

991 – Clicking Noises from Centerlock Wheels

Vehicles Affected

Models	Model Year	Model Type	VIN Range	Vehicle-Specific Equipment
911 Carrera GTS, Turbo, Turbo S, GT3, GT3RS, GT2RS, Speedster	As of 2014 up to 2019	991	N/A	Centerlock wheel nuts, aluminum alloy wheels, and PCCB brake discs

Revision History

Revision	Release Date	Changes
0	April 9, 2021	Original document
1	October 7, 2021	Content update

Condition

The customer complains of clicking noises from the front of the vehicle while turning, typically at slow speeds.

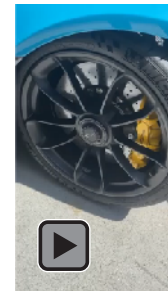


Figure 1
Clicking Noise Example (Sound File)

In order to play this sound file, you need to enable "playing of 3D content" under 3D & Multimedia in the preference settings (Edit) of Adobe Acrobat.

Technical Background

The wheels may experience "micro-movements" at the interface with the brake disc bell during driving. Micro-movements may be caused by an insufficient pretension of the centerlock nut, reduced friction values between multiple contact surfaces, or geometrical discrepancies between parts.

These micro-movements may cause material to be transferred from the aluminum alloy wheels to the brake disc bell. The transferred material may cold-weld to the brake disc bell, causing a "stick-slip" effect. The stick-slip effect produces clicking noises while turning.

NOTE:

The clicking noises do not impair the performance or safety of the braking system. The customer may continue to drive the vehicle without restriction. The clicking noises do not constitute a defect.

Service Information

To eliminate the clicking noises, please perform the following:

1. Remove both front wheels and both front brake discs.
2. Visually inspect for damage on the brake discs, wheel hubs, wheel cones (seat on the wheel for the center lock nuts), centerlock nut assemblies, wheels, and drive pegs. **Replace any damaged parts and document all damage with pictures.**
3. Inspect the outer surface of the brake disc bell and the inner surface of the wheel that contacts the brake disc bell. If any material transfer or corrosion is present on either surface (Figure 2), gently and thoroughly clean the surface of both parts. Document any material transfer and corrosion with pictures.
 - a. To clean the surfaces, please use special tool **VAS 294009 – Wheel Hub Cleaner**.
 - i. **Only if special tool VAS 294009 is unavailable**, 3M Scotch-Brite Hand Pads 7445 (white) and 7448 (light gray) may also be used.
 1. Begin by gently cleaning with pad 7445. If pad 7445 does not completely remove all corrosion and material transfer from the surfaces, gently clean the surfaces with pad 7448.
 2. **Note: Do not use a more abrasive Scotch-Brite pad than pad 7448. Doing so may remove any protective coating from the surfaces of the wheel and brake disc bell.**



Figure 2
Material Transfer to Brake Disc Bell (Left) from Wheel (Right)

- b. If a surface cannot successfully be cleaned, replace **only** the component that cannot be cleaned.
 - i. If no parts are replaced, or if only the wheel is replaced, or if only the brake disc is replaced, continue to Step 4.
 - ii. If both the wheel and brake disc are replaced, skip to Step 6
- 4. Inspect for material transfer on the contact surfaces between the drive pegs and brake disc (Figure 3). Replace the drive pegs **and all drive peg screws** if material transfer is present. Document any material transfer with pictures.



Figure 3
Material Transfer on Drive Peg

- 5. Check the flatness of the wheel mating surfaces with a straight edge (12" Starrett 380). Imperfections in the surface may have an influence on the rotor and cause noise. It is necessary to check for flatness in 6 different positions around the mating surface, roughly every 60 degrees. Using a feeler gauge, determine the minimum gap between the straight edge and the mating surface on both the inner and outer rings of the mating surface. Be sure to thoroughly document all measurements.

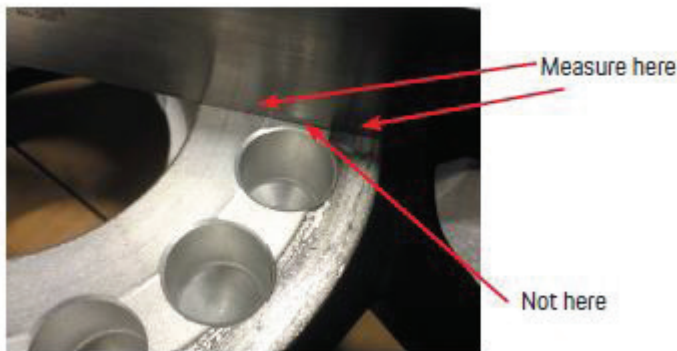


Figure 4
Flatness measuring positions

NOTE:

The inner (smaller) ring of the mating surface has a conical taper and may not be completely flat. However, the minimum distance between the mating surface and the straight edge should be relatively uniform across all measuring positions.

