# Noise Symptom – Clicking Noises from the Area of the Front Axle: Observe Specified Procedure (SY 109/21)

Vehicle Type: **911 GT3 (992) / 911 GT3 with Touring Package (992) / 911 GT3 RS (992) / 911 S/T (992)**

Model Year: **As of 2020**

Equipment: **Central wheel lock (M-no. 1PJ)**

Concerns: **Front wheel mount**

Symptom: The customer complains about clicking noises from the front axle area when turning or turning at slow speeds.

Cause: Micro-movements between the contact surfaces of the wheel and brake disc may occur while driving. These micro-movements may occur due to the following main causes:

- Reduced preload on the central wheel lock
- Reduced coefficient of friction between the surfaces
- Geometric discrepancies

As a result, the rim material is removed from the brake disc.
The transferred material can weld itself to the brake disc and thus cause a stick-slip effect. This generates the clicking noises during wheel rotation.

**Information**

The stick-slip effect is the jerking motion that can occur while two solid bodies are sliding over each other. This phenomenon occurs when a body is moved whose static friction is significantly higher than the sliding friction.

Remedial Action: Check the front wheel mount components as described below and carry out the appropriate remedial action depending on the respective test result.
When checking the components, ensure that the sequence described below is followed:

- Check central wheel lock; for instructions, see: ⇒ *Technical Information 'Check central wheel lock'*
- Check contact surfaces of rim, brake disc and wheel hub for friction loss; for instructions, see: ⇒ *Technical Information 'Reduced coefficient of friction between the surfaces'*
- Check rim, brake disc and wheel hub for geometric discrepancies; for instructions, see: ⇒ *Technical Information 'Geometric discrepancies'*

**Information**

The wheel design with central locking was originally developed for racing circuit use. This allows the wheels to be changed quickly during a race. Today, however, wheel and hub designs with central locking on road vehicles differ significantly from those of pure racing vehicles. Therefore, the following guidelines and precautions must always be observed when removing or installing the wheels of a road vehicle with central locking.

- The vehicle must be on a lift and the wheels must hang freely (no contact with the ground) while the central locking nut is tightened. This ensures that the wheel is properly centered on the hub.
- The parking brake must not be used to hold the rear wheels against each other when tightening. The parking brake mechanism cannot withstand the high forces when tightening the central locking device and can be damaged. The damage may not be immediately visible. This applies, in particular, to the motor-operated electronic parking brake actuators.
- Impact tools must never be used to loosen, remove or tighten the central locking device. The nut and hub can be damaged and the damage may not be immediately apparent.
- Only calibrated, high-quality standard torque spanners with sufficient load-bearing capacity and leverage may be used to tighten the central locking device. The use of torque multipliers is not approved for use on Porsche vehicles.
- The specified final torque must be achieved while the torque spanner is in a smooth, continuous motion.
- The appropriate lubricant must be applied to the contact surfaces of the central wheel locking device and the rim as specified. See: ⇒ *Workshop Manual '440737 Disassembling and assembling central lock'*
- If the central wheel lock, wheel hub or rim is new, the central locking device must be tightened to the specified final torque, loosened and then loosened and retightened. As a result, geometrical discrepancies may be compensated.

## Required parts and materials

Parts Info: **Required parts:**

| Part No. | Designation<br>– Point of use | Number |
|---|---|---|
| WHT008186 | ⇒ Cheese head bolt, M12 x 1.5 x 62<br>– Front axle fixed calliper<br>– M-no. 1LR, 1LS | 4 piece(s) |
| | **or** | |
| 9A70075850 | ⇒ Cheese head bolt, M12 x 1.5 x 95<br>– Front axle fixed calliper<br>– M-no. 1LQ, 1LX | 4 piece(s) |

Material: **Required materials** (usually already available in the Porsche Center):

| Part No. | Designation | Quantity |
|---|---|---|
| 00004330508 | ⇒ Mounting paste (3.52oz tube) | 0.07oz |

### Required tools

Tools:
- Hair ruler, e.g. 12" Starret 380
- Feeler gauge, 0.05 mm
- Brass brush
- Microfiber cloth
- – Brake cleaner
- **9451 - Socket wrench**
- **9794 - Assembly aid**
- **9796 - Socket wrench**

### Required tools

Tools:
- Microfiber cloth
- Brake cleaner
- **9451 - Socket wrench**
- **9794 - Assembly aid**
- **9796 - Socket wrench**

