

TIRE AND WHEEL SYSTEM

PRECAUTION

1. **REMOVAL AND INSTALLATION OF THE TIRE PRESSURE MONITOR VALVE SUB-ASSEMBLY**
 - (a) When installing a tire, make sure that the tire pressure monitor valve sub-assembly does not interfere with the tire bead.
 - (b) After completing the operation, remove the valve core to rapidly release the air in the tire and check that the warning light comes on. If the warning light does not come on, the system may be defective.
 - (c) If there is an air leakage, tighten the nut to a force of 4.0 N*m (41 kgf*cm, 35 in.*lbf) and push the valve core 2 or 3 times to remove any dirt attached to the valve core. If air continues to leak, replace the grommet, washer and nut.
 - (d) When installing the tire pressure monitor valve, check whether the rim, grommet, washer and nut are clean. Use a manufacturer-specified cap.
 - (e) When putting air into the tire, first install the tire pressure valve straight onto the stem of the tire pressure monitor valve.
2. **TIRE AND WHEEL REPLACEMENT OR TIRE ROTATION**
 - (a) If replacing a tire, be sure to check the grommet of the tire valve for damage. If necessary, replace the grommet, washer and nut.
 - (b) If tires and wheels are replaced, be sure to register the transmitter ID (see page [TW-17](#)).
 - (c) Transmitter IDs of all tires of the vehicle must correspond with IDs registered in ECU.

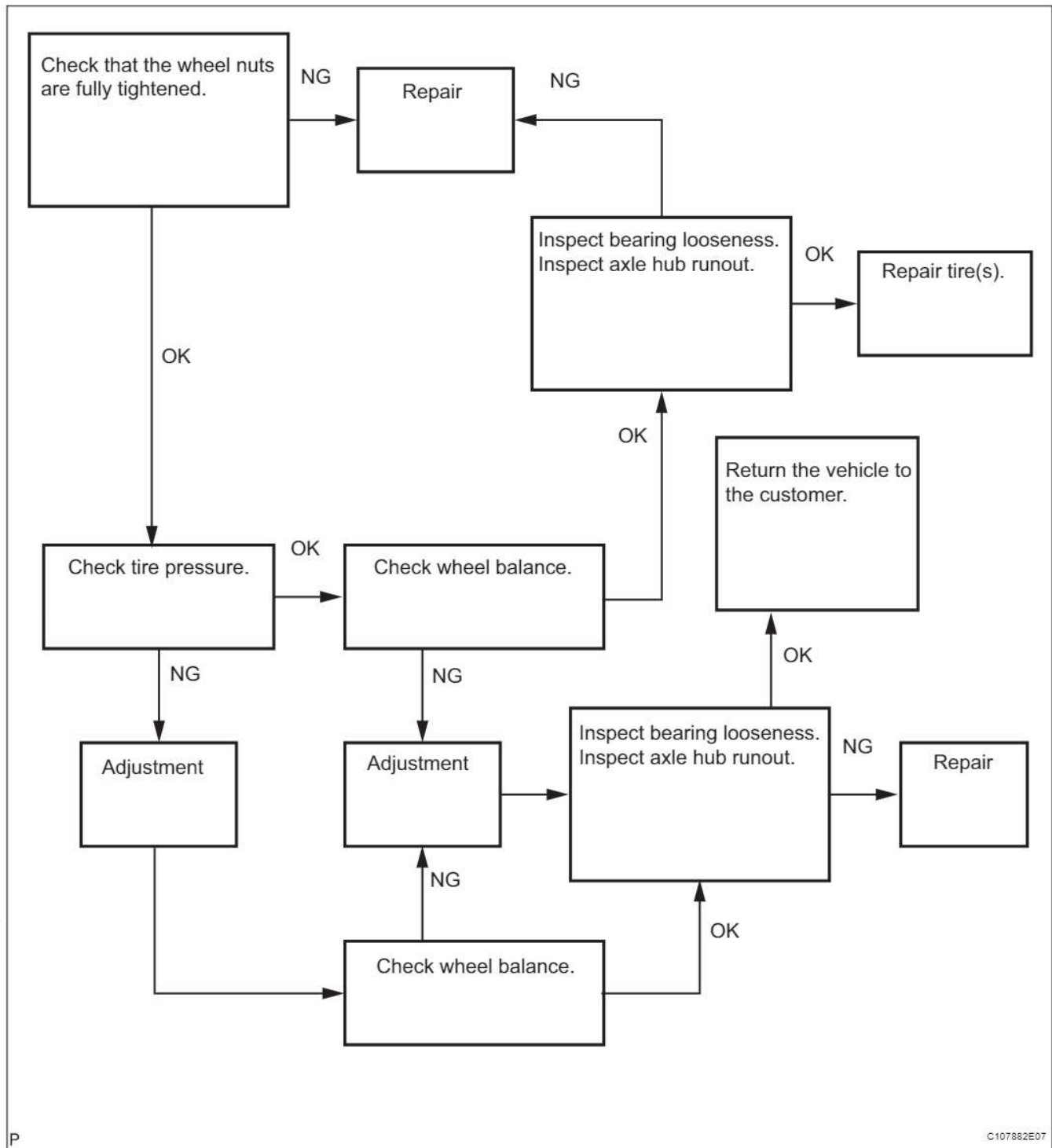
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TIRE AND WHEEL – TIRE AND WHEEL SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

1. DIAGNOSIS OF TIRE VIBRATION

(a) Inspection procedure.

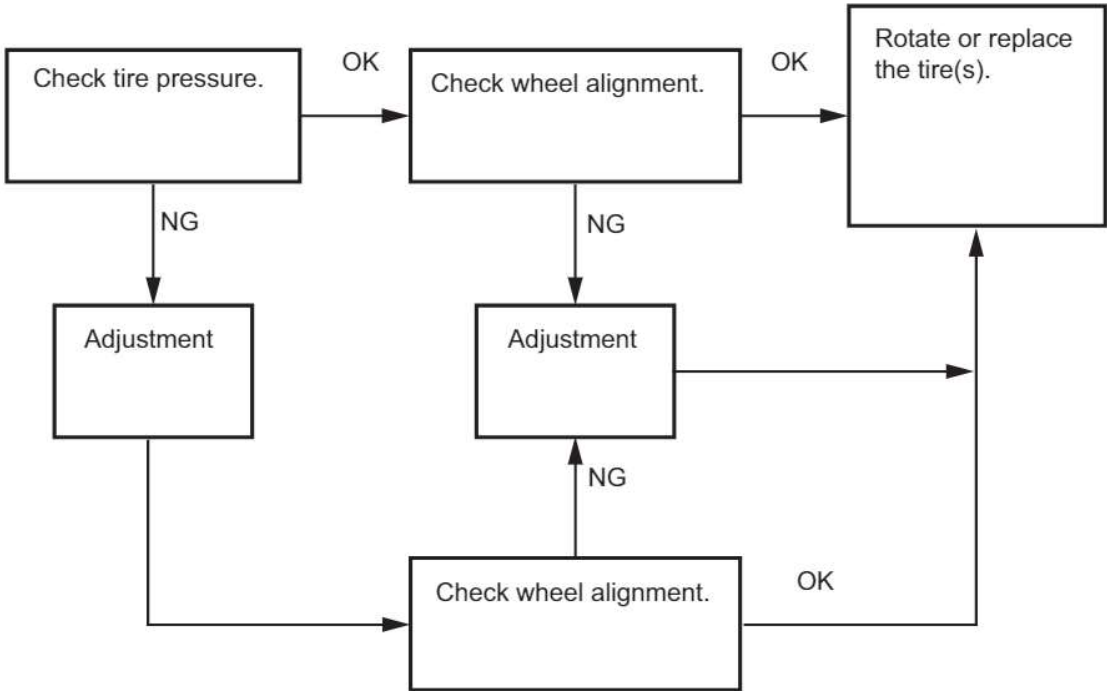


2. DIAGNOSIS OF IRREGULAR TIRE WEAR

(a) Inspection procedure.

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INSPECTION

1. INSPECT TIRE

- (a) Check the tires for wear and proper inflation pressure.

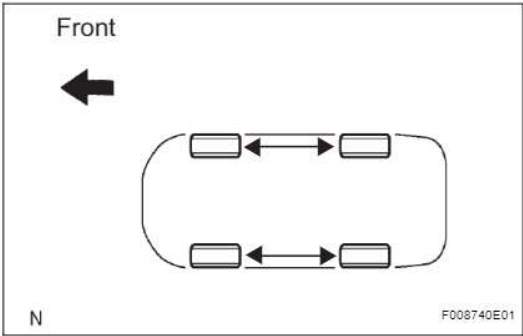
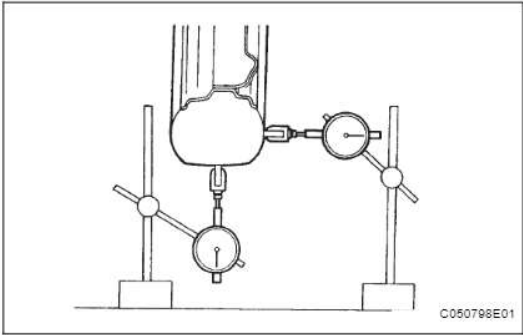
Standard cold tire inflation pressure

Tire Size	Front Pressure	Rear Pressure
185/65R15 86S	240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

- (b) Using a dial indicator, check the tire runout (vertical and horizontal).

Standard tire runout:

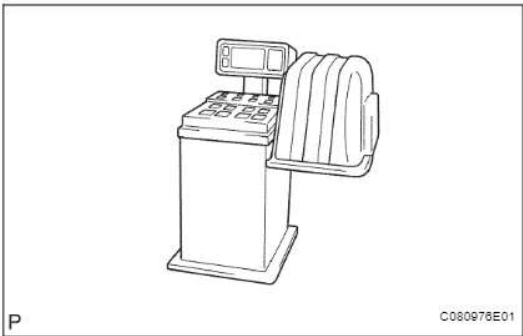
1.4 mm (0.055 in.) or less



2. ROTATE TIRE

HINT:

Rotate tires as shown in the illustration.



3. INSPECT WHEEL BALANCE

- (a) Check and adjust the off-the-car balance.
(b) If necessary, check and adjust the on-the-car balance.

Standard imbalance after adjustment:

8.0 g (0.018 lb) or less

4. INSPECT BEARING BACKLASH

- (a) Inspect the front bearing backlash (see page AH-4).

5. INSPECT FOR AXLE HUB DEVIATION

- (a) Inspect for front axle hub deviation (see page AH-4).

6. INSPECT BEARING BACKLASH

- (a) Inspect the rear bearing backlash (see page AH-10).

7. INSPECT FOR AXLE HUB DEVIATION

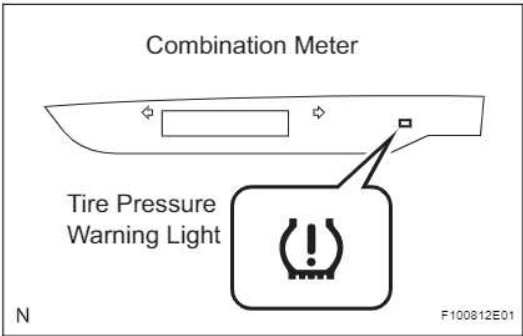
- (a) Inspect for rear axle hub deviation (see page AH-10).

TIRE PRESSURE WARNING SYSTEM

PRECAUTION

NOTICE:
When disconnecting the cable from the negative (-) battery terminal, initialize the following system after the cable is reconnected.

System Name	See procedure
Power window control system	IN-32



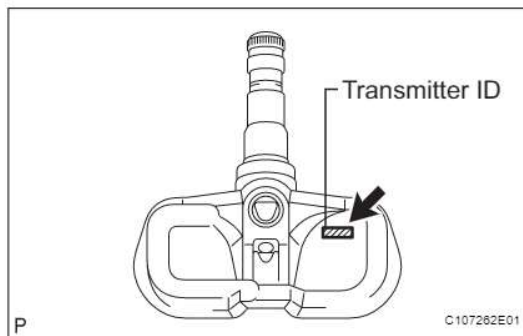
1. **TIRE PRESSURE WARNING SYSTEM PRECAUTION**
- (a) When the tire pressure warning light turns on, immediately check the tire pressure of each tire and adjust it to the specified value. When the tire pressure warning light circuit is open, the tire pressure warning light flashes for 1 minute and then illuminates.
- NOTICE:**
Check the spare tire as well since this system only monitors the pressure of the 4 vehicle tires.
- Standard pressure**

Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

- (b) When the tire pressure warning light blinks, there is a malfunction in the system. Check for DTCs.
- (c) It is necessary to register the transmitter ID in the tire pressure warning ECU after replacing the tire pressure warning valve and transmitter and / or tire pressure warning ECU (see page TW-14).
- (d) When replacing the tire pressure warning ECU:
- Using the DATA LIST, read the transmitter IDs registered in the ECU and make a note of them before removing the tire pressure warning ECU.
 - Register the transmitter IDs after installing a new tire pressure warning ECU.

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM



(e) When replacing the tire pressure warning valve and transmitter:

- (1) Make a note of the 7 digit number (transmitter ID) written on the tire pressure warning valve and transmitter when replacing it. Register the transmitter IDs in the tire pressure warning ECU after replacing the tire pressure warning valve and transmitter and installing the tires and wheels on the vehicle.

NOTICE:

The transmitter ID is written on the tire pressure warning valve and transmitter and it will be unable to be read after installing the tire pressure warning valve and transmitter on the tire and wheel. Therefore, make a note of the transmitter ID before installing the tire pressure warning valve transmitter.

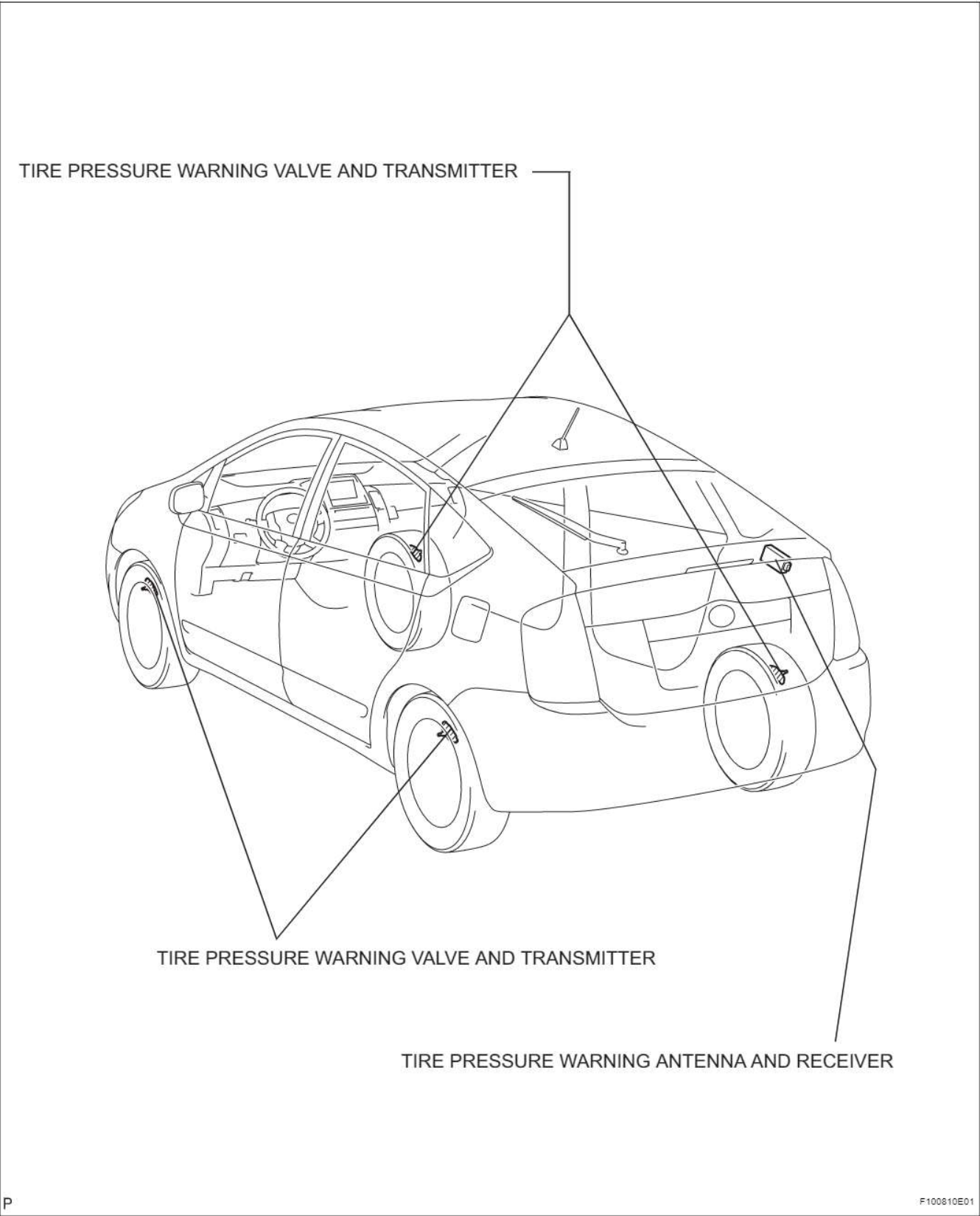
2. IN CASE OF TIRE AND WHEEL REPLACEMENT

- (a) When tires and wheels are replaced, always be sure to register the transmitter ID correctly.

3. FAIL-SAFE FUNCTION

- (a) When a system malfunction occurs in the tire pressure warning system, the tire pressure warning light blinks and informs the driver of the system failure.
- (b) The result of this diagnosis is stored in the tire pressure warning ECU.
- (c) Precautions about tire pressure:
 - Tire pressure decreases naturally over time.
 - In winter, tire pressure may decrease due to low ambient temperature (tire pressure decreases by approximately 10 kPa (0.2 kgf/cm², 1.45 psi) for every 10°C (50°F) drop in the ambient temperature). Therefore, the tire pressure warning is more likely to operate if the tire pressure are not adjusted appropriately. If the daily temperature variation is large, pressurize the tires high so that the tire pressures are suitable under cold conditions. Incorrect tire pressure warning operation becomes less likely.

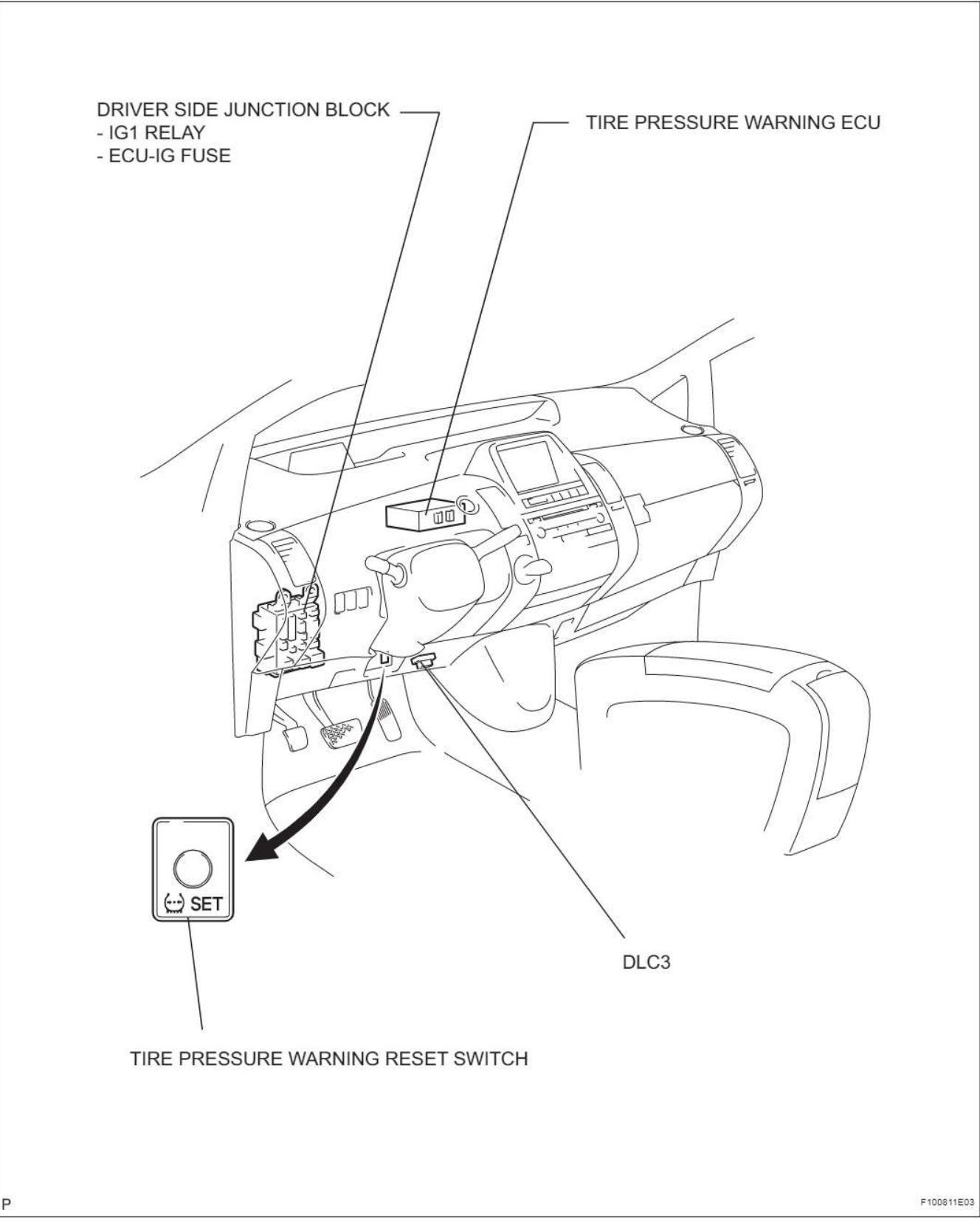
PARTS LOCATION



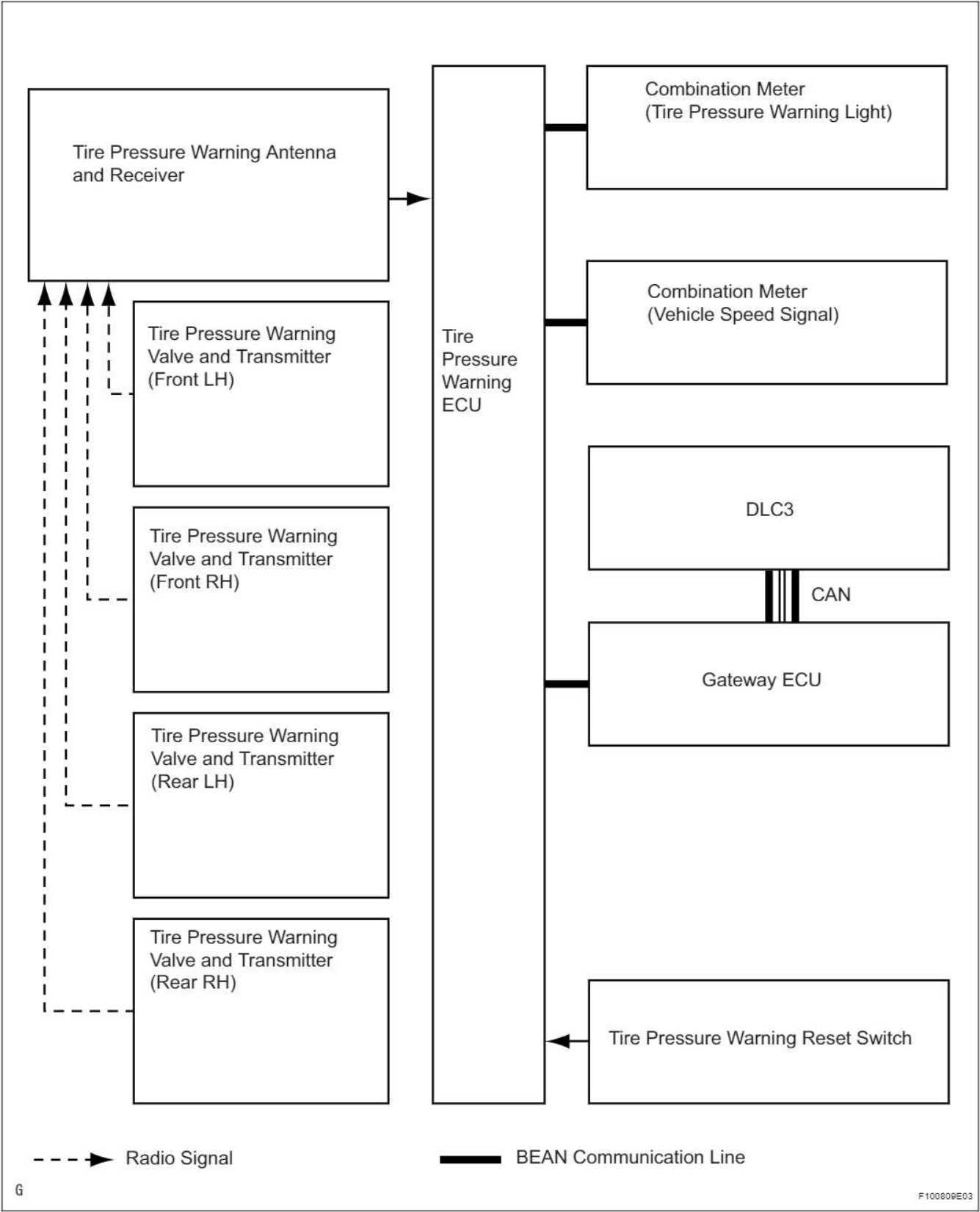
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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM



