Tire Pressure Control (RDC)

Tire Pressure Monitor

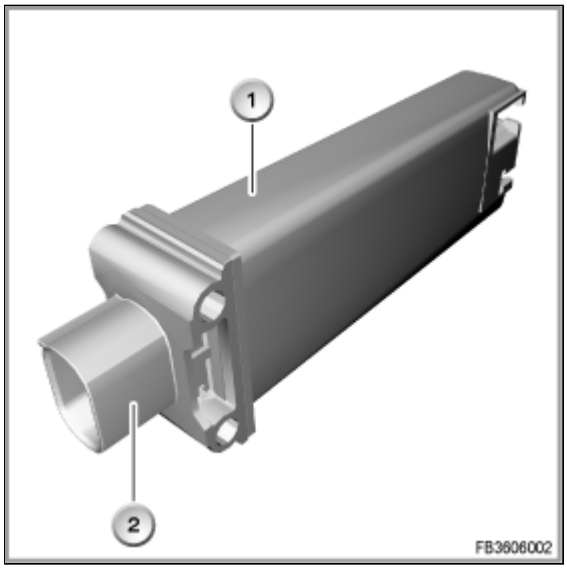
The Tyre Pressure Monitor (TPM) is a system for monitoring the tyre inflation pressure while the vehicle is being driven. To achieve this, the tyre inflation pressure and tyre air temperature are measured at certain intervals at the request of the TPM control module and telemetrically transmitted across an HF transmission path to the TPM antenna. The TPM antenna feeds the signals back across the bus to the TPM control module. The control module evaluates the received data. If required, it forwards the information to the driver. The driver is thus informed of a necessary correction of tyre inflation pressure or a puncture that might have occurred.

Brief description of components

The following components are described for the TPM:

TPM antenna

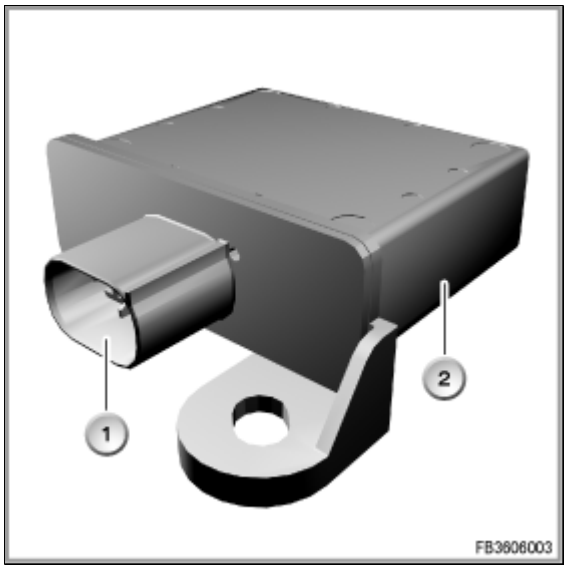
The TPM antenna is generally located on the underbody. Depending on the model series, the position can be in the front area (cross-member of A-pillar) or in the central area of the underbody.



Index	Explanation	Index	Explanation
1	TPM antenna	2	Connector for TPM antenna

TPM transmitters

The 4 TPM transmitters are fitted under the wheel arch trim in the wheelhouses. The TPM transmitters send the requests from the control module to the wheel electronics systems. This achieves bidirectional communication.



Index	Explanation	Index	Explanation
1	Connector for TPM transmitter	2	TPM transmitters

Wheel electronics systems in the running wheels and/or in the spare wheel

The wheel electronic systems are mounted in the wheel drop center. Together with the filling valve, they form a compact unit and are fitted in the same way as a screw valve in the rim. The wheel electronics system contains:

- pressure sensor
- temperature sensor
- Lateral-acceleration sensor
- Battery
- A transmission and reception antenna

The wheel electronics system is activated on initial fill of the tire. The measured values are transmitted from the wheel electronics system either on request or cyclically (every 3 seconds) from the tyre to the TPM antenna. This cycle is temporarily shortened if a certain pressure change is detected. In the case of temperature values greater than 120 °C inside the tyre, the wheel electronic system is switched off; if it cools down to less than 110 °C, it is switched on again.
Transmission rate normal: 54 s
Transmission rate increased: 0.8 s
Battery service life: approx. 10 years.

