

# DIAGNOSIS SYSTEM

## 1. DESCRIPTION

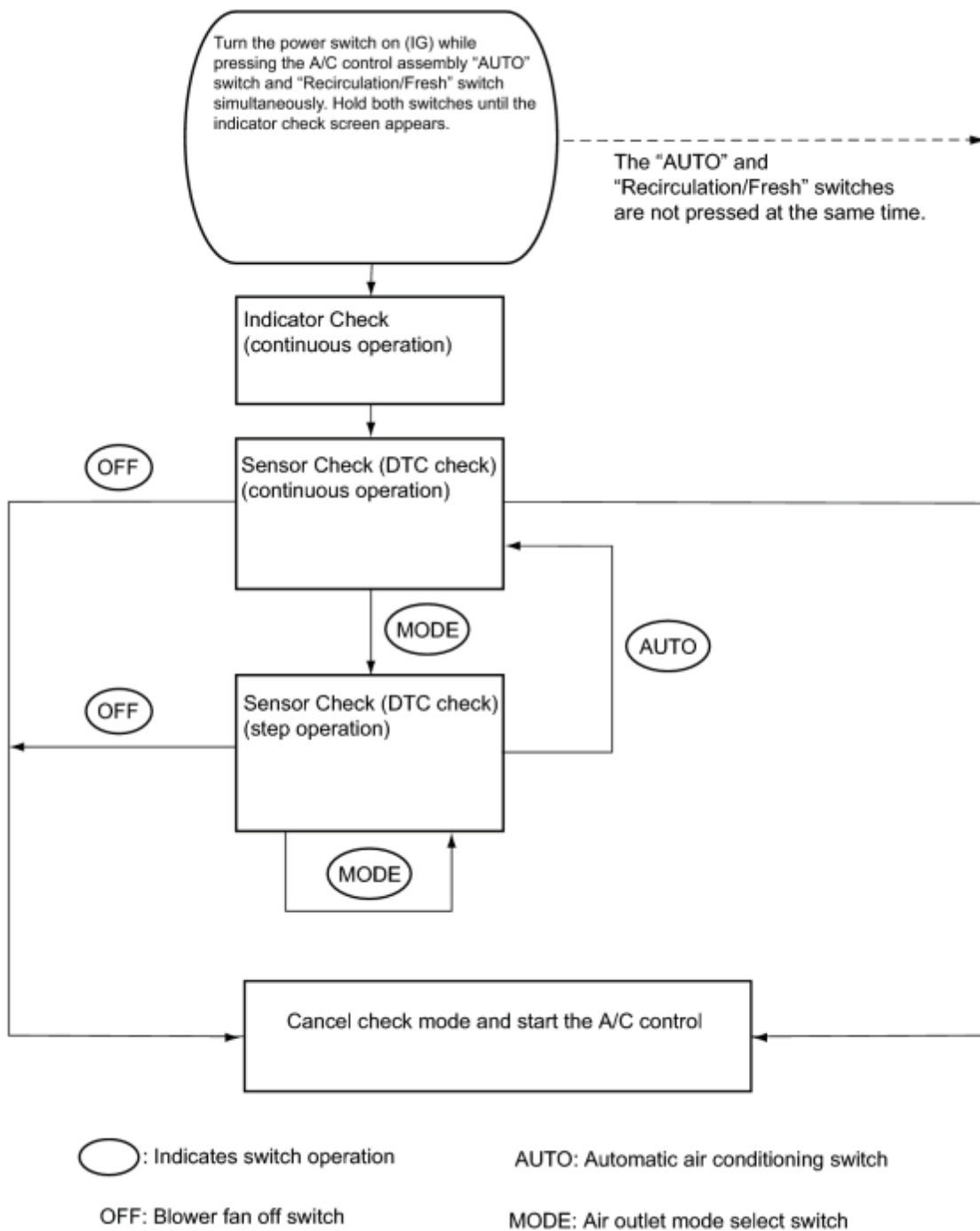
(a) Air conditioning system data and the Diagnostic Trouble Codes (DTCs) can be read through the Data Link Connector 3 (DLC3) of the vehicle. When the system seems to be malfunctioning, use the Techstream to check for malfunctions and perform troubleshooting.