SYSTEM DIAGRAM



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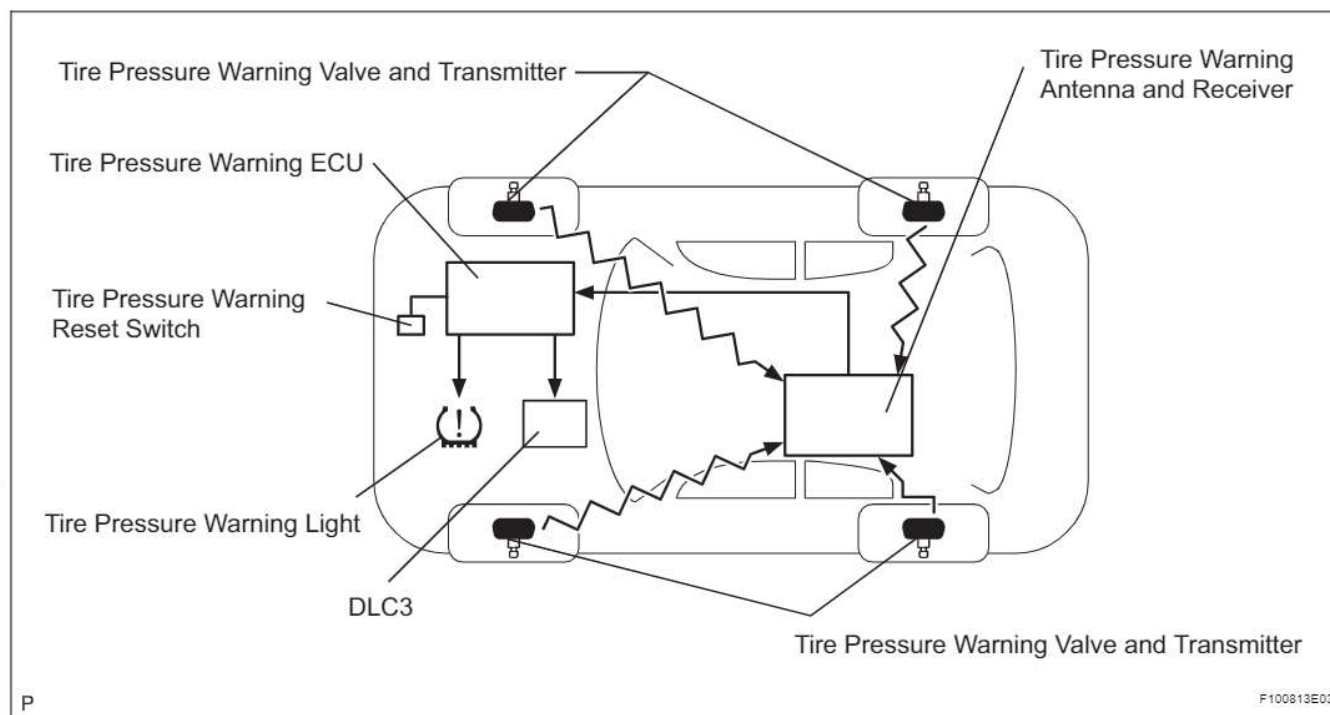
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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

SYSTEM DESCRIPTION

1. DESCRIPTION OF SYSTEM

- (a) A tire pressure warning valve and transmitter is equipped with a tire pressure sensor and is installed in each tire wheel assembly. The sensor measures the tire pressure. The measured value and transmitter ID are transmitted to the tire pressure warning antenna and receiver on the body as radio waves, and then sent to the tire pressure warning ECU from the tire pressure warning antenna and receiver. If the transmitter ID has already been registered, the ECU compares the measured air pressure value with the standard value. When the value is less than the standard value registered in the tire pressure warning ECU, the warning light on the combination meter turns on.
- The tire pressure warning reset switch resets the warning threshold in accordance with the various tire pressure settings that exist due to tire types and installation positions.
 - The tire pressure warning valve and transmitters may not be used on wheels other than those originally fitted on the vehicle due to the air valve angle of the tire pressure warning valve and transmitter.



2. WHEN TIRE PRESSURE WARNING LIGHT IS LIT

- (a) When the tire pressure warning light does not go off, or when it turns on during driving, check the tire pressure. If the tire pressure warning light turns on within several hours after adjusting the tire pressure, the tire may have a slow air leak.

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM**TW-11**

- (b) Under the following conditions, the system may not function properly:
- Areas, facilities or devices that use similar radio frequencies are located in the vicinity of the vehicle.
 - Devices using similar radio frequencies are used in the vehicle.
 - Large amounts of snow or ice are stuck to the vehicle, especially on the wheels and around the wheel houses.
 - The battery of the transmitter is depleted.
 - Tires and wheels without tire pressure warning valves and transmitters are used.
 - Snow tires and tire chains are used.
 - If wheels other than the specified ones are used, the system may not function properly because different radio waves are transmitted from the tire pressure warning valve and transmitter.
 - Depending on the tire type, the tire pressure warning valve and transmitter may not function properly even though the specified wheels are used.
 - The system may not function properly if it is initialized with tire pressures which are not the specified values.
- (c) After removing and installing the ECU or a sensor, output a diagnosis code and check that it is a normal code.

3. FUNCTION OF COMPONENTS

Components	Function
Tire pressure warning valve and transmitter	Combined as a single unit with a disc wheel air valve, it measures tire pressure and temperature, and transmits an ID number for measurement value and identification. Built into the battery.
Tire pressure warning antenna and receiver	Receives a necessary signal from the transmitter to the tire pressure warning ECU.
Tire pressure warning ECU	Receives the signal from the receiver and identifies it as vehicle's own signal. If the measurement value is equal to or lower than the specified value, it transmits a signal so that the air pressure warning light on the combination meter turns on.
Tire pressure warning light	Located in the combination meter, it informs the driver of lowered tire air pressure and system failure.
Tire pressure warning reset switch	Enters the initialization mode for tire or wheel replacement, or tire rotation.

TW**4. TIRE PRESSURE WARNING RESET SWITCH**

- By operating the tire pressure warning reset switch, the tire pressure warning ECU can be set to issue a warning at a specified tire pressure that corresponds to the type of tires.
Therefore, the dealer must set the warning threshold to the proper value in order to comply with the local regulations.
- Operate the tire pressure warning reset switch only after the tire pressures of all 4 tires have been adjusted on the vehicle.

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- To initialize the system, press and hold the tire pressure warning reset switch for 3 seconds or longer with the power switch ON (IG). After the system has been initialized, the warning light blinks 3 times (1 second on, 1 second off).
- During initialization, the tire pressure warning valve and transmitter measures the tire pressure of the tires, and registers the signals that are transmitted into the tire pressure warning ECU at a frequency of one per minute. The initialization process is completed when the signals from the 4 tires have been received.

TW

HOW TO PROCEED WITH TROUBLESHOOTING

- HINT:
- Use these procedures to troubleshoot the tire pressure warning system.
 - *: Use the intelligent tester.

1 VEHICLE BROUGHT TO WORKSHOP

NEXT

2 INSPECT BATTERY VOLTAGE

Standard voltage:
11 to 14 V
If the voltage is below 11 V, recharge or replace the battery before proceeding.

NEXT

3 PROBLEM SYMPTOM CONFIRMATION

NEXT

4 INSPECT COMMUNICATION FUNCTION OF MULTIPLEX COMMUNICATION SYSTEM (BEAN)*

- (a) Check for output DTCs.
HINT:
The ECM of this system is connected to the multiplex communication system. Therefore, before starting troubleshooting, make sure to check that there is no trouble in the multiplex communication system.

Result

Result	Proceed to
MPX system DTC is not output	A
MPX system DTC is output	B

B

PROCEED TO MULTIPLEX COMMUNICATION SYSTEM

A

5 CHECK CAN COMMUNICATION SYSTEM*

- (a) Check for output DTCs.

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

HINT:

The ECM of this system is connected to the CAN communication system. Therefore, before starting troubleshooting, make sure to check that there is no trouble in the CAN communication system.

Result	Proceed to
CAN system DTC is not output	A
CAN system DTC is output	B

B

PROCEED TO CAN COMMUNICATION SYSTEM

A

6

CHECK FOR DTC (OTHER THAN MPX AND CAN SYSTEM)

- (a) Check for a DTC and note any codes that are output.
- (b) Delete the DTC.
- (c) Recheck for DTCs, and try to prompt the DTC by simulating the original activity that the DTC suggests.

Result

Result	Proceed to
DTC does not reoccur	A
DTC reoccurs	B

B

Go to step 9

A

7

PROBLEM SYMPTOMS TABLE

Result

Result	Proceed to
Fault is not listed in problem symptoms table	A
Fault is listed in problem symptoms table	B

B

Go to step 9

A

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OVERALL ANALYSIS AND TROUBLESHOOTING*

- (a) DATA LIST/ACTIVE TEST (see page [TW-28](#)).
- (b) Terminals of ECU (see page [TW-23](#)).

NEXT

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9	REPAIR OR REPLACE
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NEXT

10	CONFIRMATION TEST
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- (a) Check for DTC (see page [TW-27](#)).
- (b) Perform initialization (see page [TW-17](#)).
- (c) Confirm that the initialization has been completed.

NEXT

END

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

REGISTRATION

1. IN CASE OF TIRE PRESSURE WARNING ECU REPLACEMENT

- (a) Read the ID stored in the old ECU using the intelligent tester.

2. IN CASE OF TIRE PRESSURE WARNING VALVE AND TRANSMITTER AND/OR TIRE PRESSURE WARNING ECU REPLACEMENT

- (a) Read the ID written on the tire pressure warning valve.

3. REGISTER TRANSMITTER ID

NOTICE:

It is necessary to register the transmitter ID in the tire pressure warning ECU when replacing the tire pressure warning valve and transmitter and/or tire pressure warning ECU.

- (a) Prepare all transmitter ID data before starting registration.

HINT:

- Read the registered transmitter IDs that are stored in the ECU using the intelligent tester and note them down.
- If reading stored transmitter IDs is impossible due to malfunctions of components such as the tire pressure warning antenna and receiver, remove the tires from the wheels and check the IDs written on the tire pressure warning valves and transmitters (see page TW-71).
- When replacing the tire pressure warning valves and transmitters, note down the IDs written on the tire pressure warning valves and transmitters.

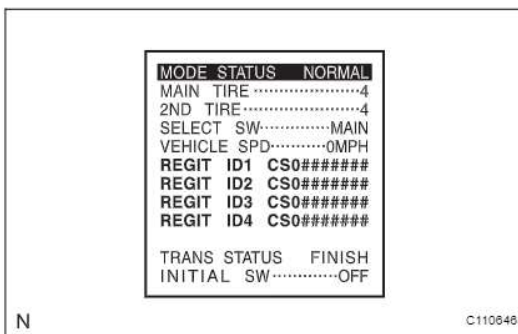
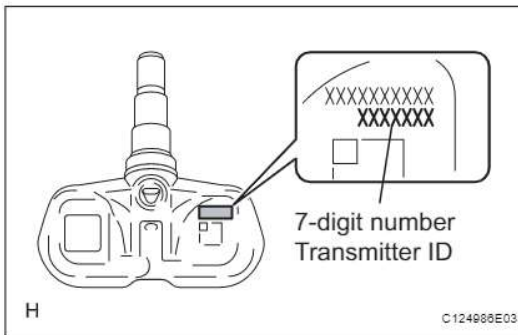
- (b) Connect the intelligent tester (with CAN VIM) to the DLC3.

- (c) Turn the power switch ON (IG).

- (d) *1: Read and write down the ID (ID1 to ID4) by using the DATA LIST.

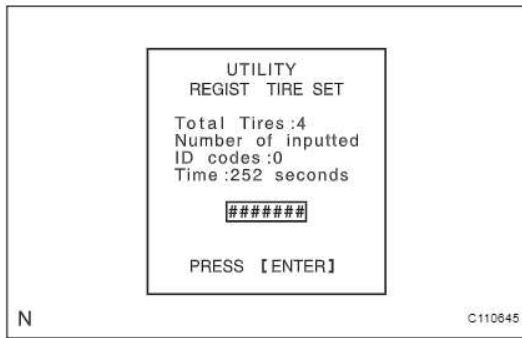
- (e) *2: Select REGIST TIRE by following the prompts on the intelligent tester screen. (UTILITY - REGIST TIRE)

- (f) *3: Select the registration mode "MAIN".

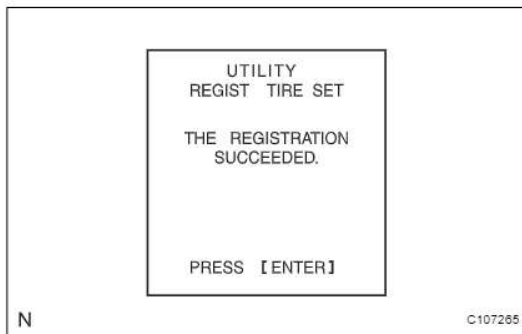


TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

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- (g) *4: Input the ID (ID1 to ID4) using the intelligent tester and transmit it to the tire pressure warning ECU.



- (h) Check that "THE REGISTRATION SUCCEEDED" appears on the intelligent tester screen.

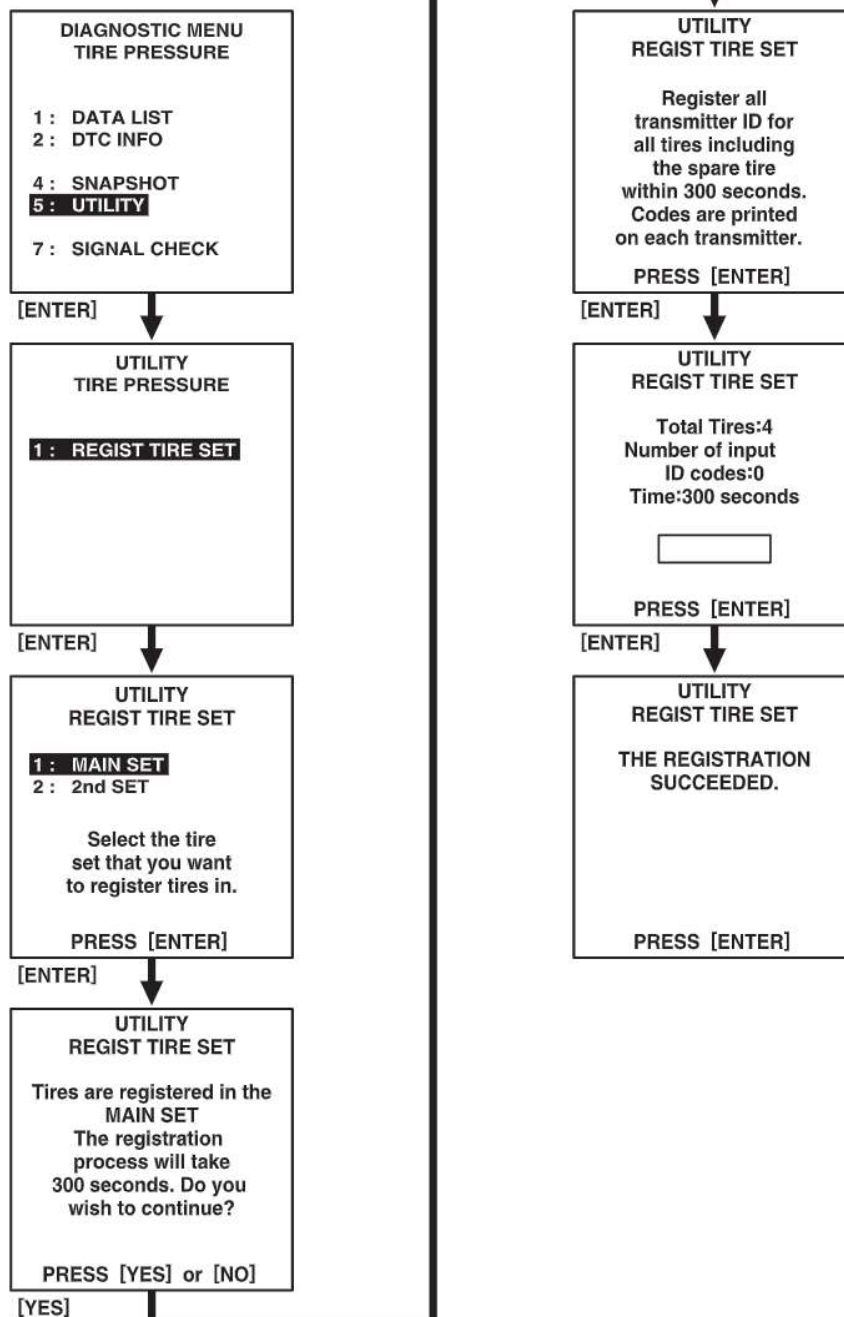
HINT:

The previously registered IDs will be deleted from the memory when the registration is completed. If the operations of steps *1 to *4 do not complete within 5 minutes, the mode will return to normal operation mode.

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM



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4. CONFIRMATION OF TRANSMITTER ID REGISTRATION

- (a) Set the tire pressure of the 4 tires to the specified value.

Standard pressure

Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

- (b) Connect the intelligent tester (with CAN VIM) to the DLC3.

- (c) Turn the power switch ON (IG).
- (d) Select "SIGNAL CHECK" mode on the intelligent tester (see page [TW-19](#)).
- (e) Confirm that the transmitter IDs and the data of tire pressure of all the tires are displayed on the intelligent tester screen.

NOTICE:

- It may take up to 1 minute to update the tire pressure data.
- If the IDs have not been registered, DTC C2171/71 is set in the tire pressure warning ECU after approximately 60 minutes.

INITIALIZATION

1. INITIALIZATION

NOTICE:

- Perform the tire pressure warning system initialization after the transmitter ID registration has been completed.
- The initialization is necessary when one of the following situations applies:
 - Tire pressure warning ECU is replaced.
 - Tires are replaced with those of different pressures.
 - Tire pressure warning valve and transmitters are replaced.
 - Vehicle is newly delivered.

- (a) Set the tire air pressure for the 4 wheels to the specified value.

Standard pressure

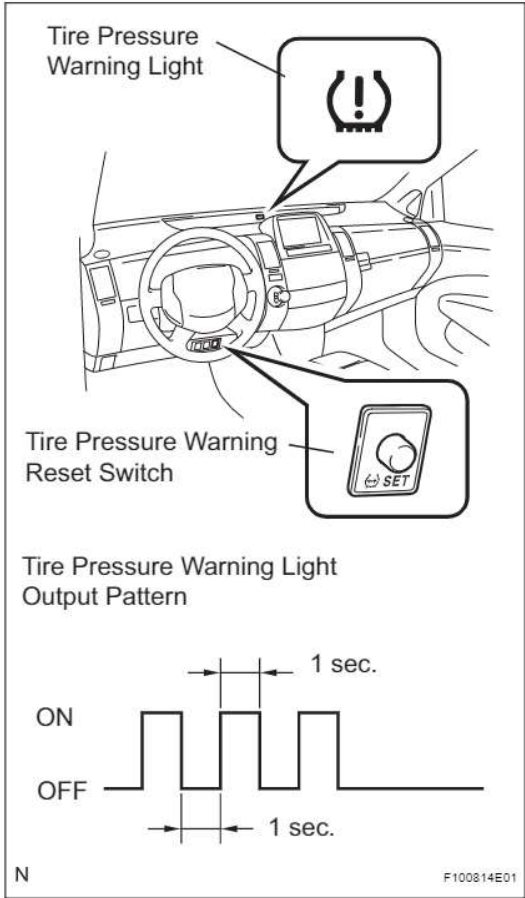
Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

- (b) Keep the tire pressure warning reset switch pressed for 3 seconds or more with the power switch ON (IG).

- (c) Check that the tire pressure warning light blinks 3 times at 1 second intervals.

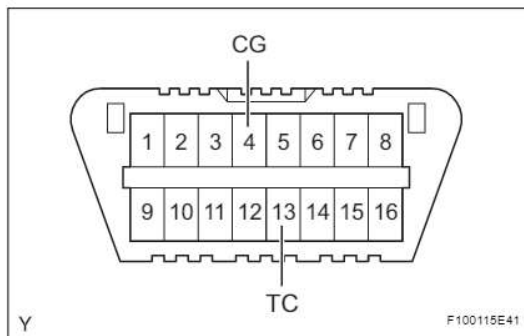
HINT:

The initialization is complete when the tire pressure warning ECU has received signals from all of the wheels.



TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

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- (d) Wait for 2 or 3 minutes with the power switch ON (IG).

NOTICE:

- The initialization is normally completed within 2 to 3 minutes.
- If the initialization has not been completed successfully, DTC C2177/77 is set approximately 20 minutes after driving starts.
- The initialization can be terminated by making a short circuit between terminals TC and CG of the DLC3 connector.

- (e) Confirm that the initialization has been completed using the intelligent tester.

- (1) Change the mode to test mode using intelligent tester and check that test DTCs have been stored.

- The test DTCs will not be indicated until the system initialization is complete.
- After the initialization has been completed successfully, the test DTCs (C2181/81 to C2191/91) are indicated.

NOTICE:

The following operations can be used instead of above procedure:

1. Turn the power switch from OFF to ON (IG).
2. Monitor the tire pressure values of all the wheels using intelligent tester.
3. If the tire pressure values cannot be displayed on the intelligent tester screen, the initialization has failed.
4. It takes 2 to 3 minutes to display the tire pressure data.

