05 C2921 and Intermittent TPMS DTC Diagnosis

Techline has received several calls regarding tire pressure DTCs, intermittent flashing of the TPMS lamp, and/or the center information display (in the combination meter) not displaying tire pressures. Technicians may find DTC C2921 set as history or current in the TPMS control module.

Situation 1: This code is originally set when TPMS ID is not registered correctly.

Situation 2: It is also set when one or more of the sensor status parameters do not change.

This means a communication error between TPMS CM and TPMS sensor(s) has occurred. If the TPMS CM cannot communicate, it assumes there is a sensor registration error. In some cases, the TPMS CM sets DTC C2121-C2124, for each TPMS malfunction, and DTC C2921 is set afterwards. Unfortunately, those DTCs move to "history" on the next key cycle, but C2921 remains as "current". If the TPMS memory is cleared, only C2921 is left in the TPMS CM. The TPMS CM is constantly trying to communicate with the sensors and needs to see the status change on each sensor within a specified time. Diagnosis should begin with a recorded data monitor file of the TPMS live data while driving at varying speeds and making several turns. When reviewing the data, look for one or more of the tire pressure sensor status parameters performing differently than the others. These parameters use a BIT code to record several conditions in each sensor.

First, let's break down how to read the BIT data associated with the sensors.

The BIT code is an 8-digit number, read left to right, with corresponding digits 7 to 0. The chart below can be found on STIS, and if here for reference.

BIt	Data	Condition	
7	Low Battery	Shows the remaining battery level.	0: Normal 1: Low level
6	Sensor Fail	Shows the malfunction of TPMS.	0: Normal 1: Malfunctioning
5	LF Response	Shows the responding transmission to the LF signal.	0: Transmission for other than LF response 1: Transmission for LF response
4	PAL Condition	Shows the status of position information.	0: Position detection finished 1: Position detection in progress
3	Rolling Detection	Shows the status of tire rotation detection.	0: Tire stop status detected 1: Tire rotation status detected
2-0	Status code	Shows the status in valve transmission.	0: Responding to the LF signal "Learn LF" 1: Detecting the change in tire pressure 2: — 3: Responding to the LF signal "Entering off LF" 4: Position detection is in progress (transmission timing is synchronized with tire rotation) 5: Position detection is in progress (transmission timing is not synchronized with tire rotation) 6: Normal driving status (position detection mode is ended) 7: Detecting the completion of change in tire pressure

	Example : 00001110	
		[765432-0]
BIT	Status	Condition
7	0	Normal
6	0	Normal
5	0	Transmitting
4	0	Position Detected
3	1	Tire Rotation
2--0	110	110 or 6, Normal Driving

The last BIT code sequence (2-0) will need to be read in binary. This will create the number associated with the condition.

This is as follows: 000 = 0; 001 = 1; 010 = 2; 011 = 3; 100 = 4; 101 = 5; 110 = 6; 111 = 7

