

**Misfiring at High RPM (59/15)**



**Information**

This Technical Information replaces the previous Technical Information dated September 2, 2015.

- **Reason: Different repair concept used if there are visible signs of wear on camshaft and/or valve levers**

If visible signs of wear are found on the camshaft and/or valve levers during the fault finding steps described in this Technical Information, **the engine must always be replaced.**

This means that the various repair stages used previously depending on the date of manufacture of the respective engine will no longer be used.

**Please note this procedure may lead to a diagnosis of a replacement engine. Standard warranty policy and procedures must be adhered to with respect to major assembly replacement.**

You will find details of the procedure in the description below.

Vehicle Type: **911 GT3 (991)**

Model Year: **As of 2014 up to 2016**

Concerns: **Engine malfunction (Misfiring at high rpm)**

- Situation:
- **Diagnostic path for fault finding in the event of the complaint "Engine malfunction"**
  - **Required repair measures**

## Diagnostic path for systematic fault finding

Action  
Required:



### Information

The following diagnostic path will assist you to quickly and effectively diagnose "**Misfires at high rpm** (> 7,000 rpm)".

In particular, this involves identifying possible wear on the valve levers which usually occurs at high engine speeds.

If misfires occur even at **considerably lower engine speeds** or **over the entire rpm range** and depending on the fault memory entries stored in the DME control unit fault memory, the **components that are usually affected by this type of fault** (spark plugs, ignition coils, injectors, etc.) must always be checked **first** in accordance with the instructions provided under Guided Fault Finding in the PIWIS Tester.

The recommended procedure for systematic fault finding in the event of the complaint "Misfires at high rpm (> 7,000 rpm)" is described here. For greater clarity, the detailed description includes a condensed overview of the information in the form of a table.

### Customer complaint:

- Engine malfunctions occur during **full-load acceleration at high rpm** (> 7,000 rpm).
- The **yellow warning message** "Reduced power Driving permitted Consult a garage" is displayed on the multi-function display in the instrument cluster.
- The **engine warning light** ("Check Engine" symbol) also comes on in the instrument cluster.
- Engine running in **limp-home mode**.
- The engine warning light and warning message disappear after switching off the ignition and then switching it back on again (ignition reset). The engine is running normally again.

### Fault verification:

If these symptoms are present, the fault must be verified using the procedure described below.



### Information

If misfires occur even at **considerably lower engine speeds** or **over the entire rpm range** and depending on the fault memory entries stored in the DME control unit fault memory, the **components that are usually affected by this type of fault** (spark plugs, ignition coils, injectors, etc.) must always be checked **first** in accordance with the instructions provided under Guided Fault Finding in the PIWIS Tester.

- **Read out the fault memory using the PIWIS Tester:** The fault entry **P0300 – Misfire totals error** together with a fault entry **P0301 ... P0306 (Misfire cylinder 1 ... 6)** is set in the DME control unit fault memory.
- **Create Vehicle Analysis Log (VAL)** using the PIWIS Tester.
- **Test-drive the vehicle until the fault occurs:** Drive with full-load acceleration in 3rd gear (manual gate) over a rev range of 4,000 – 8,500 rpm
- **Reproduce the fault:** The fault can be reproduced again - always in the same rev range (+/- 300 rpm) - as described above.

**Action Required:**

1 The fault **cannot** be reproduced:

- There is a high probability that the malfunction is **not** caused by wear on a valve lever. Another component must be checked in order to determine the cause.
- If necessary, contact Technical Support in order to decide what to do next.

2 **The fault can be reproduced:**

2.1 Swap the ignition coil and spark plug from the "suspect" cylinder with the ignition coil and spark plug from a cylinder that is working perfectly.

For instructions, see ⇒ *Workshop Manual '282020 Removing and installing ignition coils'* and ⇒ *Workshop Manual '287020 Removing and installing spark plugs'*.

2.2 Test-drive the vehicle and try to reproduce the fault again under the conditions specified above.

2.3 Then read out the fault memory of the DME control unit using the PIWIS Tester and check whether the same fault memory entry is stored again, i.e. after swapping the ignition coil and spark plug, the previously suspect cylinder is now working perfectly and the fault occurs instead on the cylinder into which you installed the ignition coil and spark plug from the cylinder that was originally suspect.

- If **YES** (The same fault is stored again): Remove the ignition coil from the cylinder that is now suspect and install it again in the cylinder that was originally suspect. Leave the spark plug in the cylinder that is now suspect. Then test-drive the vehicle again and reproduce the fault again in order to clearly identify the component that is causing the fault.
- If **NO** (The cylinder that was originally suspect is still suspect): Remove the cylinder head cover on the suspect cylinder bank and check the camshafts and valve levers for visible signs of wear. For instructions, see section ⇒ *Technical Information '1X0000 Checking camshafts and valve levers for wear'*.