HINT:

In winter, as the tire pressure may decrease depending on the ambient temperature, increase the tire pressure by 20 kPa (0.2 kgf/cm², 2.9 psi) to 30 kPa (0.3 kgf/cm², 4.3 psi) above the specified value after confirmation that the initialization has been completed.

- (f) Initialization is completed.

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

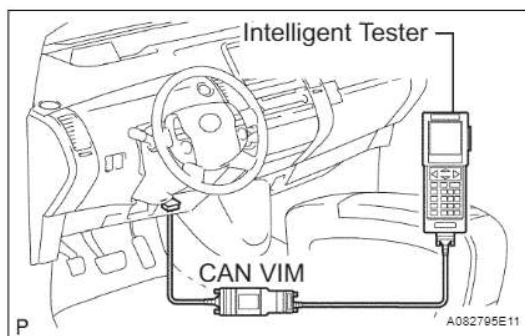
TEST MODE PROCEDURE

1. TEST MODE CHECK

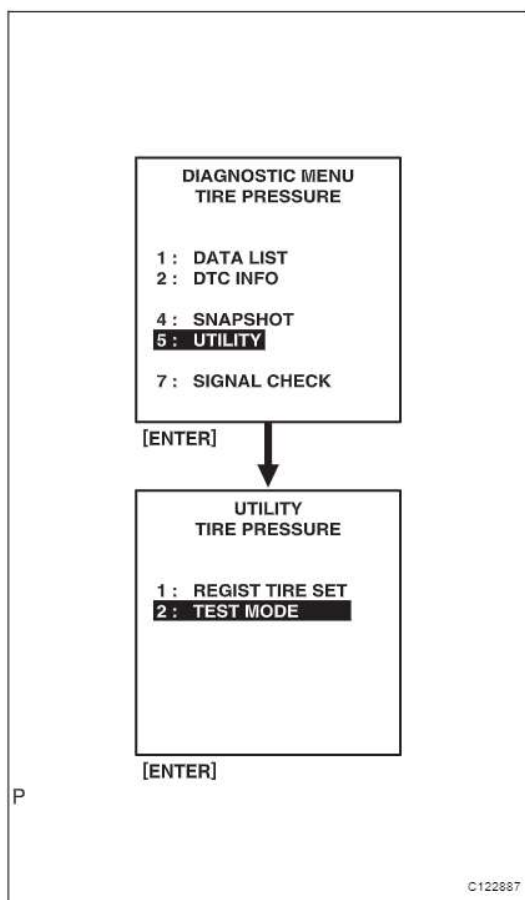
HINT:

- When entering the TEST MODE, the tire pressure warning ECU sets all the test DTCs first. After completing the test mode for each inspection item, the DTCs that are determined normal by the tire pressure warning ECU will be erased. The DTCs for other inspection items may not be erased when only a certain signal is inspected.
- When the test mode returns back to the normal mode, all the test DTCs will be erased.

- (a) Make sure that the power switch is OFF.
- (b) Connect the intelligent tester (with CAN VIM) to the DLC3.
- (c) Turn the power switch ON (IG).

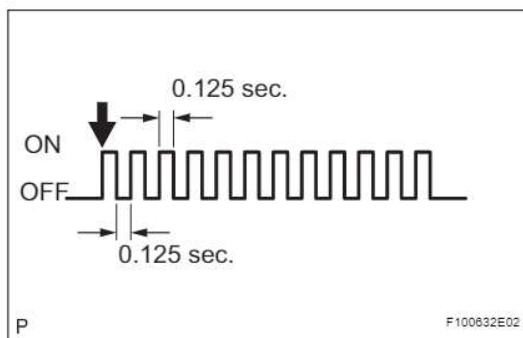


- (d) Select the TEST MODE on the intelligent tester.



TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

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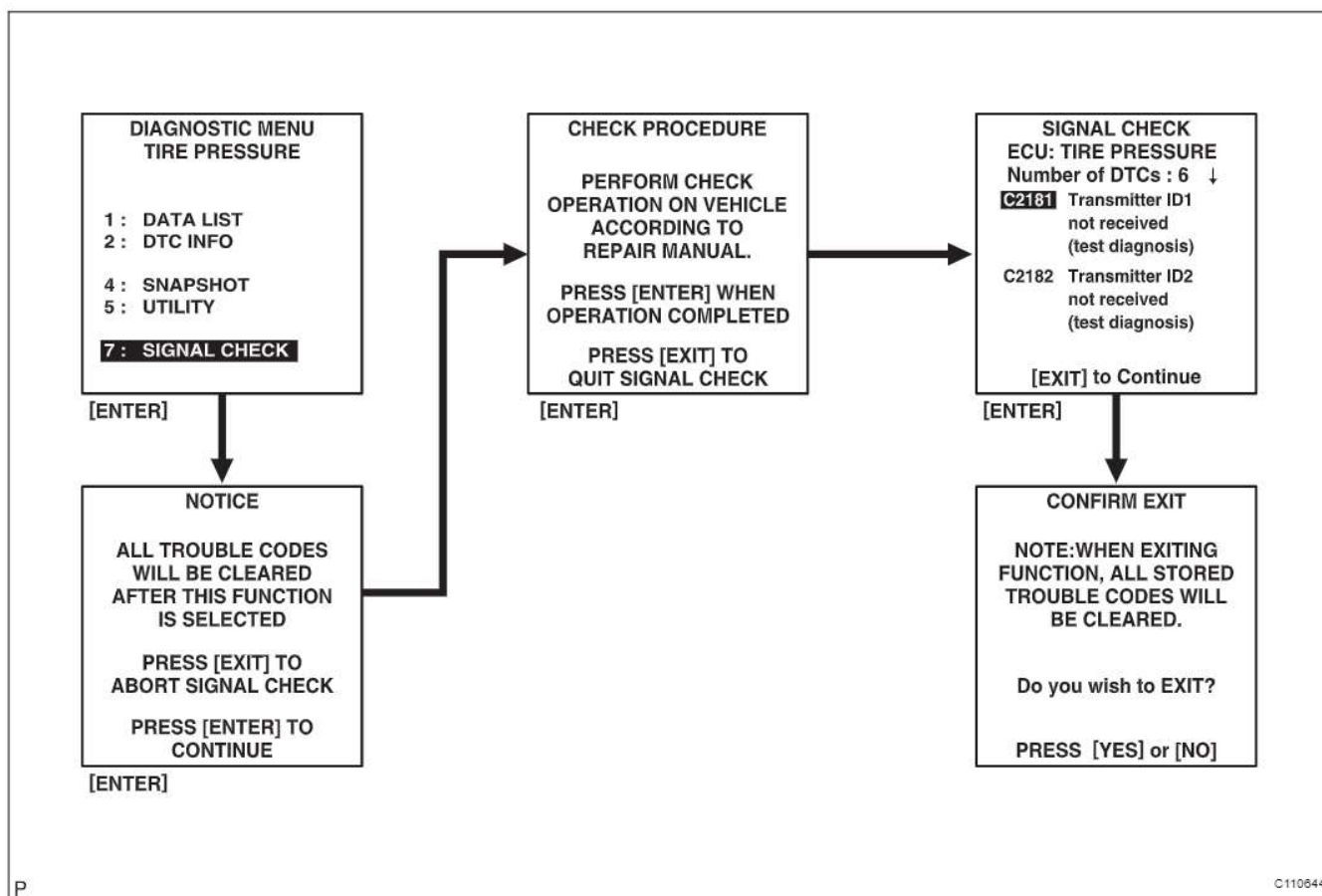
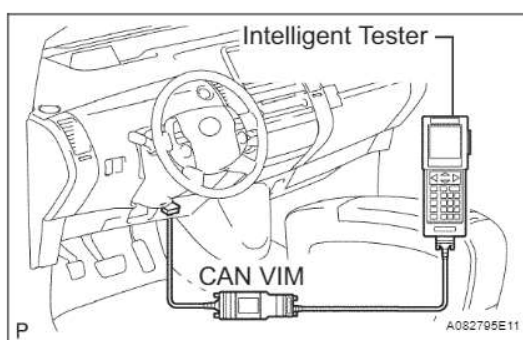


- (e) Confirm that the tire pressure warning light in the combination meter blinks at 0.125 second intervals.

2. PERFORM SIGNAL CHECK

HINT:

- When entering signal check, the tire pressure warning ECU sets all the signal check DTCs first. After completing signal check for each inspection item, the DTCs that are determined to be normal by the tire pressure warning ECU will be erased. The DTCs for other inspection items may not be erased when only a certain signal is inspected.
 - When the signal check returns to normal mode, all the signal check DTCs will be erased.
- Make sure that the power switch is OFF.
 - Connect the intelligent tester (with CAN VIM) to the DLC3.
 - Turn the power switch ON (IG).
 - Select the SIGNAL CHECK on the intelligent tester.



- (e) Drive the vehicle at 12 mph (20 km/h) or more for 30 seconds or more.

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

- (f) Loosen the valve core and rapidly reduce the pressure (above 40 kPa (0.4 kgf/cm², 5.8 psi) /30 sec.).

HINT:

The transmitter ID can be transmitted by rapidly reducing the tire pressure.

- (g) Check that the tire pressure warning system test mode DTCs are erased.

SIGNAL CHECK DTC	Test Signal	Signal Check DTC Clear Condition
C2181 to C2184	Transmitter Data	Receive DATA from the transmitter which has a registered ID in tire pressure warning ECU
C2191	Vehicle Speed Signal	Vehicle speed of 12 mph (20 km/h) or more is detected for 3 seconds or more

- (h) Result

HINT:

After the signal check is completed, check for a DTC and signal check DTC to confirm the system status.

Condition	Procedure
SIGNAL CHECK DTC is output	Repair the faulty part and enter SIGNAL CHECK again
SIGNAL CHECK DTCs are cleared	No problem

- (i) End of SIGNAL CHECK

After completing test mode (SIGNAL CHECK), turn the power switch OFF and disconnect the tester.

- (j) DTC of SIGNAL CHECK (TEST DIAGNOSIS)

HINT:

If a malfunction code is displayed during the test mode DTC check, check the circuit listed for that code. For details of each code, refer to the relevant page listed under the respective "DTC No." in the chart.

DTC No.	Detection Item	Trouble Area	See page
C2181/81	Transmitter ID1 not received	• Tire pressure warning antenna and receiver • Each tire pressure warning valve and transmitter • Tire pressure warning ECU • Wire harness	TW-35
C2182/82	Transmitter ID2 not received	• Tire pressure warning antenna and receiver • Each tire pressure warning valve and transmitter • Tire pressure warning ECU • Wire harness	TW-35
C2183/83	Transmitter ID3 not received	• Tire pressure warning antenna and receiver • Each tire pressure warning valve and transmitter • Tire pressure warning ECU • Wire harness	TW-35
C2184/84	Transmitter ID4 not received	• Tire pressure warning antenna and receiver • Each tire pressure warning valve and transmitter • Tire pressure warning ECU • Wire harness	TW-35

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DTC No.	Detection Item	Trouble Area	See page
C2191/91	Vehicle speed signal error	• Vehicle speed sensor • Combination meter • Tire pressure warning ECU • Wire harness	TW-53

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

PROBLEM SYMPTOMS TABLE

- Use the table below to help determine the cause of the problem symptom. The potential causes of the symptoms are listed in order of probability in the "Suspected area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.

Tire pressure warning system

Symptom	Suspected area	See page
Tire pressure warning system does not operate.	1. Power source circuit	TW-60
	2. TC and CG terminal circuit	TW-62
	3. Tire pressure warning valve and transmitter	TW-72
	4. Combination meter	ME-46
	5. Tire pressure warning antenna and receiver	TW-68
	6. Tire pressure warning ECU	TW-23
DTC check cannot be performed.	1. Power source circuit	TW-60
	2. TC and CG terminal circuit	TW-62
	3. Tire pressure warning ECU	TW-23
Tire pressure warning light malfunctions (does not light up).	1. Power source circuit	TW-60
	2. Tire pressure warning light circuit	TW-58
	3. Combination meter	ME-11
	4. Tire pressure warning ECU	TW-23
Tire pressure warning light malfunctions (remains on).	1. Tire pressure check	TW-3
	2. Tire pressure warning ECU connector poorly connected	-
	3. Tire pressure warning light circuit	TW-58
	4. Combination meter	ME-11
	5. Tire pressure warning ECU	TW-23
Tire pressure warning light malfunctions (blinking).	1. Check DTC	TW-27
	2. TC and CG terminal circuit	TW-62
	3. Test mode (SIGNAL CHECK)	TW-19
	4. Tire pressure warning ECU	TW-23
Initialization cannot be performed.	1. Combination meter	ME-46
	2. Tire pressure warning reset switch circuit	TW-55
	3. Tire pressure warning ECU	TW-23

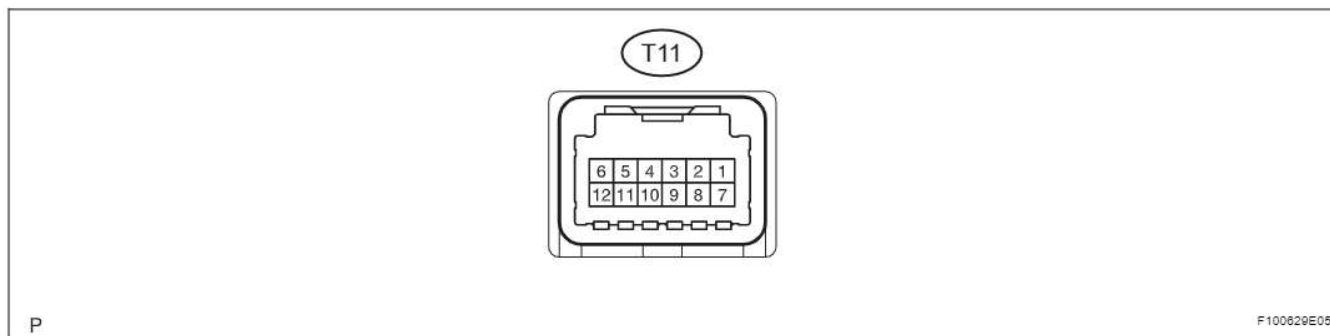
TW

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

TW-27

TERMINALS OF ECU

1. CHECK TIRE PRESSURE WARNING ECU



(a) Measure the voltage of the connector.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
IG (T11-1) - GND (T11-7)	B - W-B	IG power source	Power switch ON (IG)	10 to 16 V
CLSW (T11-2) - GND (T11-7)	GR - W-B	Tire pressure warning reset switch	Power switch ON (IG), Tire pressure warning reset switch on	8 to 15 V
CLSW (T11-2) - GND (T11-7)	GR - W-B	Tire pressure warning reset switch	Power switch ON (IG), Tire pressure warning reset switch off	Below 1.5 V
MPX1 (T11-6) - GND (T11-7)	W - W-B	Multiplex communication line	Power switch ON (IG)	10 to 16 V
RDA (T11-9) - GND (T11-7)	B - W-B	Tire pressure warning antenna and receiver signal	Power switch ON (IG), when the tire pressure warning antenna and receiver is not connected	9 to 16 V
RF5V (T11-10) - GND (T11-7)	R - W-B	Tire pressure warning antenna and receiver power source	Power switch ON (IG)	4.5 to 5.5 V
MPX2 (T11-12) - GND (T11-7)	B - W-B	Multiplex communication line	Power switch ON (IG)	10 to 16 V
GND2 (T11-4) - GND (T11-7)	G - W-B	Tire pressure warning antenna and receiver ground	Always	Below 1 Ω

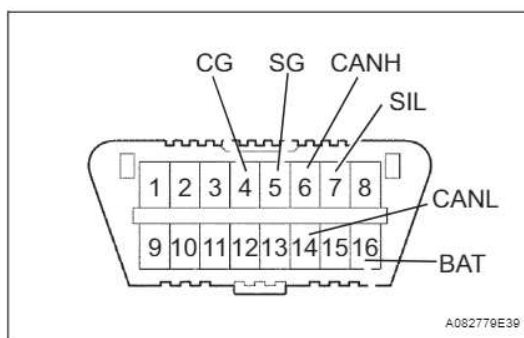
If the result is not as specified, the ECU may have a malfunction.

DIAGNOSIS SYSTEM

1. CHECK DLC3

- (a) The ECM uses ISO 15765-4 for communication. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO 15765-4 format.

TW



Symbols (Terminal No.)	Terminal Description	Condition	Specified Condition
SIL (7) - SG (5)	Bus "+" line	During transmission	Pulse generation
CG (4) - Body ground	Chassis ground	Always	Below 1 Ω
SG (5) - Body ground	Signal ground	Always	Below 1 Ω
BAT (16) - Body ground	Battery positive	Always	11 to 14 V
CANH (6) - CANL (14)	HIGH - level CAN bus line	Power switch is OFF*	54 to 69 Ω

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

Symbols (Terminal No.)	Terminal Description	Condition	Specified Condition
CANH (6) - Battery positive	HIGH - level CAN bus line	Power switch is OFF*	1 MΩ or higher
CANH (6) - CG (4)	HIGH - level CAN bus line	Power switch is OFF*	1 kΩ or higher
CANL (14) - Battery positive	LOW-level CAN bus line	Power switch is OFF*	1 MΩ or higher
CANL (14) - CG (4)	LOW-level CAN bus line	Power switch is OFF*	1 kΩ or higher

NOTICE:

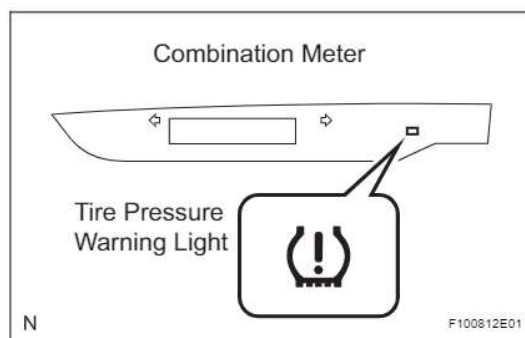
*: Before measuring the resistance, leave the vehicle as is for at least 1 minute and do not operate the power switch, other switches or the doors.

If the result is not as specified, the DLC3 may have a malfunction. Repair or replace the harness and connector.

HINT:

Connect the cable of the intelligent tester (with CAN VIM) to the DLC3, turn the power switch ON (IG) and attempt to use the tester. If the screen displays UNABLE TO CONNECT TO VEHICLE, there may be a problem on the vehicle side or the tester side.

- If communication is normal when the tester is connected to another vehicle, inspect the DLC3 of the original vehicle.
- If communication is still not possible when the tester is connected to another vehicle, the problem may be in the tester itself. Consult the Service Department listed in the tester's instruction manual.

**2. DIAGNOSIS SYSTEM**

(a) Warning light

- (1) When there is a problem with the tire pressure warning system, the tire pressure warning light blinks at 0.5 second intervals.

NOTICE:

When the malfunction has been corrected, the tire pressure warning light does not turn on.

(b) DTCs (normal mode)

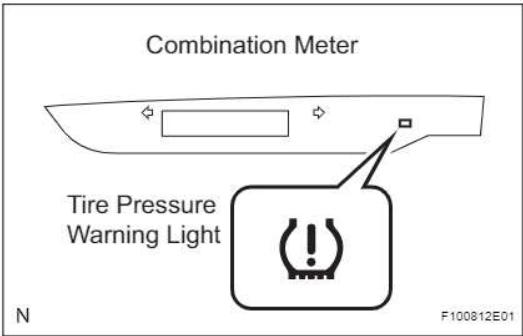
- (1) DTCs are memorized in the tire pressure warning ECU and read by the blinks of the tire pressure warning light or using the intelligent tester (see page TW-27).

(c) Test mode

- (1) By switching from normal mode into test mode (input signal check), you can inspect the tire pressure warning antenna and receiver, each tire pressure warning valve and transmitter and vehicle speed sensor (see page TW-17).

3. CHECK WARNING LIGHT

- (a) Turn the power switch ON (IG).



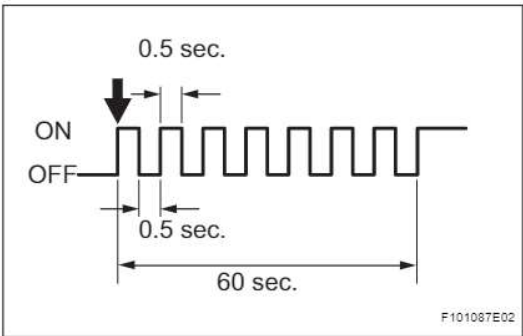
- (b) Check that the tire pressure warning light comes on for 3 seconds.
If the warning check result is not normal, proceed to the troubleshooting for the tire pressure warning light circuit.

Trouble Area	See procedure
Tire pressure warning light circuit	TW-58

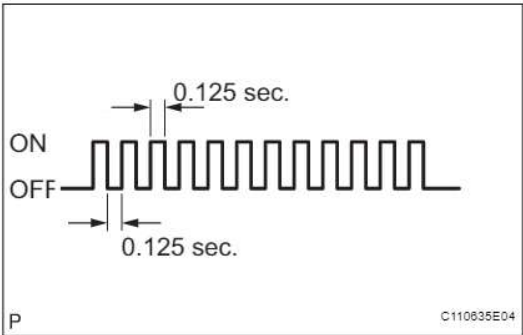
4. TIRE PRESSURE WARNING LIGHT

HINT:
The table below indicates the state of the tire pressure warning light after the power switch is turned ON (IG).

	Immediately after turning the power switch ON (IG)	Always				
	Turns on for 3 sec.	Warning light output pattern				
		Turns off	Turns on	Blinks (*1) (Warning light flashes for 1 minute and then remains on)	Blinks (*2)	Blinks (*3)
Normal	○	○				
Low tire pressure	○		○			
System fail	○			○		
Test mode	○				○	
Initialization	○					○
ECU connector poorly connected			○			
TC ground	○					



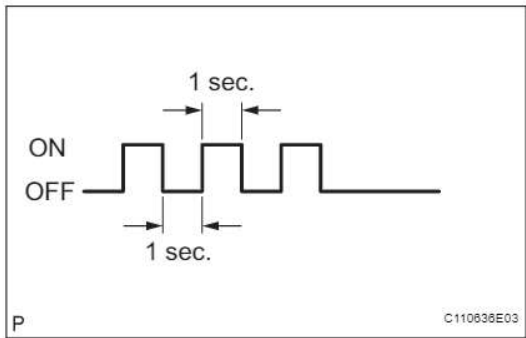
- *1: Comes on and goes off repeatedly at 0.5 second intervals.
HINT:
The tire pressure warning light blinks for approximately 1 minute and then remains on.