### Preparatory work

Work Procedure: 1 Remove front wheels. ⇒*Workshop Manual '440519 Removing and installing wheel with central bolt'*

### Checking central wheel lock

**Information**

Reduced preload on the central wheel lock may be due to:

- Reduced amount of grease on the cone of the central wheel lock or on the thread and external diameter of the wheel hub
- A damaged central wheel lock bolt
- A damaged cone on the rim

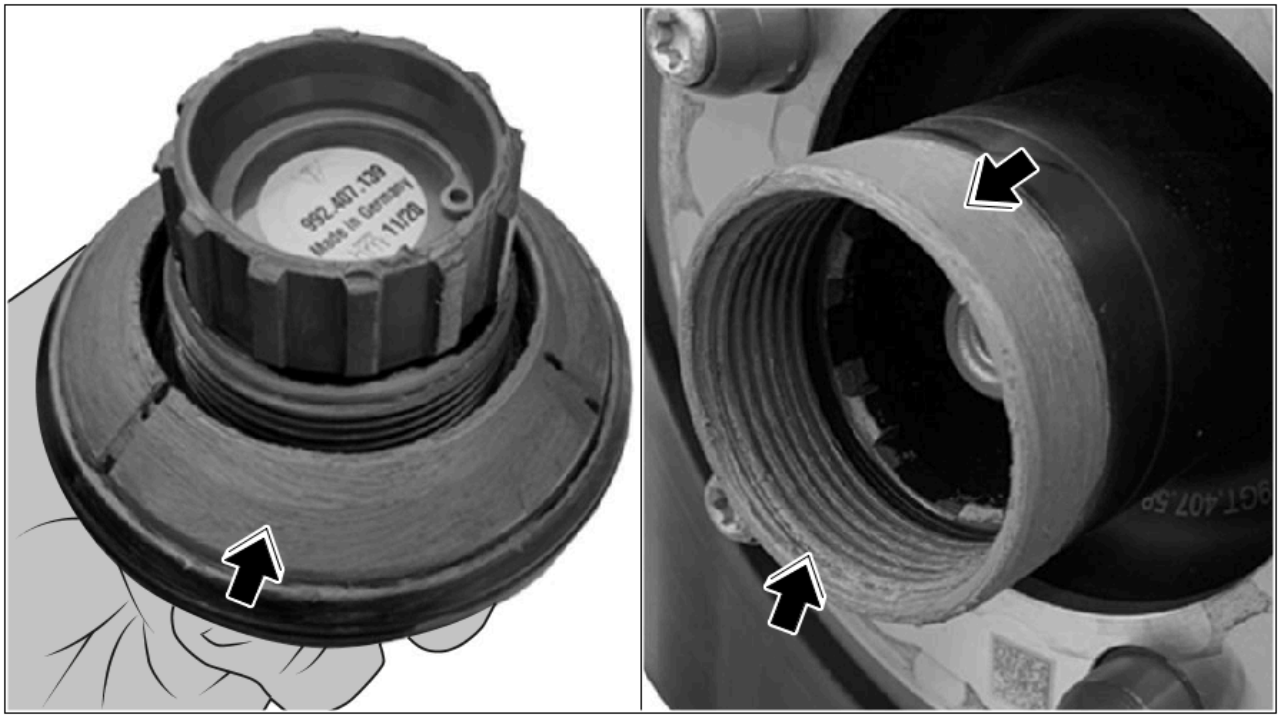
**Information**

If one or more of the central bolts is damaged, it must be replaced. Make sure that the central bolt is sufficiently greased. For instructions, see: ⇒*Workshop Manual '440737 Disassembling and assembling central wheel lock'*

