

DIAGNOSIS SYSTEM

1. CHECK BATTERY VOLTAGE

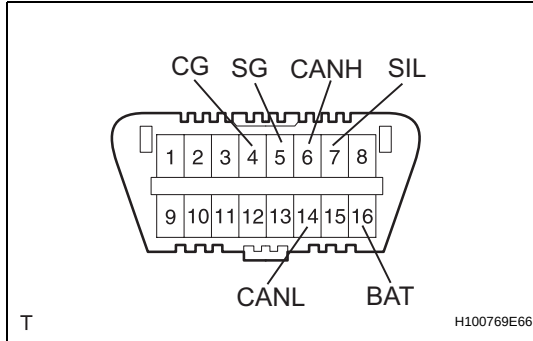
Standard voltage:

11 to 14 V

If the voltage is below 11 V, recharge the battery before proceeding.

2. CHECK DLC3

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



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)	CAN bus line	Engine switch off*	54 to 69 Ω
CANH (6) - CG (4)	HIGH-level CAN bus line	Engine switch off*	200 Ω or higher
CANL (14) - CG (4)	LOW-level CAN bus line	Engine switch off*	200 Ω or higher
CANH (6) - BAT (16)	HIGH-level CAN bus line	Engine switch off*	6 k Ω or higher
CANL (14) - BAT (16)	LOW-level CAN bus line	Engine switch off*	6 k Ω or higher

NOTICE:

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

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

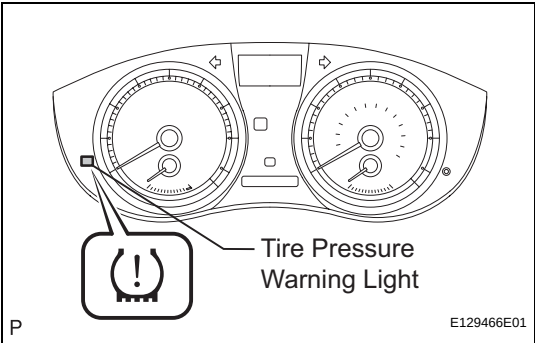
HINT:

Connect the cable of the intelligent tester to DLC3, turn the engine switch on (IG) and attempt to use the tester. If the display indicates that a communication error has occurred, there is a problem either with the vehicle or with the tester.

- If communication is normal when the tester is connected to another vehicle, inspect 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.

3. DIAGNOSIS SYSTEM

- (a) 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 by using the intelligent tester (See page TW-29).
- (b) 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, tire pressure warning select switch, and vehicle speed sensor (See page TW-20).



4. CHECK WARNING LIGHT

- (a) Turn the engine 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.

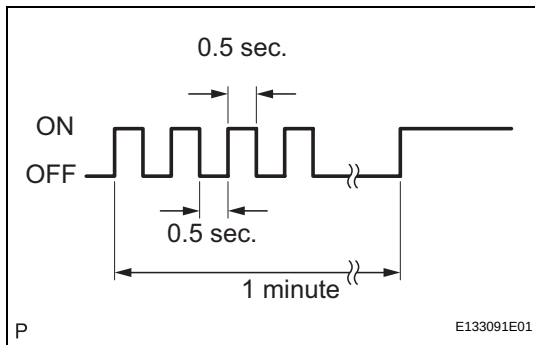
Trouble Area	See procedure
Tire pressure warning light circuit	TW-71

5. TIRE PRESSURE WARNING LIGHT AND INDICATOR CHART

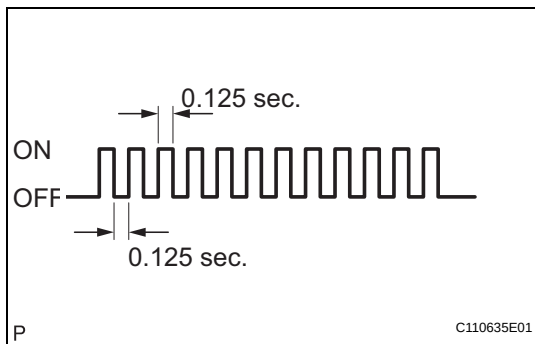
HINT:

The table below indicates the state of the tire pressure warning light and indicator after the engine switch is turned on (IG).

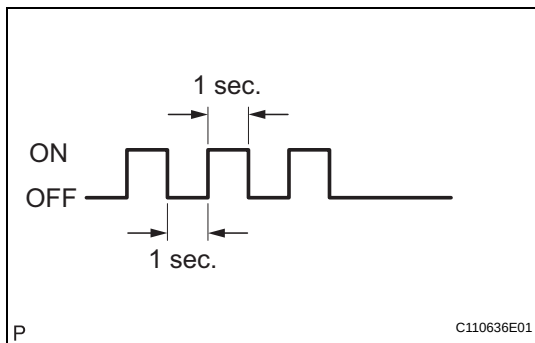
	Immediately after turning the engine switch on (IG)	Always						
		Warning light output pattern						
	Comes on for 3 sec.	Goes off	Comes on	Blinks (*1)	Blinks (*2)	Blinks (*3)	Blinks (*4)	Outputs DTC
Normal	○	○	-	-	-	-	-	-
Low tire pressure	○	-	○	-	-	-	-	-
System fail	○	-	-	○	-	-	-	-
Test mode	○	-	-	-	○	-	-	-
Initialization	○	-	-	-	-	○	-	-
ECU connector poorly connected	-	-	-	○	-	-	-	-
TC ground (DTC is output)	○	-	-	-	-	-	-	○
TC ground (DTC is not output)	○	-	-	-	-	-	○	-



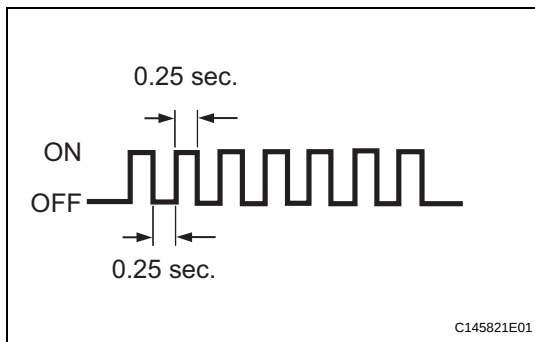
*1: Comes on and goes off repeatedly at 0.5 second intervals, and comes on after 1 minute.



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



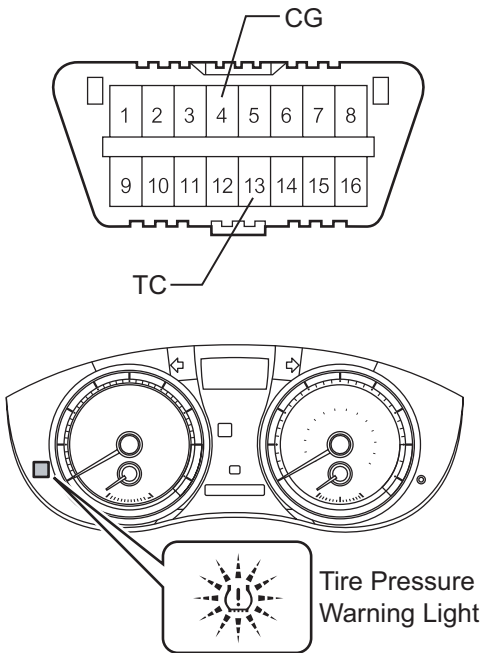
*3: Blinks 3 times (1 second on, 1 second off).



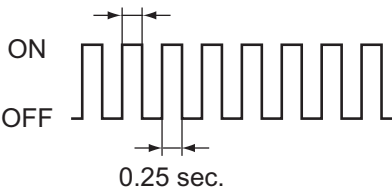
*4: Comes on and goes off repeatedly at 0.25 second intervals.

DTC CHECK / CLEAR

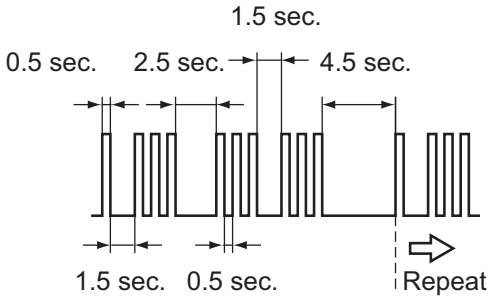
DLC3:



Normal System Code:



Codes 13 and 33:

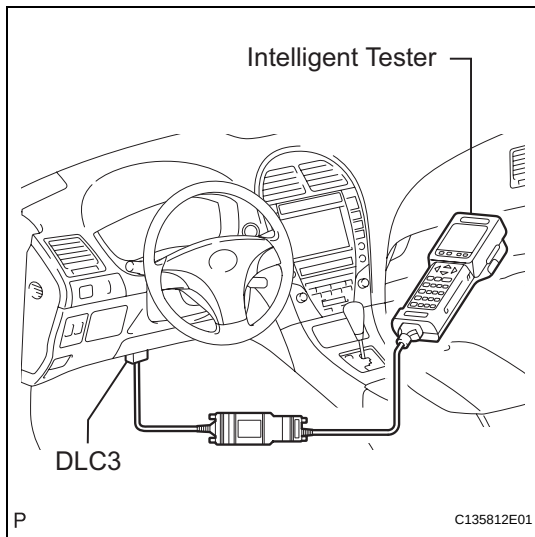


1. DTC CHECK (USING SST CHECK WIRE)

- (a) Check DTCs.
- (1) Using SST, connect terminals TC and CG of DLC3.
- SST 09843-18040**
- (2) Turn the engine switch on (IG).
- (3) 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 indicate 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-71
TC and CG terminal circuit	TW-75

- If 2 or more malfunctions are indicated at the same time, the lowest numbered DTC is displayed first.
- (4) Refer to the Diagnostic Trouble Code Chart (See page [TW-32](#)) for DTC information.
- (5) After completing the check, turn the engine switch off and remove the SST from DLC3.
- SST 09843-18040**



2. DTC CHECK (USING INTELLIGENT TESTER)

(a) Check DTCs.