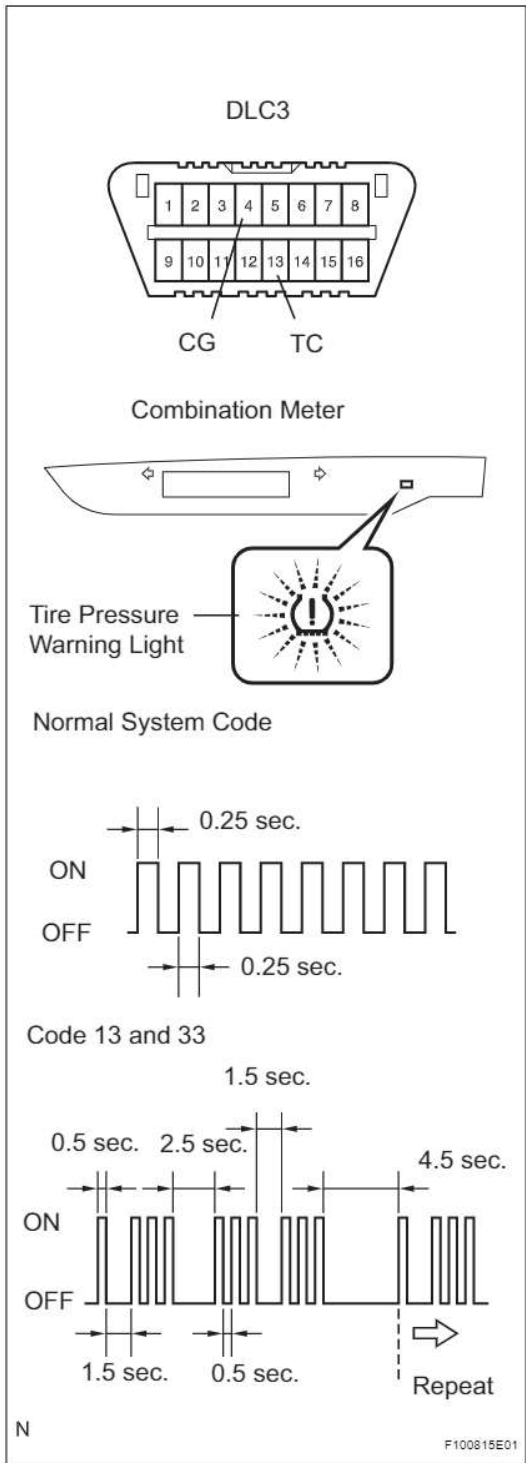
- *2: Comes on and goes off repeatedly at 0.125 second intervals.

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM



*3: Blinks 3 times (1 second on, 1 second off).

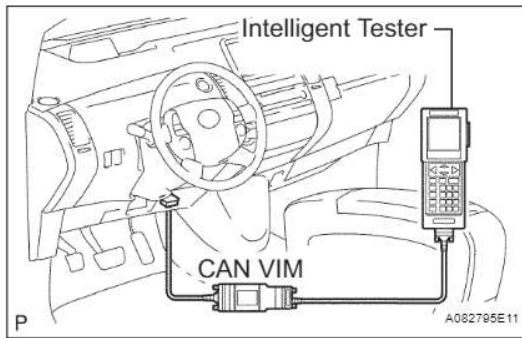


DTC CHECK / CLEAR

1. CHECK DTC (USING SST CHECK WIRE)
- (a) Using SST, connect terminals TC and CG of DLC3.
 - (b) Turn the power switch ON (IG).
 - (c) Read and record any DTCs from the tire pressure warning light on the combination meter. Refer to the illustration on the left for examples of a normal system code and codes 13 and 33.
- HINT:
- If the tire pressure warning light does not blink any DTCs or the normal system code, inspect the tire pressure warning light circuit or TC and CG terminal circuit.

Trouble Area	See procedure
Tire pressure warning light circuit	TW-58

- If 2 or more malfunctions are indicated at the same time, the lowest numbered DTC is displayed first.
- (d) Refer to the Diagnostic Trouble Code Chart (see page [TW-29](#)) for DTC information.
 - (e) Using SST, connect terminals TC and CG of DLC3.
- SST 09843-18040**

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM**TW-31****2. CHECK DTC (USING INTELLIGENT TESTER)**

- (a) Connect the intelligent tester (with CAN VIM) to the DLC3.
- (b) Turn the power switch ON (IG).
- (c) Read the DTCs by following the prompts on the tester screen.

HINT:

Refer to the intelligent tester operator's manual for further details.

3. CLEAR DTC**HINT:**

After repairing the malfunctions, clear the DTCs.

- (a) Connect the intelligent tester (with CAN VIM) to the DLC3.
- (b) Turn the power switch ON (IG).
- (c) Erase the DTCs by following the prompts on the tester screen.

HINT:

Refer to the intelligent tester operator's manual for further details.

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

DATA LIST / ACTIVE TEST

1. READ DATA LIST

HINT:

Using the intelligent tester's DATA LIST allows switch, sensor, actuator and other item values to be read without removing any parts. Reading the DATA LIST early in troubleshooting is one way to save time.

- Connect the intelligent tester (with CAN VIM) to the DLC3.
- Turn the power switch ON (IG) and press the intelligent tester main switch on.
- Read the DATA LIST by following the directions on the tester screen.

Tire pressure warning ECU

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
MODE STATUS	Tire pressure warning system mode / NORMAL or REG 2nd or REG M or TEST	NORMAL: Normal mode TEST: Test mode	-
MAIN TIRE	Number of main tire ID to be registered / 0 or 1 or 2 or 3 or 4	0 to 4 should be displayed	-
INITIAL SW	Initialization switch / ON or OFF	ON: Switch on OFF: Switch off	-
VEHICLE SPEED	Vehicle speed reading / min.: 0 km/h (0 mph), max.: 255 km/h (158 mph)	Actual vehicle speed	Speed indicated on the combination meter
REGIT ID1 CODE	Registered ID1 code / min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID1 is displayed	-
REGIT ID2 CODE	Registered ID2 code / min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID2 is displayed	-
REGIT ID3 CODE	Registered ID3 code / min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID3 is displayed	-
REGIT ID4 CODE	Registered ID4 code / min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID4 is displayed	-
TRANS STATUS	ID code transmission status / FINISH or NOW	FINISH or NOW	-
TIREPRESS1	ID1 tire inflation pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire inflation pressure	-
TIREPRESS2	ID2 tire inflation pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire inflation pressure	-
TIREPRESS3	ID3 tire inflation pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire inflation pressure	-
TIREPRESS4	ID4 tire inflation pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire inflation pressure	-
TIRE TEMP1	ID1 temperature in tire / min.: -40°C (-40°F), max.: 215°C (419°F)	Actual tire temperature	-
TIRE TEMP2	ID2 temperature in tire / min.: -40°C (-40°F), max.: 215°C (419°F)	Actual tire temperature	-

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

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Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TIRE TEMP3	ID3 temperature in tire / min.: -40°C (-40°F), max.: 215°C (419°F)	Actual tire temperature	-
TIRE TEMP4	ID4 temperature in tire / min.: -40°C (-40°F), max.: 215°C (419°F)	Actual tire temperature	-
BATT VOLT1	ID1 battery voltage / OVER or LESS	OVER	-
BATT VOLT2	ID2 battery voltage / OVER or LESS	OVER	-
BATT VOLT3	ID3 battery voltage / OVER or LESS	OVER	-
BATT VOLT4	ID4 battery voltage / OVER or LESS	OVER	-
INITIAL SW INFO	Initialization switch setting information / WITH or WITHOUT	WITH or WITHOUT	-
INIT THRESHOLD1	ID1 initial threshold of low-pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Threshold pressure after initialization	-
INIT THRESHOLD2	ID2 initial threshold of low-pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Threshold pressure after initialization	-
INIT THRESHOLD3	ID3 initial threshold of low-pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Threshold pressure after initialization	-
INIT THRESHOLD4	ID4 initial threshold of low-pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Threshold pressure after initialization	-
# CODES	Number of DTC recorded / min.: 0, max.: 255	Min.: 0, Max.: -	-

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

DIAGNOSTIC TROUBLE CODE CHART

HINT:

- If no abnormality is found when the parts are inspected, inspect the tire pressure warning ECU.
- If a malfunction code is displayed during the DTC check, inspect the circuit listed for that code. For details of each code, refer to the "DTC No." in the DTC chart.

DTC chart of tire pressure warning

DTC No.	Detection Item	Trouble Area	See page
C2111/11	Transmitter ID1 Operation Stop	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-32
C2112/12	Transmitter ID2 Operation Stop	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-32
C2113/13	Transmitter ID3 Operation Stop	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-32
C2114/14	Transmitter ID4 Operation Stop	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-32
C2121/21	No Signal from Transmitter ID1 in Main Mode	1. Tire pressure warning valve and transmitter 2. Tire pressure warning antenna and receiver 3. Tire pressure warning ECU 4. Wire harness	TW-35
C2122/22	No Signal from Transmitter ID2 in Main Mode	1. Tire pressure warning valve and transmitter 2. Tire pressure warning antenna and receiver 3. Tire pressure warning ECU 4. Wire harness	TW-35
C2123/23	No Signal from Transmitter ID3 in Main Mode	1. Tire pressure warning valve and transmitter 2. Tire pressure warning antenna and receiver 3. Tire pressure warning ECU 4. Wire harness	TW-35
C2124/24	No Signal from Transmitter ID4 in Main Mode	1. Tire pressure warning valve and transmitter 2. Tire pressure warning antenna and receiver 3. Tire pressure warning ECU 4. Wire harness	TW-35
C2141/41	Transmitter ID1 Error	1. Tire pressure warning valve and transmitter	TW-41
C2142/42	Transmitter ID2 Error	1. Tire pressure warning valve and transmitter	TW-41
C2143/43	Transmitter ID3 Error	1. Tire pressure warning valve and transmitter	TW-41
C2144/44	Transmitter ID4 Error	1. Tire pressure warning valve and transmitter	TW-41
C2165/65	Abnormal Temperature Inside ID1 Tire	1. Tire pressure warning valve and transmitter 2. Tire pressure warning antenna and receiver	TW-43
C2166/66	Abnormal Temperature Inside ID2 Tire	1. Tire pressure warning valve and transmitter 2. Tire pressure warning antenna and receiver	TW-43

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

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DTC No.	Detection Item	Trouble Area	See page
C2167/67	Abnormal Temperature Inside ID3 Tire	1. Tire pressure warning valve and transmitter 2. Tire pressure warning antenna and receiver	TW-43
C2168/68	Abnormal Temperature Inside ID4 Tire	1. Tire pressure warning valve and transmitter 2. Tire pressure warning antenna and receiver	TW-43
C2171/71	Transmitter ID not Registered in Main Mode	1. Tire pressure warning ECU	TW-46
C2176/76	Receiver Error	1. Tire pressure warning antenna and receiver 2. Tire pressure warning ECU 3. Wire harness	TW-48
C2177/77	Initialization not Completed	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-52
C2181/81	Transmitter ID1 not Received (Test Mode DTC)	1. Tire pressure warning valve and transmitter 2. Each tire pressure warning valve and transmitter 3. Tire pressure warning ECU 4. Wire harness	TW-35
C2182/82	Transmitter ID2 not Received (Test Mode DTC)	1. Tire pressure warning valve and transmitter 2. Each tire pressure warning valve and transmitter 3. Tire pressure warning ECU 4. Wire harness	TW-35
C2183/83	Transmitter ID3 not Received (Test Mode DTC)	1. Tire pressure warning valve and transmitter 2. Each tire pressure warning valve and transmitter 3. Tire pressure warning ECU 4. Wire harness	TW-35
C2184/84	Transmitter ID4 not Received (Test Mode DTC)	1. Tire pressure warning valve and transmitter 2. Each tire pressure warning valve and transmitter 3. Tire pressure warning ECU 4. Wire harness	TW-35
C2191/91	Vehicle Speed Signal Error (Test Mode DTC)	1. Vehicle speed sensor 2. Tire pressure warning ECU 3. Combination meter 4. Wire harness	TW-53

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

DTC	C2111/11	Transmitter ID1 Operation Stop
DTC	C2112/12	Transmitter ID2 Operation Stop
DTC	C2113/13	Transmitter ID3 Operation Stop
DTC	C2114/14	Transmitter ID4 Operation Stop

DESCRIPTION

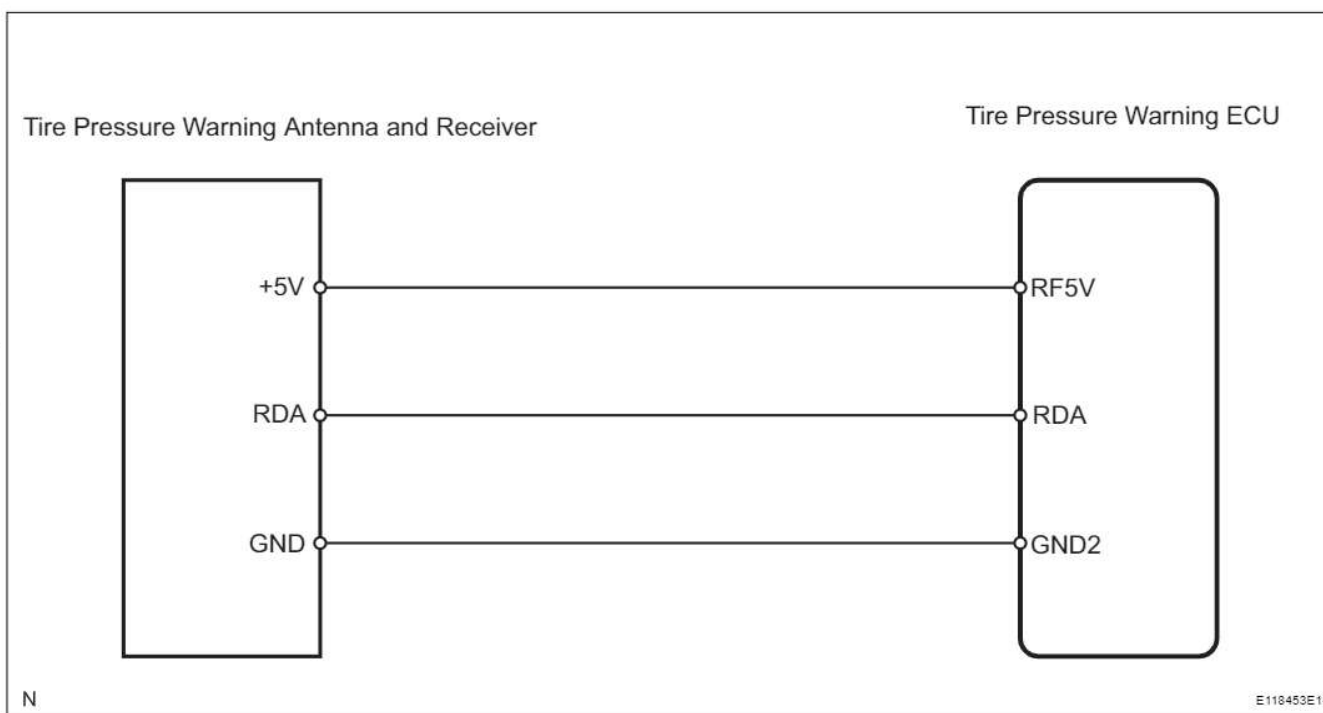
The tire pressure warning valve and transmitter that is installed in the tires and wheels measures the air pressure of the tires. The measured values are transmitted to the tire pressure warning antenna and receiver on the body as radio waves and then sent to the tire pressure warning ECU. The ECU compares the measured air pressure values with the air pressure threshold. When the measured air pressure values are less than this threshold, the warning light in the combination meter turns on.

The tire pressure warning ECU stores a DTC when the tire pressure warning valve stops transmitting signals. At this time, forcibly transmit the signals by releasing the tire pressure rapidly. The stored DTC is cleared when the signal transmission is resumed.

DTC No	DTC Detection Condition	Trouble Area
C2111/11 C2112/12 C2113/13 C2114/14	Tire pressure monitor valve stops transmitting signals	- Tire pressure warning valve and transmitter - Tire pressure warning ECU

HINT:

It is necessary to perform the procedure to identify the tire pressure monitor valve that is malfunctioning because it cannot be identified by the output DTC.

WIRING DIAGRAM

INSPECTION PROCEDURE

NOTICE:

It is necessary to register an ID code after replacing the tire pressure warning antenna and receiver and/or the tire pressure warning ECU (see page [TW-14](#)).

1 PERFORM FORCED TRANSMISSION OF TRANSMITTER ID OF ALL WHEELS

- (a) Set the pressure of each tire to the specified value.
Standard pressure

Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

- (b) Connect the intelligent tester (with CAN VIM) to the DLC3.
(c) Turn the power switch ON (IG).
(d) Select TIREPRESS by following the prompts displayed on the intelligent tester.

Tire pressure warning ECU

Item	Measurement item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS1	ID1 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS2	ID2 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS3	ID3 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS4	ID4 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-

- (e) Rapidly release the pressure from each wheel by approximately 40 kPa (0.4 kgf/cm², 5.8 psi) for 30 seconds or more.
(1) Check that each tire pressure data displayed on the intelligent tester screen changes.

OK:

The tire pressure data displayed on the intelligent tester screen changes with the value of the tire pressure.

NOTICE:

- It may take up to 1 minute to display the updated tire pressure data.
 - When the TIREPRESS data (IDs 1 to 4) changes, reset the tire pressure of the tires to the specified value, rotate the tires 90 to 270° and recheck.
- (2) After confirming that the tire pressure data displayed on the intelligent tester screen has changed, set the pressure of each tire to the specified value.

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

Standard pressure

Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

HINT:
If the tire pressure data displayed on the intelligent tester screen has not changed after rechecking, go to the troubleshooting procedures of DTCs C2121/21 to C2124/24 which indicate transmission or reception malfunctions (see page [TW-35](#)).

NG

CHECK OTHER PROBLEM (MALFUNCTION IN TRANSMISSION OR RECEPTION FUNCTION)

OK

END

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

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DTC	C2121/21	No Signal from Transmitter ID1 in Main Mode
DTC	C2122/22	No Signal from Transmitter ID2 in Main Mode
DTC	C2123/23	No Signal from Transmitter ID3 in Main Mode
DTC	C2124/24	No Signal from Transmitter ID4 in Main Mode
DTC	C2181/81	Transmitter ID1 not Received (Test Mode DTC)
DTC	C2182/82	Transmitter ID2 not Received (Test Mode DTC)
DTC	C2183/83	Transmitter ID3 not Received (Test Mode DTC)
DTC	C2184/84	Transmitter ID4 not Received (Test Mode DTC)

DESCRIPTION

The tire pressure warning valve and transmitter constantly sends radio waves to the tire pressure warning ECU.

Under the following conditions, the tire pressure warning antenna and receiver is unable to receive the signals from the tire pressure warning valve and transmitter, and a DTC is output.

- Areas, facilities, or devices that use similar radio frequencies are located in the vicinity of the vehicle.
- Devices using similar radio frequencies are used in the vehicle.

DTCs C2121/21 to C2124/24 can only be deleted by the tester. DTCs C2181/81 to C2184/84 can be deleted when the transmitter sends a forced transmission signal or the test mode ends. DTCs C2181/81 to C2184/84 are output only in the test mode.

DTC No.	DTC Detection Condition	Trouble Area
C2121/21 C2122/22 C2123/23 C2124/24	These DTCs are detected when no signals are received for 51 minutes or more, after a vehicle speed of 5 mph (8 km/h) or more is detected and no signals are received for 12 minutes or more	• Tire pressure warning valve and transmitter • Tire pressure warning antenna and receiver • Tire pressure warning ECU • Wire harness
C2181/81 C2182/82 C2183/83 C2184/84	Malfunction in transmission / reception circuit	• Tire pressure warning valve and transmitter • Tire pressure warning antenna and receiver • Tire pressure warning ECU • Wire harness

TW**HINT:**

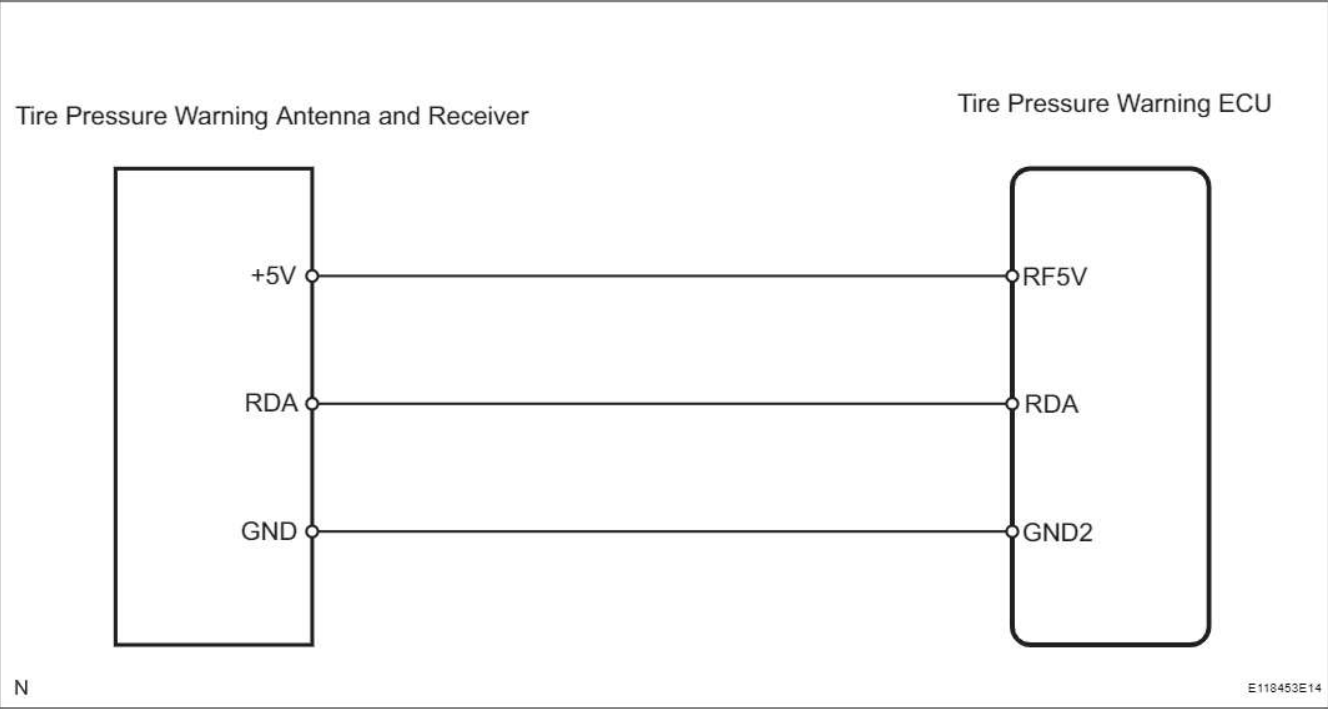
When no signals are received for 60 minutes or more, a DTC is output.

It is necessary to perform the procedure to identify the tire pressure warning valve and transmitter that is malfunctioning because it cannot be identified by the output DTC.

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:
It is necessary to register an ID code after replacing the tire pressure warning valve and transmitter and/or the tire pressure warning ECU (see page TW-14).

1

IDENTIFY TRANSMITTER (CORRESPONDING TO DTC)

- (a) Set the pressure of each tire to the specified value.
Standard pressure

Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

- (b) Connect the intelligent tester (with CAN VIM) to the DLC3.
(c) Turn the power switch ON (IG).
(d) Select TIREPRESS by following the prompts displayed on the intelligent tester.

Tire pressure warning ECU

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS1	ID1 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS2	ID2 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

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Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS3	ID3 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS4	ID4 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-

- (e) Rapidly release the tire pressure from any tire by 40 kPa (0.4 kgf/cm², 5.8 psi) for 30 seconds or more.

HINT:

- Identify the malfunctioning tire pressure warning valve and transmitter by rapidly releasing the tire pressures from each tire.
- Record which TIREPRESS data (ID1 to ID5) corresponds to each tire.

- (f) Check the DATA LIST.

