

# Technical Service Bulletin



## 46 Brake pulsation diagnostic guidelines

46 14 66 2022584/4 January 9, 2014. Supersedes Technical Service Bulletin Group 46 number 12-23 dated June 18, 2012 for reasons listed below.

Model(s)	Year	VIN Range	Vehicle-Specific Equipment
All	2006 - 2014	All	Not Applicable

## Condition

REVISION HISTORY		
Revision	Date	Purpose
4	-	Revised header data (Changed model years) Revised <i>Service</i> (Added images; updated instructions)
3	6/18/2012	Revised header data (Added model year 2013)
2	1/18/2012	Revised header data (Updated VIN ranges)
1	1/27/2010	Original publication

Customer may report that the steering wheel vibrates or pulsates when the brakes are applied.

## Technical Background

Brake-related vibration and pulsation has several causes that depend on driving style and resulting brake disc temperature, as well as environmental conditions.

Both the intensity of the wear of the brake system and the type of wear depend on the operating conditions of the vehicle. The wear of the brake discs is determined by the frequency and intensity of the brake operations. Dirt build-up, exposure to sand, long standing times, and road salt or similar, can also promote wear as well as cause scoring marks on the brake discs.

The driving style of the driver also influences the wear of the brake system. An overly-aggressive driving style, which results in frequent sharp braking, can lead to more wear (particularly of the brake pads). A gentle driving style can result in very light brake applications. If the brakes are always applied with little pressure, a rust film and other airborne particles may settle on the brake discs and pads. Firm brake operations can help clean off such build-up from the brakes.

## Production Solution

Not applicable.

## Service

1. Before proceeding, check for other applicable TSBs.
2. Confirm the complaint with a test drive. Check the following points:
  - At what speed does the vibration/pulsation start?
  - At what speed does the vibration/pulsation stop?
  - How much pedal pressure needs to be applied for the vibration/pulsation to be felt (light/medium/heavy)?
  - Is the vibration/pulsation felt or seen:
    - In the steering wheel?
    - In the brake pedal?
    - In the seat?
    - In the front of the vehicle?
  - Does the vibration/pulsation also occur when the vehicle is coasting (not in gear) at the speeds established in the first point?
  - For warranty claims:
    - Perform the procedure shown in the *Brake Pulsation Service Tree* (attachment 1) and attach one completed copy to the repair order and one copy to the causal part being replaced.
    - Use the appropriate Brake Measurement Form to document brake disc and pad thickness. Attach one completed copy to the repair order and one copy to the causal part being replaced.
3. Diagnose according to the list of conditions listed below:
  - **Condition A:** Brake disc thickness variations (DTV) (Figure 1) or parallelism after certain mileage that cannot be detected with normal workshop methods. There is no Audi specification for DTV/parallelism.  
**Service:** Replace brake disc(s).

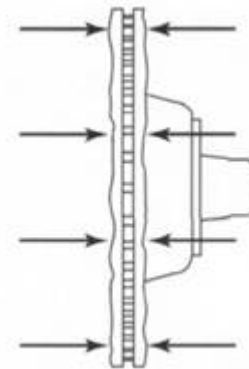
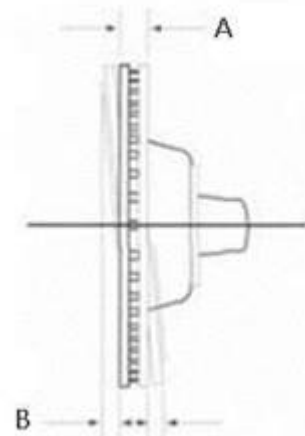


Figure 1. Brake disc thickness variations.

- **Condition B:** Excessive brake disc or wheel hub run-out (Figure 2). Industry guidelines for run-out are as low as .04mm to .13mm (.0015in to .005in).  
**Service:** Determine if the run-out is caused by the hub or by the actual brake disc(s). Replace brake disc(s).



**Figure 2.** True rotor rotation (A) and rotor lateral run-out (B).

- **Condition C:** Corrosion/rust build-up on brake discs (Figure 3) because the vehicle was not driven for prolonged periods of time.  
**Service:** Follow the procedure outlined in the *Brake Pulsation Service Tree*. Any rust build-up that occurred because inventory maintenance (as outlined in the Inventory Maintenance Checklist) procedures were not performed will not be covered under Warranty.




**Figure 3.** Corrosion/rust build-up.

- **Condition D:** Corrosion marks from brake pads on the brake disc, also known as “pad marks” (Figure 4). These marks may appear if the vehicle has not been driven for a prolonged period of time.  
**Service:** Follow the procedure outlined in the *Brake Pulsation Service Tree*.



**Figure 4.** Corrosion marks on the brake disc.

- **Condition E:** Deposits on the brake disc (Figure 5) due to thermal stress. Thermal stress is when the brake pads overheat as a result of aggressive driving,

 **Tip:** If the vehicle is driven aggressively, the brakes must be cooled down before the vehicle is parked for an extended period of time. The driver can cool the brakes by driving around with minimal braking before parking the vehicle.

**Service:** Damage to the brake components due to aggressive driving is not covered under warranty.



*Figure 5. Deposits on the brake disc.*

- **Condition F:** Worn brake pads and discs (Figure 6) have reduced dampening characteristics.


**Service:** Try replacing the brake pads if they are at least 50% worn. If the replacement brake pads do not improve the condition, replace the brake discs.

Normal wear and tear of brake components is not covered under warranty.



*Figure 6. Worn brake pad.*

- **Condition G:** Blue-tempered brake discs or brake discs with heat marks (Figure 7) exhibit extremely high thermal loading of the brake system (with distortion and structural change of the brake discs). This high thermal loading results in permanent damage to the brake discs and brake pads.

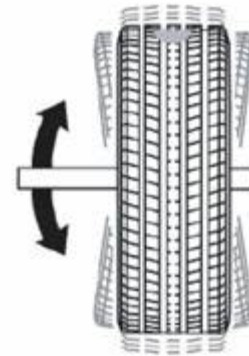
 **Tip:** If the vehicle is driven aggressively, the brakes must be cooled down before the vehicle is parked for an extended period of time. The driver can cool the brakes by driving around with minimal braking before parking the vehicle.

**Service:** Replace brake disc(s). This type of damage is not covered under Warranty.



*Figure 7: Brake disc with heat marks.*

- **Condition H:** Wheel/tire imbalance (Figure 8) or radial run-out can significantly amplify vibration/pulsation or lead to body vibrations, which only become noticeable when braking.  
**Service:** Eliminate wheel and tire vibration concerns by using VAS 6230 and any relevant TSBs.



**Figure 8.** Wheel/tire imbalance.

- **Condition I:** Faulty or damaged suspension components (e.g., ball joints, tie rods, bushing, etc.) can significantly amplify the vibration/pulsation or lead to body vibrations which only become noticeable when braking.  
**Service:** Inspect the condition of these components. All values must be within factory specifications. Ensure that only OEM components are on the vehicle. Damage due to outside influence is not covered under Warranty.

## Warranty

This TSB is informational only and not applicable to any Audi warranty.

## Additional Information

All parts and service references provided in this TSB (2022584) are subject to change and/or removal. Always check with your Parts Department and service manuals for the latest information.