- (1) Connect the intelligent tester to the DLC3.
- (2) Turn the engine switch on (IG).
- (3) Read the DTCs following the prompts on the tester screen.

HINT:

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

(b) Clear the DTCs.

HINT:

After repairing the malfunctions, clear the DTCs.

- (1) Connect the intelligent tester to DLC3.
- (2) Turn the engine switch on (IG).
- (3) Clear the DTCs following the prompts on the tester screen.

HINT:

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

DATA LIST / ACTIVE TEST

1. DATA LIST

- (a) Connect the intelligent tester to DLC3.
- (b) Turn the engine switch on (IG).
- (c) Following the display on the intelligent tester, read "DATA LIST".

TIRE PRESSURE:

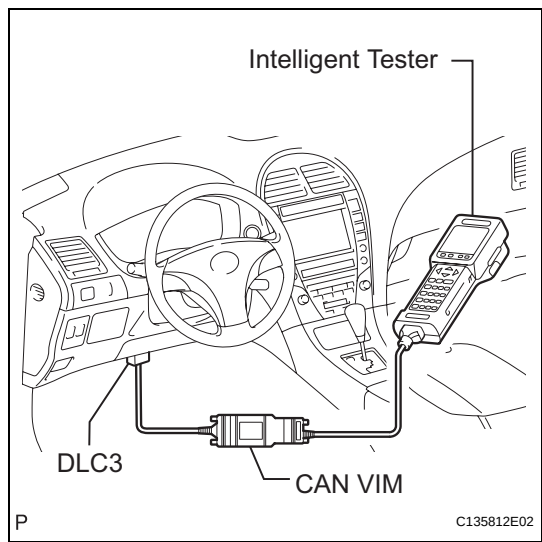
Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
MODE STATUS	Tire pressure warning system mode/NORMAL or REG 2nd or REG M or TEST	NORMAL: Normal mode TEST: Test mode	-
MAIN TIRE	Number of main tire ID to be registered/ 0 or 1 or 2 or 3 or 4 or 5	0 to 5 should be displayed	-
2ND TIRE	Number of 2nd tire ID to be registered/ 0 or 1 or 2 or 3 or 4 or 5	0 to 5 should be displayed	-
SELECT SW	Tire Pressure Warning Select Switch Status	Not pressed: MAIN Pressed: 2nd	-
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	-
REGIT ID5 CODE	Registered ID5 code/min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID5 is displayed	-
TRANS STATUS	ID code transmission status/ FINISH or NOW	FINISH or NOW	-
INITIAL SW	Tire pressure warning reset switch/ON, OFF	ON: Switch on OFF: Switch off	-
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	-
TIREPRESS5	ID5 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	-

Tester Display	Measurement Item/Range	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	-
TIRE TEMP5	ID5 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	-
BATT VOLT5	ID5 battery voltage/ OVER or LESS	OVER	-
SELECT SW INFO	Tire Pressure Warning Select switch setting information/ WITH or WITHOUT	WITH	-
INITIAL SW INFO	Tire pressure warning reset switch setting information/ WITH or WITHOUT	WITH	-
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)	Tire 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)	Tire 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)	Tire 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)	Tire pressure after initialization	-
INIT THRESHOLD5	ID5 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)	Tire pressure after initialization	-
# CODES	Number of DTC recorded/ min.: 0, max.: 255	Min.: 0, Max.: -	-

TW

METER:

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
SPEED METER	Vehicle speed/Min.: 0 km/h (0 mph), Max.: 255 km/h (158 mph)	Almost same as actual vehicle speed (When driving)	-



2. ACTIVE TEST

Performing the ACTIVE TEST using the intelligent tester allows the meters, indicators and so on to operate without parts removal. Performing the ACTIVE TEST as the first step of troubleshooting is one way to save diagnostic time. It is possible to display the DATA LIST on the intelligent tester during the ACTIVE TEST.

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the engine switch on (IG).
- (c) Enter the following menus: DIAGNOSIS / OBD/ MOBD / METER / ACTIVE TEST.

METER:

Tester Display	Test Part	Control Range	Diagnostic Note
TIRE PRESS WARN	Tire Pressure warning Light	TIRE PRESS warning light is OFF/ON	Confirm that the vehicle is stopped with the engine idling

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 relevant page listed under respective "DTC No." in the DTC chart.

TIRE PRESSURE WARNING SYSTEM

DTC Code	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-36
C2112/12	Transmitter ID2 Operation Stop	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-36
C2113/13	Transmitter ID3 Operation Stop	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-36
C2114/14	Transmitter ID4 Operation Stop	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-36
C2115/15	Transmitter ID5 Operation Stop	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-36
C2121/21	No Signal from Transmitter ID1 in Main Mode	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2122/22	No Signal from Transmitter ID2 in Main Mode	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2123/23	No Signal from Transmitter ID3 in Main Mode	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2124/24	No Signal from Transmitter ID4 in Main Mode	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2125/25	No Signal from Transmitter ID5 in Main Mode	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2131/31	No Signal from Transmitter ID1 in 2nd Mode	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40

DTC Code	Detection Item	Trouble Area	See page
C2132/32	No Signal from Transmitter ID2 in 2nd Mode	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2133/33	No Signal from Transmitter ID3 in 2nd Mode	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2134/34	No Signal from Transmitter ID4 in 2nd Mode	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2135/35	No Signal from Transmitter ID5 in 2nd Mode	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2141/41	Transmitter ID1 Error	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-49
C2142/42	Transmitter ID2 Error	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-49
C2143/43	Transmitter ID3 Error	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-49
C2144/44	Transmitter ID4 Error	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-49
C2145/45	Transmitter ID5 Error	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-49
C2165/65	Abnormal Temperature Inside ID1 Tire	1. Tires 2. Tire pressure warning valve and transmitter 3. Tire pressure warning ECU	TW-52
C2166/66	Abnormal Temperature Inside ID2 Tire	1. Tires 2. Tire pressure warning valve and transmitter 3. Tire pressure warning ECU	TW-52
C2167/67	Abnormal Temperature Inside ID3 Tire	1. Tires 2. Tire pressure warning valve and transmitter 3. Tire pressure warning ECU	TW-52
C2168/68	Abnormal Temperature Inside ID4 Tire	1. Tires 2. Tire pressure warning valve and transmitter 3. Tire pressure warning ECU	TW-52
C2169/69	Abnormal Temperature Inside ID5 Tire	1. Tires 2. Tire pressure warning valve and transmitter 3. Tire pressure warning ECU	TW-52
C2171/71	Transmitter ID not Registered in Main Mode	1. Tire pressure warning light	TW-55
C2172/72	Transmitter ID not Registered in 2nd Mode	1. Tire pressure warning light	TW-55

DTC Code	Detection Item	Trouble Area	See page
C2176/76	Receiver Error	1. Tire pressure warning antenna and receiver 2. Wire harness or connector 3. Tire pressure warning ECU	TW-57
C2177/77	Initialization not Completed	1. Tire pressure warning valve and transmitter 2. Tire pressure warning ECU	TW-60
C2181/81	Transmitter ID1 not Received (Test Mode DTC)	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2182/82	Transmitter ID2 not Received (Test Mode DTC)	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2183/83	Transmitter ID3 not Received (Test Mode DTC)	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2184/84	Transmitter ID4 not Received (Test Mode DTC)	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2185/85	Transmitter ID5 not Received (Test Mode DTC)	1. Tire pressure warning valve and transmitter 2. Wire harness or connector 3. Tire pressure warning ECU 4. Tire pressure warning antenna and receiver	TW-40
C2191/91	Vehicle Speed Signal Error (Test Mode DTC)	1. Vehicle speed sensor 2. Combination meter 3. Wire harness or connector 4. Tire pressure warning ECU	TW-63
C2192/92	Select Switch Error (Test Mode DTC)	1. Tire pressure warning select switch 2. Wire harness or connector 3. Tire pressure warning ECU	TW-65

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
DTC	C2115/15	Transmitter ID5 Operation Stop

DESCRIPTION

The tire pressure warning valve and transmitters that are installed in the tire and wheel assemblies measure the air pressures 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 value is less than this threshold, the warning light in the combination meter comes on. The tire pressure warning ECU stores a DTC when the tire pressure warning valve and transmitter 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 Detecting Condition	Trouble Area
C2111/11 C2112/12 C2113/13 C2114/14 C2115/15	Tire pressure warning valve and transmitters stop 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 warning valve and transmitter that is malfunctioning because it cannot be identified by the output DTC.
- DTC C2115/15 are used only when the vehicle is equipped with a full-size spare tire.

INSPECTION PROCEDURE

NOTICE:

- When replacing the tire pressure warning ECU, read the IDs stored in the old ECU using the intelligent tester and write them down before removal.
- It is necessary to perform initialization (See page [TW-18](#)) after registration (See page [TW-15](#)) of the transmitter IDs into the tire pressure warning ECU after the ECU and / or valve and transmitter has been replaced.

1 PERFORM FORCED TRANSMISSION OF TRANSMITTER ID OF ALL WHEELS

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

Cold tire inflation pressure

Tire size	Front kPa (kgf/cm ² , psi)	Rear kPa (kgf/cm ² , psi)
P215/55R17 93V	210 (2.1, 30)	210 (2.1, 30)

- (b) Connect the intelligent tester to the DLC3.
(c) Turn the engine switch on (IG) and turn the tester on.