Result

Condition	Detection Condition
One of TIREPRESS data (ID1 to ID4) changed	Normal
No TIREPRESS data changed	Transmitter corresponding to DTC

NOTICE:

- It may take up to 1 minute to display the updated tire pressure data.
 - When the TIREPRESS data (IDs 1 to 4) changes, reset the tire pressure of the tires to the specified value, rotate the tires 90 to 270° and recheck.
 - When the transmitter is normal, record the tire location and the transmitter ID.
- (g) When the TIREPRESS data (IDs 1 to 4) changes, repeat the same procedure on the rest of the tires (one by one) to identify which tire pressure warning valve and transmitter the DTC corresponds to.
- (h) Set the pressure of each tire to the specified value.

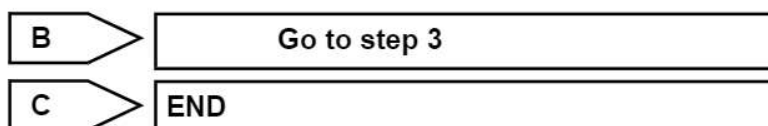
Standard pressure

Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

- (i) Check all transmitters of the tires.

Result

Result	Detection Condition
One or more of transmitters abnormal	A
All abnormal	B
All normal	C



TW

TW-42

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

A

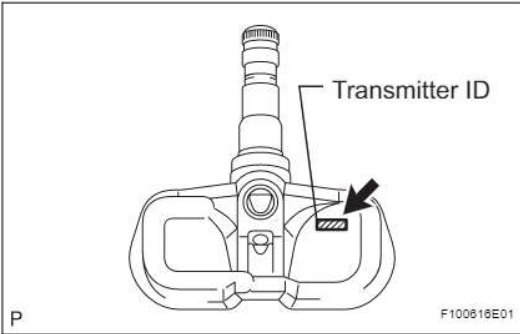
2

CHECK TIRE PRESSURE WARNING VALVE AND TRANSMITTER

- (a)
- Select REGIT ID CODE by following the prompts displayed on the intelligent tester.

Tire pressure warning ECU

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
REGIT ID1 CODE	Registered ID1 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID1 is display	-
REGIT ID2 CODE	Registered ID2 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID2 is display	-
REGIT ID3 CODE	Registered ID3 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID3 is display	-
REGIT ID4 CODE	Registered ID4 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID4 is display	-



- (b)
- Remove the tire pressure warning valve and transmitter and check its ID number (see page TW-72).
- (c)
- Check whether the recorded transmitter ID and the actual transmitter ID match.

Result

Result	Detection Condition
Unmatched	A
Matched	B

B

REPLACE TIRE PRESSURE WARNING VALVE AND TRANSMITTER

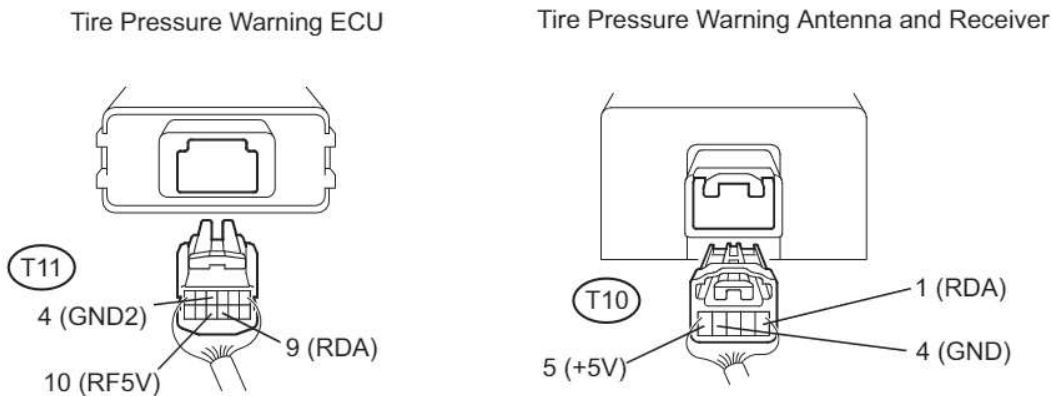
A

PERFORM REGISTRATION (TRANSMITTER ID)

3

CHECK WIRE HARNESS (ECU - RECEIVER)

Wire Harness Side



B128075E03

- (a) Disconnect the T11 ECU connector.
- (b) Disconnect the T10 receiver connector.
- (c) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Specified Condition
T11-10 (RF5V) - T10-5 (+5V)	Below 1 Ω
T11-9 (RDA) - T10-1 (RDA)	
T11-4 (GND2) - T10-4 (GND)	

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

4

READ VALUE OF INTELLIGENT TESTER (TIRE PRESSURE)

- (a) Check the DATA LIST tire pressure valve.

Tire pressure warning ECU

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS1	ID1 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS2	ID2 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS3	ID3 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-

TW

TW-44

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS4	ID4 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-

OK:

All tire pressure readings are equal to the actual tire pressure.

NOTICE:

It may take up to 1 minute to display the updated tire pressure data.

OK

END

NG

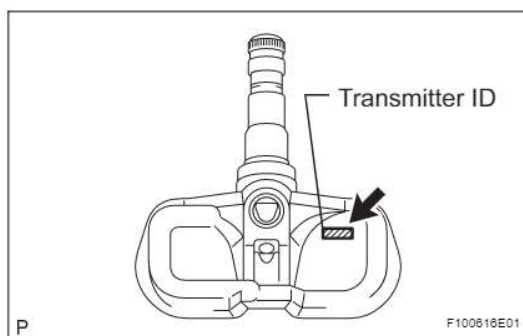
5

CHECK ID CODE (TIRE PRESSURE WARNING VALVE AND TRANSMITTER)

- (a) Select REGIT ID CODE by following the prompts displayed on the intelligent tester.

Tire pressure warning ECU

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
REGIT ID1 CODE	Registered ID1 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID1 is display	-
REGIT ID2 CODE	Registered ID2 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID2 is display	-
REGIT ID3 CODE	Registered ID3 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID3 is display	-
REGIT ID4 CODE	Registered ID4 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID4 is display	-



- (b) Remove the tire pressure monitor valve and check its ID number (see page TW-72).
(c) Check whether the recorded transmitter ID and the actual transmitter ID match.

Result

Result	Detection Condition
Unmatched	A
Matched	B

B

REPLACE TIRE PRESSURE WARNING RECEIVER AND TRANSMITTER

A

PERFORM REGISTRATION (TRANSMITTER ID)

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

TW-45

DTC	C2141/41	Transmitter ID1 Error
DTC	C2142/42	Transmitter ID2 Error
DTC	C2143/43	Transmitter ID3 Error
DTC	C2144/44	Transmitter ID4 Error

DESCRIPTION

DTC No.	DTC Detection Condition	Trouble Area
C2141/41 C2142/42 C2143/43 C2144/44	If an "ERROR" signal is received 3 times consecutively, tire pressure monitor valve will be judged as defective and this DTC will be output. This will happen in situations where inflation pressure is outside range 0 to 537.5 kPa (0 to 5.27 kgf/cm ² , 0 psi to 77.7 psi), temperature inside tire is outside specified range -40 to 215°C (-40 to 419 °F), or an error occurs in tire pressure monitor valve.	Tire pressure warning valve and transmitter

HINT:

It is necessary to perform the procedure to identify the tire pressure monitor valve that is malfunctioning because it cannot be identified by the output DTC.

INSPECTION PROCEDURE

NOTICE:

It is necessary to register an ID code after replacing the tire pressure warning valve and transmitter and/or the tire pressure warning ECU (see page [TW-14](#)).

1	IDENTIFY TRANSMITTER (CORRESPONDING TO DTC)
---	---

- (a) Set the pressure of each tire to the specified value.
Standard pressure

Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

- (b) Connect the intelligent tester (with CAN VIM) to the DLC3.
(c) Turn the power switch ON (IG).
(d) Select TIREPRESS by following the prompts displayed on the intelligent tester.

Tire pressure warning ECU

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS1	ID1 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS2	ID2 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-

TW

TW-46

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS3	ID3 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS4	ID4 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-

NOTICE:

It may take up to 1 minute to display the updated data.

- (e) Rapidly release the tire pressure from any tire by 40 kPa (0.4 kgf/cm², 5.8 psi) for 30 seconds or more.

HINT:

- Identify the malfunctioning tire pressure warning valve and transmitter by rapidly releasing the tire pressures from each tire.
- Record which TIREPRESS data (ID1 to ID4) corresponds to each tire.

- (f) Check the DATA LIST.

Result

Condition	Detection Condition
One of TIREPRESS data (ID1 to ID4) changed	Normal
None of TIREPRESS data changed	Transmitter corresponding to DTC

NOTICE:

- When the TIREPRESS data (IDs 1 to 4) changes, reset the tire pressure of the tires to the specified value, rotate the tires 90 to 270° and recheck.**
- When the transmitter is normal, record the tire location and the transmitter ID.**

- (g) When one of the TIREPRESS data (IDs 1 to 4) changes, repeat the same procedure on the rest of the tires one by one to identify which tire pressure warning valve and transmitter the DTC corresponds to.
- (h) When the TIREPRESS data (IDs 1 to 4) has been changed, identify the malfunctioning tire pressure warning valve and transmitter by using recorded ID numbers and the output DTC.
- (i) Set the pressure of each tire to the specified value.

Standard pressure

Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

NEXT

REPLACE TIRE PRESSURE WARNING VALVE AND TRANSMITTER

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

TW-47

DTC	C2165/65	Abnormal Temperature Inside ID1 Tire
DTC	C2166/66	Abnormal Temperature Inside ID2 Tire
DTC	C2167/67	Abnormal Temperature Inside ID3 Tire
DTC	C2168/68	Abnormal Temperature Inside ID4 Tire

DESCRIPTION

The tire pressure warning valve and transmitter measures tire internal temperature as well as tire pressure, and transmits the information to the tire pressure monitor receiver along with the transmitter ID. If the measured temperature is out of the specified range, the tire pressure warning ECU recognizes it as a malfunction, outputs DTCs, and blinks the tire pressure warning light.

DTC No.	DTC Detection Condition	Trouble Area
C2165/65 C2166/66 C2167/67 C2168/68	Tire internal temperature is not within -40 to 120°C (-40 to 246°F)	• Tire • Tire pressure warning valve and transmitter

HINT:

It is necessary to perform the procedure to identify the tire pressure warning valve and transmitter that is malfunctioning because it cannot be identified by the output DTC.

INSPECTION PROCEDURE**NOTICE:**

It is necessary to register an ID code after replacing the tire pressure warning valve and transmitter and/or the tire pressure warning ECU (see page [TW-14](#)).

1	IDENTIFY TRANSMITTER (CORRESPONDING TO DTC)
----------	--

- (a) Set the pressure of each tire to the specified value.
Standard pressure

Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

- (b) Connect the intelligent tester (with CAN VIM) to the DLC3.
(c) Turn the power switch ON (IG).
(d) Select TIREPRESS by following the prompts displayed on the intelligent tester.

TW**Tire pressure warning ECU**

Item	Measurement item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS1	ID1 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS2	ID2 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS3	ID3 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-

TW-48

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

Item	Measurement item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS4	ID4 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-

- (e) Rapidly release the tire pressure from any tire by 40 kPa (0.4 kgf/cm², 5.8 psi) for 30 seconds or more.

HINT:

- Identify the malfunctioning tire pressure warning valve and transmitter by rapidly releasing the tire pressures from each tire.
- Record which TIREPRESS data (ID1 to ID4) corresponds to each tire.

- (f) Check the DATA LIST.

Result

Condition	Detection Condition
One of TIREPRESS data (ID1 to ID4) changed	Normal
No TIREPRESS data changed	Transmitter corresponding to DTC

NOTICE:

- It may take up to 1 minute to display the updated data.
 - When the TIREPRESS data (IDs 1 to 4) changes, reset the tire pressure of the tires to the specified value, rotate the tires 90 to 270° and recheck.
 - When the transmitter is normal, record the tire location and the transmitter ID.
- (g) When one of the TIREPRESS data (IDs 1 to 4) changes, repeat the same procedure on the rest of the tires (one by one) to identify which tire pressure warning valve and transmitter the DTC corresponds to.
- (h) When the TIREPRESS data (IDs 1 to 4) has been changed, identify the malfunctioning tire pressure warning valve and transmitter by using recorded ID numbers and output DTC.
- (i) Set the pressure of each tire to the specified value.

Standard pressure

Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

TW

NEXT

2

CHECK TIRE

- (a) Check that the tire is not punctured, and there is no indication of air pressure drop.

OK:

Tire is normal.

NG

REPLACE TIRE

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM**TW-49****OK****REPLACE TIRE PRESSURE WARNING VALVE AND TRANSMITTER****TW**

TW-50

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

DTC	C2171/71	Transmitter ID not Registered in Main Mode
-----	----------	--

DESCRIPTION

DTC No.	DTC Detection Condition	Trouble Area
C2171/71	Transmitter ID code is not registered (when an ID code is unregistered for 51 minutes or more)	Tire pressure warning ECU

INSPECTION PROCEDURE

NOTICE:

It is necessary to register an ID code after replacing the tire pressure warning valve and transmitter and/or the tire pressure monitor ECU (see page [TW-14](#)).

HINT:

Set the tire pressure to the specified value.

Standard pressure

Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

1	READ VALUE OF INTELLIGENT TESTER (REGISTERED ID CODES)
---	--

- (a) Check the DATA LIST for proper functioning of the registered ID codes.

Tire pressure warning ECU

Item	Measurement item/ Range (Display)	Normal Condition	Diagnostic Note
REGIT ID1 CODE	Registered ID1 code / min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID1 is displayed	-
REGIT ID2 CODE	Registered ID2 code / min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID2 is displayed	-
REGIT ID3 CODE	Registered ID3 code / min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID3 is displayed	-
REGIT ID4 CODE	Registered ID4 code / min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID4 is displayed	-

OK:

The registered transmitter ID codes are displayed on the intelligent tester screen.

OK

REPLACE TIRE PRESSURE WARNING ECU

NG

2	PERFORM REGISTRATION (TRANSMITTER ID)
---	---------------------------------------

- (a) Register the transmitter IDs for all the wheels (see page [TW-14](#)).
- (b) Set the pressure of each tire to the specified value.

Standard pressure

Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

TW-51

NEXT

3

READ VALUE OF INTELLIGENT TESTER (TIRE PRESSURE)

(a) Check the DATA LIST tire pressure value.

Tire pressure warning ECU

Item	Measurement item/ Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS1	ID1 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS2	ID3 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS3	ID3 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS4	ID4 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-

OK:

All tire pressure readings are equal to the actual tire pressure.

NOTICE:

It may take up to 1 minute to display the tire pressure data.

NG

REPLACE TIRE PRESSURE WARNING ECU

OK

END

TW

TW-52

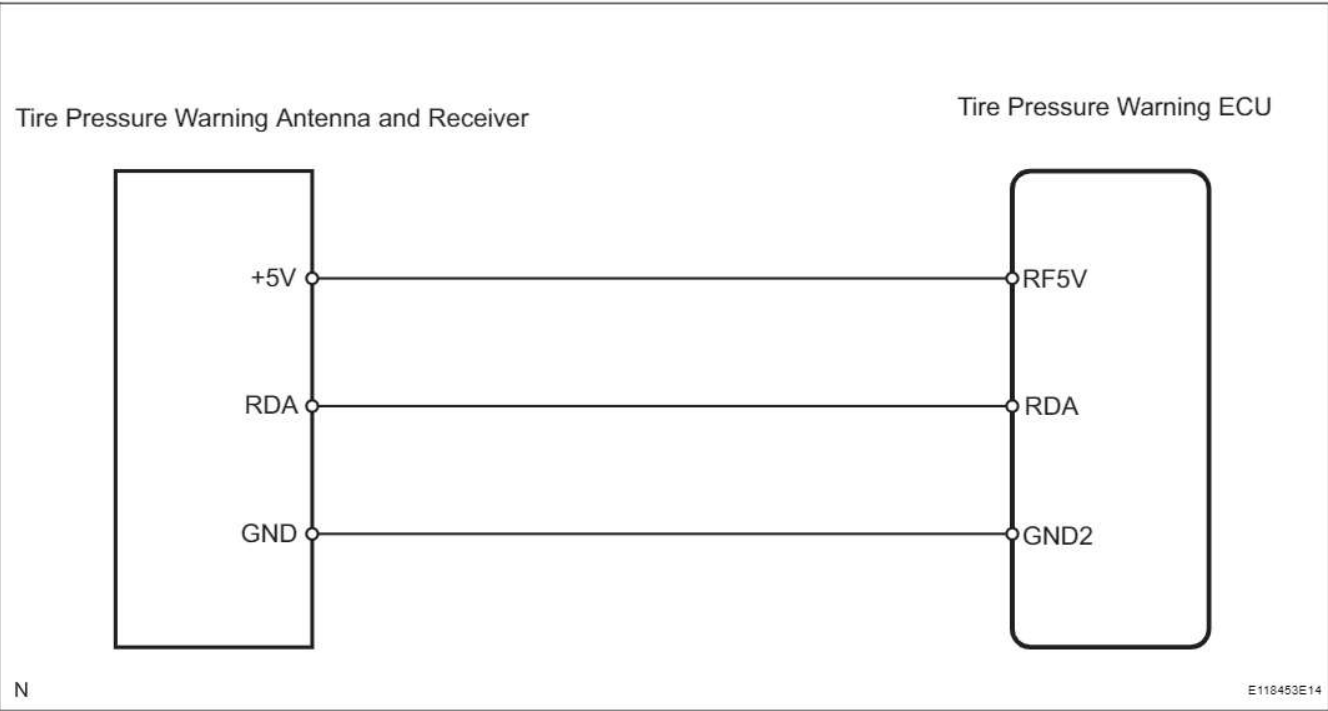
TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

DTC	C2176/76	Receiver Error
-----	----------	----------------

DESCRIPTION

DTC No.	DTC Detection Condition	Trouble Area
C2176/76	DTC is stored when either of following is detected: - Malfunction in tire pressure warning ECU internal circuit. - Terminal RF5V is shorted to ground.	- Tire pressure warning antenna and receiver - Tire pressure warning ECU - Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:
It is necessary to register an ID code after replacing the tire pressure warning valve abd transmitter and/or the tire pressure warning ECU (see page [TW-14](#)).

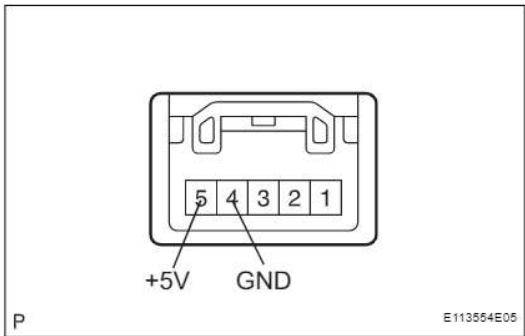
HINT:
Set the tire pressure to the specified value.

Standard pressure

Front	Rear
240 kPa (2.4 kgf/cm ² , 35 psi)	230 kPa (2.3 kgf/cm ² , 33 psi)

1

CHECK TIRE PRESSURE WARNING ANTENNA AND RECEIVER



- (a) Measure the voltage of the connector.
Standard voltage

Tester Connection	Switch Condition	Specified Condition
T10-5 (+5V) - T10-4 (GND)	Power switch ON (IG)	4.5 to 5.5 V

NG

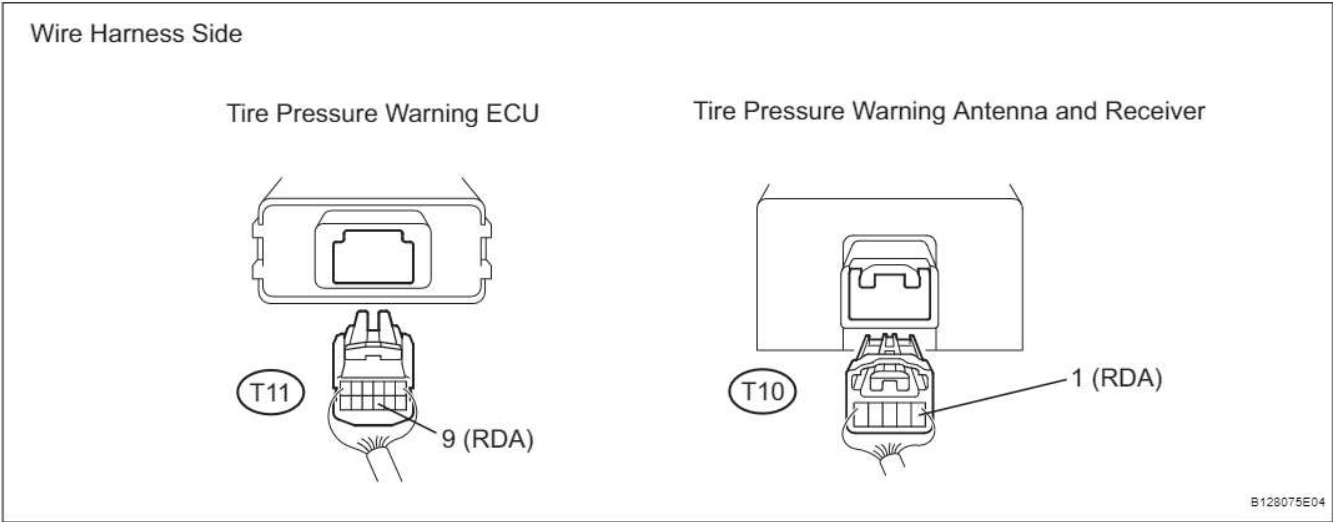
Go to step 5

OK

2

CHECK WIRE HARNESS (ECU - RECEIVER)

- (a) Disconnect the T11 ECU connector.
(b) Disconnect the T10 receiver connector.
(c) Measure the resistance of the wire harness side connectors.



Standard resistance

Tester Connection	Specified Condition
T11-9 (RDA) - T10-1 (RDA)	Below 1 Ω

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3

REPLACE TIRE PRESSURE WARNING ANTENNA AND RECEIVER

NEXT

TW-54

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

4

CHECK DTC

- (a) Check for DTC (see page TW-27).
- OK:
- DTC is not output.
- HINT:
- It is necessary to register an ID when replacing the tire pressure warning ECU (see page TW-14).
 - Read the ID on the DATA LIST before removing the tire pressure warning ECU. Register the ID in the new tire pressure warning ECU.

NG

REPLACE TIRE PRESSURE WARNING ECU

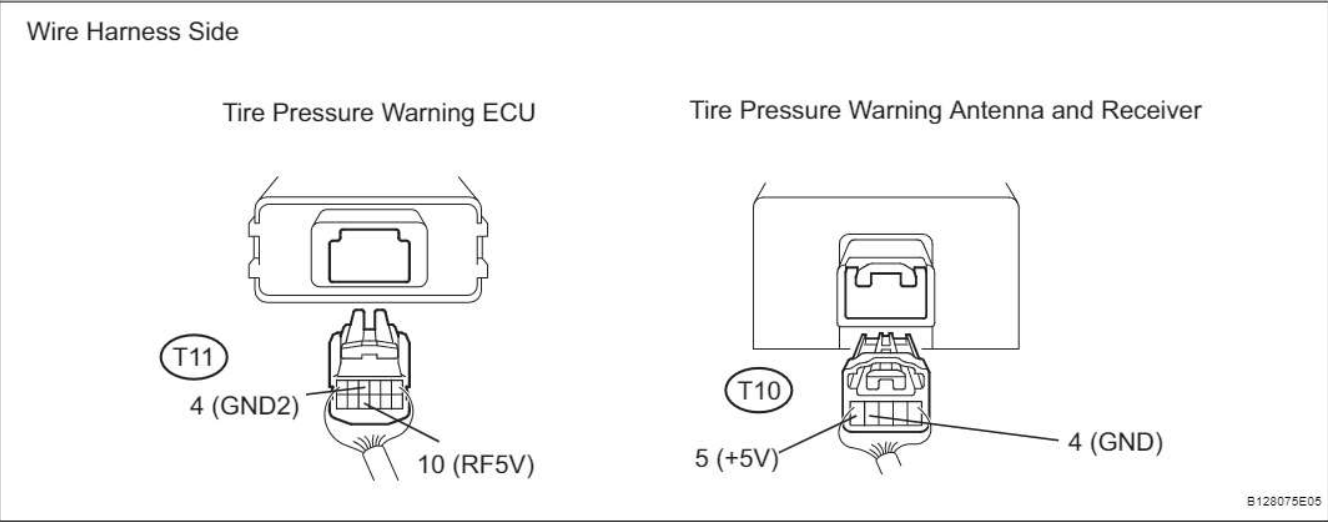
OK

END

5

CHECK WIRE HARNESS (ECU - RECEIVER)

- (a) Disconnect the T11 ECU connector.
- (b) Disconnect the T10 receiver connector.
- (c) Measure the resistance of the wire harness side connectors.