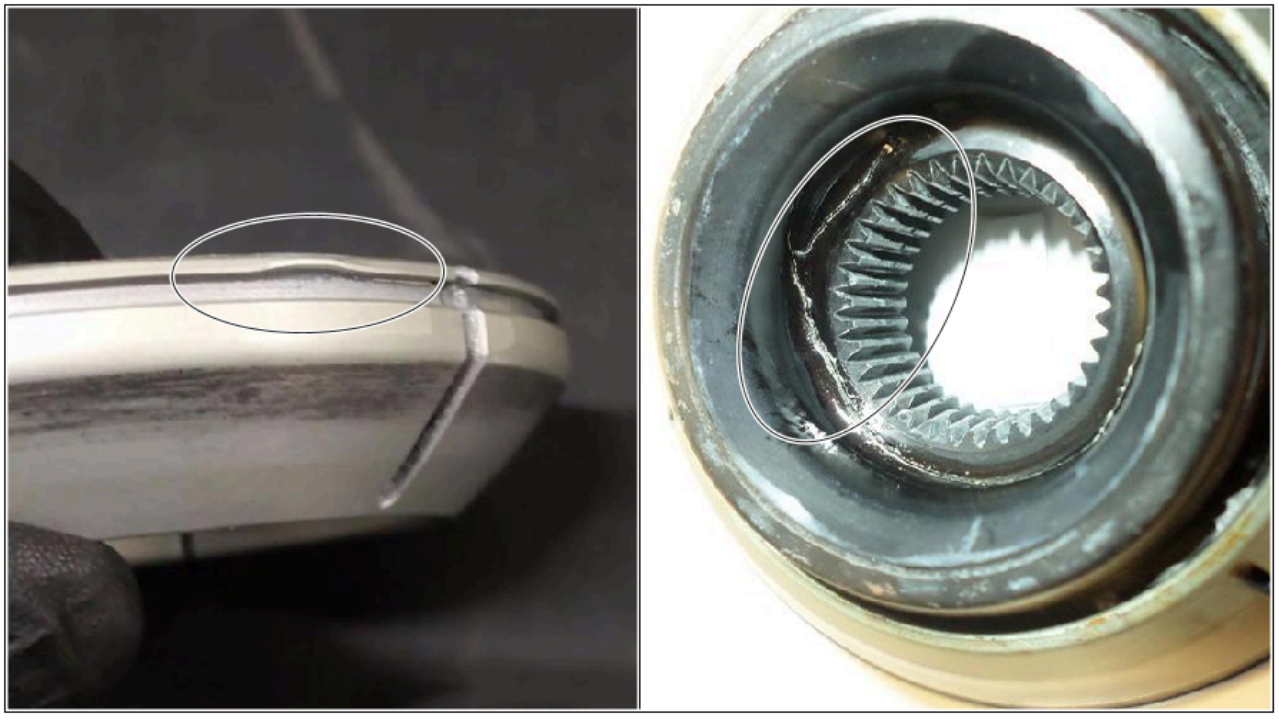
Work Procedure: 1 Disassemble central wheel lock.
For instructions, see:
⇒ *Workshop Manual '440737 Disassembling and assembling central wheel lock'*

2 Check central wheel lock for sufficient lubricating film ⇒ *Lubricating film on central wheel lock* , cracks, deformation ⇒ *Example of damage* and other damage. Damage can occur at the following points:

- Wheel hub thread
- Central wheel lock thread
- Cone on rim
- Cone on central wheel lock



*Lubricating film on central wheel lock*



*Example of damage*

**Information**

If new parts are used, it is necessary to perform the wheel tightening procedure during wheel assembly as described in the Workshop Manual ⇒ *Workshop Manual '440519 Removing and installing wheel with central bolt'*.

Parts Info: **Required parts if necessary for one side of the vehicle:**

| Part No. | Designation<br>– Point of use | Number |
|---|---|---|
| 992601119B | ⇒ Central wheel lock complete | 1 piece |
| | **or** | |
| PAF008814 | ⇒ O-ring<br>– Central wheel lock | 1 piece |
| | **or** | |

| | | |
|---|---|---|
| 9P1601213 | ⇒ Support<br>– Central wheel lock | 1 piece |
| | **or** | |
| 9P1601299 | ⇒ Central lock cone ring<br>– Central wheel lock | 1 piece |
| | **or** | |
| 9P1601138 | ⇒ Circlip<br>– Central wheel lock | 1 piece |

