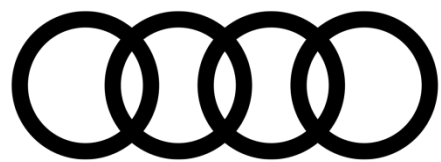


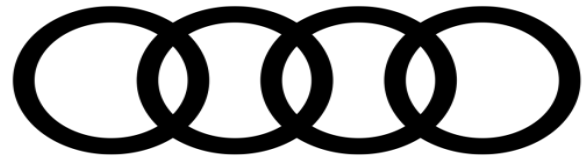
ATU (Audi Technical Update)

Winter 2019



Chassis

Winter 2019



ATU 2019– Brake System

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01.

Brake System

1.0 MLBevo – new procedure for bleeding brake systems

Brake System

1.0 MLBevo – new procedure for bleeding brake systems

- › Due to the routing of the brake lines, it is not always possible to bleed the brake system successfully using only commercially available brake bleeding equipment.
- › Procedure in ODIS has changed.



Old procedure:

Self-diagnosis

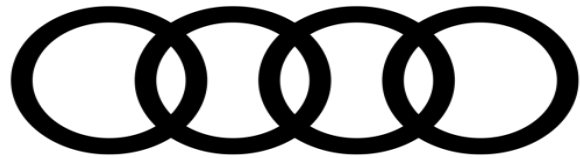
- › 003 Brakes
- › Perform basic setting
- › Bleed brakes

- › Use login “40168”

New procedure (front and rear systems):

Self-diagnosis

- › 003 Brakes
- › Perform basic setting
- › Select “Bleed brakes”
 - › arrow to right
- › Select “Bleed front”
 - › arrow to right
- › Brake bleeding and check for interchange + arrow to right
- › Use login “40168”
- › Press start (pump starts operating)



ATU - Tire pressure loss indicator

Tire pressure warning received

Agenda

01.
Introduction

02.
**Function of the tire pressure
loss indicator (TPLI)**

03.
**Tire pressure warning – design
for gradual loss of pressure**

04.
**Tire pressure warning without
actual loss of pressure**

05.
**Diagnosis in the event of a
false tire pressure warning**

06.
Summary

01. Introduction

- › Isolated concerns that a tire pressure warning is issued for no reason are reported repeatedly.
- › Replacing various parts such as the ABS control module or speed sensor does not fix the problem.
- › The problem cannot be resolved even after several repair attempts.
- › In the case of many concerns, there is no technical fault.

02. Function of the tire pressure loss indicator (TPLI)

➤ **The TPLI (tire pressure loss indicator) is primarily designed for two scenarios:**

1. Rapid loss of pressure in one tire due to damage (e.g. nail in tire).
2. Slow loss of pressure in all tires due to natural diffusion.

1. Rapid loss of pressure in one tire:

- A rapid loss of pressure is identified via the wheel speed sensor.
- When a tire loses air, the dynamic rolling circumference changes, which in turn causes a change in the wheel speed.
- The wheel speeds of the other three tires that have not lost pressure remain unchanged.
- This difference compared to the unchanged wheel speeds is identified.
- A rapid drop in pressure can often also quickly be identified from the outside as it results in a visible flat tire relatively quickly.

02. Function of the tire pressure loss indicator

2. Slow loss of pressure in all tires due to natural diffusion:

- › The wheel speeds of all wheels change by approximately the same amount.
 - › The difference between the wheel speeds of the four wheels remains almost the same.
 - › It is therefore not possible for the change in all wheel speeds to be identified because there is no reference value.
 - › In this case, loss of pressure is identified on the basis of the natural frequency of the tires.
 - › The wheel speed signals also transmit the natural frequency of a tire.
 - › The natural frequencies change depending on the tire pressure.
 - › A loss of pressure is identified on the basis of this change.
-
- › Gradual loss of pressure happens very slowly. It is therefore not visible from the outside in the initial phase.
 - › **For this reason, a warning that results from gradual loss of pressure is often defined as an unexplained concern.**

03. Design of tire pressure warning for gradual pressure loss

The tire pressure should be checked and stored at least once a month according to the Owner's Manual.