Standard resistance

Tester Connection	Specified Condition
T11-4 (GND2) - T10-4 (GND)	Below 1 Ω
T11-10 (RF5V) - T10-5 (+5V)	

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM**TW-55****OK****REPLACE TIRE PRESSURE WARNING ECU****TW**

TW-56

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

DTC	C2177/77	Initialization not Completed
-----	----------	------------------------------

DESCRIPTION

The initialization procedure starts when the tire pressure warning reset switch is pressed for 3 seconds or more with the power switch in the ON (IG) position.

The tire pressure warning ECU registers the tire pressure data signals from the tire pressure warning valve and transmitter, and blinks the tire pressure warning light 3 times at 1 second intervals.

DTC No.	DTC Detection Condition	Trouble Area
C2177/77	Initialization not complete after vehicle driven at 5 mph (8 km/h) or more for total of 20 minutes or more.	- Tire pressure warning valve and transmitter - Tire pressure warning ECU

INSPECTION PROCEDURE**NOTICE:**

- When replacing the tire pressure warning ECU, read the IDs stored in the ECU using the intelligent tester and note them down before removal (see page [TW-28](#)).
- It is necessary to perform initialization (see page [TW-17](#)) after registration (see page [TW-14](#)) the transmitter IDs into the tire pressure warning ECU after the tire pressure warning ECU and/ or tire pressure warning valve and transmitter have been replaced.

1	CHECK DTC
---	-----------

(a) Check for DTCs (see page [TW-27](#)).

Result

Result	Proceed to
DTC C2177 output with another DTCs	A
Only DTC C2177 output	B

HINT:

- When the tire pressure warning ECU receives no signals for several minutes after the initialization procedure has finished, a DTC is output.
- When only DTC C2177 is output, refer to the other troubleshooting procedure (see page [TW-35](#)).

B

GO TO OTHER PROBLEM (MALFUNCTION IN TRANSMISSION OR RECEPTION)

A

INSPECTION PROCEDURE RELEVANT TO OUTPUT DTC

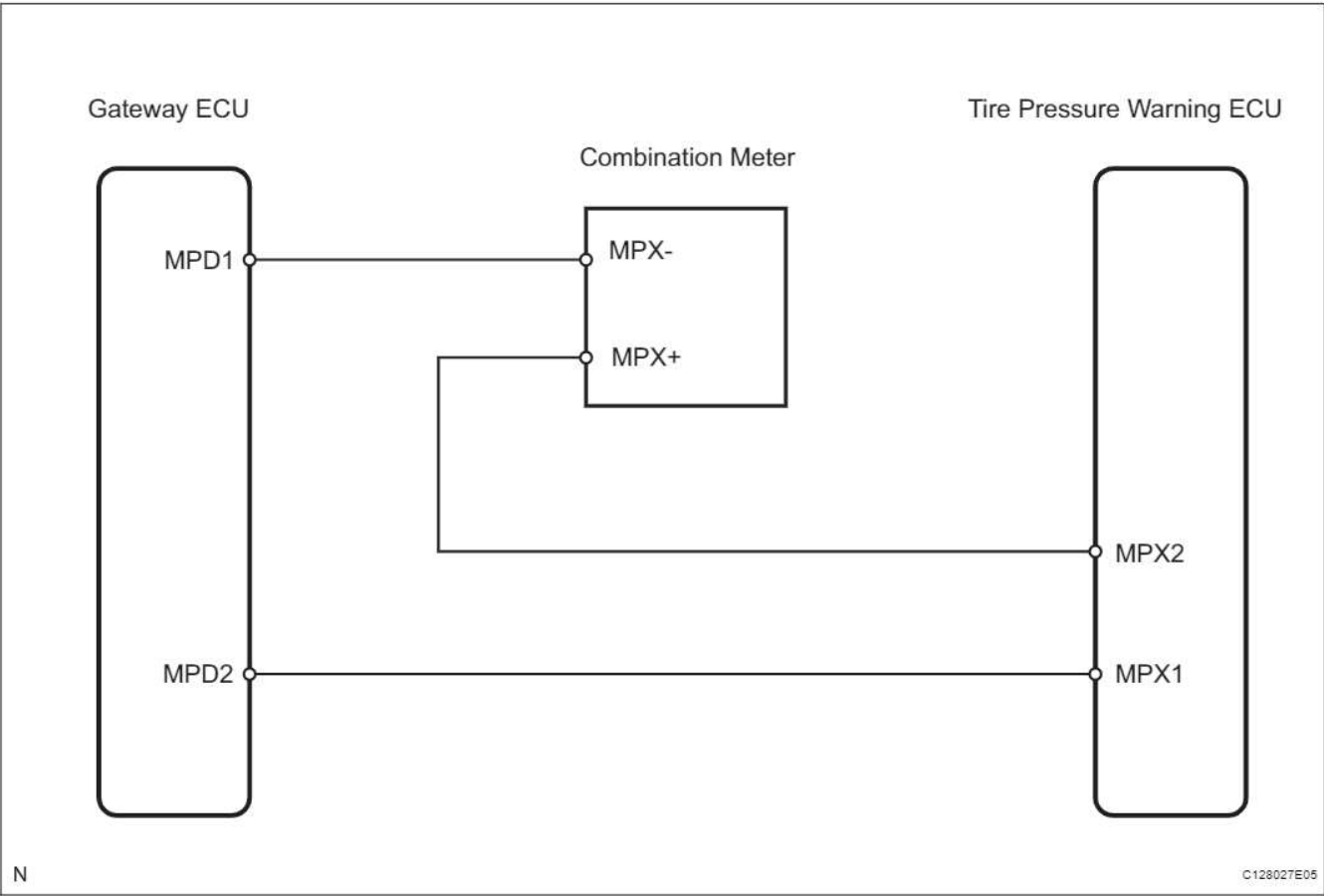
DTC	C2191/91	Vehicle Speed Signal Error (Test Mode DTC)
-----	----------	--

DESCRIPTION

The tire pressure monitor ECU receives speed signals from the combination meter. This DTC is stored upon entering the test mode, and cleared when a vehicle speed signal of 20 km/h (12 mph) is detected for 3 seconds or more. The DTC is output only in the test mode.

DTC No.	DTC Detecting Condition	Trouble Area
C2191/91	Speed sensor circuit malfunction.	• Combination meter • MPX communication system • Tire pressure warning ECU • Wire harness

WIRING DIAGRAM



TW

INSPECTION PROCEDURE

NOTICE:

- When replacing the tire pressure warning ECU, read the IDs stored in the ECU using the intelligent tester and note them down before removal.
- It is necessary to perform initialization (see page TW-17) after registration (see page TW-14) of the transmitter IDs into the tire pressure warning ECU after the ECU or valve and transmitter has been replaced.

TW-58

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

1 CHECK DTC

- (a) Check for DTCs of the MPX communication and the speed sensor.

Result

Condition	Proceed to
MPX communication error DTC is output.	A (See page MP-16)
DTC of the vehicle speed sensor (C0200/31, C0205/32, C0210/33 and C0215/34) is output.	B (See page BC-54 , BC-61)
DTCs of the MPX communication and the speed sensor are not output.	C

A**REPAIR CIRCUITS INDICATED BY OUTPUT DTCs****B****REPAIR CIRCUITS INDICATED BY OUTPUT DTCs****C****2 READ VALUE OF INTELLIGENT TESTER**

- (a) Connect the intelligent tester (with CAN VIM) to the DLC3.
- (b) Turn the power switch to the ON (IG) position, and turn the intelligent tester on.
- (c) Select the item below in the DATA LIST, and read the value displayed on the intelligent tester.

Tire pressure warning ECU

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
VEHICLE SPEED	Vehicle speed reading/ min.: 0 km/h (0 mph) max.: 255 km/h (158 mph)	Almost same as actual vehicle speed	Speed indicated on the combination meter

- (d) Check that the value indicated on the tester and on the combination meter are the same.

OK:

Vehicle speed indicated on the intelligent tester indicates the actual speed.

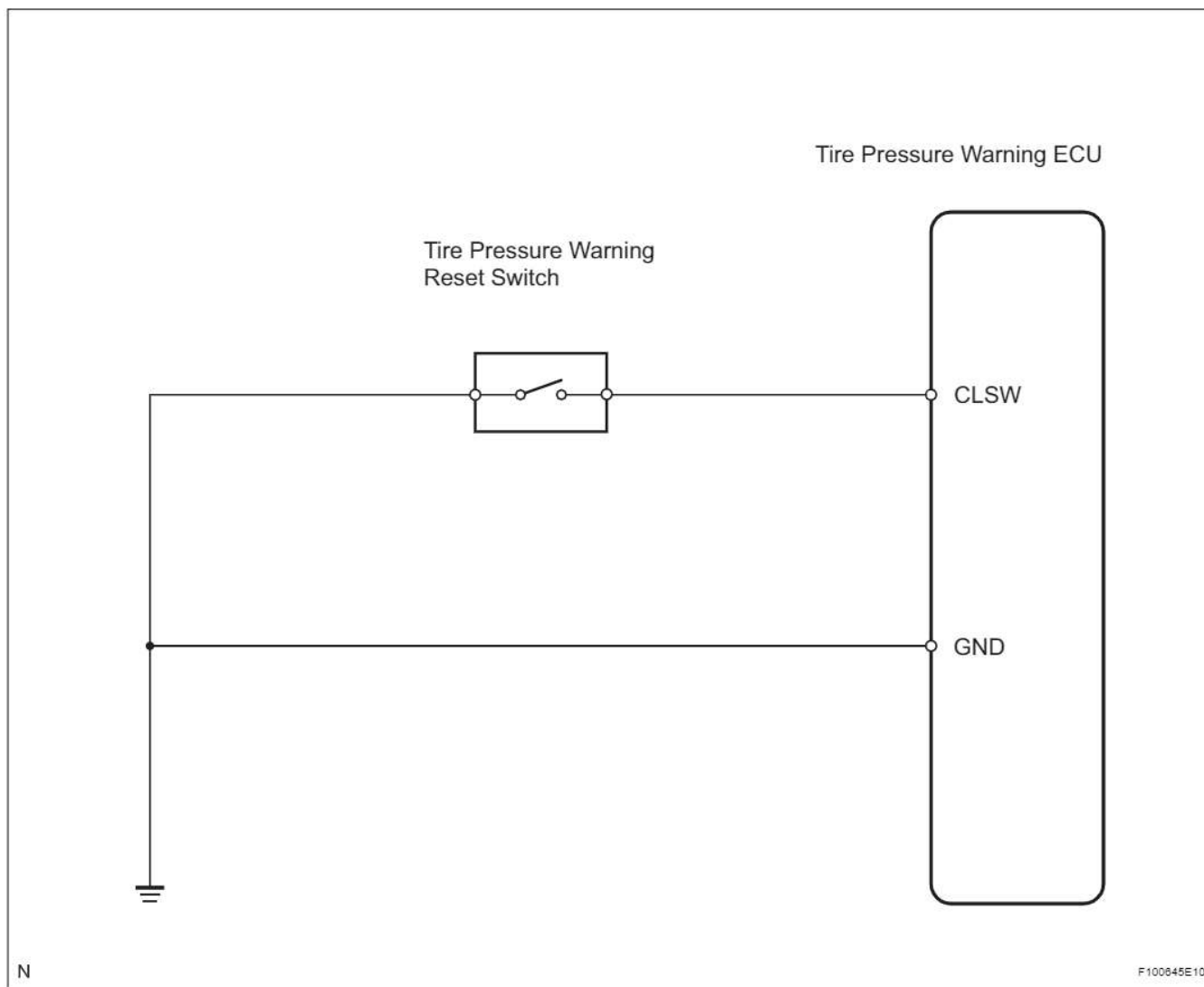
OK**REPLACE TIRE PRESSURE WARNING ECU****NG****REPLACE COMBINATION METER**

Tire Pressure Warning Reset Switch Circuit

DESCRIPTION

During initialization, the tire pressure warning ECU receives the signal from the tire pressure warning reset switch. If the initialization is completely normally, the tire pressure warning light blinks 3 times (1 second on, 1 second off).

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

It is necessary to register an ID code after replacing the tire pressure warning valve and transmitter and / or the tire pressure warning ECU (see page [TW-14](#)).

1

CHECK TIRE PRESSURE WARNING RESET SWITCH FUNCTION

- (a) Turn the power switch ON (IG).
- (b) Check that the tire pressure warning light comes on for 3 seconds.

- (c) Perform the tire pressure warning reset switch test in TEST MODE PROCEDURE (see page TW-19).

OK:

Reset switch ON:

Tire pressure warning light comes on.

Reset switch OFF:

Tire pressure warning light blinks.

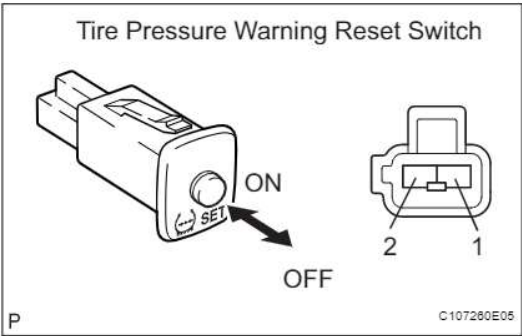
OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

NG

2

INSPECT TIRE PRESSURE WARNING RESET SWITCH



- (a) Remove the tire pressure warning reset switch.
(b) Measure the resistance of the switch.

Standard resistance

Tester Connection	Switch Condition	Specified Condition
1 - 2	ON	Below 1 Ω
1 - 2	OFF	10 kΩ or higher

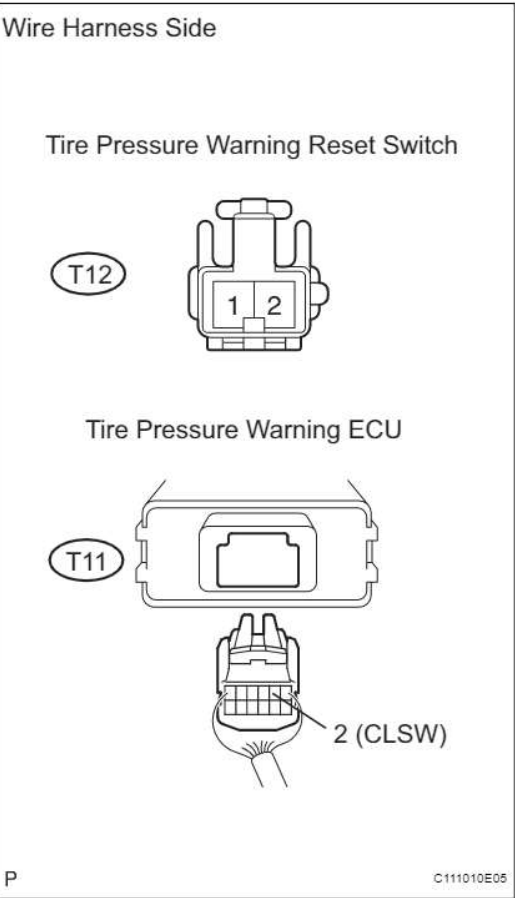
NG

REPLACE TIRE PRESSURE WARNING RESET SWITCH

OK

3

CHECK WIRE HARNESS (RESET SWITCH - TIRE PRESSURE WARNING ECU)



- (a) Disconnect the T12 tire pressure warning reset switch connector and T11 tire pressure warning ECU connector.
- (b) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Specified Condition
T11-2 (CLSW) - T12-1	Below 1 Ω
T11-2 (CLSW) - Body ground	10 kΩ or higher

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE TIRE PRESSURE WARNING ECU

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

Tire Pressure Warning Light Circuit

DESCRIPTION

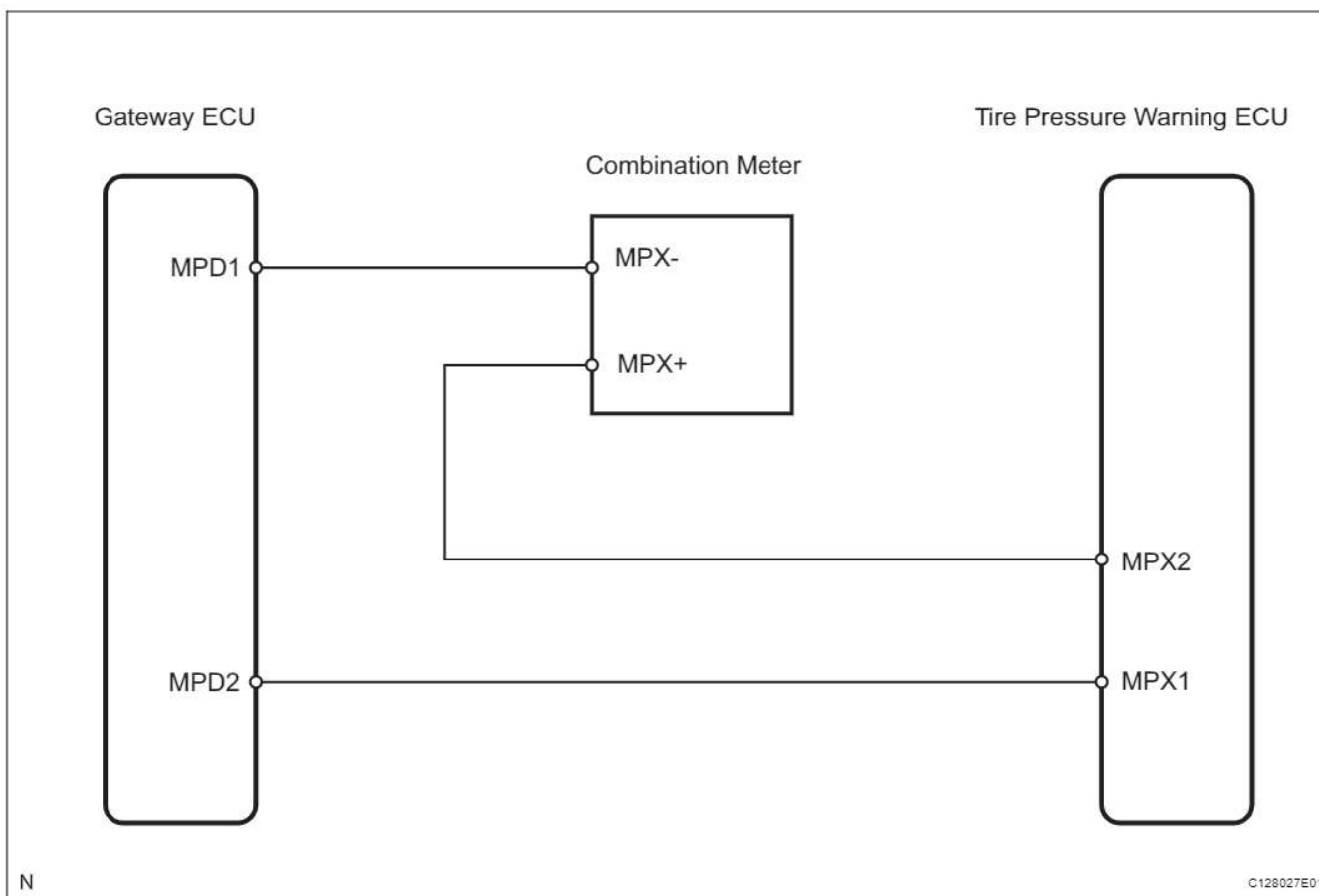
When the tire pressure decreases, the ECU sends the communication signal to the combination meter assembly through the BEAN, and it illuminates the tire pressure warning light on the combination meter assembly.

The tire pressure warning light also turns on when the signal for the tire pressure warning light is cut off.

HINT:

Refer to the "TIRE PRESSURE WARNING LIGHT CHART" section of the "DIAGNOSIS SYSTEM" for checking the condition of the tire pressure warning light (see page [TW-24](#)).

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

It is necessary to perform initialization (see page [TW-17](#)) after registration (see page [TW-14](#)) of the transmitter IDs into the tire pressure warning ECU after the ECU or valve and transmitter has been replaced.

HINT:

This procedure must be performed according to the PROBLEM SYMPTOMS TABLE.

TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

TW-63

1 CHECK DIAGNOSTIC CODE OUTPUT

- (a) Check if DTC B1247 is output in the multiplex communication system (See page [MP-41](#)).

Result

Result	Proceed to
B1247 is not output	A
B1247 is output	B

B**REPAIR CIRCUIT INDICATED BY OUTPUT CODE****A****2 PERFORM ACTIVE TEST BY INTELLIGENT TESTER (TIRE PRESSURE WARNING LIGHT)**

- (a) Connect the intelligent tester (with CAN VIM) to the DLC3.
 (b) Turn the power switch ON (IG) and press the intelligent tester main switch on.
 (c) Select the ACTIVE TEST mode on the intelligent tester.
 (d) Check the condition of the tire pressure warning light by operating the tester.

Combination meter

Item	Vehicle Condition / Test Details	Diagnostic Note
TIRE PRESS WARN	Tire pressure warning light / ON or OFF	ON: light turns on OFF: light turns off

OK:

The warning light turns on when operating the tester.