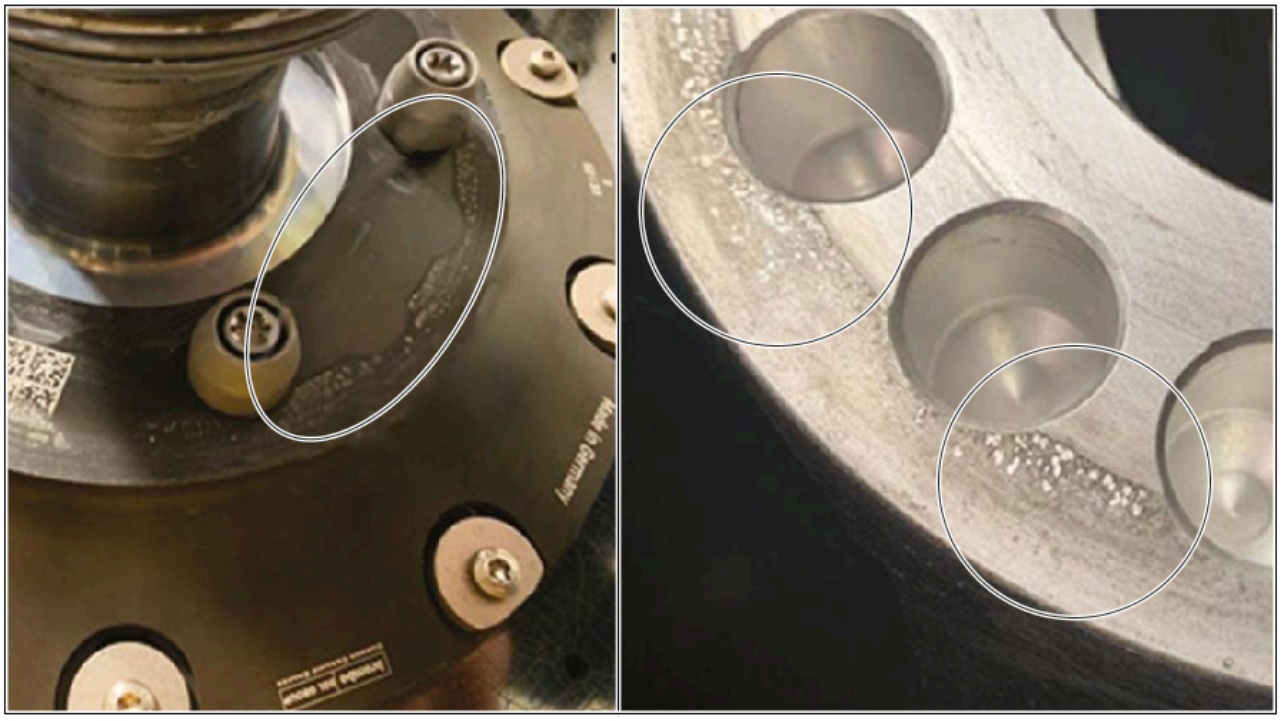
**Check contact surfaces of the rim, brake disc and wheel hub for loss of friction**

**Information**

A reduced friction coefficient between the surfaces can be due to:

- Material transfer from rim to brake disc or from rim to driver pin
- Anti-corrosion oil on the contact surfaces
- Contact surfaces dirty, e.g. brake dust
- Hub grease on the contact surface

Work Procedure: 1 Check the mounting surface of the wheel hub and inside of the rim for material transfer or corrosion.
⇒ *Material transfer for brake disc/wheel hub*



*Material transfer for brake disc/wheel hub*

**Information**

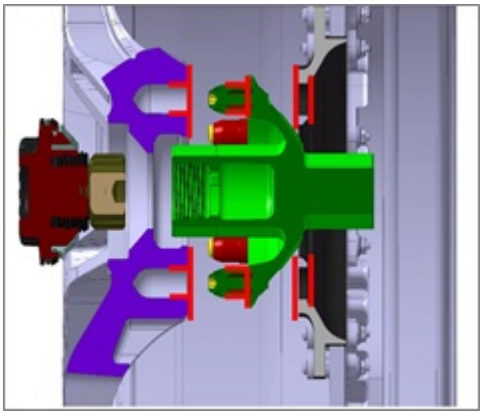
If there has been material transfer from the rim to the brake disc, the brake disc must be replaced. For instructions, see:
⇒ *Workshop Manual '465019 Removing and installing front brake disc'*

2 Document material transfer or corrosion, if available, with pictures.

3 Remove front brake discs. ⇒ *Workshop Manual '465019 Remove and install front brake disc'*

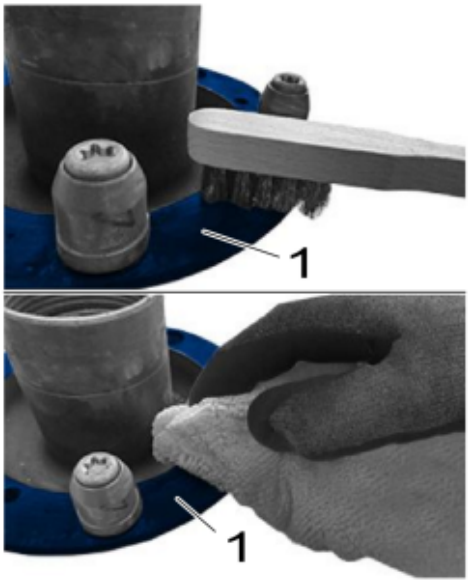
4 Check contact surface of brake disc, wheel hub and rim for dirt and clean them if necessary.

