■ DETAIL

1. Function of Main Components

Component		Function
Tire Pressure Monitor Valve Sub-assembly		Detects the tire pressure, internal temperature and rotational acceleration of the tire, and transmits the measured values and the ID code to the tire pressure monitor receiver assembly.
Tire Pressure Monitor Receiver Assembly		• Receives the data from the tire pressure monitor valve sub-assembly and monitors the tire inflation pressure. • Outputs the respective signal to the combination meter assembly when a drop in the tire inflation pressure, a system malfunction or the beginning of initialization is detected.
Tire Pressure Warning Switch		• The warning threshold is calculated from the tire inflation pressure value at the time of initialization and memorized in the tire pressure monitor receiver assembly by operating the tire pressure warning switch. • Selects the wheel set.
Combination Meter Assembly	Tire Pressure Warning Light	• Illuminates or stays on after blinking for 1 minute to warn the driver in accordance with the signal from the tire pressure warning system. • Flashes 3 times after initialization.
	Speedometer	Sends a vehicle speed signal to the tire pressure monitor receiver assembly.

2. Function

1) Warning Function

- The tire pressure monitor receiver assembly has 2 warning methods, depending on the condition detected.
- The table below shows the warning methods for the tire pressure warning light in the combination meter assembly:

Detection Condition	Tire Pressure Warning Light
The tire pressure warning system has detected that the tire pressure has become lower than the warning threshold.	Illuminates*1
The tire pressure warning system has detected a malfunction in the system.	Illuminates after blinking for 1 minute*2

*1: If the tire pressure warning light illuminates, adjust the tire pressure.
*2: If the tire pressure warning light stays on after blinking for 1 minute, the system is malfunctioning and must be repaired in order to turn off the light. For details, refer to the Repair Manual.

2) Initial Check Function

After the ignition switch is ON, the tire pressure monitor receiver assembly illuminates the tire pressure warning light for 3 seconds to check the warning light circuits.

3) Initialization Function

- The warning threshold is calculated from the tire inflation pressure value and memorized in the tire pressure monitor receiver assembly. Therefore, the tire pressure monitor receiver assembly should be initialized after:
  - The recommended tire inflation pressure changes due to changes in vehicle weight, speed conditions or tire size.
  - The tire pressure monitor receiver assembly or the tire pressure monitor valve sub-assembly are replaced.
  - The tires are rotated on a vehicle with different recommended tire inflation pressures for the front and rear tires.
  - The tire pressure is adjusted.

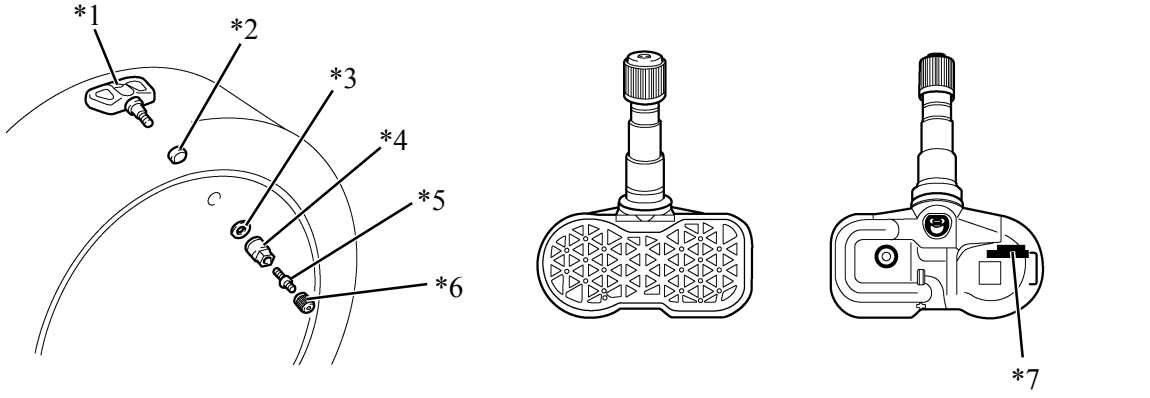
- Initialization starts after the tire pressure warning switch is pressed and held (with the ignition switch ON and with the vehicle stopped) and the tire pressure warning light illuminates slowly 3 times.
- Before performing initialization, adjust the tire inflation pressure to the recommended pressure when the tires are cold. For details, refer to the Repair Manual.