## 2. CHECK DLC3

(a) Check the DLC3 .

## 3. LIST OF OPERATION METHODS

(a) By operating each of the air conditioning control switches as shown in the diagram below, it is possible to enter diagnostic check mode.

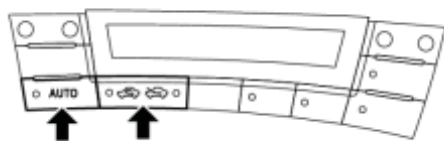


#### 4. INDICATOR CHECK

- (a) Turn the power switch off.
- (b) Turn the power switch on (ACC) and wait for at least 5 seconds.
- (c) Turn the power switch on (IG) while pressing the A/C control

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assembly "AUTO" switch and "Recirculation/Fresh" switch simultaneously. Hold both switches until the indicator check screen appears.

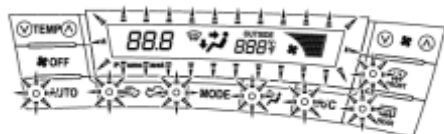


## Text in Illustration

*1	A/C Control Assembly
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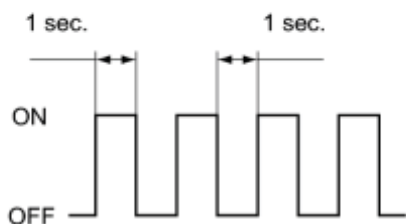
\*1



(d) The indicator check is automatically performed when panel diagnosis is activated. Check that the indicators light up and go off 4 times at 1-second intervals continuously.

- The sensor check automatically starts when the indicator check is completed.
- Press the "OFF" switch to cancel the check mode.

Indicator Blinking Pattern:



## Text in Illustration

*1	A/C Control Assembly
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### 5. SENSOR CHECK (DTC CHECK)

- Start the engine and warm it up.
- Perform the indicator check.

HINT:

After the indicator check is completed, the system enters DTC check mode automatically.

(c) Read the DTC displayed on the A/C control assembly.

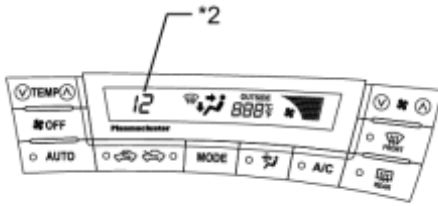
NOTICE:

In sensor check mode, which is automatically entered after indicator check mode, troubleshooting may be partially performed. Be sure to perform the sensor check again.

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HINT:

Refer to Diagnostic Trouble Code Chart for details of the codes INFO.



- When there are no problems, DTC 00 is output.
- As an example, the illustration shows that display DTC 12 is output.

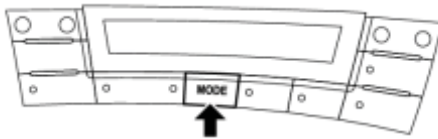
## Text in Illustration

*1	A/C Control Assembly
*2	Diagnostic Trouble Code (DTC)

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\*1

(d) If the steps are difficult to read because they change automatically, press the "MODE" switch to display the steps one at a time so that they can be read easily. The items are displayed step by step each time the "MODE" switch is pressed.



HINT:

Press the "OFF" switch to finish panel diagnosis.

## Text in Illustration

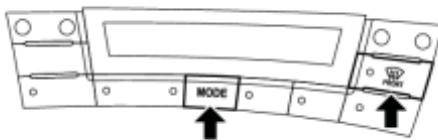
*1	A/C Control Assembly
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(e) Clear the DTC

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(1) During the sensor check, press the "FRONT DEF" switch and "MODE" switch simultaneously.



## Text in Illustration

*1	A/C Control Assembly
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# DTC CHECK / CLEAR

## 1. DTC CHECK USING TECHSTREAM

- (a) Connect the Techstream to the DLC3.
- (b) Turn the power switch on (IG).
- (c) Turn the Techstream on.
- (d) Enter the following menus: Body Electrical / Air Conditioner / Trouble Codes.
- (e) Check for DTCs.