4.1 **Clean wheel assembly:**



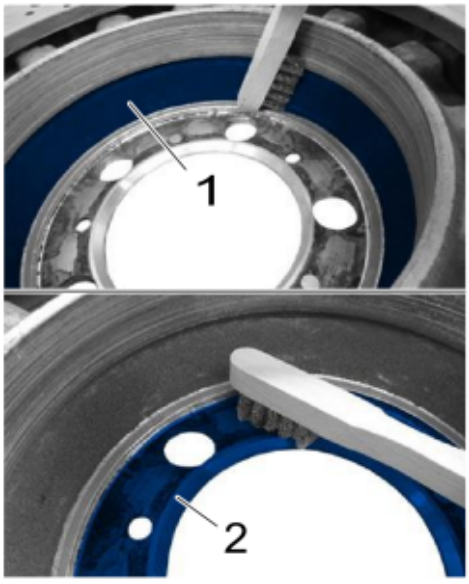
*Contact surfaces of brake disc, wheel hub, rim*

Brush off wheel hub ⇒*Cleaning wheel hub* **-1-** using a brass brush until all particles of dirt have been removed. Then spray a microfiber cloth with brake cleaner and use it to rub off the wheel hub ⇒*Cleaning wheel hub* **-1-**.




*Cleaning wheel hub*

4.2 Clean brake dust off the inner brake disc hub ⇒*Cleaning brake disc hub* **-1-** and brush off the contact surface between brake disc and wheel hub ⇒*Cleaning brake disc hub* **-2-** using a brass brush until all particles of dirt have been removed. Then, spray a microfiber cloth with brake cleaner and use it to rub off the cleaned areas.



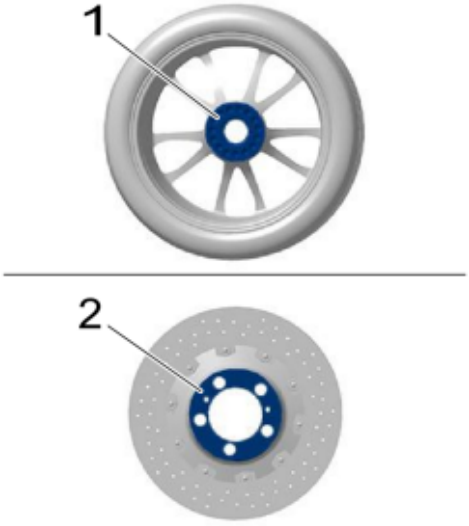

*Cleaning brake disc hub*

4.3 Clean the contact surfaces between the rim and brake disc ⇒*Contact surfaces between rim / brake disc* **-1 and 2-** using a microfiber cloth and brake cleaner **(do not use a brass brush)**.

**Information**

Make sure that the cleaned surfaces are kept clean until assembly is complete.

5 Check driving pins.




*Contact surfaces between rim / brake disc*

5.1 Check material transfer at the driving pins. If a material transfer has taken place, the driving pins must be replaced. ⇒ *Material transfer on driving pin*

5.2 **Subsequent torque 22 Nm (16.2 ftlb.)**of screw connection for wheel driving pin and then remove brake disc. If the pins can still be turned, replace pins and screws and clean the thread and contact surfaces to remove any remaining screw-locking material.

⇒ *Workshop Manual '465319 Removing and installing rear brake disc'*

⇒ *Workshop Manual '465419 Removing and installing rear PCCB brake disc'*

*Material transfer on driving pin*

5.3 Check wheel driving pins for damage. If there are visible signs of damage, replace pins and screws and clean the thread and contact surfaces to remove any remaining screw-locking material.

**Information**

If new parts are used, it is necessary to perform the wheel tightening procedure during wheel assembly as described in the Workshop Manual ⇒ *Workshop Manual '440519 Removing and installing wheel with central bolt'*.