3. Construction

1) Tire Pressure Monitor Valve Sub-assembly

- A high-pressure tire pressure monitor valve sub-assembly that can measure tire pressure up to approximately 800 kPa (116 psi, 8.0 bar)* is used.
- The tire pressure monitor valve sub-assemblies are integrated in the tire valves. Each transmitter consists of a lithium battery, sensor and transmitter.
- Make sure not to damage the resin cover on the backside of the transmitter (the surface opposite to the side with the ID code) with anything sharp.
- The transmitter directly measures tire inflation pressure and temperature to see if the vehicle can continue to run.
- The transmitter transmits the measured tire inflation pressure and temperature values to the tire pressure monitor receiver assembly at a frequency of 433.90 MHz.
- Depending on the timing of the data transmission, it may take several minutes to receive the data from the tire pressure monitor valve sub-assembly.
- The ID code is written on the tire pressure monitor valve sub-assembly.

HINT:
***: This value is relative pressure.**



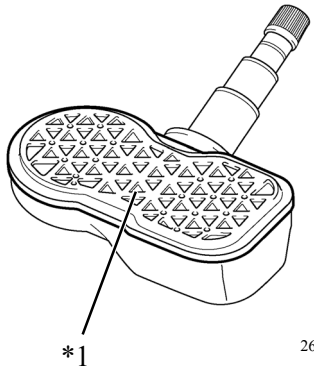
► Text in Illustration ◄

*1	Tire Pressure Monitor Valve Sub-assembly - Sensor and Transmitter - Lithium battery	*2	Grommet
*3	Washer	*4	Nut
*5	Tire Valve Core	*6	Tire Valve Cap
*7	ID Code (Hexadecimal 7 Digits)	-	-

HINT:

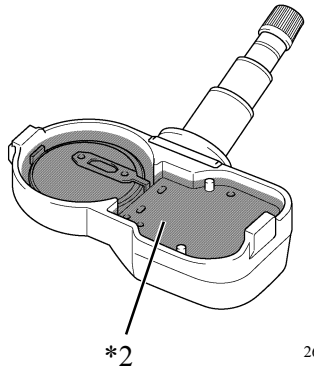
- **A high-pressure tire pressure monitor valve sub-assembly is used in this vehicle. The low-pressure tire pressure monitor valve sub-assembly for passenger vehicles and the high-pressure tire pressure monitor valve sub-assembly are not compatible. When the low-pressure tire pressure monitor valve sub-assembly has been erroneously installed, the system detects an error.**
- **A resin cover is attached to the backside of the transmitter of the high-pressure tire pressure monitor valve sub-assembly. In contrast, the low-pressure tire pressure monitor valve sub-assembly has a urethane-covered backside without a resin cover. This difference can be used to distinguish between the high-pressure and low-pressure types.**
- **The lithium batteries of the tire pressure monitor valve sub-assemblies are non-replaceable. If the lithium battery is depleted, the tire pressure monitor valve sub-assembly must be replaced (battery life: approximately 10 years).**
- **A new tire pressure monitor valve sub-assembly is shipped in sleep mode to prevent the battery from depleting in storage. When the tire inflation pressure in the detection portion of the tire pressure monitor valve sub-assembly decreases by 40 kPa (5.8 psi, 0.4 bar) within 30 seconds, the tire pressure monitor valve sub-assembly automatically cancels sleep mode. Once sleep mode is canceled, the tire pressure monitor valve sub-assembly cannot return to sleep mode.**
- **When replacing a tire pressure monitor valve sub-assembly, the ID codes of each tire pressure monitor valve sub-assemblies must be registered. If even one of the tire pressure monitor valve sub-assemblies is replaced, the ID codes of all tire pressure monitor valve sub-assemblies must be registered again. Record all existing ID codes before beginning the process to enter new ID codes.**
- **To register an ID code, use a Global TechStream (GTS) to enter the ID code that are indicated on the tire pressure monitor valve sub-assembly.**
- **Be careful not to damage the tire pressure monitor valve sub-assemblies when removing and reinstalling them.**
- **Replace the grommet, valve core, washer and nut with new ones when replacing or removing and reinstalling the tire pressure monitor valve sub-assembly. This is necessary to ensure sealing performance.**
- **When replacing a valve cap, use only the specified cap. If an unspecified cap is used, it may seize to the tire pressure monitor valve sub-assembly.**
- **For details, refer to the Repair Manual.**

*A:



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*B:



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► Text in Illustration ◄

*A	High-pressure Tire Pressure Monitor Valve Sub-assembly	*B	Low-pressure Tire Pressure Monitor Valve Sub-assembly
*1	Resin Cover	*2	Urethane-covered

4. Diagnosis

- To inform the driver when the tire pressure monitor receiver assembly detects a malfunction in the system, the tire pressure monitor receiver assembly will blinks the tire pressure warning light for 1 minute, after which the light will stay on. The tire pressure monitor receiver assembly also stores the Diagnostic Trouble Codes (DTCs) in memory.
- 5-digit DTCs can be read by connecting a Global TechStream (GTS) to the DLC3. For details, refer to the Repair Manual.