- › The TPLI is primarily intended to prompt the driver to check the tire pressure before damage occurs. The aim of the TPLI is not to issue a warning once a tire is already flat.
- › The TPLI is therefore designed to warn the driver at an early stage when loss of air starts to occur.
- › A warning is already displayed after a loss of pressure of 10-20%, depending on the driving conditions and the specific vibration behavior of the tire.
 - › In this case, the tire pressure must be corrected and stored.

03. Design of tire pressure warning for gradual pressure loss

Example:

- › According to the tire pressure sticker, the permissible tolerance range between the maximum tire pressure and the minimum tire pressure (comfort value) is 0.3 bar (4.5 psi).
- › If the tire is filled to the maximum pressure and this pressure is stored, and the air pressure subsequently drops by 0.3 bar (4.5 psi), the tire pressure will still be within the permissible tolerance range.
- › However, a tire pressure warning may still be issued.

04. Tire pressure warning without actual loss of pressure

- › Loss of pressure is determined indirectly.
- › In certain situations the tire radius or vibration behavior can also be influenced by other factors.
- › It is therefore not possible to rule out a tire pressure warning being issued without previous loss of pressure.

- › The rolling circumference of a new tire may change multiple times during the running-in phase of approx. 350 miles (500 km).
- › If one side of the vehicle is subject to significantly higher load, the dynamic rolling circumference will be affected on one side.

- › Different road conditions may lead to a pressure warning:
 - › For example, if one side of the road is icy and the other is not.
- › Differences in how much tires have been heated up can lead to a pressure warning:
 - › For example, if one side of the vehicle is exposed to strong sunlight.

05. Diagnosis in the event of a false tire pressure warning

- › There are no diagnostic tools available in the event of a false tire pressure warning.
- › The last five calibrations and warnings can be read out via the measured values.
- › However, the crucial reference value for the actual loss of pressure is not available.
- › With the exception of the value for the outside temperature, all values used for the TPLI are determined in the brake electronics control module.
- › Recording all data bus messages therefore does not result in any significant information.
- › For this reason, a data logger generally cannot provide any usable information.

05. Diagnosis in the event of a false tire pressure warning

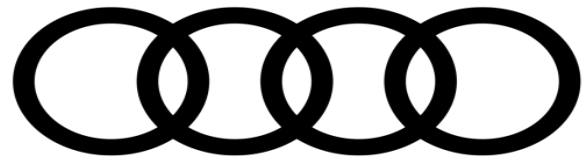
Effect of the ABS speed sensor on the TPLI function

- › The signal of the speed sensor is defined by a frequency of the magnets in the sensor ring.
- › Foreign objects, dirt, or internal damage to the magnets in the sensor ring can make this signal unrecognizable, but this does not lead to an inaccurate speed value.
- › Faults in the area of the speed sensor or sensor ring cause the TPLI to be deactivated and the message “TPMS fault” to appear, but they do not usually result in a pressure warning.

- › **The test method that is most likely to yield a result is to try changing the wheels:**
 - › In the case of a pressure warning for a tire in a specific position, swap the affected tire with a tire from a different position.
 - › In the case of a general pressure warning, try fitting a different set of tires.

06. Summary

- › The tire pressure loss indicator already issues a warning when loss of pressure begins to occur.
- › A warning may already be issued once a deviation of 10% from the stored tire pressure has occurred.
- › If a pressure warning is given when the tire pressure is within the tolerance range, this does not necessarily mean that there is a technical fault in the system.
- › Pressure warnings that are issued as a result of a small initial loss of air are often thought to be false.
- › If a pressure warning is genuinely false, no diagnostic tools are available.
- › The only remaining diagnosis method that is likely to yield a result is to try changing the wheels.