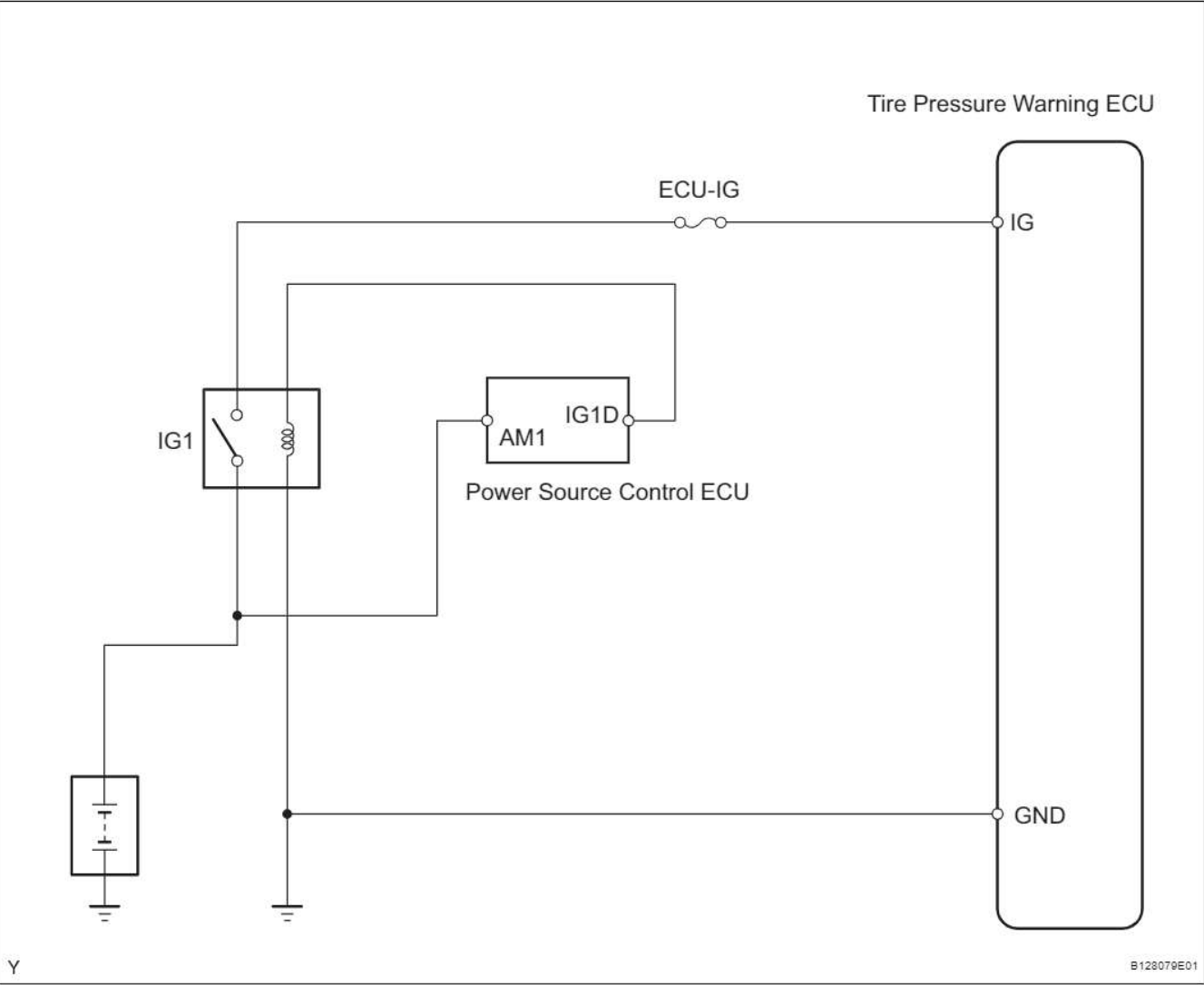
NG**REPLACE COMBINATION METER ASSEMBLY****OK****REPLACE TIRE PRESSURE WARNING ECU****TW**

ECU Power Source Circuit

DESCRIPTION

This is the power source for the tire pressure warning ECU. It also supplies the power to the tire pressure warning antenna and receiver via the ECU.

WIRING DIAGRAM



TW

INSPECTION PROCEDURE

1 INSPECT FUSE (ECU-IG)

- (a) Remove the ECU-IG fuse from the driver side junction block.
- (b) Measure the resistance of the fuse.
Standard resistance:
Below 1 Ω

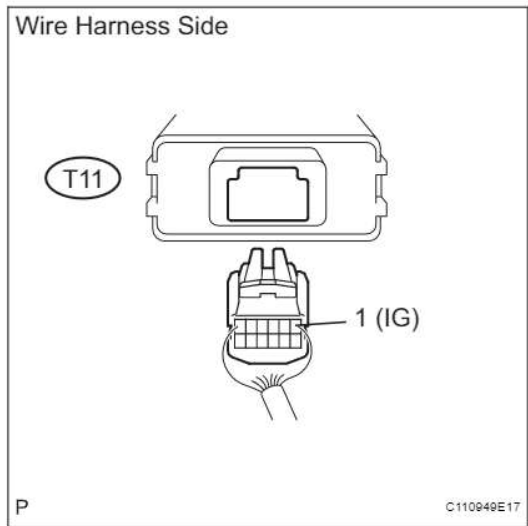
NG

CHECK FOR SHORT IN ALL HARNESSES AND CONNECTORS CONNECTED TO FUSE AND REPLACE FUSE

OK

2

CHECK WIRE HARNESS (TIRE PRESSURE WARNING ECU - BATTERY)



- (a) Disconnect the T11 tire pressure warning ECU connector.
- (b) Turn the power switch ON (IG).
- (c) Measure the voltage of the wire harness side connector.
- Standard voltage**

Tester Connection	Specified Condition
T11-1 (IG) - Body ground	10 to 14 V

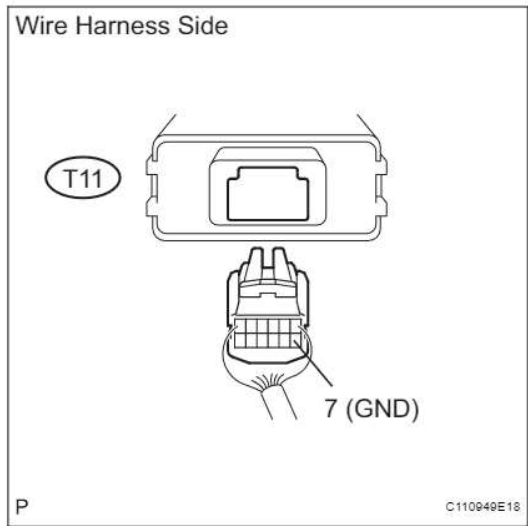
NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3

CHECK WIRE HARNESS (TIRE PRESSURE WARNING ECU - BODY GROUND)



- (a) Disconnect the T11 tire pressure warning ECU connector.
- (b) Measure the resistance of the wire harness side connector.
- Standard resistance**

Tester Connection	Specified Condition
T11-7 (GND) - Body ground	Below 1 Ω

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE TIRE PRESSURE WARNING ECU

TW

TW-66**TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM**

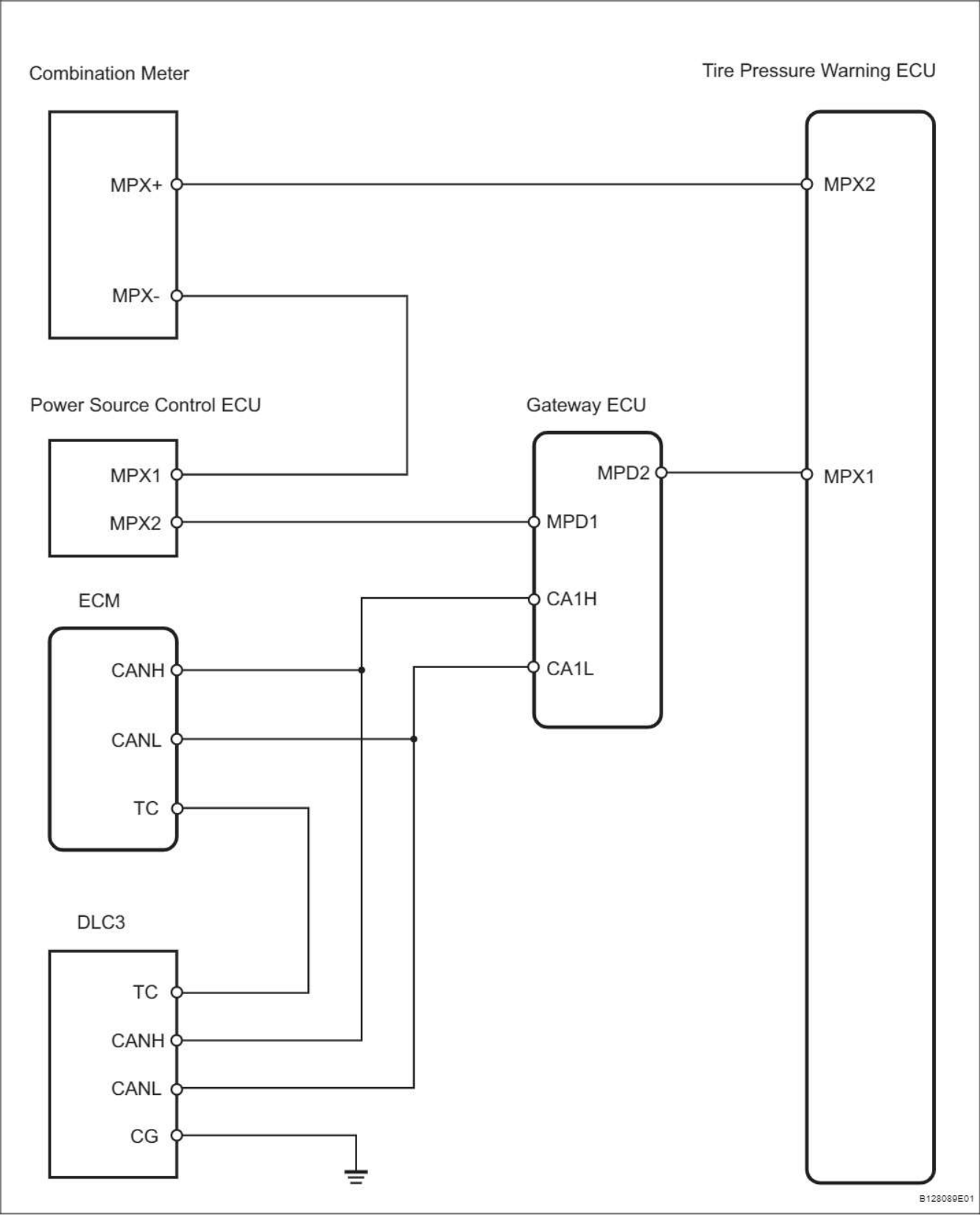
TC and CG Terminal Circuit**DESCRIPTION**

DTC output mode is set by connecting terminals TC and CG of the DLC3.

The DTCs are displayed by blinking the tire pressure warning light.

TW

WIRING DIAGRAM



TW

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TIRE AND WHEEL – TIRE PRESSURE WARNING SYSTEM

INSPECTION PROCEDURE

1

CHECK CAN COMMUNICATION SYSTEM AND MULTIPLEX COMMUNICATION SYSTEM

- (a) Check if a DTC of CAN communication system and multiplex communication system is output.

Result

Result	Proceed to
DTC is not output	A
DTC is output	B

B

REPAIR CIRCUITS INDICATED BY OUTPUT DTCs

A

2

CHECK WIRE HARNESS (ECM - DLC3)

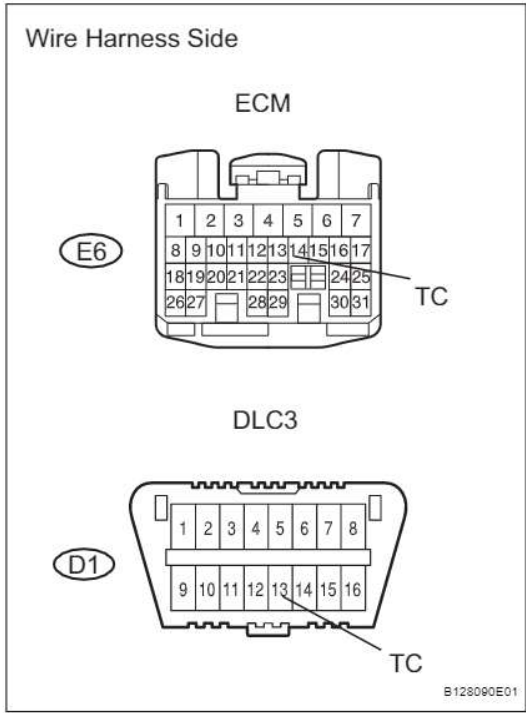
- (a) Disconnect the E6 ECM connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Specified Condition
E6-14 (TC) - D1-13 (TC)	Below 1 Ω
D1-13 (TC) - Body ground	10 kΩ or higher

NG

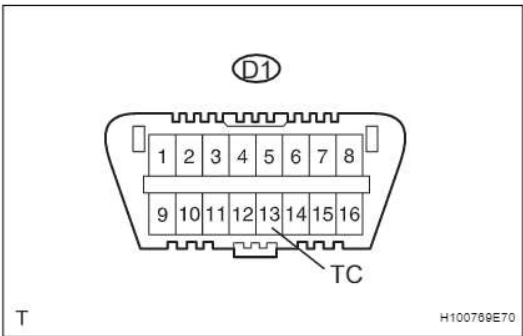
REPAIR OR REPLACE HARNESS AND CONNECTOR



OK

3

INSPECT DLC3 TERMINAL VOLTAGE



- (a) Turn the power switch ON (IG).
(b) Measure the voltage of the DLC3 connector.
Standard voltage

Tester Connection	Specified Condition
D1-13 (TC) - Body ground	10 to 14 V

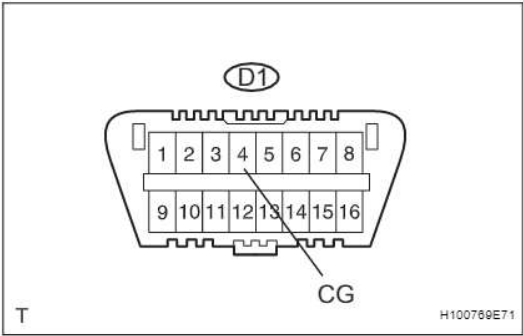
NG

REPLACE ECM

OK

4

CHECK WIRE HARNESS (DLC3 - BODY GROUND)



- (a) Measure the resistance of the DLC3 connector.
Standard resistance

Tester Connection	Specified Condition
D1-4 (CG) - Body ground	Below 1 Ω

NG

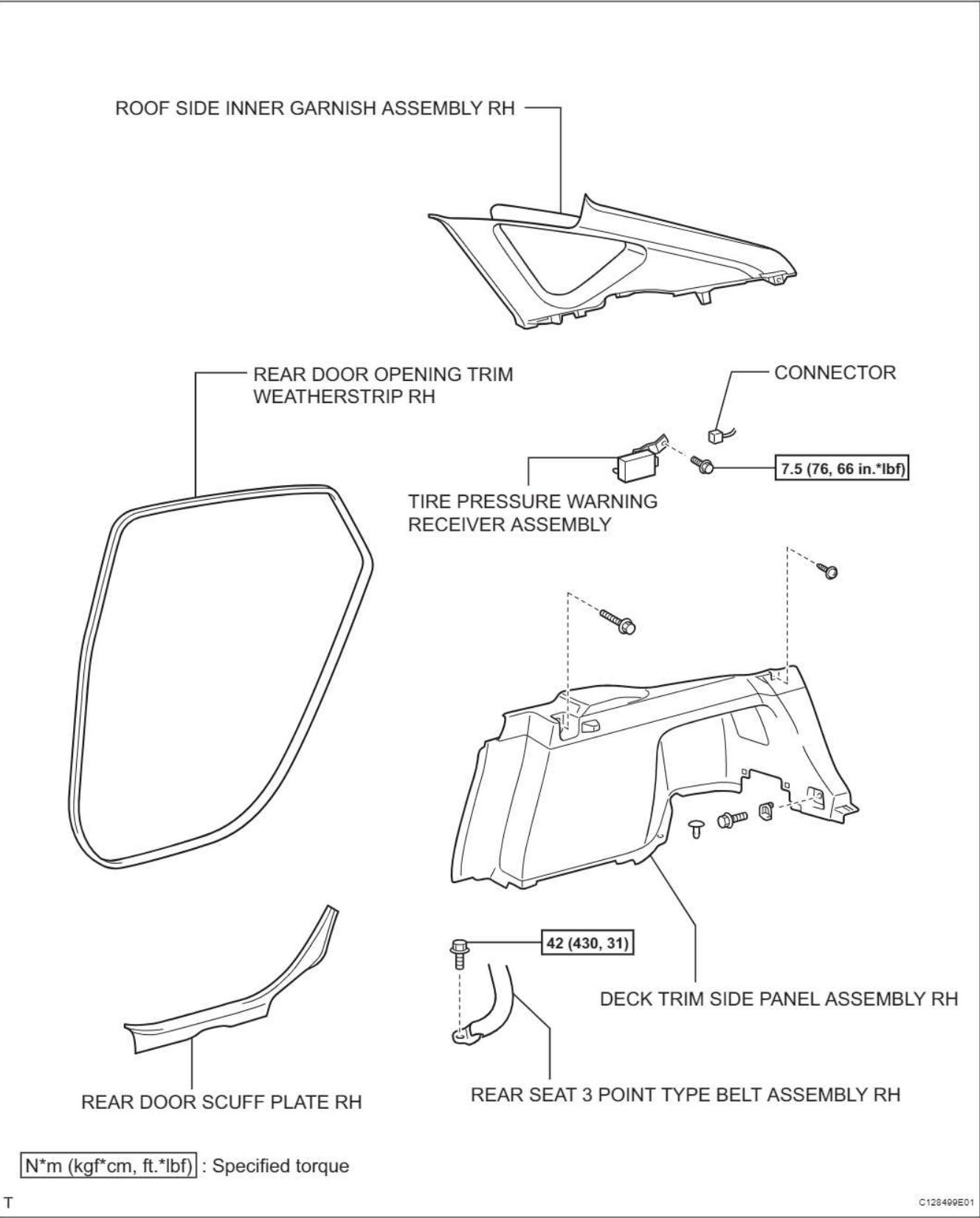
REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE TIRE PRESSURE WARNING ECU

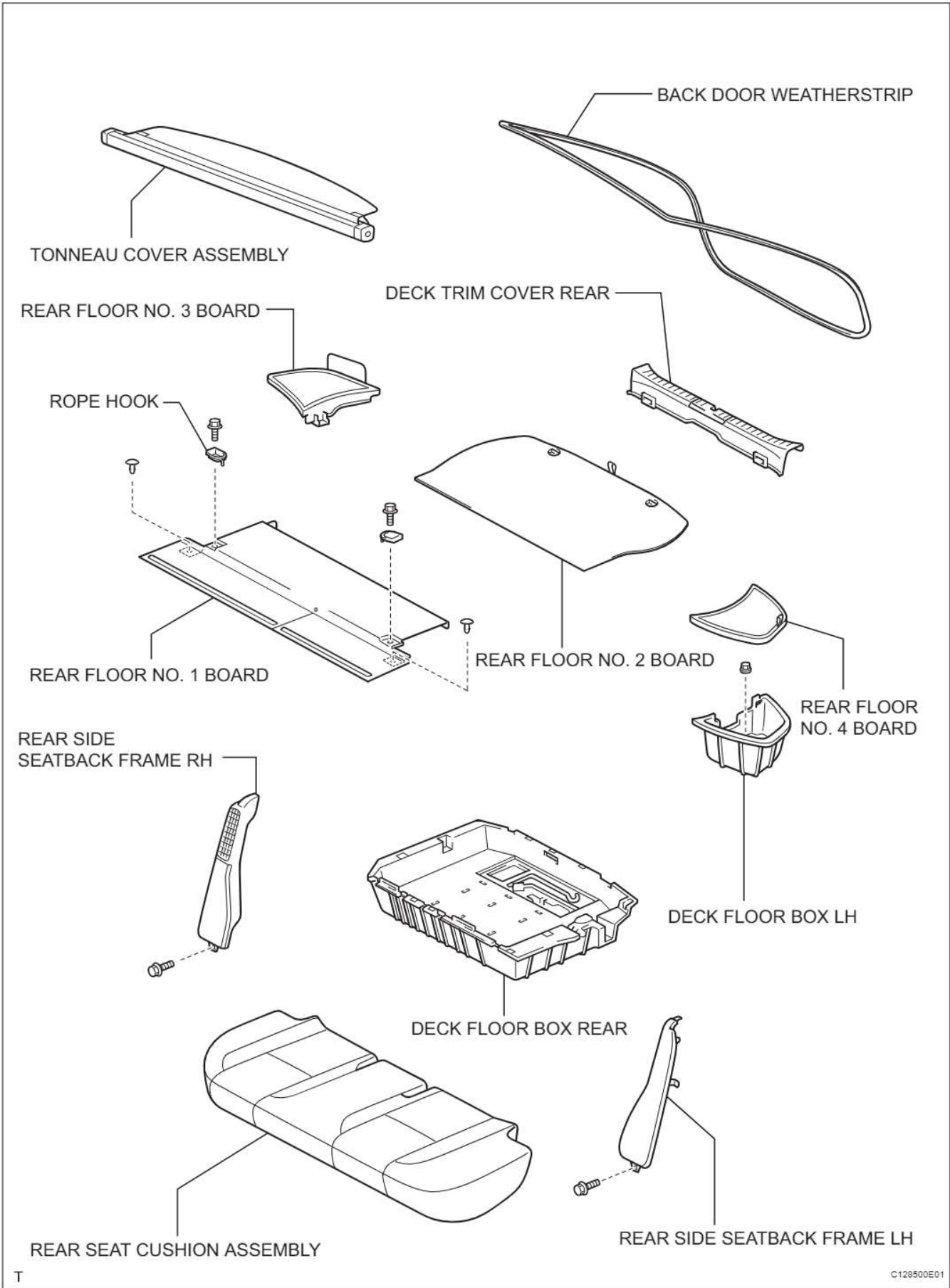
TIRE PRESSURE WARNING RECEIVER

COMPONENTS



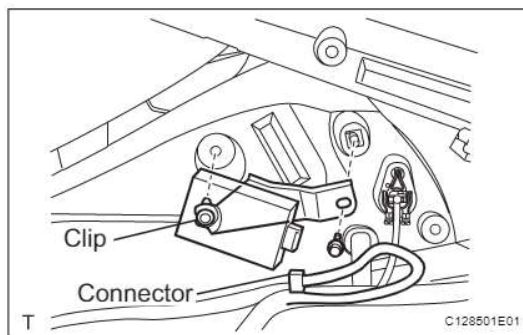
TIRE AND WHEEL – TIRE PRESSURE WARNING RECEIVER

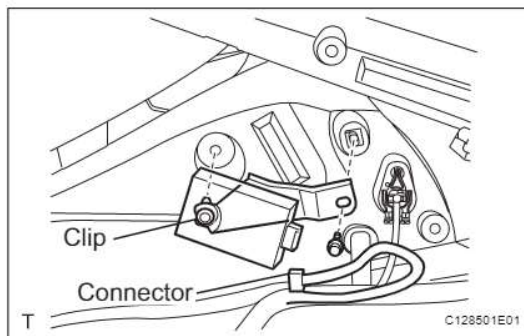
TW-67



REMOVAL

1. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**
CAUTION:
 Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.
2. **REMOVE REAR SEAT CUSHION ASSEMBLY** (See page [SE-15](#))
3. **REMOVE REAR DOOR SCUFF PLATE RH** (See page [IR-9](#))
4. **REMOVE REAR SIDE SEATBACK FRAME LH** (See page [IR-9](#))
5. **REMOVE REAR SIDE SEATBACK FRAME RH** (See page [IR-9](#))
6. **REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP RH**
7. **REMOVE REAR SEAT 3 POINT TYPE BELT ASSEMBLY RH** (See page [IR-10](#))
8. **REMOVE BACK DOOR WEATHERSTRIP**
9. **REMOVE TONNEAU COVER ASSEMBLY**
10. **REMOVE REAR FLOOR NO. 2 BOARD**
11. **REMOVE REAR FLOOR NO. 3 BOARD**
12. **REMOVE REAR FLOOR NO. 4 BOARD**
13. **REMOVE DECK FLOOR BOX REAR**
14. **REMOVE DECK FLOOR BOX LH**
15. **REMOVE REAR FLOOR NO. 1 BOARD** (See page [IR-10](#))
16. **REMOVE DECK TRIM COVER REAR** (See page [IR-10](#))
17. **REMOVE DECK TRIM SIDE PANEL ASSEMBLY RH** (See page [IR-11](#))
18. **REMOVE ROOF SIDE INNER GARNISH ASSEMBLY RH** (See page [IR-11](#))
19. **REMOVE TIRE PRESSURE WARNING RECEIVER ASSEMBLY**
 - (a) Disconnect the connector.
 - (b) Remove the bolt.
 - (c) Using a clip remover, detach the clip and remove the receiver.