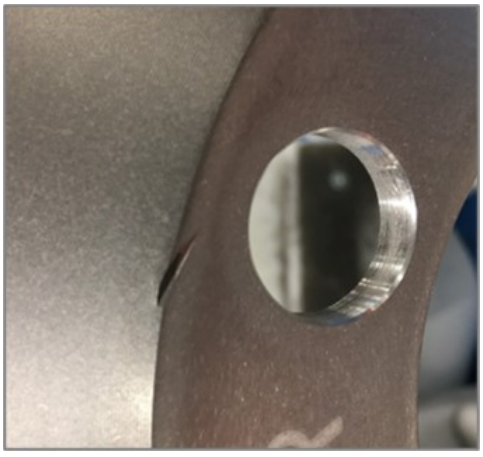
**Checking rim, brake disc and wheel hub for geometric discrepancies**

**Information**

Geometrical discrepancies may be due to the following factors:

- Damaged parts
- Wear
- Use of new and old parts

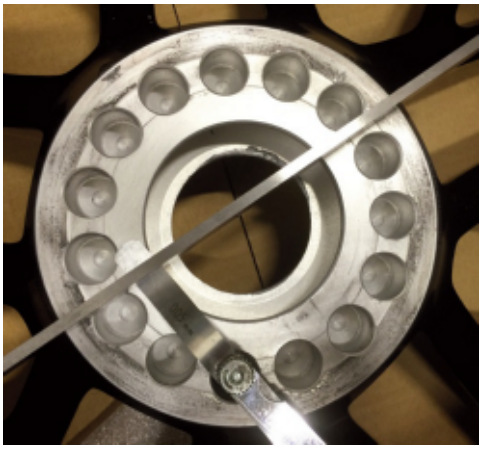
Work Procedure: 1 Check brake discs, wheel hub and rim for damage, e.g. notches or "dents" due to incorrect assembly.
⇒ *Example of damage*



*Example of damage*

2 Check contact surface of the rim.
To ensure that the surface is flat, check the rim using a ruler and feeler gauge.
Uneven surfaces can affect the rim and cause noise.

2.1 Check the inside of the rim for evenness at least at six different positions (approx. every 60°) using a straight edge (e.g. 12" Starret 380) and a feeler gauge at the measuring points ⇒ *Measuring points on inside of rim* **-Arrow-**.

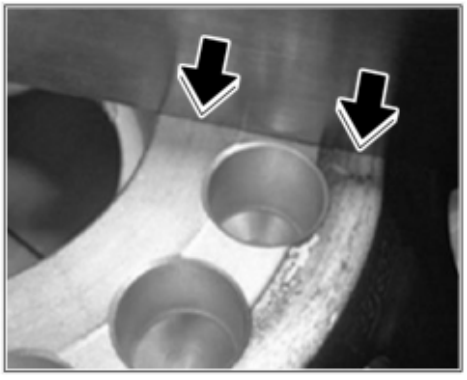


*Checking rim*

| Dimensions | | Assessment |
|---|---|---|
| **(✓)** | up to 0.1 mm | Evenness **OK**. |
| **(✗)** | from 0.11 mm | Evenness **not OK**. |

Document all measurements with photos.

If there are uneven surfaces, replace the affected rim.



*Measuring points on inside of rim*

**Information**

If new parts are used, it is necessary to perform the wheel tightening procedure during wheel assembly as described in the Workshop Manual ⇒ *Workshop Manual '440519 Removing and installing wheel with central bolt'*.

## Concluding work

Work Procedure:

**Information**

During wheel assembly, the **three tightening stages** must always be observed as described in the Workshop Manual ⇒ *Workshop Manual '440519 Removing and installing wheel with central bolt'* and using the following special tools:

- **9451 - Socket wrench**
- **9794 - Assembly aid**
- **9796 - Socket wrench**

The central bolt must be tightened in **continuous movement** to ensure that the specified tightening torque is achieved.

1 Install front brake discs. ⇒ *Workshop Manual '465019 Remove and install front brake disc'*

2 Install front wheels. ⇒ *Workshop Manual '440519 Removing and installing wheel with central bolt'*

## Working position and PCSS encryption

Labor position:

| APOS | Labor operation | I No. |
|---|---|---|
| 44074941 | Reworking wheel mount (left) | |
| 44074942 | Reworking wheel mount (right) | |

PCSS encryption:

| | | |
|---|---|---|
| **Location (FES5)** | 4407A | Wheel mount central bolt |
| **Damage type (SA4)** | 9735 | Repair according to PAG instructions |