

# UNDERSTANDING TPMS BATTERIES

A tire-pressure monitoring system (TPMS) sensor is engineered to perform well and survive under very harsh conditions inside a vehicle tire. Its typical operational life span is five to 10 years — depending on the type of sensor, how the vehicle is used and a variety of other conditions. TPMS sensor batteries are sealed in the sensor housing and cannot be serviced. When the battery is depleted, the sensor can no longer provide protection to the driver and passengers and must be replaced.

Key factors affecting sensor battery life include:

- **Driving vs. parked** — More transmissions are sent while the vehicle is driving, using more battery energy.
- **Sensor specifications** — Some sensors have an additional factory-enabled parking supervision mode, whereas others only transmit during motion.
- **Temperature extremes** — Exposure to very hot and cold temperatures can affect sensor operation and damage the battery.
- **Battery type** — CR type batteries have a lower self-discharge rate and broad temperature operating range. BR types have a higher self-discharge and poor performance at low temperatures, but are more able to withstand extremely high temperatures.
- **Sensor efficiency** — The Application-Specific Integrated Circuit (ASIC) in older-generation sensors consumed a lot more energy than current models.
- **Battery capacity** — Capacity typically ranges from 350mA up to 560mA across the industry.

## Sensor battery diagnosis

It's not always easy to assess the actual condition of a sensor battery, unless it has already gone bad! When that happens, the sensor stops transmitting and sets off the vehicle's malfunction indicator lamp (MIL). A weakened battery may be more difficult to determine because the transmissions could become sporadic. Some TPMS scan tools have a battery status check, which can help identify a battery with reduced voltage.

## Low-temperature troubleshooting

Not all sensor transmission issues are battery-related. Cold temperatures can create a frustrating TPMS "Christmas tree" intermittent light effect, from a low tire pressure telltale, system MIL or back-to-back combination thereof. For example, the first frost of the season or a big drop in overnight temperatures can set the stage for this scenario. When



temperatures drop, so does pressure, which can lead to the low tire pressure telltale. That's why it's important to maintain proper placard pressure at all times, especially with the change of each season, when temperature fluctuations are most likely. Extremely low temperatures can further cause sensor battery inoperability, thereby illuminating the MIL.

## New tire service and sensor replacement

If a customer comes in for new tires and a bad or weak sensor battery is detected, consider recommending the replacement of all four sensors while the tires are off the vehicle. This will increase the initial overall cost, but will save the customer a lot of hassle and future charges for a second mounting and balancing, as well as the frustration of not being warned ahead of time.

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