- (d) Select "TIREPRESS" by following the prompts displayed on the intelligent tester.

TIRE PRESSURE:

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
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	-
TIREPRESS5	ID5 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	-

- (e) Rapidly release the pressures from each wheel by approximately 40 kPa (0.4 kgf/cm², 5.8 psi) /30 seconds or more.

- (1) Check that each tire pressure data displayed on the intelligent tester screen has changed.

NOTICE:

- It takes about 1 minute or more to display the updated tire pressure data.
- When the "TIREPRESS" data has not changed, reset the tire pressure to the appropriate specified value and rotate the tire 90 to 270 degrees (including the full-size spare tire). Then rapidly release the tire pressure and recheck it.

- (2) After confirming that all of the tire pressure data displayed on the intelligent tester screen have changed, set the tire pressure to the appropriate specified values.

HINT:

If the tire pressure data displayed on the intelligent tester screen has not changed after rechecking, go to other problem procedure (For malfunction in transmission or reception function (See page [TW-23](#)))

Result

Condition	Proceed to
All tire pressure readings are equal to specified values	A
Any of tire pressure valves are not displayed	B
All tire pressure values are not displayed	C

A

END

B

INSPECT OTHER PROBLEM
(MALFUNCTION IN TRANSMISSION OR
RECEPTION FUNCTION)

C

2

SWITCH TIRE PRESSURE WARNING SELECT SWITCH

- (a) Switch tire pressure warning select switch to the other position (MAIN to 2nd or 2nd to MAIN).
- (b) Set the tire pressure to the specified value.

Cold tire inflation pressure

Tire size	Front kPa (kgf/cm ² , psi)	Rear kPa (kgf/cm ² , psi)
P215/55R17 93V	210 (2.1, 30)	210 (2.1, 30)

- (c) Connect the intelligent tester to the DLC3.
- (d) Turn the engine switch on (IG) and turn the tester on.
- (e) Select "TIREPRESS" by following the prompts displayed on the intelligent tester.

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
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	-
TIREPRESS5	ID5 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	-

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

NOTICE:

- It takes about 1 minute or more to display the updated tire pressure data.

- When the "TIREPRESS" data has not changed, reset the tire pressure to the appropriate specified value and rotate the tire 90 to 270 degrees (including the full-size spare tire). Then rapidly release the tire pressure and recheck it.
- (2) After confirming that all of the tire pressure data displayed on the intelligent tester screen have changed, set the tire pressure to the appropriate specified values.

Result

Condition	Proceed to
All tire pressure readings are equal to specified values	A
Tire pressure values are not displayed	B



3	RETURN TIRE PRESSURE WARNING SELECT SWITCH TO ORIGINAL POSITION
---	---



INSPECT OTHER PROBLEM (MALFUNCTION IN TRANSMISSION OR RECEPTION FUNCTION)

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	C2125/25	No Signal from Transmitter ID5 in Main Mode
DTC	C2131/31	No Signal from Transmitter ID1 in 2nd Mode
DTC	C2132/32	No Signal from Transmitter ID2 in 2nd Mode
DTC	C2133/33	No Signal from Transmitter ID3 in 2nd Mode
DTC	C2134/34	No Signal from Transmitter ID4 in 2nd Mode
DTC	C2135/35	No Signal from Transmitter ID5 in 2nd 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)
DTC	C2185/85	Transmitter ID5 not Received (Test Mode DTC)

DESCRIPTION

The tire pressure warning valve and transmitters that are installed in the tire and wheel assemblies measure 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 value is less than this threshold, the warning light in the combination meter comes on. The tire pressure warning valve and transmitters constantly send radio waves to the tire pressure warning antenna and receiver.

Under the following conditions below, the tire pressure warning antenna and receiver is unable to receive the signals from the tire pressure warning valves and transmitters, and a DTC is stored.

- 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.

HINT:

When no signals are received for 51 minutes or more, a DTC is output.

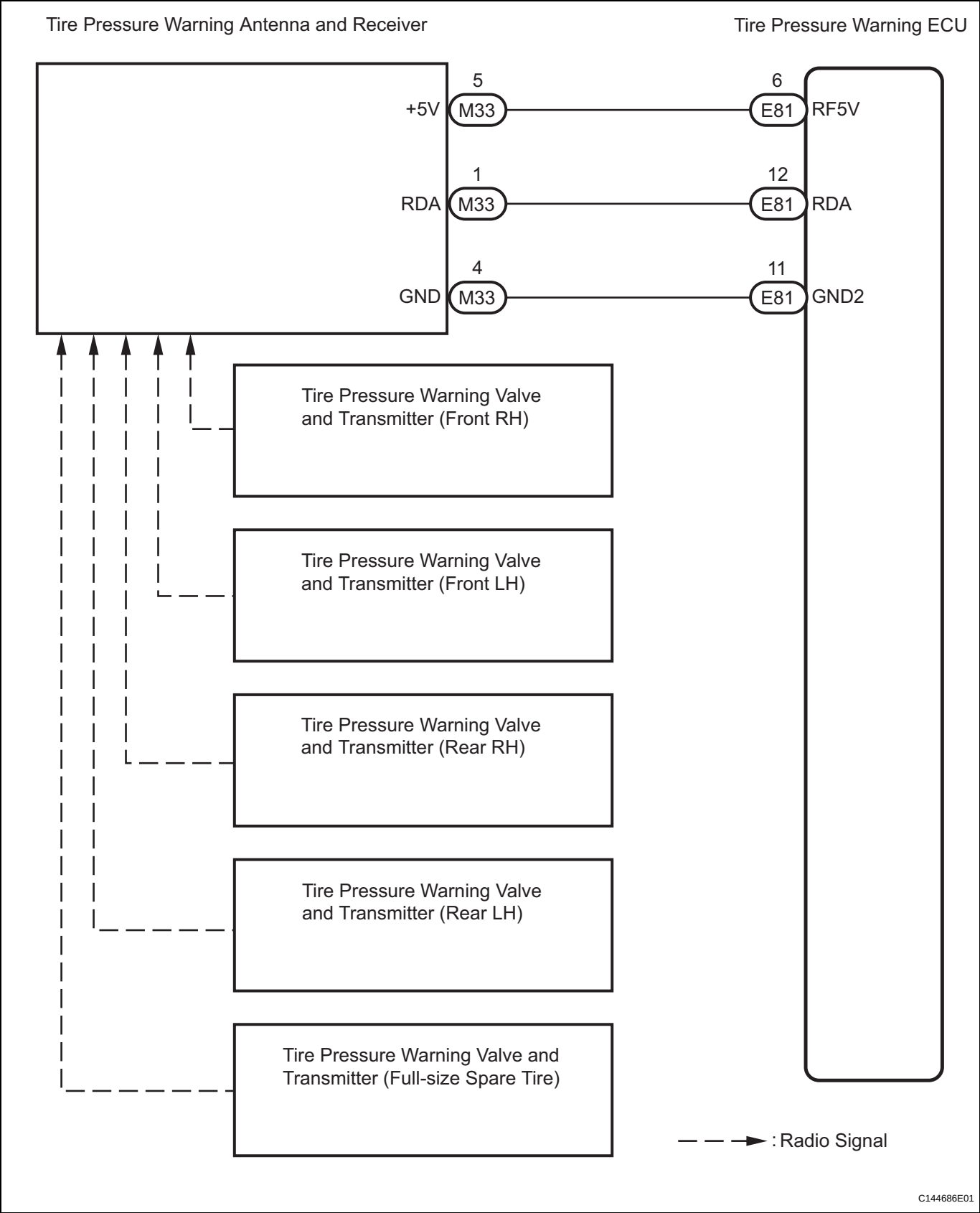
DTCs from C2121/21 to C2135/35 can only be cleared by using the tester. DTCs from C2181/81 to C2185/85 can be cleared when the transmitter in the tire pressure warning valve and transmitter sends a forced transmission signal or when the test mode ends. DTCs from C2181/81 to C2185/85 are output only in test mode.

DTC No.	DTC Detecting Condition	Trouble Area
C2121/21 C2122/22 C2123/23 C2124/24 C2125/25 C2131/31 C2132/32 C2133/33 C2134/34 C2135/35	These DTCs are detected when no signals are received for 51 minutes or more.	• Tire pressure warning valve and transmitter • Wire harness or connector • Tire pressure warning ECU
C2181/81 C2182/82 C2183/83 C2184/84 C2185/85	Malfunction in the transmitting/receiving circuit	• Tire pressure warning valve and transmitter • Wire harness or connector • Tire pressure warning ECU

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.
- DTCs C2125/25, C2135/35 and C2185/85 are used only when the vehicle is equipped with a full-size spare tire.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- When replacing the tire pressure warning ECU, read the IDs stored in the old ECU using the intelligent tester and write them down before removal.
- It is necessary to perform initialization (See page TW-18) after registration (See page TW-15) of the transmitter IDs into the tire pressure warning ECU after the ECU and/or valve and transmitter has been replaced.

1

CHECK FREQUENCY RECEIVING CONDITION

- (a) Check if the vehicle is not located in areas such as described below:
- (1) Facilities or devices that use similar radio frequencies are located in the vicinity of the vehicle.
HINT:
If the vehicle is located in areas described above, the tire pressure warning light may come on only in a particular area.
 - (2) Devices using similar radio frequencies are used in the vehicle.
OK:
Facilities, or devices that use similar radio frequencies are not located in the vicinity of the vehicle.
HINT:
Radio frequency may be interrupted due to surroundings or devices installed by the user.

