Damage type (SA4)	1025	fitted loosely

- References:
- ⇒ *Workshop Manual '465002 Checking front brake discs (wear assessment)'*
 - ⇒ *Workshop Manual '465102 Checking front PCCB brake discs (wear assessment)'*
 - ⇒ *Workshop Manual '4600TW Grey cast-iron brakes - Technical values and wear limits'*
 - ⇒ *Workshop Manual '4600TW PCCB Technical values and wear limits'*
 - ⇒ *Workshop Manual '465019 Removing and installing front brake disc'*
 - ⇒ *Workshop Manual '465119 Removing and installing front PCCB brake disc'*
 - ⇒ *Workshop Manual '440519 Removing and installing wheel'*
 - ⇒ *Workshop Manual '519219 Removing and installing cover for front underbody'*
 - ⇒ *Workshop Manual '405019 Removing and installing wheel bearing housing'*
 - ⇒ *Workshop Manual '401719 Removing and reinstalling lower trailing arm'*
 - ⇒ *Workshop Manual '449503 Performing front and rear suspension alignment'*
 - ⇒ *Workshop Manual '4495TW Adjustment values for suspension alignment'*

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