Summary:

<b>Customer complaint</b>	
<ul style="list-style-type: none"> <li>• Engine malfunctions occur during full-load acceleration at high rpm (&gt; 7,000 rpm).</li> <li>• The yellow warning message "Reduced power Driving permitted Consult a garage" is displayed on the multi-function display in the instrument cluster.</li> <li>• The engine warning light ("Check Engine" symbol) also comes on in the instrument cluster.</li> <li>• Engine running in limp-home mode.</li> <li>• The engine warning light and warning message disappear after switching off the ignition and then switching it back on again (ignition reset). The engine is running normally again.</li> </ul>	
<b>Fault verification</b>	
<ul style="list-style-type: none"> <li>• <b>Read out the fault memory using the PIWIS Tester:</b> The fault entry <b>P0300 – Misfire totals error</b> together with a fault entry <b>P0301 ... P0306 (Misfire cylinder 1 ... 6)</b> is set in the DME control unit fault memory.</li> <li>• <b>Create Vehicle Analysis Log (VAL)</b> using the PIWIS Tester.</li> <li>• <b>Test-drive the vehicle until the fault occurs:</b> Drive with full-load acceleration in 3rd gear (manual gate) over a rpm range of 4,000 – 8,500 rpm.</li> <li>• <b>Reproduce the fault:</b> The fault can be reproduced again - always in the same rev range (+/- 300 rpm) - as described above.</li> </ul>	
<b>Fault can be reproduced</b>	<b>Fault cannot be reproduced</b>
<ul style="list-style-type: none"> <li>• Swap the ignition coil and spark plug from the "suspect" cylinder with the ignition coil and spark plug from a cylinder that is working perfectly.</li> <li>• Test-drive the vehicle and try to reproduce the fault again under the conditions specified above.</li> <li>• Check whether the same fault memory entry is stored again.</li> <li>• If <b>YES:</b> Remove the ignition coil from the cylinder that is now suspect and install it again in the cylinder that was originally suspect. Leave the spark plug in the cylinder</li> </ul>	<ul style="list-style-type: none"> <li>• There is a high probability that the malfunction is <b>not</b> caused by wear on a valve lever. Another component must be checked in order to determine the cause.</li> <li>• If necessary, contact Technical Support in order to decide what to do next.</li> </ul>

that is now suspect. Then test-drive the vehicle again and reproduce the fault again in order to clearly identify the component that is causing the fault.

- If **NO**: Remove the cylinder head cover on the suspect cylinder bank and check the camshafts and valve levers for visible signs of wear. For instructions, see section ⇒ *Technical Information '1X0000 Checking camshafts and valve levers for wear'*.

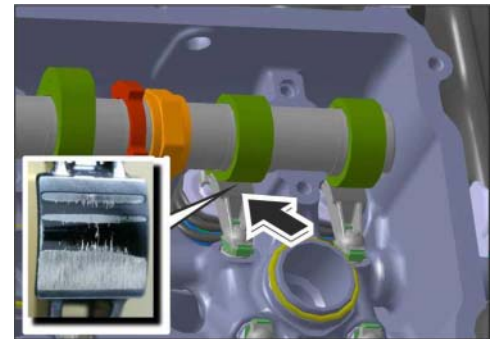
### Checking camshafts and valve levers for wear

Work Procedure: 1 Remove cylinder head cover on the affected cylinder bank ⇒ *Workshop Manual '158219 Removing and installing cylinder head cover'*.

2 Check camshafts and valve levers for visible signs of wear.

#### The following problems indicate a worn valve lever:

- Rough surface on the cams of the cylinder in question. If there is a significant amount of wear, the contour of the tip of the cam will be "square" and will show significant tempering colors (blue/brown discoloration of the material caused by high temperatures).
- The valve lever shows significant signs of linear wear on the contact surface to the cam ⇒ *Wear on valve lever -arrow-* at the edge of the hydraulic valve clearance compensating element ⇒ *Wear on valve lever -inset-*. The black coating is worn down and the silver base material can be seen.



*Wear on valve lever*

3 **If there are visible signs of wear on the camshaft and/or valve levers:**  
**Take photos and replace the engine**

- 3.1 Take photos of the damaged areas on the camshaft and/or valve levers ⇒ *Wear on valve lever -arrow-*. Make sure that the photos clearly show the installation position of the valve levers in question.

Also indicate the installation position of the valve levers in question (e.g. cylinder 6 – intake) or identify the components by labelling them ⇒ *Marking valve levers*.

- 3.2 Document the **photos** together with the **vehicle analysis log** and the **engine number** of the vehicle in the related PQIS job.
- 3.3 Replace engine and re-program DME control unit. For instructions, see ⇒ *Technical Information '1X0000 Repair measures'*.