TPM control module

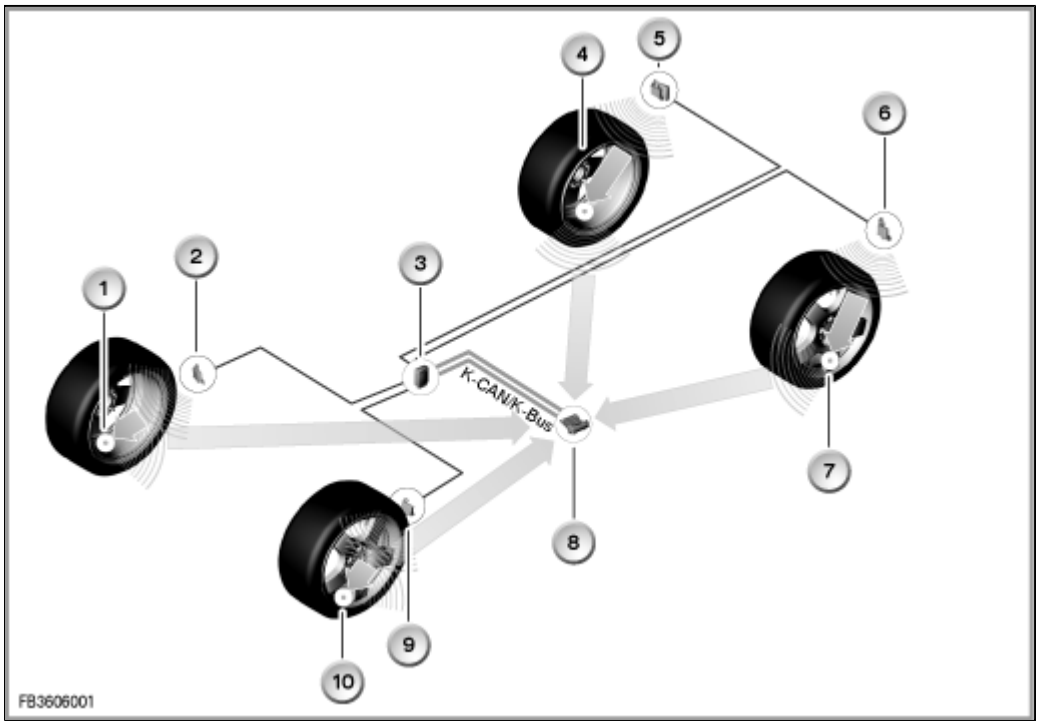
The TPM control module evaluates the transmitted pressure and temperature values from the individual tyres. If required, a Check Control message in the instrument cluster notifies the driver. This signal may also be supported by supplementary information via the Control Display.

Index	Explanation	Index	Explanation
1	TPM control module	2	Connector for TPM control module

System functions

The following system functions are described for the TPM:

- Overall function
- Resetting the TPM



Index	Explanation	Index	Explanation
1	Wheel electronics system, front right	2	TPM transmitter, front right
3	TPM control module	4	Wheel electronics system, rear right
5	TPM transmitter, rear right	6	TPM transmitter, rear left
7	Wheel electronics system, rear left	8	TPM antenna
9	TPM transmitter, front left	10	Wheel electronics system, front left

Overall function

The TPM monitors the tyre inflation pressure while the vehicle is being driven. The tyre pressure to be monitored is specified by the driver. Using the control function in the iDrive or the TPM button, the driver instructs the system to adopt the current tyre pressure as setpoint pressure (reset). The plausibility of the setpoint pressure is checked before the TPM control module adopts it (axle-wise comparison of the specified pressures, minimum pressures). A reset is only possible when the tyre inflation pressure on all wheels is at least 1.6 bar. If the tyre pressure of one wheel falls below this limit, a Check Control message is issued immediately. If the pressure difference between the wheels on one axle > 0.4 bar, the reset is rejected following a plausibility check. A Check Control message is output. Remedy: set tyre pressures to the correct values and then run the reset once again.

Internal sequence after triggered adaptation process (reset):

1. Recognition of the fitted wheel electronics systems
2. Identifying of the position of the wheel electronics systems
3. Plausibility check by checking the specified pressures
4. Adoption of the specified pressures as setpoint pressures

On comparison of the current tyre pressure with the specified pressure, the air temperature is taken into account. On the basis of the specified pressure and temperature during the reset, the TPM calculates the limit values for the tyre inflation pressure for the current air temperature. The tyre inflation pressure increases by 0.1 bar per 10 °C increase in temperature. If the temperature-evaluated values are not reached, the TPM issues a Check Control message.

Resetting the TPM

In the case of vehicles without iDrive, the TPM is reset using a button in the centre console switch centre. This TPM button must be pressed for 4 seconds. On vehicles with iDrive, the TPM is reset via the menu item: Settings/Vehicle/TPM/Reset. In general, the reset can be carried out with the ignition on or engine on (only when vehicle is stationary).

Notes for Service department

Diagnosis instructions

Important! Conditions for reset.

The TPM must be reset in the following cases:

- The tyre inflation pressure is changed.
- A wheel exchange is carried out. The exchanged wheels must be equipped with the correct wheel electronics systems.

- Axle-wise wheel exchange on the vehicle.
- Diagnosis instruction

Note! Check of the wheel electronics system

A check as to whether the correct wheel electronics system has been fitted can only by run after the tyre has been removed. Unfortunately, a query via the BMW diagnosis system is not possible for technical reasons.

Note! Reset of the TPM control module

During the reset, the control-module functions (measurement data of wheels 1 - 5) contain substitute values until the wheel allocation is complete (e.g. 6.4 bar; 127 °Celsius). To enable successful conclusion of the wheel allocation, the wheels must turn.

Country-specific versions

USA, Canada

Transmission frequency of the system: 433 MHz

Reception frequency of the system: 125 MHz

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