## 2. DTC CLEAR USING TECHSTREAM

- (a) Connect the Techstream to the DLC3.
- (b) Turn the power switch on (IG).
- (c) Turn the Techstream on.
- (d) Enter the following menus: Body Electrical / Air Conditioner / Trouble Codes.
- (e) Clear the DTCs by pressing the YES button on the Techstream display.

# DATA LIST / ACTIVE TEST

## 1. DATA LIST

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

### NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

- (a) Connect the Techstream to the DLC3.
- (b) Turn the power switch on (IG).
- (c) Turn the Techstream on.
- (d) Enter the following menus: Body Electrical / Air Conditioner / Data List.
- (e) Check the value(s) by referring to the table below.

### *Air Conditioner*

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Room Temperature Sensor	Room temperature sensor / Min.: -6.5°C (20.3°F) Max.: 57.25°C (135.05°F)	Actual cabin temperature displayed	-
Ambient Temp Sensor	Ambient temperature sensor / Min.: -23.3°C (-9.94°F) Max.: 65.95°C (150.71°F)	Actual ambient temperature displayed	-
Adjusted Ambient Temp	Adjusted ambient temperature / Min.: -30.8°C (-23.44°F) Max.: 50.8°C (123.44°F)	-	-
Evaporator Fin Thermistor	Evaporator temperature sensor / Min.: -29.7°C (-21.46°F) Max.: 59.55°C (139.19°F)	Actual evaporator temperature displayed	-

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Evaporator Target Temp	Evaporator target temperature / Min.: -327.68°C (-557.82°F) Max.: 327.67°C (621.81°F)	Evaporator target temperature displayed	-
Solar Sensor (D side)	Solar sensor / Min.: 0 Max.: 255	Solar sensor value increases as brightness increases	-
Engine Coolant Temp	Engine coolant temperature sensor / Min.: 1.3°C (34.34°F) Max.: 90.55°C (194.99°F)	Actual engine coolant temperature displayed	-
Set Temperature (D side)	Set temperature / Min.: 65°F (18°C) Max.: 85°F (32°C)	Actual set temperature displayed	-
Blower Motor Speed Level	Blower motor speed level / Min.: 0 Max.: 31	Displayed speed level increases in range between 0 and 31 as blower motor speed increases	-
Regulator Pressure Sensor	Air conditioning pressure sensor / Min.: -0.45668 MPaG Max.: 3.29437 MPaG	Actual regulator pressure displayed	-
Air Mix Servo Targ Pulse (D)	Air mix servo motor target pulse / Min.: 0 Max.: 255	MAX. COLD: 6 (pulse) MAX. HOT: 93 (pulse)	-
Air Mix Servo Actual Pulse (D)	Air mix servo motor actual pulse / Min.: 0 Max.: 255	MAX. COLD: 6 (pulse) MAX. HOT: 93 (pulse)	-
Air Outlet Servo Pulse (D)	Air outlet servo motor target	FACE: 47 (pulse)	-

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
	pulse / Min.: 0 Max.: 255	B/L: 37 (pulse) FOOT: 17(pulse) FOOT/DEF: 9 (pulse) DEF: 5 (pulse)	
Air Outlet Servo Actu Pulse (D)	Air outlet servo motor actual pulse / Min.: 0 Max.: 255	FACE: 47 (pulse) B/L: 37 (pulse) FOOT: 17 (pulse) FOOT/DEF: 9 (pulse) DEF: 5 (pulse)	-
Air Inlet Damper Targ Pulse	Air inlet servo motor target pulse / Min.: 0 Max.: 255	RECIRCULATION: 19 (pulse) FRESH: 7 (pulse)	-
Air Inlet Damper Actual Pulse	Air inlet servo motor actual pulse / Min.: 0 Max.: 255	RECIRCULATION: 19 (pulse) FRESH: 7 (pulse)	-
Compressor Speed	Compressor speed / Min.: 0 rpm Max.: 65535 rpm	Displays actual rotation speed in the range between 0 rpm and 10000 rpm	-
Compressor Target Speed	Compressor target speed / Min.: 0 rpm Max.: 65535 rpm	Displays actual rotation speed in the range between 0 rpm and 10000 rpm	-
Electric Heater Active Level*1	Heater active level / Min.: 0 Max.: 3	Actual electric heater active level displayed	-
ECO Switch	ECO MODE switch / OFF or ON	OFF: ECO MODE switch off ON: ECO MODE switch on	-



Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Solar Ventilation Switch*2	Solar ventilation switch (Switch recognition value at A/C amplifier side) / OFF or ON	OFF: solar ventilation switch off ON: solar ventilation switch on	-
Number of Trouble Codes	Number of trouble codes / Min.: 0 Max.: 255	Number of DTCs displayed	-

- \*1: w/ PTC Heater Assembly
- \*2: w/ Solar Ventilation System

(f) Connect the Techstream to the DLC3.