*Marking valve levers*

References: ⇒ *Workshop Manual '158219 Removing and installing cylinder head cover'*  
 ⇒ *Workshop Manual '282020 Removing and installing ignition coils'*  
 ⇒ *Workshop Manual '287020 Removing and installing spark plugs'*

## Repair measures

- Work Procedure: 1 Replace engine ⇒ *Workshop Manual '100119 Removing and installing engine'*.
- 2 **After** you have **replaced the engine**, re-program the **DME control unit** using the **PIWIS Tester** with PIWIS Tester software version **15.700** (or higher) installed: **DME control unit** > ⇒ **'Programming'** menu >> **'Automatic programming'** function.
  - 3 **After** completing the **work**, carry out a **test drive** until the **engine** reaches **operating temperature**.
  - 4 **After** carrying out the **test drive**, use the **PIWIS Tester** to create a **Vehicle Analysis Log (VAL)** and select the function ⇒ **'Data management'** > **'VAL data return'** using the PIWIS Tester to **send it to PCNA**.

Parts Info:



### Information

To **simplify** the **ordering process**, the **additional parts required for replacing the engine** have been grouped together as a **repair kit** under **one part number**.

**Overview of the parts to be ordered for replacing the engine:**

Part No.	Designation – Use	Qty.
9A1 100 975 EX	⇒ Replacement engine	1 ea.
000 043 303 61	⇒ Engine repair kit	1 ea.

The **parts** included in the **repair kit** and details of where they are used are **listed** here **for your information**.

**There is no need to order the parts individually unless additional individual parts are required.**

Part No.	Designation – Use	Qty.
000 043 303 61	Engine repair kit	1 ea.
<b>Includes:</b>		
• 999 073 443 01	Combination screw, M12 x 1.5 x 40 – Threaded joint for diagonal brace	2 ea.
• 999 072 869 01	Hexagon-head bolt, M12 x 1.5 x 45 – Threaded joint for diagonal brace	2 ea.
• 999 084 123 09	Hexagon nut, M10 – Threaded joint securing anti-roll bar to connecting link	2 ea.
• 900 076 064 02	Hexagon nut, M8 – Threaded joint securing anti-roll bar to body	4 ea.
• 999 072 868 01	Hexagon-head bolt, M12 x 1.5 x 80 – Threaded joint for rear axle cross member	2 ea.
• 999 072 859 01	Hexagon-head bolt, M12 x 1.5 x 58 – Threaded joint for rear axle cross member	2 ea.
• 999 084 445 01	Hexagon nut, M12 x 1.5 – Threaded joint for rear axle cross member	4 ea.
• 999 076 053 01	Hexagon nut, M10 – Threaded joint for transmission support	2 ea.
• 999 086 009 02	Hexagon nut, M12 – Threaded joint for transmission mount	1 ea.
• N 908 484 05	Hexagon nut, M12 x 1.5 – Threaded joint for engine carrier	2 ea.
• 996 106 801 03	O-ring – Coolant lines	3 ea.
• 999 707 660 40	O-ring – Desiccator	2 ea.
• 944 573 143 01	Desiccator	1 ea.
• N 906 651 01	Cheese head bolt, M10 x 1 x 29 – Threaded joint securing flywheel to crankshaft	10 ea.

• 999 385 009 01	Hexagon round-head bolt, M12 x 1.5 x 55 – Threaded joint securing transmission to engine	6 ea.
• 999 073 517 01	Cheese head bolt, M10 x 1 x 46.5 – Threaded joint securing drive shaft to transmission	12 ea.
• 997 111 336 90	Clamp – For securing front silencer to catalytic converter flange	2 ea.
• 900 380 005 01	Hexagon nut, M8 – For securing front silencer holder	4 ea.
• 900 067 362 01	Cheese head bolt, M8 x 50 – Threaded joint for restraining straps for rear silencer	2 ea.
• 999 651 401 01	Line bracket – For securing control line for exhaust flaps to engine carrier	4 ea.
• 999 512 707 00	Hose clamp – For securing control line for exhaust flaps to vacuum unit	2 ea.
• N 100 988 11	Hexagon-head bolt, M6 x 16 – Threaded joint for heat shield on engine carrier	3 ea.
• 980 111 561 00	Seal – Exhaust manifold	2 ea.