ATU – Fuel tank

Design and function

Agenda

**01.
Versions**

**02.
Fuel delivery/sender
technology**

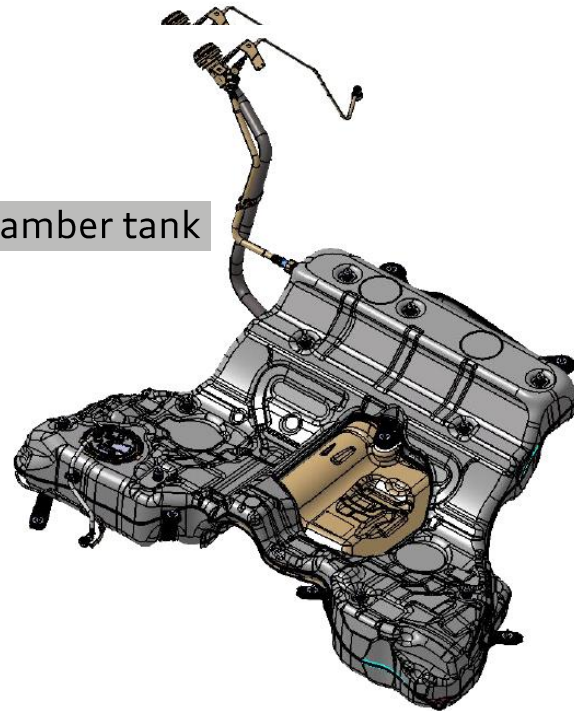
**03.
Breather system for Audi B9**

**04.
Summary**

01. Versions

1. Single-chamber and dual-chamber tanks are fitted on Audi vehicles.
2. Dual-chamber tanks are used on vehicles with quattro drive to achieve a large tank capacity despite limited installation space.