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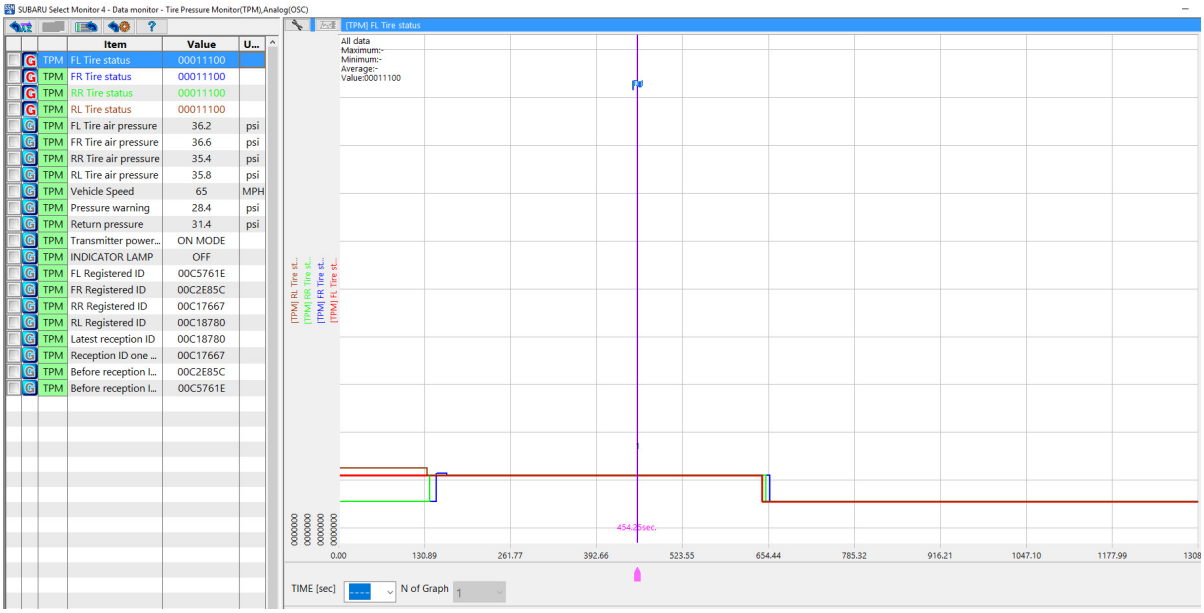
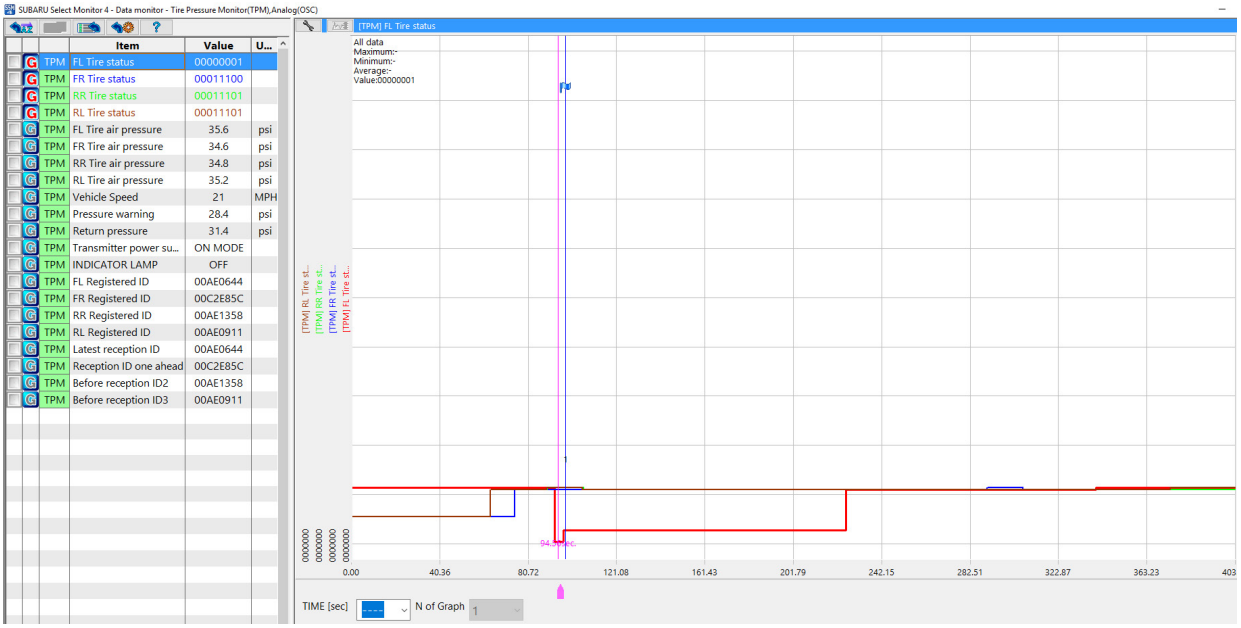
Below is a SSM4 graph of normal operating sensors for reference:



Take note, the sensors are reading the same status and are uniform.

Below is an example of a faulty TPMS sensor:



In the picture above, you can see one of the sensors does not communicate properly and drops status. The other sensors change status as designed and eventually the faulty sensor comes online. This would be a case of intermittent transmission. This will aid in diagnosis to isolate the potential faulty sensor.