NG

CHECK IF ANY DEVICE IS INSTALLED BY USER

OK

2

IDENTIFY TRANSMITTER CORRESPONDING TO DTC

- (a) Set the tire pressure to the appropriate specified values.

Cold tire inflation pressure

Tire size	Front kPa (kgf/cm ² , psi)	Rear kPa (kgf/cm ² , psi)
P215/55R17 93V	210 (2.1, 30)	210 (2.1, 30)

TW

- (b) Select "TIREPRESS" by following the prompts displayed on the intelligent tester.

TIRE PRESSURE:

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
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	-

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
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	-
TIREPRESS5	ID5 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	-

- (c) Rapidly reduce the tire pressure for each wheel at least 40 kPa (0.41 kg/cm², 5.8 psi) within 30 seconds.
- (d) Check the DATA LIST.

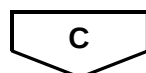
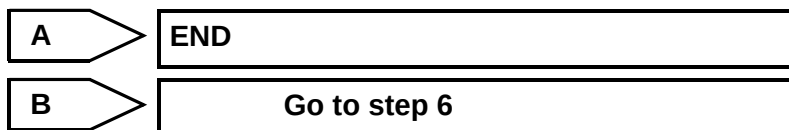
NOTICE:

- It takes about 1 minute or more to display the updated tire pressure data.
- When no "TIREPRESS" data has changed, reset the tire pressure to the appropriate specified value and rotate the tire 90 to 270 degrees. Then rapidly release the tire pressure and recheck it.
- Record the transmitter ID of which "TIREPRESS" data corresponds to each tire.

- (e) After confirming that one of "TIREPRESS" data for one tire (ID1 to ID4 or ID5) has changed, repeat this procedure one by one. Identify the transmitter that corresponds to DTC.

Result

Condition	Proceed to
All tire pressure readings are equal to specified values	A
Any of tire pressure values are not displayed	B
All tire pressure values are not displayed	C

**3****SWITCH TIRE PRESSURE WARNING SELECT SWITCH**

- (a) Switch tire pressure warning select switch to the other position (MAIN to 2nd or 2nd to MAIN).
- (b) Set the tire pressure to the appropriate specified values.

Cold tire inflation pressure

Tire size	Front kPa (kgf/cm ² , psi)	Rear kPa (kgf/cm ² , psi)
P215/55R17 93V	210 (2.1, 30)	210 (2.1, 30)

- (c) Select "TIREPRESS" by following the prompts displayed on the intelligent tester.

TIRE PRESSURE:

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
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	-

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
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	-
TIREPRESS5	ID5 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	-

- (d) Rapidly reduce the tire pressure for each wheel at least 40 kPa (0.41 kg/cm², 5.8 psi) within 30 seconds.
- (e) Check the DATA LIST.

NOTICE:

- It takes about 1 minute or more to display the updated tire pressure data.
 - When no "TIREPRESS" data has changed, reset the tire pressure to the appropriate specified value and rotate the tire 90 to 270 degrees. Then rapidly release the tire pressure and recheck it.
 - Record the transmitter ID of which "TIREPRESS" data corresponds to each tire.
- (f) After confirming that one of "TIREPRESS" data for one tire (ID1 to ID4 or ID5) has changed, repeat this procedure one by one. Identify the transmitter that corresponds to DTC.

Result

Condition	Proceed to
All tire pressure readings are equal to specified values	A
Tire pressure values are not displayed	B

A

END

B

4

RETURN TIRE PRESSURE WARNING SELECT SWITCH TO ORIGINAL POSITION

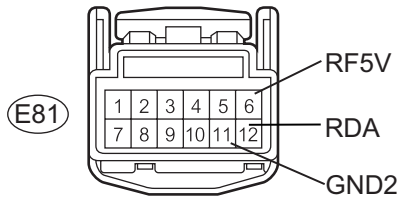
NEXT

TW

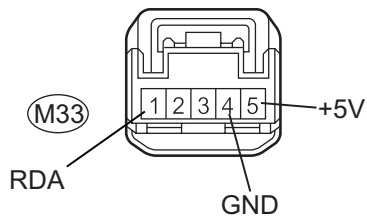
5 CHECK HARNESS AND CONNECTOR (ECU - RECEIVER)

Wire Harness Side Connector Front View:

Tire Pressure Warning ECU



Tire Pressure Warning Antenna and Receiver



H

E129461E05

- Disconnect the E81 ECU connector.
- Disconnect the M33 receiver connector.
- Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester Connection	Specified Condition
E81-12 (RDA) - M33-1 (RDA)	Below 1 Ω
E81-11 (GND2) - M33-4 (GND)	
E81-6 (RF5V) - M33-5 (+5V)	
E81-12 (RDA) - Body ground	10 k Ω or higher
E81-11 (GND2) - Body ground	
E81-6 (RF5V) - Body ground	

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

6 INSPECT TIRE PRESSURE WARNING ANTENNA AND RECEIVER

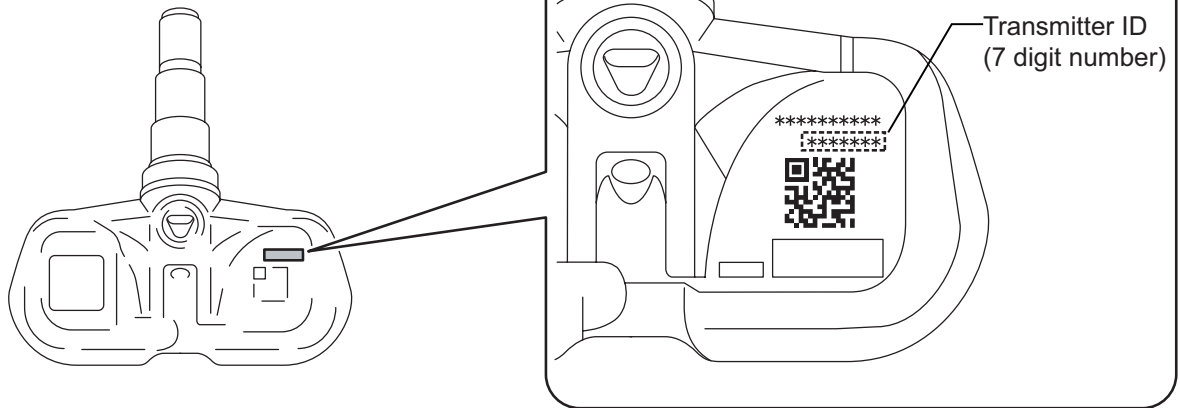
- Select REGIT ID CODE by following the prompts displayed on the intelligent tester.

TIRE PRESSURE:

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
REGIT ID1 CODE	Registered ID1 code/ min.: 0, max.: FFFFFFF*	The ID No. registered in the transmitter ID1 is displayed	*: Displayed only when the ID No. is not registered.
REGIT ID2 CODE	Registered ID2 code/ min.: 0, max.: FFFFFFF*	The ID No. registered in the transmitter ID2 is displayed	*: Displayed only when the ID No. is not registered.
REGIT ID3 CODE	Registered ID3 code/ min.: 0, max.: FFFFFFF*	The ID No. registered in the transmitter ID3 is displayed	*: Displayed only when the ID No. is not registered.
REGIT ID4 CODE	Registered ID4 code/ min.: 0, max.: FFFFFFF*	The ID No. registered in the transmitter ID4 is displayed	*: Displayed only when the ID No. is not registered.
REGIT ID5 CODE	Registered ID5 code/ min.: 0, max.: FFFFFFF*	The ID No. registered in the transmitter ID5 is displayed	*: Displayed only when the ID No. is not registered.

- Check the ID number on the identified transmitter by removing it from the tire and wheel.

Tire pressure warning valve and transmitter:



H

E128762E01

- (c) Confirm that the ID number on the transmitter and recorded transmitter ID match.

Result

Result	Proceed to
Match	A
Do not match	B

B

Go to step 8

A

7

REPLACE TIRE PRESSURE WARNING VALVE AND TRANSMITTER

HINT:
(See page [TW-80](#))

NEXT

8

REGISTRATION OF TRANSMITTER ID

- (a) Perform registration (See page [TW-15](#)).
(b) Set the tire air pressure appropriate specified values.

Cold tire inflation pressure

Tire size	Front kPa (kgf/cm ² , psi)	Rear kPa (kgf/cm ² , psi)
P215/55R17 93V	210 (2.1, 30)	210 (2.1, 30)

NEXT

9

PERFORM INITIALIZATION

- (a) Perform initialization (See page [TW-18](#)).

NEXT

TW

10 READ VALUE OF DATA LIST

- (a) Turn the engine switch off, and then turn it on (IG).
- (b) Select "TIREPRESS" by following the prompts displayed on the intelligent tester.

HINT:

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

Result

Condition	Proceed to
All tire pressure readings are equal to specified values.	A
Tire pressure values are not displayed.	B

A

END

B

11 REPLACE TIRE PRESSURE WARNING ANTENNA AND RECEIVER

- (a) Replace the tire pressure warning antenna and receiver (See page [TW-77](#)).

NEXT

12 READ VALUE OF DATA LIST

- (a) Turn the engine switch off, and then turn it on (IG).
- (b) Select "TIREPRESS" by following the prompts displayed on the intelligent tester.