Dual-chamber tank

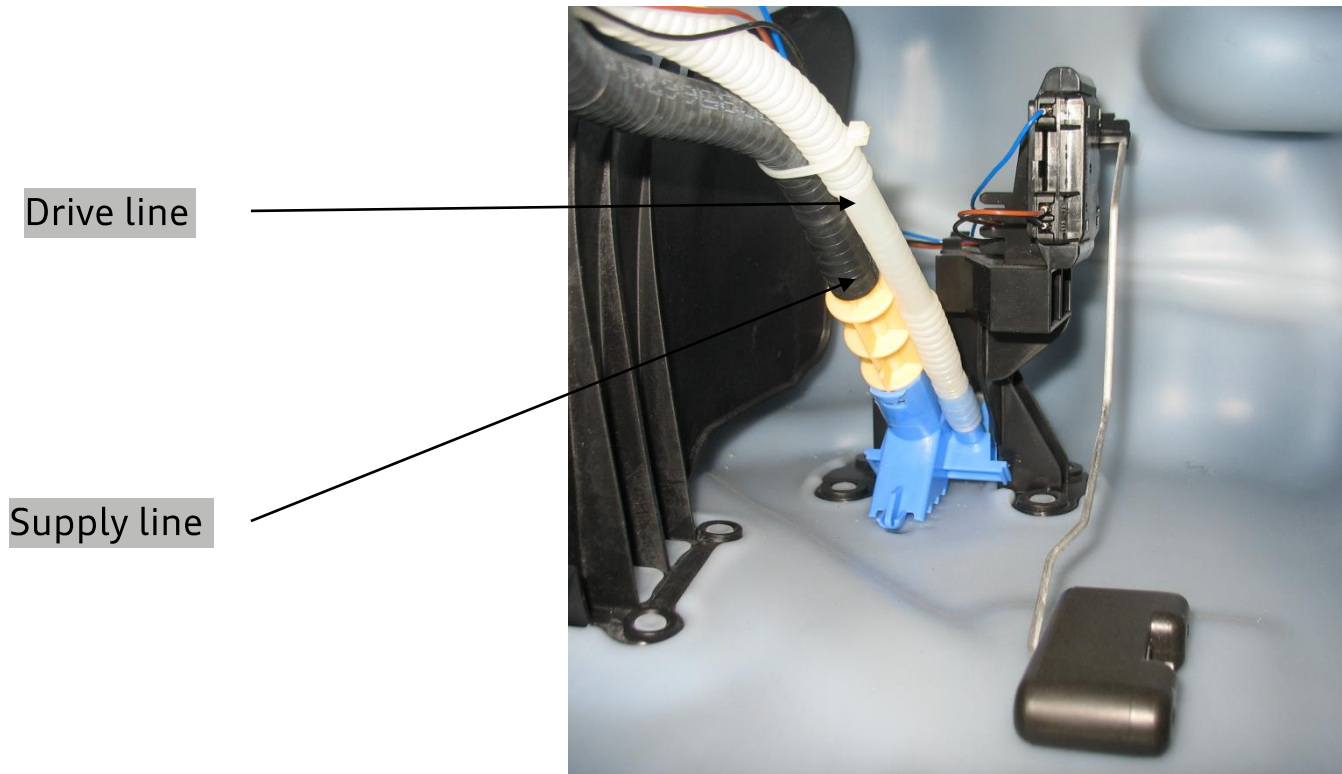


Single-chamber tank



02. Fuel delivery/sender technology

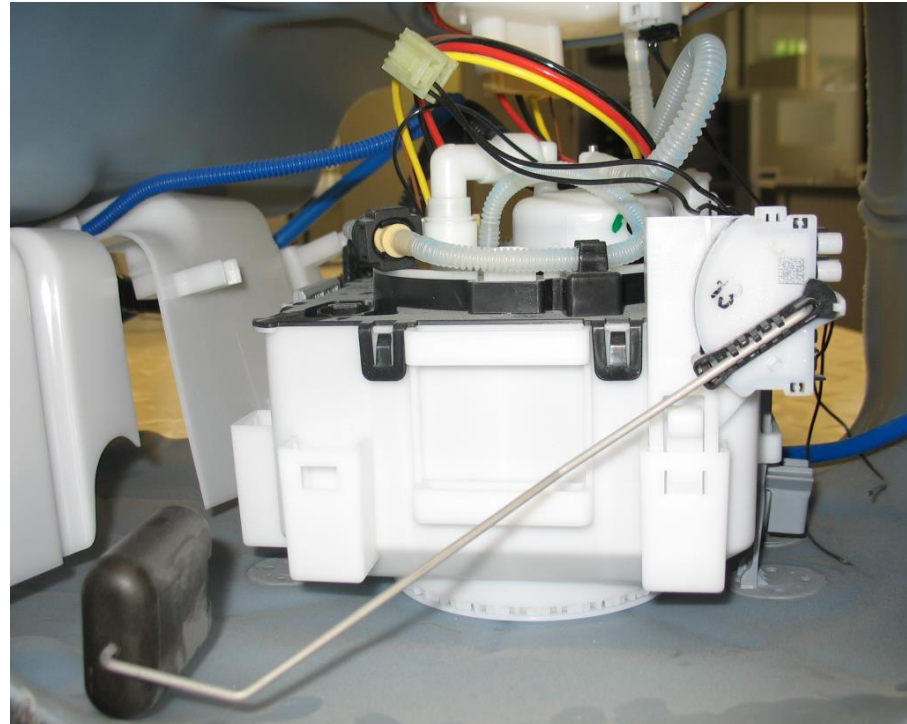
- › On the dual-chamber tank, the fuel must be delivered from the left half of the tank to the right half; this is because no subsequent flow to the delivery unit is possible via the propshaft tunnel.
- › For this purpose, a suction-jet pump is used in the left half of the tank; it features a separate tank sender which is driven by the pump unit of the main chamber.



02. Fuel delivery/sender technology

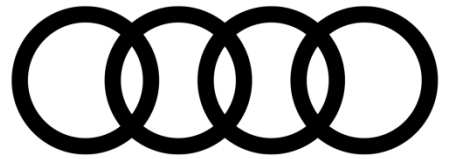
- The pump unit of the main chamber comprises the following components:
 - Pump (supplies fuel and drives the suction-jet pump of the secondary chamber).
 - Filter.
 - Pressure retention valve.
 - Swirl pot with base valve.
 - Fuel gauge sender.
 - Suction-jet pumps.

Pump unit of main chamber with sender system



04. Summary

- › The tank sender and suction-jet pump on dual-chamber tanks (with secondary chamber) can only be replaced together with the entire tank.
- › Breather lines are mostly routed inside the tank (EVAP).
- › On current tank versions, there is only one service opening on the main chamber unit.
- › When performing low-pressure tests, the pressure and quantity must always be checked in accordance with ELSA.
- › Always check the pressure in the low-pressure fuel system upstream of the high-pressure pump at the time of the concern; use a pressure gauge.



Thank you!