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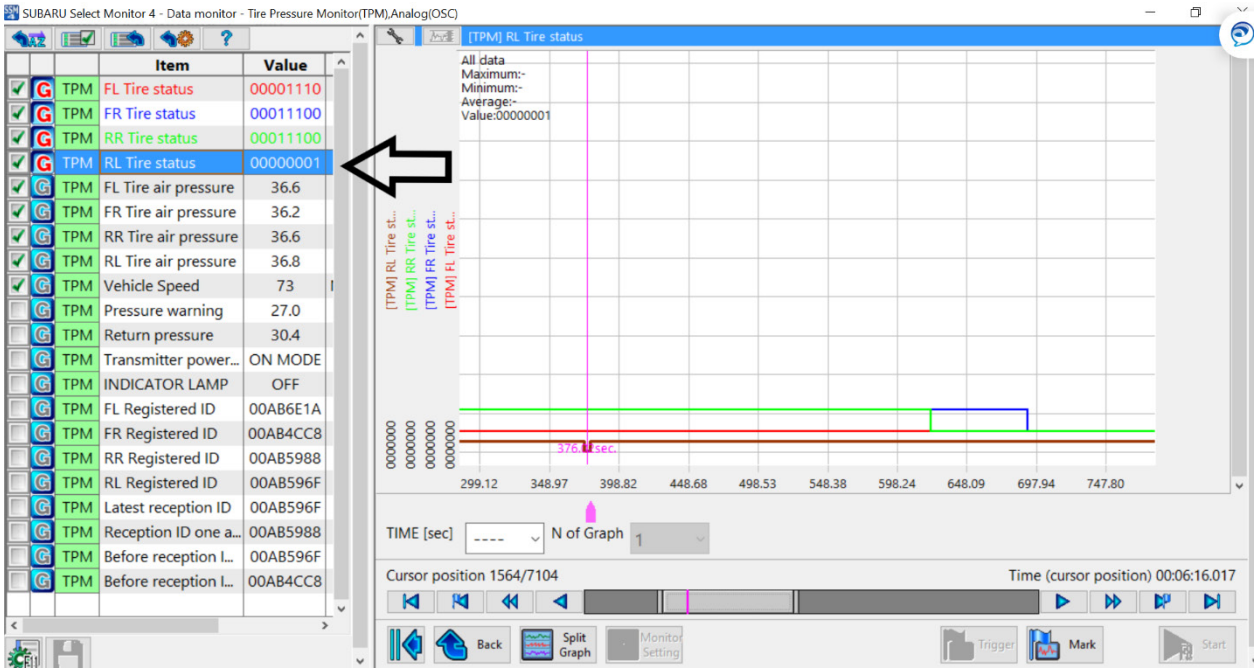
05 C2921 and Intermittent TPMS DTC Diagnosis (continued)



Above is another example of a faulty sensor.

A transmitter code may be set if the individual tire pressure sensor malfunctions multiple times in correspondence with TPMS CM logic. This should be considered when determining which of the sensors may be malfunctioning.

Once a sensor is isolated, the wheel and tire should be swapped with a known good assembly for testing. Do not neglect to register the sensors before performing another test drive. The BIT/live data should then be monitored again for any fluctuations.

NOTE: Technician preliminary checks should include inspection of customer accessories that may cause interference with the system and proper diagnosis. These accessories may include but are not limited to: USB converter to 12V power port, USB cables, mylar blankets and metallic sun shades.

15 Review of and Additional DTC B2A15 Telematics Information

NOTE: The first 4 paragraphs (in italics) of this article were previously released in the May 2019 issue of TIPS. The new information begins with the 5th paragraph.

There have been a significant number of inquiries regarding DTC B2A15 and telematics system operation. Customers usually report a concern about the red telematics LED being illuminated, either currently or in the past. In a case where the red LED is presently not displayed, the customer may also have an email stating STARLINK has detected their services may not be operating correctly and recommending they return to the retailer to have the system diagnosed. Once at the retailer, if the LED is green, the system is usually operating within manufacturer specification BUT, there may be a DTC B2A15 in history.

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