HINT:

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

Result

Condition	Proceed to
All tire pressure readings are equal to specified values.	A
Tire pressure values are not displayed.	B

B

REPLACE TIRE PRESSURE WARNING ECU
(See page [TW-85](#))

A

END

DTC	C2141/41	Transmitter ID1 Error
DTC	C2142/42	Transmitter ID2 Error
DTC	C2143/43	Transmitter ID3 Error
DTC	C2144/44	Transmitter ID4 Error
DTC	C2145/45	Transmitter ID5 Error

DESCRIPTION

The tire pressure warning valve and transmitters that are installed in the tire and wheel assemblies measure 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 value is less than this threshold, the warning light in the combination meter comes on. When the internal circuit of the tire pressure warning valve and transmitter is malfunctioning, this DTC is output.

DTC No.	DTC Detecting Condition	Trouble Area
C2141/41 C2142/42 C2143/43 C2144/44 C2145/45	If an "ERROR" signal is received 3 times consecutively, the tire pressure warning valve and transmitter will be judged as defective and a DTC will be output. This will happen in situations where the inflation pressure is outside the range 0 to 637.5 kPa (0 to 6.48 kgf/cm ² , 0 psi to 92.2 psi), the temperature inside the tire is outside the specified range -40 to 120°C (-40 to 253°F), or an error occurs in the tire pressure warning valve and transmitter or the surrounding area.	• Tire pressure warning valve and transmitter • Tire pressure warning ECU

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.
- DTC 2145/45 is used only when the vehicle is equipped with the full-size spare tire.

INSPECTION PROCEDURE

NOTICE:

- When replacing the tire pressure warning ECU, read the IDs stored in the old ECU using the intelligent tester and write them down before removal.
- It is necessary to perform initialization (See page [TW-18](#)) after registration (See page [TW-15](#)) of the transmitter IDs into the tire pressure warning ECU after the ECU and/or valve and transmitter has been replaced.

TW

1	IDENTIFY TRANSMITTER CORRESPONDING TO DTC
----------	--

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

Cold tire inflation pressure

Tire size	Front kPa (kgf/cm², psi)	Rear kPa (kgf/cm², psi)
P215/55R17 93V	210 (2.1, 30)	210 (2.1, 30)

- (b) Display the "TIREPRESS" data for each wheel using the intelligent tester.

- (c) Rapidly reduce the tire pressure for each wheel at least 40 kPa (0.41 kg/cm², 5.8 psi) within 30 seconds. If "TIREPRESS" displayed on the tester (ID1 to ID4 or ID5) does not change, the tire pressure warning valve and transmitter corresponds to the DTC that was detected.

HINT:

- Identify the malfunctioning tire pressure warning valve and transmitter by repeatedly decreasing the tire pressure for each tire.
- Record which "TIREPRESS" data (ID1 to ID4 or ID5) corresponds to each tire.

TIRE PRESSURE:

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
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	-
TIREPRESS5	ID5 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	-

- (d) Check the DATA LIST.

Result

Condition	Detection Condition
One of "TIREPRESS" data (ID1 to ID4 or ID5) changed.	Normal
"TIREPRESS" data did not change.	Transmitter corresponding to DTC

NOTICE:

- When "TIREPRESS" data has not changed, reset the tire pressure to the appropriate specified value and rotate the tire 90 to 270 degrees. Then forcibly transmit the transmitter ID and recheck.
 - Record the transmitter ID and position of transmitters that are normal.
- (e) When the "TIREPRESS" data (ID1 to ID4 or ID5) has changed, repeat this procedure to identify the tire pressure warning valve and transmitter that corresponds to a DTC.
- (f) When all of the "TIREPRESS" data (ID1 to ID4 or ID5) have changed, identify the malfunctioning tire pressure warning valve and transmitter using recorded ID numbers and output DTC.
- (g) Set the tire pressures to the appropriate specified values.

2**REPLACE TIRE PRESSURE WARNING VALVE AND TRANSMITTER**

- (a) Replace the identified tire pressure warning valve and transmitter with a new one.

HINT:

- Before installing a new tire pressure warning valve and transmitter, read and write down its transmitter ID.
- The IDs for the tire pressure warning valve and transmitter not be replaced should be checked using the tester and recorded.

NEXT**3****REGISTRATION OF TRANSMITTER ID**

- (a) Register the transmitter ID for all wheels (See page [TW-15](#)).
- (b) Set the tire air pressure to the specified value.

Result

Condition	Detection Condition
One of "TIREPRESS" data (ID1 to ID4 or ID5) changed.	Normal
"TIREPRESS" data did not change.	Transmitter corresponding to DTC

NEXT**4****PERFORM INITIALIZATION**

- (a) Perform initialization (See page [TW-18](#)).

NEXT**5****CHECK DTC**

- (a) Check for a DTC (See page [TW-29](#)).

Result

Condition	Proceed to
Any of the DTCs from C2141/41 to C2144/44 or C2145/45 are output.	A
Any of the DTCs from C2141/41 to C2144/44 or C2145/45 are not output.	B

B**END****A****REPLACE TIRE PRESSURE WARNING ECU (See page [TW-85](#))****TW**

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
DTC	C2169/69	Abnormal Temperature Inside ID5 Tire

DESCRIPTION

Each tire pressure warning valve and transmitter measures the internal temperature of its tire as well as tire pressure, and transmits the information to the tire pressure warning ECU 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 (come on after blinking for 1 minute) the tire pressure warning light.

DTC No.	DTC Detecting Condition	Trouble Area
C2165/65 C2166/66 C2167/67 C2168/68 C2169/69	Temperature inside the tire exceeds 119°C (246.2°F) more than once.	- Tires - Tire pressure warning valve and transmitter - Tire pressure warning ECU

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.
- DTC 2169/69 is used only when the vehicle is equipped with a full-size spare tire.

INSPECTION PROCEDURE

NOTICE:

- When replacing the tire pressure warning ECU, read the IDs stored in the old ECU using the intelligent tester and note them down before removal.
- It is necessary to perform initialization (See page [TW-18](#)) after registration (See page [TW-15](#)) of the transmitter IDs into the tire pressure warning ECU after the ECU and/or valve and transmitter has been replaced.

TW

1	CHECK TIRES
---	-------------

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

OK:

Tire is normal.

HINT:

If a tire is damaged, the tire pressure warning valve and transmitter may also have been damaged at the same time.

NG

REPLACE TIRE AND TIRE PRESSURE WARNING VALVE AND TRANSMITTER

OK

2**IDENTIFY TRANSMITTER CORRESPONDING TO DTC**

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

Cold tire inflation pressure

Tire size	Front kPa (kgf/cm ² , psi)	Rear kPa (kgf/cm ² , psi)
P215/55R17 93V	210 (2.1, 30)	210 (2.1, 30)

- (b) Display the "TIREPRESS" data for each wheel using the intelligent tester.
- (c) Rapidly reduce the tire pressure for each wheel at least 40 kPa (0.41 kg/cm², 5.8 psi) within 30 seconds.
- (d) Check the DATA LIST

TIRE PRESSURE:

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
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	-
TIREPRESS5	ID5 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	-

Result

Condition	Detection Condition
One of "TIREPRESS" data (ID1 to ID4 or ID5) changed.	Normal
No "TIREPRESS" data changed.	Transmitter corresponding to DTC

NOTICE:

- It takes about 1 minute or more to display the updated data.
 - When no "TIREPRESS" data has changed, reset the tire pressure to the appropriate specified value and rotate the tire 90 to 270 degrees. Then forcibly transmit the transmitter ID and recheck it.
 - Record the transmitter ID and position that is normal condition.
- (e) When the "TIREPRESS" data (ID1 to ID4 or ID5) has changed, repeat this procedure to identify the tire pressure warning valve and transmitter that corresponds to a DTC.
- (f) When all of the "TIREPRESS" data (ID1 to ID4 or ID5) has changed, identify the malfunctioning tire pressure warning valve and transmitter based on the recorded ID numbers and output DTC.

NEXT

3

REPLACE TIRE PRESSURE WARNING VALVE AND TRANSMITTER

- (a) Replace the identified tire pressure warning valve and transmitter with a new one (See page [TW-80](#)).

HINT:

- Before installing a new tire pressure warning valve and transmitter, read and write down its transmitter ID.
- The IDs for the tire pressure warning valve and transmitter not be replaced should be checked using the tester and recorded.

NEXT

4

CHECK REGISTRATION OF TRANSMITTER ID

- (a) Register the transmitter ID for 4 or 5 wheels (See page [TW-15](#)).
- (b) Set the tire pressure of all wheels to the specified value.

Cold tire inflation pressure

Tire size	Front kPa (kgf/cm ² , psi)	Rear kPa (kgf/cm ² , psi)
P215/55R17 93V	210 (2.1, 30)	210 (2.1, 30)

NEXT

5

PERFORM INITIALIZATION

- (a) Perform initialization (See page [TW-18](#)).

NEXT

6

CHECK DTC

- (a) Check for a DTC (See page [TW-18](#)).

Result

Condition	Proceed to
Any of the DTCs from C2165/65 to C2168/68 or C2169/69 are output.	A
Any of the DTCs from C2165/65 to C2168/68 or C2169/69 are not output.	B

B

END

A

REPLACE TIRE PRESSURE WARNING ECU (See page [TW-85](#))

DTC	C2171/71	Transmitter ID not Registered in Main Mode
DTC	C2172/72	Transmitter ID not Registered in 2nd Mode

DESCRIPTION

The IDs of each tire pressure warning valve and transmitter are registered to the tire pressure warning ECU. When the ECU detects that an ID is not the one of registered IDs, or cannot receive an ID signal, a DTC is output.

DTC No.	DTC Detection Condition	Trouble Area
C2171/71 C2172/72	Transmitter ID code is not registered. (When an ID code is unregistered for 51 minutes or more)	Tire pressure warning ECU

INSPECTION PROCEDURE**NOTICE:**

- When replacing the tire pressure warning ECU, read the IDs stored in the old ECU using the intelligent tester and note them down before removal.
- It is necessary to perform initialization (See page [TW-18](#)) after registration (See page [TW-15](#)) of the transmitter IDs into the tire pressure warning ECU after the ECU and/valve and transmitter has been replaced.

