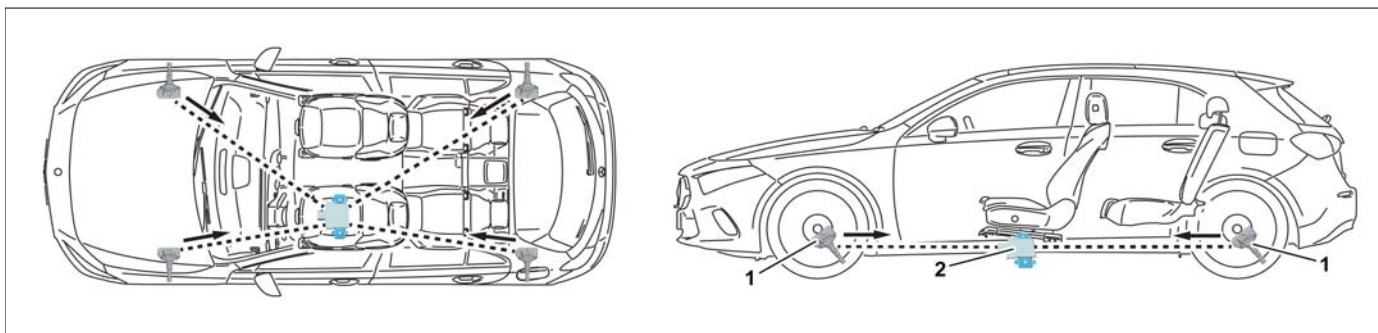


Model all (CAR)
with code 475 (Tire pressure monitor (TPM))



P40.15-2650-77

Shown on model 177.0

1 Tire pressure sensor

2 Tire pressure monitor control unit

Overview

This document contains information on:

- Location
- General
- Function requirements
- Tire pressure monitor
- Tire pressure sensors
- Leak detection (rapid pressure loss)
- Automatic fill detection
- Automatic teach-in process for tire pressure sensors of tire pressure monitoring system control unit
- Monitoring of tire temperature
- Run-on
- Battery status
- Diagnosis

Location

The tire pressure monitoring system control unit is located externally on the underbody, in the vicinity of the vehicle's driver or front passenger seat.

General

The tire pressure monitoring system monitors the air pressure in the individual tires by comparing the measured pressure with a previously stored reference pressure.

Function requirements

- Ignition ON (circuit 15)
- Overspeeding from 15 to 20 km/h or a change in tire pressure > 10 kPa
- Tire pressure sensors present and operational

Tire pressure monitor

With the tire pressure monitoring system, the pressures of the front and rear wheels are monitored by comparing them with stored desired pressure values. If a relevant loss of pressure occurs, a warning message is issued to the driver, when possible with the specified location. The type of warning varies depending on the amount of pressure loss. Temperature effects are also compensated for with regard to the warning logic in the event of any pressure loss.

Tire pressure sensors

The tire pressure sensors are screwed into the inner rim side of each tire with a tire valve made of metal.

The four tire pressure sensors send radio messages to the tire pressure monitoring system control unit while driving at a speed of > 20 km/h every 30 s. These radio messages contain the pressure, the tire air temperature, the individual serial number and status information. After the trip starts, the sensor positions are identified automatically within the first 10 minutes. For this, the correlation of the ABS-wheel pulse counters with the signals from the tire pressure sensors is evaluated. In addition, the tire pressure monitoring control unit incorporates the outside temperature and the vehicle speed into the warning logic.

A warning message is canceled if the following events occur:

- Filling to specified pressure
- Successful automatic fill detection
- Manual restart

Warning message	Soft warning (Correct Tire Pressure)	Hard warning (Check Tire)	Rapid pressure loss (Caution Tire Defect)
Pressure loss	> 14 %	> 20 %	20 kPa/min

The warning threshold of the soft warning is defined as follows:

- Pressure loss > 14 % for t = 8 min
- Pressure loss > 14 % for t = 18 min (USA version)

The tire pressure sensors monitor the tire temperature as well as the tire pressure. The temperature warning is only issued at high speed, generally from > 180 km/h upwards. A colored marking for the affected

Leak detection (rapid pressure loss)

If progressive pressure loss is detected during a certain period of time, it is assumed that a tire is defective. In this case a warning is triggered even before the triggering criterion for the hard warning is reached.

The warning occurs at the latest 120 s after the start of a pressure loss of 20 kPa/min and is displayed in the instrument cluster as the warning message "Caution Tire Defect".

When the ignition is switched back on after a leak has been detected, the warning message "Tire Pressure Monitor" appears in the instrument cluster. If, after starting a journey, the relevant pressure matches the reference value again, the "Tire Pressure Monitor" warning message disappears.

i Together with a tire pressure warning message, the yellow tire pressure warning lamp in instrument cluster lights up. It also lights up at the next ignition cycle until the warning message is canceled.

Automatic fill detection

Automatic fill detection is performed if - at the start of a journey - a change in pressure of more than 20 kPa was detected. For comparison, temperature-compensated and filtered pressure values are drawn on and compared against the values for the last journey. After approx. 2 min of driving and a successful plausibility test, the new tire pressures are automatically adopted as reference values. A pressure differential between the right and left wheel of more than 17 % is deemed to be implausible.

Automatic teach-in process for tire pressure sensors of tire pressure monitoring system control unit

When the ignition is switched off, the tire pressure monitor control unit remains active for another 19 min and may receive signals from the tire pressure sensors by radio frequency. After a parking period of more than 19 min, the automatic detection and localization of the tire pressure sensors commences when the journey starts. A new tire pressure sensor is automatically taught in after a maximum driving time of 9 min. If the tire pressure monitoring system control unit has been replaced, the XENTRY Diagnosis COM Kit must be used to perform the guided "Commissioning" routine.

Monitoring of tire temperature

tires is shown on the instrument cluster depending on the given load in yellow or red.

Tires at temperatures close to the limit value are shown in yellow. Tires that exceed the limit value are shown in red and a warning message appears.

If the "Tire overheated" warning message is still shown after a period of 2 minutes, a prompt is shown to reduce speed and a warning tone is issued. As soon as the speed drops to less than 100 km/h, this message goes off and the tire temperature display is shown.

Run-on

When the ignition is switched off, the tire pressure monitor control unit remains active for another 19 min and may receive signals from the tire pressure sensors by radio frequency. The network interface changes to sleep mode during the run-on period.

Battery status

With every radio message, the tire pressure sensors transmit a battery status signal in 10 % steps, thus providing an indication of the remaining battery life. For this, the tire pressure sensor takes into account the energy consumption for the pressure, temperature and motion detection, as well as the self-discharge of the battery.

If the tire pressure monitor control unit repeatedly receives a low battery status from at least one tire pressure sensor, a fault is logged.

Diagnosis

i To teach in tire pressure sensors, the teach-in process must be performed using XENTRY Diagnosis COM Kit in the "Control unit adaptations" menu, "Write wheel electronics identification number" submenu.

i The guided manual tire pressure reduction causes the tire pressure sensors to transmit a data log by releasing air one by one. The tire pressure monitor control unit can then save the individual serial numbers of the sensors and identify the correct wheel position. To enable the data to be read out, at least 30 kPa of air must be released.

i Instead of lowering pressure, a trigger tool (MB3000) may be used. The trigger tool causes the tire pressure sensors to transmit a data log.

	Function schematic		
	Function schematic for tire pressure monitor (TPM)	Model 118, 177, 247 with code 475 (Tire pressure monitor (TPM))	PE40.15-P-2500-97A