6. If any anti-corrosion oil is present from manufacturing on any mating surfaces (marked in red with white arrows in Figure 5), on new or old parts, clean the parts with a microfiber cloth and brake parts cleaner. Document presence of anti-corrosion oil with pictures.

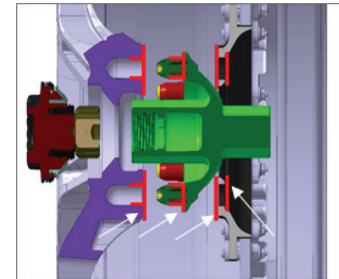


Figure 5
Mating Surfaces to Check for
Anti-Corrosion Oil

7. Thoroughly clean the centerlock nut and apply a complete layer of Optimoly grease to the centerlock cone. Ensure that the center lock nut is properly lubricated in accordance with WM 440519 / WM 440737, and that all mating surfaces are clean and free of debris.



Figure 6
Application of Grease to
Centerlock Cone

8. Thoroughly clean the wheel hub threads and apply a complete layer of Optimoly grease to both the inside threads and the outside diameter. Ensure all contact surfaces of the wheel hub are clean and free of debris.

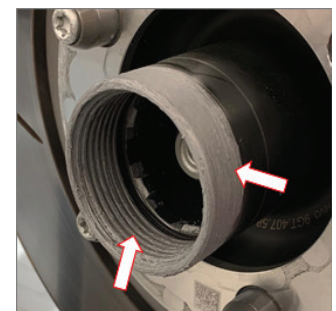


Figure 7
Application of Grease
to Wheel Hub

9. If the wheel hubs were replaced, reinstall the wheel hubs and bearings as instructed in *WM 405719 – Removing and installing front wheel bearing, section on Installing front wheel bearing*. If wheel hubs were not replaced, skip to Step 10.
 - a. Note: If the wheel bearings are damaged during the removal of the wheel hub, the parts must be replaced.

10. Reinstall the PCCB brake discs as instructed in *WM 465119 – Removing and installing front PCCB brake disc, section on Installing front brake disc*.

11. Reinstall both wheels as instructed in *WM 440519 – Removing and installing wheel with central bolt, section on Installing wheel with central bolt*.
 - a. Please use recommended special tool **QD4RN800A – Torque Wrench** from Snap-on for the centerlock wheels.
 Note: When tightening the centerlock nuts, **ensure that the nuts are tightened in one continuous motion, while the vehicle is completely lifted from the ground**. This guarantees that the prescribed tightening torque is achieved. Please see sections 6.1-6.3, within section on *Installing wheel with central bolt*, for proper tightening procedure and tightening torque values.

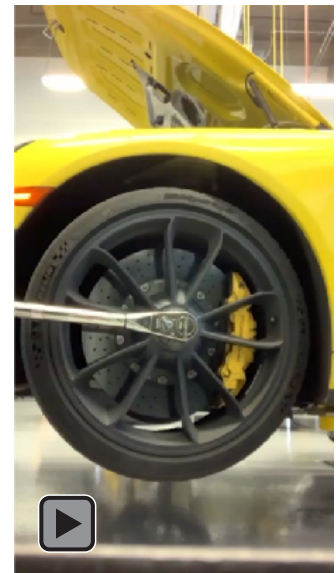


Figure 8
Proper Centerlock Tightening Motion (Video File)

In order to play this video, you need to enable "playing of 3D content" under 3D & Multimedia in the preference settings (Edit) of Adobe Acrobat.

Warranty

As always, be sure to document the repair completely in PQIS. All pictures taken during the repair procedure should be attached to the PQIS job.

For this repair, please code the "cause" as follows:

Cause location:	4407A	Central bolt for wheel mounting
Cause symptom:	2015	Clicks

Always use the following troubleshooting labor operations:

44052011 2	Wheels remove and reinstall
44073761	Wheel mounting disassemble and assemble
44073762	Wheel mounting disassemble and assemble
44120200 2	Rims check
46510250 2	Front PCCB brake discs check
46512050 2	Front PCCB brake discs remove and reinstall

The following troubleshooting labor operations are **conditional** and should only be used as necessary:

44125501	Rim replace (if only front left replaced)
44125502	Rim replace (if only front right replaced)
44125600	2 Rims replace (if both replaced)
40641955	Front wheel hub remove and reinstall (only if front left replaced)
▪	Also claim 40501905 Wheel bearing housing remove and reinstall from "Preconditions" list
40641956	Front wheel hub remove and reinstall (only if front right replaced)
▪	Also claim 40501906 Wheel bearing housing remove and reinstall from "Preconditions" list
40642055	2 Front wheel hubs remove and reinstall (only if both replaced)
▪	Also claim 40502005 2 Wheel housing bearings remove and reinstall from "Preconditions" list

Search Items

Wheel clicking, centerlock clicking, 991 wheel clicking, 991, GT3, GT3RS, GT2RS, 911 Turbo, 911 Turbo S

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