1	CONFIRM REGISTRATION CONDITION (REGISTERED ID CODES)
----------	---

- Connect the intelligent tester to the DLC3 connector.
- Turn the engine switch on (IG) and turn the tester on.
- Select REGIT ID CODE by following the prompts displayed on the intelligent tester.

OK:

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

OK

REPLACE TIRE PRESSURE WARNING ECU
(See page [TW-85](#))

NG

2	PERFORM REGISTRATION
----------	-----------------------------

TW

- Register the transmitter IDs for all the wheels (See page [TW-15](#)).
- Set the tire pressure of all the wheels to the appropriate specified values.

NEXT

3	READ VALUE ON INTELLIGENT TESTER
----------	---

- Check the DATA LIST (See page [TW-30](#))
- Select "TIREPRESS" by following the prompts displayed on the intelligent tester.

HINT:
It may take up to 1 minute or more to display the tire pressure data.

Result

Condition	Proceed to
All tire pressure readings are equal to specified values.	A
Tire pressure values are not displayed	B

B

REPLACE TIRE PRESSURE WARNING ECU
(See page [TW-85](#))

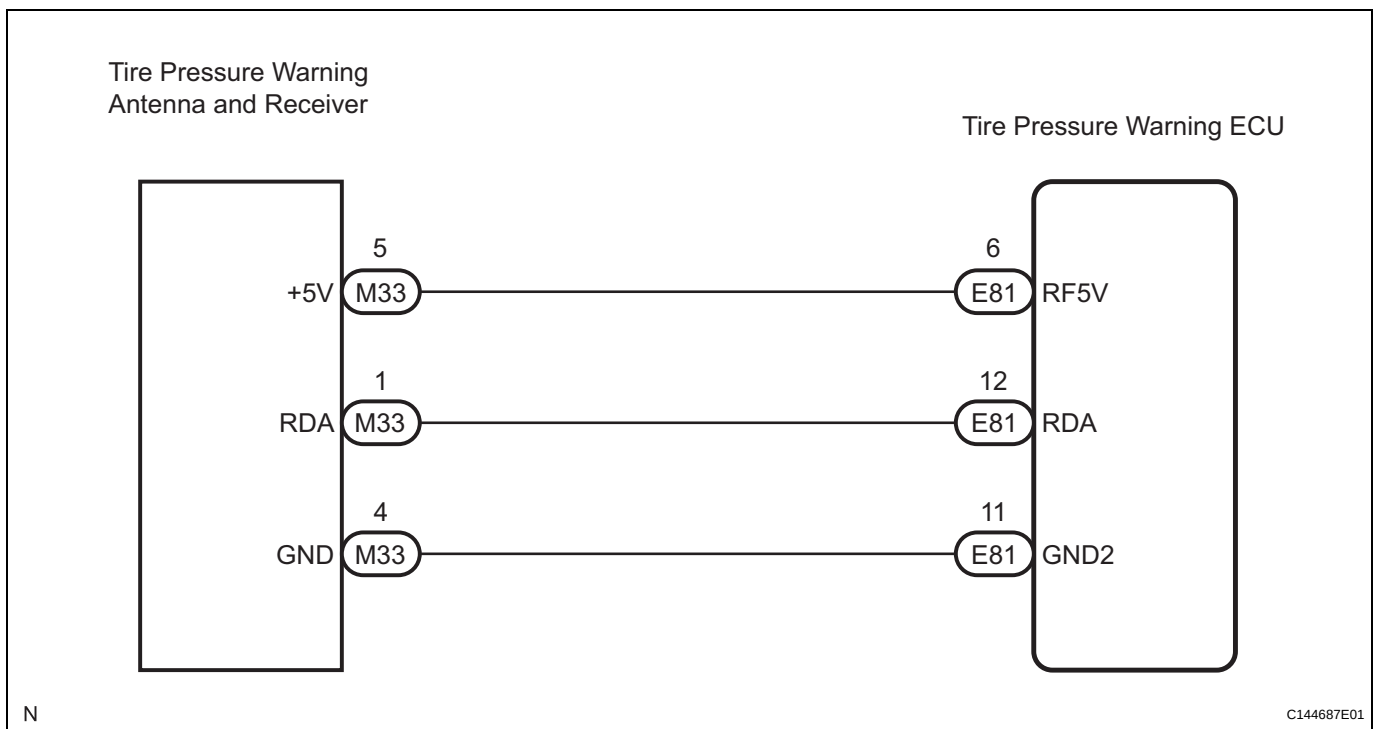
A

END

DTC**C2176/76****Receiver Error****DESCRIPTION**

The signals 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.

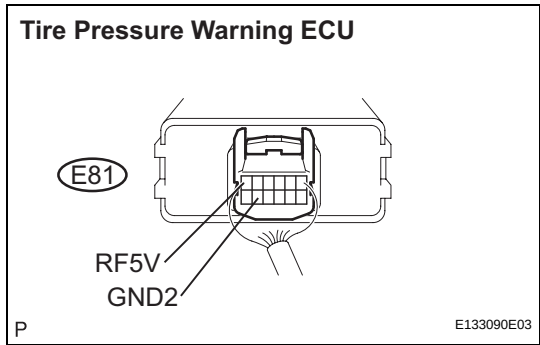
DTC No.	DTC Detection Condition	Trouble Area
C2176/76	DTC is stored when any of the following is detected: • Malfunction in the tire pressure warning ECU internal circuit. • Terminal RF5V is shorted to ground. • Malfunction in the tire pressure warning antenna and receiver internal circuit.	• Tire pressure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

WIRING DIAGRAM**INSPECTION PROCEDURE****NOTICE:**

- When replacing the tire pressure warning ECU, read the IDs stored in the ECU using the intelligent tester and write them down before removal.
- It is necessary to perform initialization (See page [TW-18](#)) after registration (See page [TW-15](#)) of the transmitter IDs into the tire pressure warning ECU after the ECU and/or valve and transmitter has been replaced.

1

CHECK TIRE PRESSURE WARNING ECU



OK

(a) Measure the voltage according to the value(s) in the table below.

Standard voltage

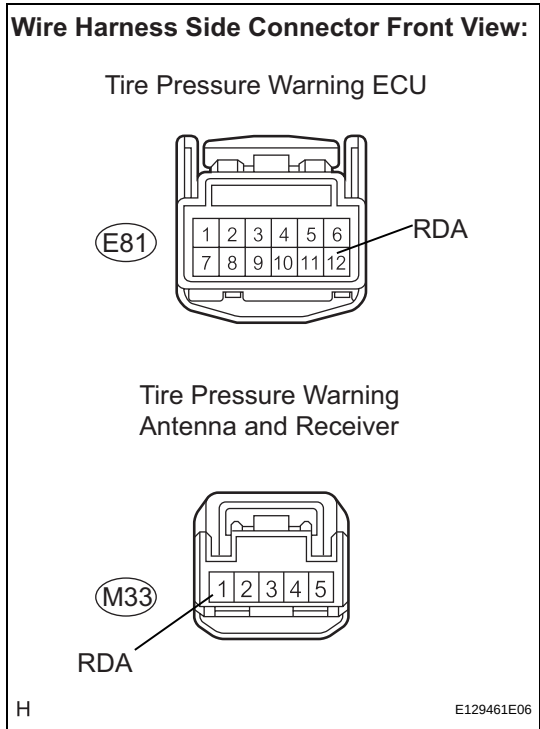
Tester Connection	Switch Condition	Specified Condition
E81-6 (RF5V) - E81-11 (GND2)	Engine switch on (IG)	4.5 to 5.5 V

NG

Go to step 5

2

CHECK WIRE HARNESS (ECU - RECEIVER)



OK

- (a) Disconnect the E81 ECU connector.
- (b) Disconnect the M33 receiver connector.
- (c) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester Connection	Specified Condition
E81-12 (RDA) - M33-1 (RDA)	Below 1 Ω
E81-12 - Body ground	

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

3

REPLACE TIRE PRESSURE WARNING ANTENNA AND RECEIVER

HINT:

Replace tire pressure warning antenna and receiver (See page [TW-77](#)).

NEXT

4 CHECK DTC

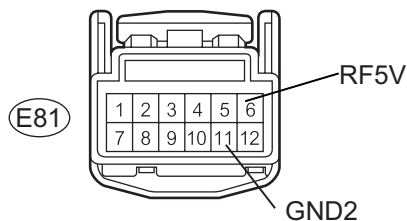
- (a) Check for DTC (See page
- [TW-29](#)
-).

OK:**DTC is not output.****HINT:**

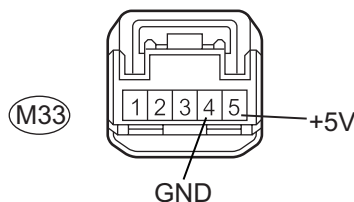
- It is necessary to register IDs when replacing the tire pressure warning ECU (See page [TW-15](#)).
- Read the IDs on the DATA LIST before removing the tire pressure warning ECU. Register the ID in the new tire pressure warning ECU.