INSTALLATION

1. **INSTALL TIRE PRESSURE WARNING RECEIVER ASSEMBLY**
 - (a) Attach the clip and install the bolt with the receiver.
Torque: 7.5 N*m (76 kgf*cm, 66 in.*lbf)
 - (b) Connect the connector.
2. **INSTALL ROOF SIDE INNER GARNISH ASSEMBLY RH** (See page [IR-15](#))
3. **INSTALL DECK TRIM SIDE PANEL ASSEMBLY RH** (See page [IR-16](#))
4. **INSTALL REAR DECK TRIM COVER** (See page [IR-16](#))
5. **INSTALL REAR FLOOR NO. 1 BOARD** (See page [IR-16](#))
6. **INSTALL DECK FLOOR BOX LH**
7. **INSTALL DECK FLOOR BOX REAR**
8. **INSTALL REAR FLOOR NO. 4 BOARD**
9. **INSTALL REAR FLOOR NO. 3 BOARD**
10. **INSTALL REAR FLOOR NO. 2 BOARD**
11. **INSTALL TONNEAU COVER ASSEMBLY**
12. **INSTALL BACK DOOR WEATHERSTRIP**
13. **INSTALL REAR SEAT 3 POINT TYPE BELT ASSEMBLY RH** (See page [IR-16](#))
14. **INSTALL REAR DOOR OPENING TRIM WEATHERSTRIP RH**
15. **INSTALL REAR SIDE SEATBACK FRAME LH** (See page [IR-17](#))
16. **INSTALL REAR SIDE SEATBACK FRAME RH** (See page [IR-17](#))
17. **INSTALL REAR DOOR SCUFF PLATE RH** (See page [IR-19](#))
18. **INSTALL REAR SEAT CUSHION ASSEMBLY** (See page [SE-23](#))
19. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**

NOTICE:

 - When the warning light is illuminated or the battery has been disconnected and reconnected, pressing the power switch may not start the system on the first try. If so, press the power switch again.
 - With the power switch's power mode changed to ON (IG), disconnect the battery. If the key is not in the key slot during reconnection, DTC B2799 may be output.

TW-70**TIRE AND WHEEL – TIRE PRESSURE WARNING RECEIVER**

20. REGISTER TRANSMITTER ID

- (a) Register the transmitter ID (see page [TW-14](#)).

21. INSPECT TIRE PRESSURE WARNING SYSTEM

- (a) Inspect the tire pressure warning system (see page [TW-22](#)).

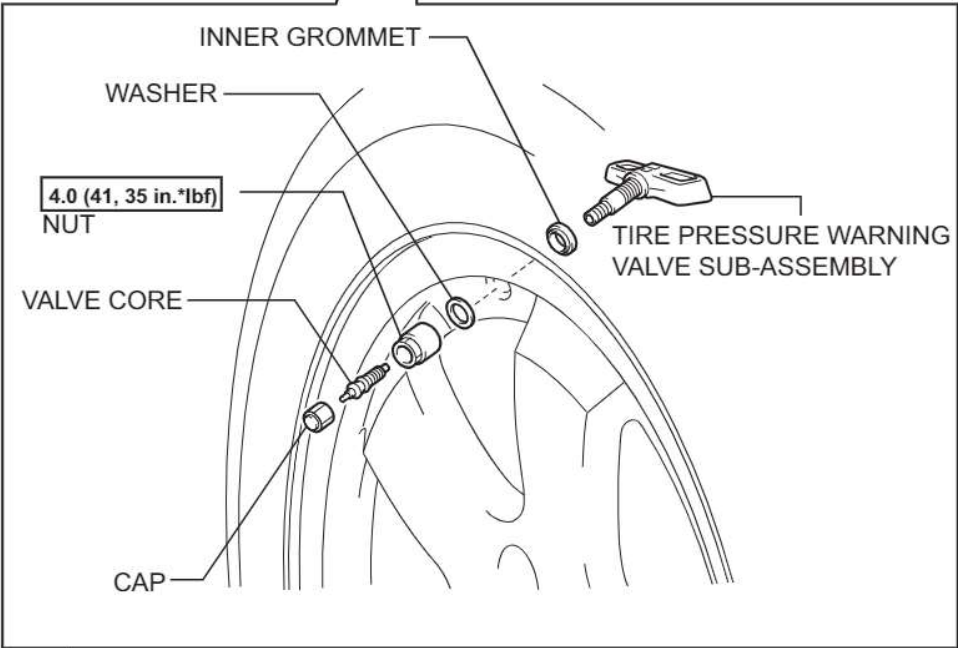
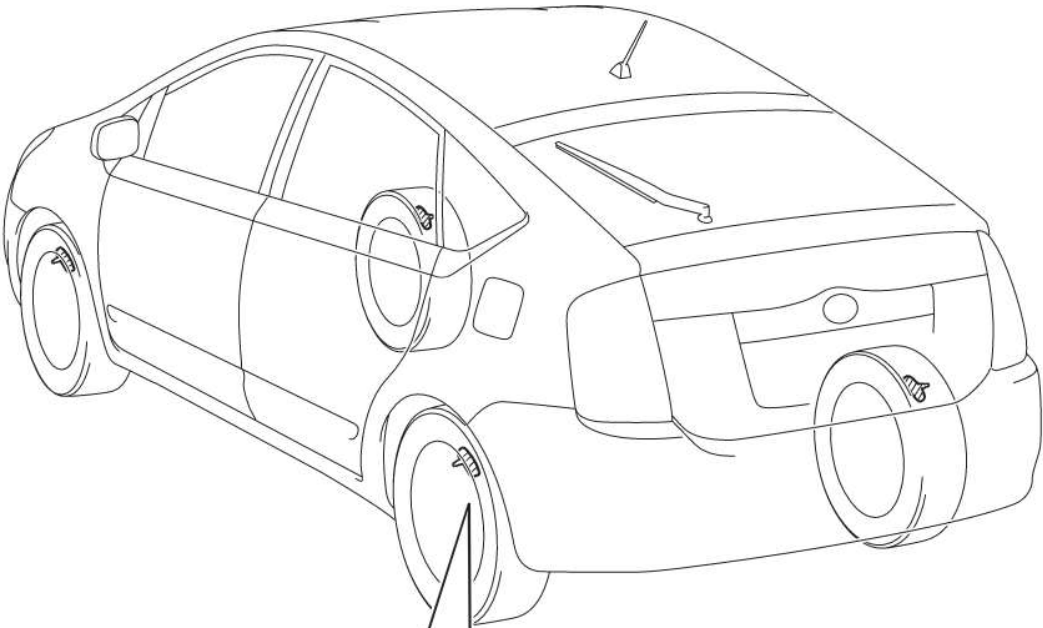
22. PERFORM INITIALIZATION

- (a) Perform initialization (see page [TW-17](#)).

NOTICE:

Certain systems need to be initialized after disconnecting and reconnecting the cable from the negative (-) battery terminal.

TIRE PRESSURE WARNING VALVE AND TRANSMITTER COMPONENTS



N*m (kgf*cm, ft.*lbf) : Specified torque

TW

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C128502E01

TW-72

TIRE AND WHEEL – TIRE PRESSURE WARNING VALVE AND TRANSMITTER

REMOVAL

1. REMOVE FRONT WHEEL
2. REMOVE REAR WHEEL
3. REMOVE TIRE PRESSURE WARNING VALVE SUB-ASSEMBLY

- (a) Remove the valve core and cap, and release air from the tire.
- (b) After ensuring that air is sufficiently released, remove the nut and washer that are used to fix the tire pressure warning valve and drop the valve sensor inside the tire.

HINT:

Keep the removed cap, valve core, nut and washer.

- (c) After dropping the tire pressure warning valve into the tire, disengage the bead using the shoe of the tire remover.

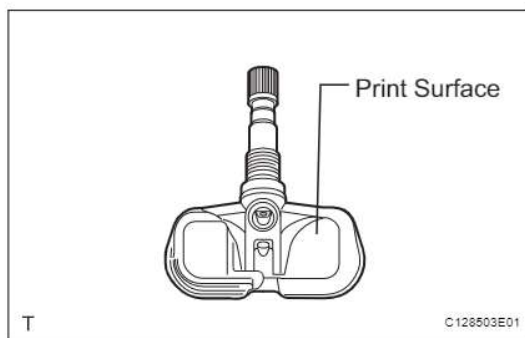
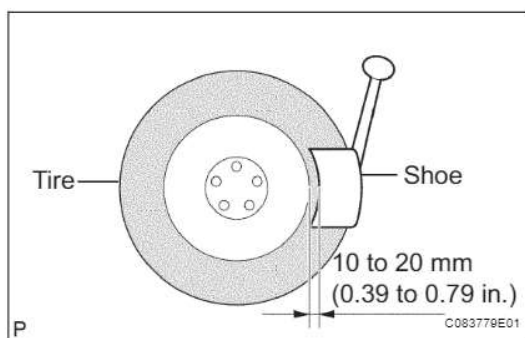
NOTICE:

Be careful not to damage the tire pressure warning valve because of interference between the sensor and tire bead.

- (d) Remove the bead on the upper side.
- (e) Take out the valve sensor from the tire and remove the bead on the lower bead.

HINT:

Check that there are no cracks or damage on the grommet. If any damage is found, replace the grommet together with the washer and nut.



INSTALLATION

1. INSTALL TIRE PRESSURE WARNING VALVE SUB-ASSEMBLY

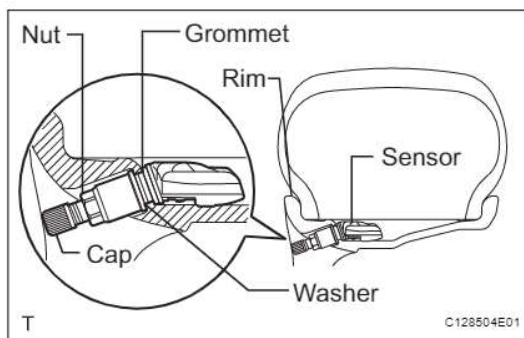
- (a) Insert the tire pressure warning valve into the valve installation hole. Insert it from the inside of the rim so that the print surface can be seen.

NOTICE:

- Check that there is no visible deformation, damage or other abnormalities on the transmitter.
- Check that there is no foreign matter on the inner grommet and around the rim hole.
- If installed in the reverse direction, the tire pressure warning valve may be damaged or fail to transmit signals when running at high speed.
- If installing a new tire pressure warning valve, write down the ID number before installation.
- It is necessary to register the ID in the ECU after installation (see page TW-14).

TIRE AND WHEEL – TIRE PRESSURE WARNING VALVE AND TRANSMITTER

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- (b) Set the washer on the tire pressure monitor valve rim side. Tighten the tire pressure warning valve with the nut.

Torque: 4.0 N*m (41 kgf*cm, 35 ft.*lbf)

NOTICE:

- Check that there is no foreign matter on the washer and nut.
 - If the tire pressure warning valve is removed when the tire is removed for replacement, check that there is no damage or cuts, and no foreign matter such as mud, dirt or sand attached to the grommet. Replace the grommet with a new one if necessary.
 - Check that there is no oil, water or lubricant around the rim hole, tire pressure warning valve, washer and nut. Failing to check may result in improper installation.
- (c) After the tire is inflated, the valve nut may be loose. Retighten the nut to the specified torque and then check for air leaks with soapy water.

Torque: 4.0 N*m (41 kgf*cm, 35 in.*lbf)

- (d) Set the wheel disc to the mounting machine and install the lower tire bead. Position the main body of the valve sensor as in the shaded area shown in the illustration.

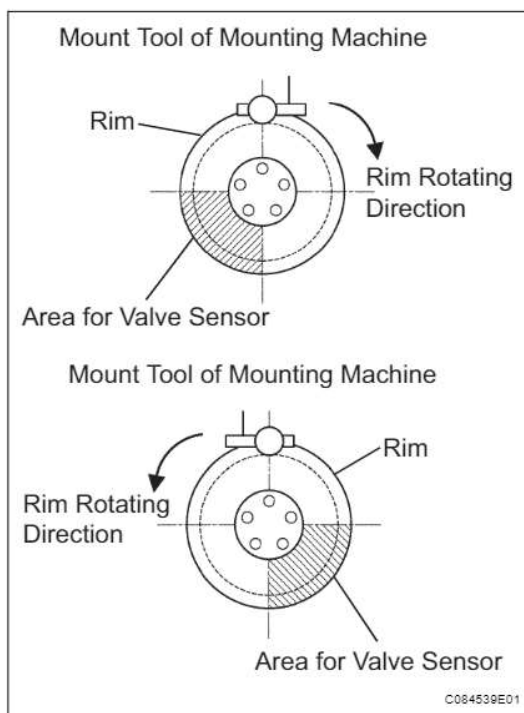
NOTICE:

If the valve sensor is positioned outside this area, it generates interference with the tire bead, and may cause damage to the valve sensor.

- (e) Install the upper bead.

NOTICE:

Make sure that the tire bead and tool do not interfere with the main body of the valve sensor and that the valve sensor is not clamped by the bead.

**2. INSTALL FRONT WHEEL**

Torque: 131 N*m (1,340 kgf*cm, 97 ft.*lbf)

3. INSTALL REAR WHEEL

Torque: 131 N*m (1,340 kgf*cm, 97 ft.*lbf)

4. INSPECT TIRE

- (a) Inspect the tire (see page [TW-3](#)).

5. REGISTER TRANSMITTER ID

- (a) Register the transmitter ID (see page [TW-14](#)).

6. INSPECT TIRE PRESSURE WARNING SYSTEM

- (a) Inspect the tire pressure warning system (see page [TW-22](#)).

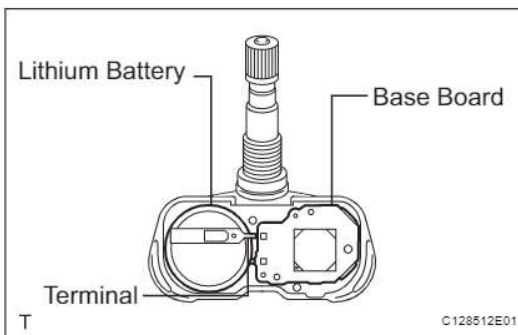
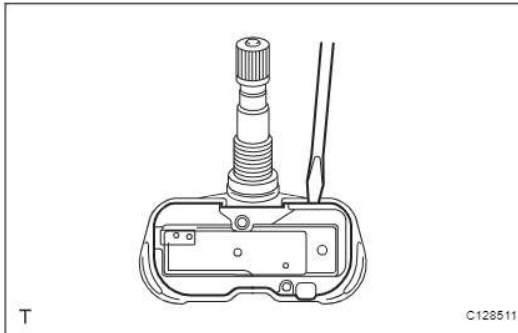
TW

TW-74**TIRE AND WHEEL – TIRE PRESSURE WARNING VALVE AND TRANSMITTER****DISPOSAL****HINT:**

The tire pressure monitor valve is powered by a lithium battery. When disposing of the tire pressure monitor valve, remove the battery and dispose of it correctly.

1. DISPOSE OF TIRE PRESSURE WARNING VALVE SUB-ASSEMBLY

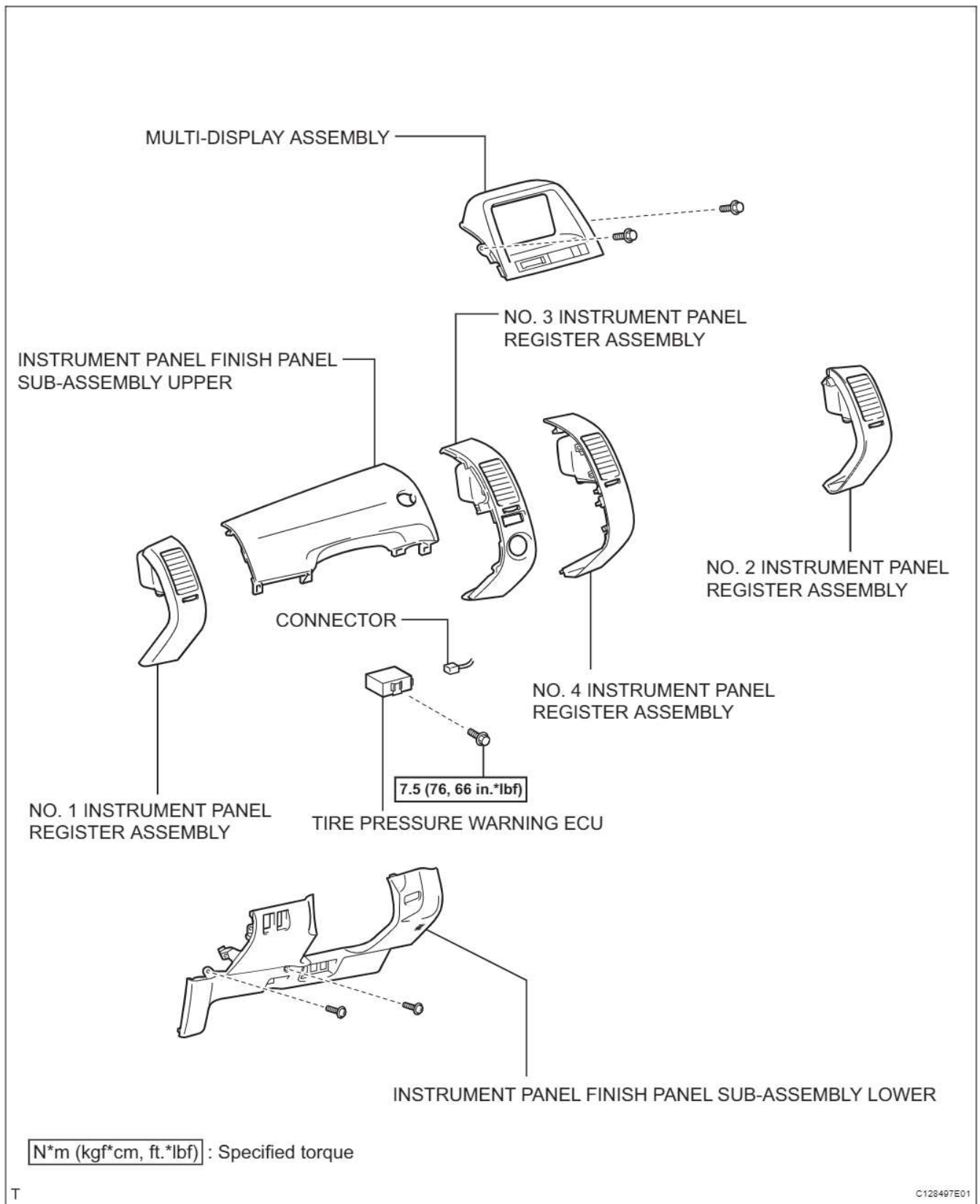
- (a) Using a screwdriver, pry off the cover. Remove the back cover.



- (b) The battery and base board covered with resin are exposed. While taking out the battery, cut the 2 terminals which connect the battery and base board.

TIRE PRESSURE WARNING ECU

COMPONENTS



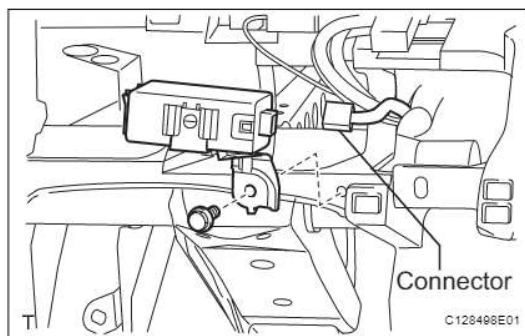
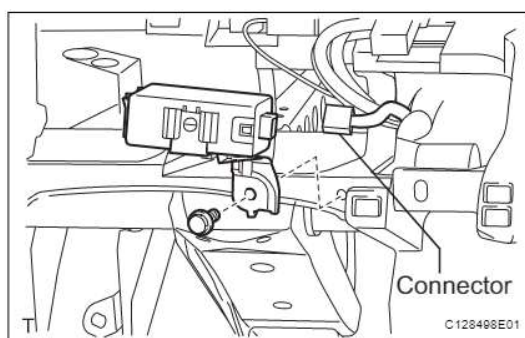
TW

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TIRE AND WHEEL – TIRE PRESSURE WARNING ECU

REMOVAL

1. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**
CAUTION:
 Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.
2. **REMOVE NO. 1 INSTRUMENT PANEL REGISTER ASSEMBLY** (See page [IP-5](#))
3. **REMOVE INSTRUMENT PANEL FINISH PANEL SUB-ASSEMBLY LOWER** (See page [IP-6](#))
4. **REMOVE INSTRUMENT PANEL FINISH PANEL SUB-ASSEMBLY UPPER** (See page [IP-6](#))
5. **REMOVE NO.3 INSTRUMENT PANEL REGISTER ASSEMBLY** (See page [IP-6](#))
6. **REMOVE NO.4 INSTRUMENT PANEL REGISTER ASSEMBLY** (See page [IP-6](#))
7. **REMOVE NO.2 INSTRUMENT PANEL REGISTER ASSEMBLY** (See page [IP-7](#))
8. **REMOVE MULTI-DISPLAY ASSEMBLY**
 (a) Remove the multi-display (see page [IP-7](#)).
9. **REMOVE TIRE PRESSURE WARNING ECU**
 (a) Disconnect the connector.
 (b) Remove the bolt and ECU.



INSTALLATION

1. **INSTALL TIRE PRESSURE WARNING ECU**
 (a) Install the ECU with the bolt.
Torque: 7.5 N*m (76 kgf*cm, 66 in.*lbf)
 (b) Connect the connector.
2. **INSTALL MULTI-DISPLAY ASSEMBLY**
 (a) Install the multi-display (see page [IP-12](#)).
3. **INSTALL NO. 2 INSTRUMENT PANEL REGISTER ASSEMBLY** (See page [IP-12](#))
4. **INSTALL NO. 4 INSTRUMENT PANEL REGISTER ASSEMBLY** (See page [IP-12](#))
5. **INSTALL NO. 3 INSTRUMENT PANEL REGISTER ASSEMBLY** (See page [IP-13](#))
6. **INSTALL INSTRUMENT PANEL FINISH PANEL SUB-ASSEMBLY UPPER** (See page [IP-13](#))

7. **INSTALL INSTRUMENT PANEL FINISH PANEL SUB-ASSEMBLY LOWER** (See page [IP-13](#))
8. **INSTALL NO. 1 INSTRUMENT PANEL REGISTER ASSEMBLY** (See page [IP-13](#))
9. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**
NOTICE:
 - When the warning light is illuminated or the battery has been disconnected and reconnected, pressing the power switch may not start the system on the first try. If so, press the power switch again.
 - With the power switch's power mode changed to ON (IG), disconnect the battery. If the key is not in the key slot during reconnection, DTC B2799 may be output.
10. **REGISTER TRANSMITTER ID**
 - (a) Register the transmitter ID (see page [TW-14](#)).
11. **INSPECT TIRE PRESSURE WARNING SYSTEM**
 - (a) Inspect the tire pressure warning system (see page [TW-22](#)).
12. **PERFORM INITIALIZATION**
 - (a) Perform initialization (see page [IN-32](#)).
NOTICE:
Certain systems need to be initialized after disconnecting and reconnecting the cable from the negative (-) battery terminal.