Materials:

**Required materials** (usually already available in the Porsche dealership, only order if additional materials are required):

Part No.	Designation – Use	Qty.
000 043 020 00	Optimoly TA mounting paste – Wheel centering surface on wheel hub	100g tube (approx. 5–10 grams required per vehicle)
000 043 205 93	Klüberplus Gel grease – For coating O-rings and coolant hoses	100g tube (approx. 5 grams required per vehicle)



000 043 305 16	Antifreeze	20-liter container (approx. 5 liters required per vehicle)
000 043 004 00	Optimoly HT mounting grease – For greasing clamp securing front silencer to catalytic converter flange	90g tube (approx. 10 grams required per vehicle)

Tools:

• **Auxiliary tool:**

Part No.	Designation – Use	Qty.
9A1 101 213 00	Transport eyebolt – For lifting engine	1 for every Porsche dealership (only if not already available)

• **Special tools:**

Designation/Comment	Use
<b>9900 - PIWIS Tester 3</b> Battery charger (current rating of at least 40 A), e.g. <b>VAS 5907 - battery charger 45A</b>	Creating VAL/On-board diagnosis
<b>9453 - Access ramps</b> Only if required (depending on type of lifting platform)	Moving the vehicle onto the lifting platform
<b>9794 - Assembly aid</b> <b>9796 - Socket wrench</b> Torque wrench, 150 – 800 Nm (111 – 592 ftlb.), e.g. <b>V.A.G 1601 - Torque wrench, 150 - 800 Nm (111 - 592 ftlb.)</b>	Removing and fitting rear wheels
Suitable air-conditioning service unit, e.g. <b>VAS 6456A - A/C service station with rinsing device</b>	Draining and filling refrigerant in the air conditioning system
Disassembly tool, e.g. <b>VAS 6933 - Disassembly tool</b>	Disconnecting parking lock cable from PDK transmission
<b>9822 - Assembly tool</b>	Opening and fitting air conditioning lines
<b>9443 - Oil filter wrench</b> Oil collection container	Removing oil filter

<p>Assembly pliers for spring band clamps, e.g. <b>VAS 6856 - Spring band clamp pliers</b></p> <p><b>VAS 6832 - Master Gear unit elevating platform</b></p> <p><b>9769 - Retainer plate</b></p> <p><b>9769/1 - Support</b></p> <p>Suitable tension strap for securing the engine on the lifting platform during removal, e.g. <b>9454 - strapping belts</b></p>	Removing and installing engine
<p>Workshop crane, e.g. <b>VAS 6100 - Workshop crane</b></p> <p>Suitable lifting equipment, e.g. cross member with carabiner hook and lifting straps</p>	Lifting the engine
<p><b>VAS 6766 - Counter-hold tool</b></p> <p><b>9321 - Centring pins</b></p> <p>Torque angle torque wrench for tightening the fastening screws for the flywheel to a tightening torque of 25 Nm (19 ftlb.) and torque angle of 120°, e.g. <b>VAS 6942 - Torque/torque angle screw tool</b></p>	Removing and installing flywheel
<b>VAS 6199 - Pliers for hose clamp with side cutters</b>	Removing and fitting hose clamps on the control line for exhaust flaps
Coolant collection container	Draining coolant
<b>9696 - Filling device</b>	Filling coolant and bleeding the cooling system

- **Other tools:**

Torque screwdriver, 1.5 – 3 Nm (1 – 2 ftlb.), e.g. **VAS 6494 - Torque screwdriver**

Torque wrench, 4 – 20 Nm (3 – 15 ftlb.), e.g. **WE1052 - Torque wrench V.A.G. 1410/1576**

Torque wrench, 6 – 50 Nm (4.5 – 37 ftlb.), e.g. **V.A.G 1331 - Torque wrench, 6-50 Nm (4.5-37 ftlb.)**

Torque wrench, 40 – 200 Nm (30 – 148 ftlb.), e.g. **V.A.G 1332 - Torque wrench, 40-200 Nm (30-148 ftlb.)**

Torque angle torque wrench, 4 – 400 Nm (3 – 296 ftlb.), e.g. **VAS 6942 - Torque/torque angle screw tool**

Insert for torque wrench, Torx E18

Ring insert for torque wrench, a/f 18

References:     ⇒ *Workshop Manual '100119 Removing and installing engine'*  
                  ⇒ *Workshop Manual '373427 Removing and mounting Porsche Doppelkupplung (PDK)'*

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

<b>Location (FES5)</b>	15050	Camshaft
<b>Damage type (SA4)</b>	1824	severe wear

**Important Notice:** Technical Bulletins issued by Porsche Cars North America, Inc. are intended only for use by professional automotive technicians who have attended Porsche service training courses. They are written to inform those technicians of conditions that may occur on some Porsche vehicles, or to provide information that could assist in the proper servicing of a vehicle. Porsche special tools may be necessary in order to perform certain operations identified in these bulletins. Use of tools and procedures other than those Porsche recommends in these bulletins may be detrimental to the safe operation of your vehicle, and may endanger the people working on it. Properly trained Porsche technicians have the equipment, tools, safety instructions, and know-how to do the job properly and safely. Part numbers listed in these bulletins are for reference only. The work procedures updated electronically in the Porsche PIWIS diagnostic and testing device take precedence and, in the event of a discrepancy, the work procedures in the PIWIS Tester are the ones that must be followed.

© 2018 Porsche Cars North America, Inc.