NG**REPLACE TIRE PRESSURE WARNING ECU****OK****END****5 CHECK HARNESS AND CONNECTOR (ECU - RECEIVER)****Wire Harness Side Connector Front View:**

Tire Pressure Warning ECU



Tire Pressure Warning Antenna and Receiver



H

E129461E07

- (a) Disconnect the E81 ECU connector.
 (b) Disconnect the M33 receiver connector.
 (c) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester Connection	Specified Condition
E81-11 (GND2) - M33-4 (GND)	Below 1 Ω
E81-6 (RF5V) - M33-5 (+5V)	
E81-11 (GND2) - Body ground	10 k Ω or higher
E81-6 (RF5V) - Body ground	

Result

Result	Proceed to
OK	A
OK (When troubleshooting in accordance with PROBLEM SYMPTOMS TABLE)	B
NG	C

A**REPLACE TIRE PRESSURE WARNING ECU**
(See page [TW-85](#))**C****REPAIR OR REPLACE HARNESS OR CONNECTOR AND REPLACE TIRE PRESSURE WARNING ECU** (See page [TW-85](#))**B****PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE****TW**

DTC**C2177/77****Initialization not Completed****DESCRIPTION**

Initialization is necessary after replacing any of the ECU, tires with different tire pressure, or tire pressure warning valve and transmitter, after rotating the tires or when a new vehicle is delivered.

DTC No.	DTC Detection Condition	Trouble Area
C2177/77	Initialization is not completed after vehicle speed of 5 mph (8 km/h) or more continues for 20 minutes or more (total).	• Tire pressure warning valve and transmitter • Tire pressure warning ECU • Tire pressure warning reset switch

INSPECTION PROCEDURE**NOTICE:**

- When replacing the tire pressure warning ECU, read the IDs stored in the old ECU using the intelligent tester and write them down before removal.
- It is necessary to perform initialization (See page [TW-18](#)) after registration (See page [TW-15](#)) of the transmitter IDs into the tire pressure warning ECU after the ECU and/or valve and transmitter has been replaced.

1**CHECK FREQUENCY RECEIVING CONDITION**

- (a) Check if the vehicle is not located in areas such as described below:
- (1) Facilities or devices that use similar radio frequencies are located in the vicinity of the vehicle.
HINT:
If the vehicle is located in areas described above, the tire pressure warning light may come on only in a particular area.
 - (2) Devices using similar radio frequencies are used in the vehicle.
OK:
Facilities, or devices that use similar radio frequencies are not located in the vicinity of the vehicle.
HINT:
Radio frequency may be interrupted due to surroundings or devices installed by the user.

NG**CHECK IF ANY DEVICE IS INSTALLED BY USER****OK****2****CHECK TIRE PRESSURE WARNING SELECT SWITCH**

- (a) Check that the position of the tire pressure warning select switch (MAIN or 2nd).
OK:
Tire pressure warning select switch position is the same as the type of registration ID of the wheels being used.

NG

**CHANGE TIRE PRESSURE WARNING
SELECT SWITCH POSITION**

OK

3

PERFORM INITIALIZATION

- (a) Perform initialization (See page [TW-18](#)).

NOTICE:

Signals from a tire pressure warning valve and transmitter may be interrupted depending on the position of the valve. If initialization is not completed, rotate the tire 90 to 270 degrees and perform initialization again.

OK

END

NG

4

INSPECT TIRE PRESSURE WARNING VALVE AND TRANSMITTER

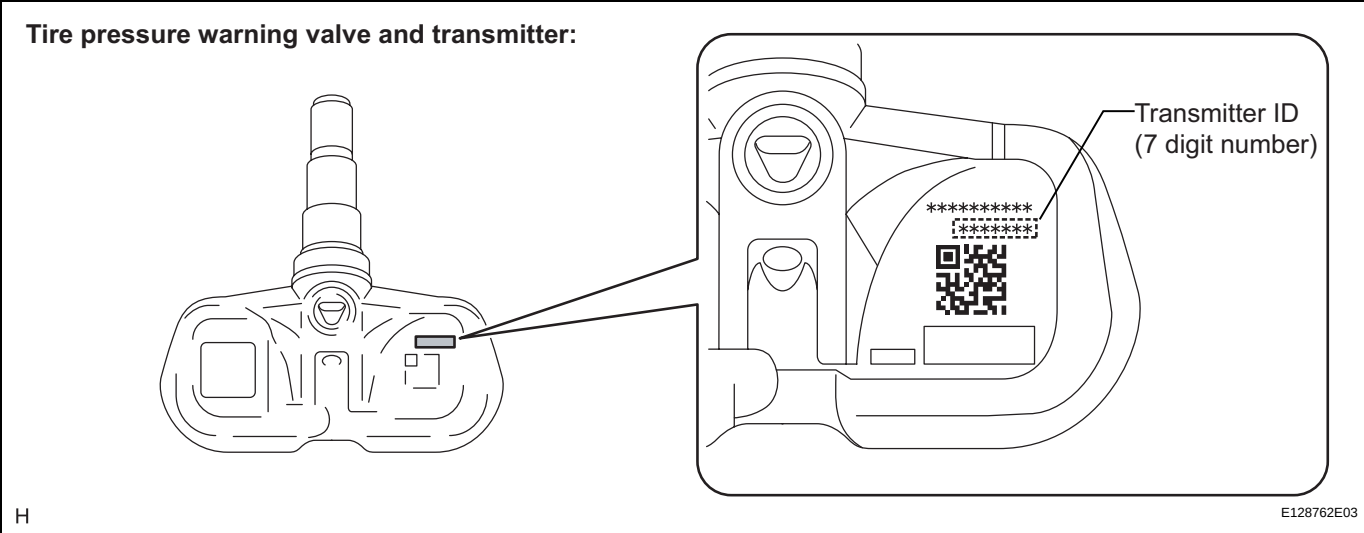
- (a) Select REGIT ID CODE by following the prompts displayed on the intelligent tester.

TIRE PRESSURE:

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
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	-
TIREPRESS5	ID5 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	-

TW

- (b) Check the ID number on the identified transmitter by removing it from the tire and wheel.



Result

Result	Proceed to
Matched	A
Not matched	B

NG

REGISTRATION OF TRANSMITTER ID (See page TW-15)

OK

5 CHECK DTC

(a) Check for a DTC (See page TW-29).

Result

Condition	Proceed to
Only DTC C2177/77 is output.	A
DTC C2177/77 and any of the DTCs from C2121/21 to C2125/25 are output.	B

B

REPAIR CIRCUITS INDICATED BY OUTPUT DTCS (See page TW-40)

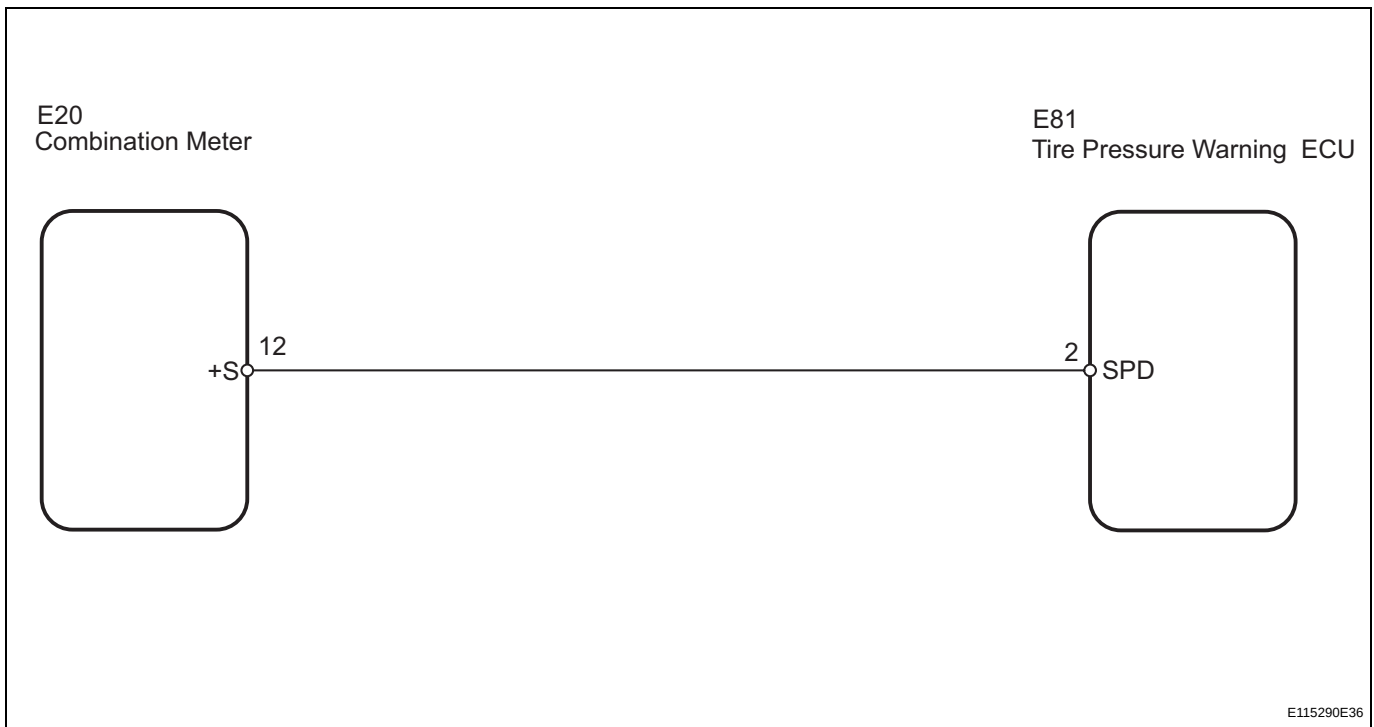
A

REPAIR OR REPLACE TIRE PRESSURE WARNING ECU (See page TW-85)

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

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

DTC No.	DTC Detecting Condition	Trouble Area
C2191/91	Speed sensor circuit malfunction	- Vehicle speed sensor - Tire pressure warning ECU - Combination meter - Wire harness or connector

WIRING DIAGRAM**INSPECTION PROCEDURE****NOTICE:**

- When replacing the tire pressure warning ECU, read the IDs stored in the ECU using the intelligent tester and write them down before removal.
- It is necessary to perform initialization (See page [TW-18](#)) after registration (See page [TW-15](#)) of the transmitter IDs into the tire pressure warning ECU after the ECU and/or valve and transmitter has been replaced.

1**READ VALUE ON INTELLIGENT TESTER**

- Connect the intelligent tester to DLC3.
- Turn the engine switch on (IG), and turn the intelligent tester on.
- Select the item below in the Data List, and read the value displayed on the intelligent tester.

HINT:

Enter the following menus: DIAGNOSIS / OBD/MOBD /
METER / DATA LIST.

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
VEHICLE SPD	Vehicle speed/Min.:0 km/h (0 mph) MAX.:255 km/h (158 mph)	Almost same as actual vehicle speed	-

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

OK:

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

NG

GO TO METER / GAUGE SYSTEM

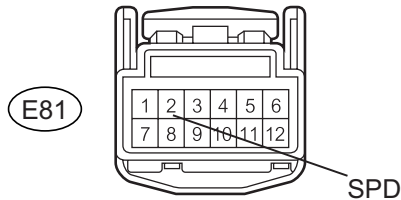
OK

2

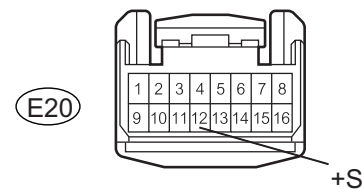
CHECK HARNESS AND CONNECTOR (ECU - COMBINATION METER)

Wire Harness Side Connector Front View:

Tire Pressure Warning ECU



Combination Meter



- (a) Disconnect the E81 ECU connector.
(b) Disconnect the E20 meter connector.
(c) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester Connection	Specified Condition
E81-2 (SPD) - E20-12 (+S)	Below 1 Ω
E81-2 (SPD) - Body ground	10 k Ω or higher

NG

REPAIR OR REPLACE HARNESS OR
CONNECTOR

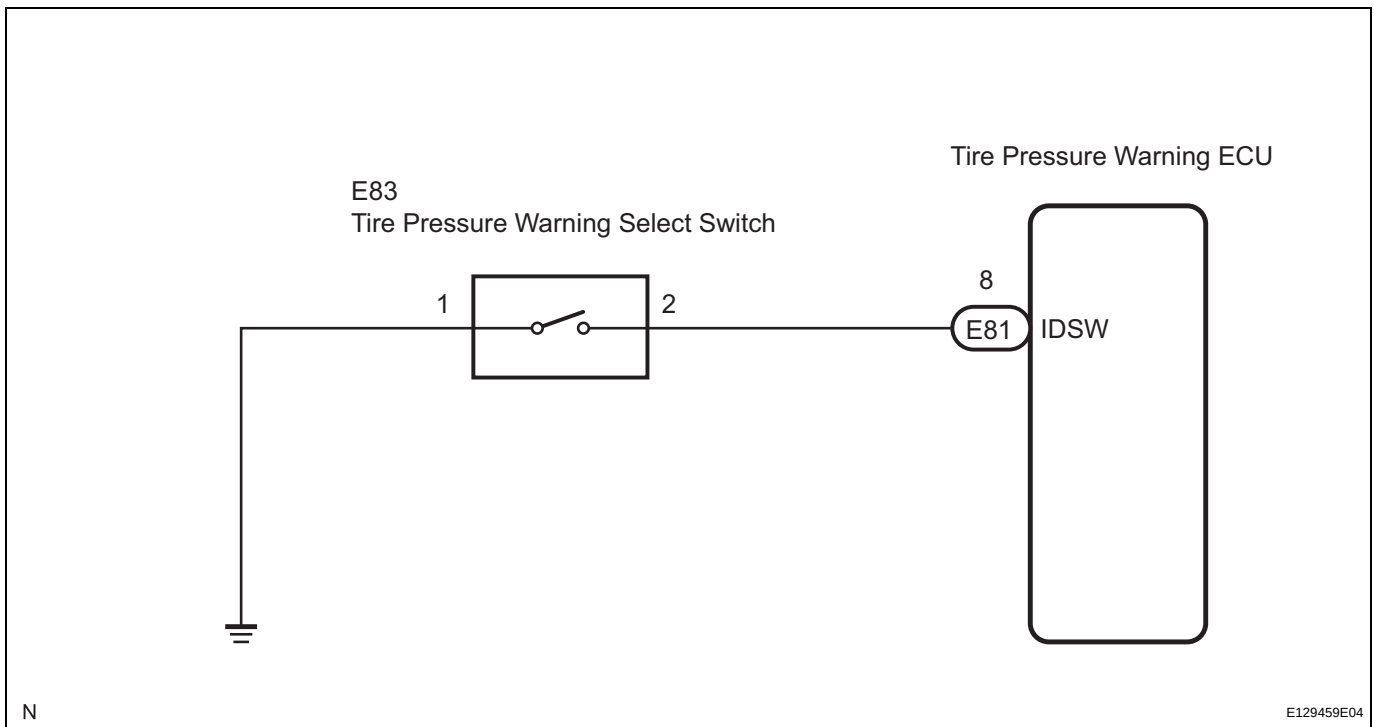
OK

REPLACE TIRE PRESSURE WARNING ECU (See page TW-85)

DTC**C2192/92****Select Switch Error (Test Mode DTC)****DESCRIPTION**

The tire pressure warning select switch has 2 positions: "MAIN" and "2nd". 2 sets of ID (2 sets of tires) for the tire pressure warning valve and transmitter can be registered to the tire pressure warning ECU.

DTC No.	DTC Detecting Condition	Trouble Area
C2192/92	In test mode, switch position is not detected in the order: "MAIN", "2nd", "MAIN"	• Tire pressure warning select switch • Wire harness or connector • Tire pressure warning ECU

WIRING DIAGRAM**INSPECTION PROCEDURE****NOTICE:**

- When replacing the tire pressure warning ECU, read the IDs stored in the old ECU using the intelligent tester and write them down before removal.
- It is necessary to perform initialization (See page [TW-18](#)) after registration (See page [TW-15](#)) of the transmitter IDs into the tire pressure warning ECU after the ECU and/or valve and transmitter has been replaced.

1**READ VALUE ON INTELLIGENT TESTER**

- Connect the intelligent tester to the DLC3.
- Turn the engine switch on (IG).
- Select the item below in the DATA LIST, and read its value displayed on the intelligent tester.

TIRE PRESSURE

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
SELECT SW	Tire pressure warning select switch status	No pressing: MAIN Pressing: 2nd	-

TIRE PRESSURE

Item	Normal Condition
SELECT SW	Not pressing: MAIN Pressing: 2nd

- (d) Check that the value displayed on the intelligent tester changes when pressing the tire pressure warning select switch.

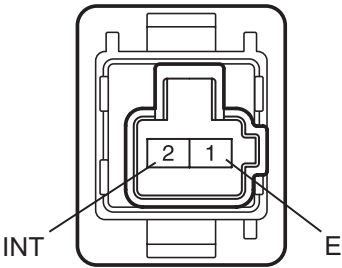
OK:
Tire pressure warning select switch value changes.

OK → END

NG

2 INSPECT TIRE PRESSURE WARNING SELECT SWITCH

Tire Pressure Warning Select Switch:



- (a) Disconnect the tire pressure warning select switch E83 connector.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

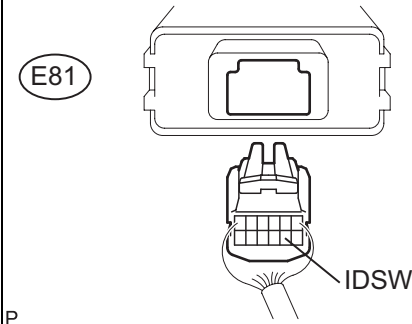
Switch Position	Tester Connection	Specified Condition
MAIN	2 (INT) - 1 (E)	10 kΩ or higher
2nd	2 (INT) - 1 (E)	Below 1 Ω

NG → REPLACE TIRE PRESSURE WARNING SELECT SWITCH

OK

3 CHECK HARNESS AND CONNECTOR (TIRE PRESSURE WARNING ECU-TIRE PRESSURE SELECT SWITCH)

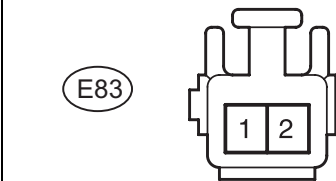
Tire Pressure Warning ECU:



C107245E19

- (a) Disconnect the tire pressure warning ECU E81 connector.

Tire Pressure Warning Select Switch:



C107252E03

- (b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester Connection	Specified Condition
E81-8 (IDSW) - E83-2	Below 1 Ω
E81-8 (IDSW) - Body ground	10 k Ω or higher

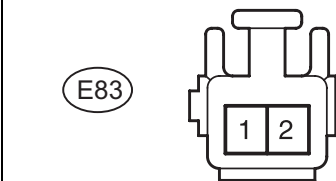
NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4 CHECK HARNESS AND CONNECTOR (TIRE PRESSURE WARNING SELECT SWITCH-BODY GROUND)

Tire Pressure Warning Select Switch:



C107252E03

- (a) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester Connection	Specified Condition
E83-1 - Body ground	Below 1 Ω

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE TIRE PRESSURE WARNING ECU (See page [TW-85](#))