(g) Turn the power switch on (IG).

(h) Turn the Techstream on.

(i) Enter the following menus: Body Electrical / Main Body / Data List.

(j) Check the value(s) by referring to the table below.

### **Main Body**

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Hood Courtesy SW*3	Engine hood courtesy signal / OFF or ON	ON: Engine hood open OFF: Engine hood closed	-

- \*3: w/ Remote Air Conditioning System

## 2. ACTIVE TEST

Using the Techstream to perform Active Tests allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Tests early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Tests.

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / Air Conditioner / Active Test.

(e) Check the operation by referring to the table below.

**Air Conditioner**

Tester Display	Test Part	Control Range	Diagnostic Note
Blower Motor	Blower motor	Min.: 0, Max.: 31	-
Compressor Target Speed	Compressor with motor assembly	Min.: 0, Max.: 10000	-
Water Pump	Water pump relay	OFF or ON	-
Electrical Fan	Electrical fan	OFF or ON	-
Heater Active Level*1	Heater active level	Min.: 0, Max.: 3	-
Defogger Relay (Rear)	Defogger relay (Rear)	OFF or ON	-
Mirror Heater Relay (Front)	Mirror heater relay (Front)	OFF or ON	-
Air Mix Servo Targ Pulse (D)	Air mix servo motor pulse	Min.: 0, Max.: 255	-
Air Outlet Servo Pulse (D)	Air outlet servo motor pulse	Min.: 0, Max.: 255	-
Air Inlet Damper Targ Pulse	Air inlet damper target pulse	Min.: 0, Max.: 255	-
Air Purifier Mode*2	Plasmacluster (ion generator)	Stop, Ion, Clean	-






- \*1: w/ PTC Heater Assembly
- \*2: w/ Plasmacluster (Ion Generator)








# DIAGNOSTIC TROUBLE CODE CHART






HINT:






When the air conditioning system functions properly, DTC 00 is output.

## Air Conditioning System


DTC Code	Detection Item	Trouble Area	Memory*4	See page
B1411/11*1	Room Temperature Sensor Circuit	<ol style="list-style-type: none"> <li>Room temperature sensor</li> <li>Harness or connector between room temperature sensor and A/C amplifier</li> <li>A/C amplifier</li> </ol>	Memorized  (4 sec. or more)	
B1412/12*2	Ambient Temperature Sensor Circuit	<ol style="list-style-type: none"> <li>Ambient temperature sensor</li> <li>Harness or connector between ambient temperature sensor and A/C amplifier</li> <li>A/C amplifier</li> </ol>	Memorized  (4 sec. or more)	
B1413/13	Evaporator Temperature Sensor Circuit	<ol style="list-style-type: none"> <li>Evaporator temperature sensor</li> <li>Air conditioning harness</li> <li>A/C amplifier</li> </ol>	Memorized  (4 sec. or more)	
B1423/23	Pressure Sensor Circuit	<ol style="list-style-type: none"> <li>A/C pressure sensor</li> <li>Harness or connector between A/C pressure sensor and A/C amplifier</li> <li>A/C amplifier</li> <li>Expansion valve (blocked, stuck)</li> <li>Condenser (blocked, deterioration of cooling capacity due to dirt)</li> <li>Cooler dryer (moisture in the refrigerant cycle cannot be absorbed)</li> <li>Cooling fan system (condenser cannot be cooled down)</li> <li>A/C system (leaks, blocked)</li> </ol>	-	
B1441/41	Air Mix Damper Control Servo Motor Circuit (Passenger Side)	<ol style="list-style-type: none"> <li>Air mix control servo motor</li> </ol>	Memorized  (30 sec. or	

DTC Code	Detection Item	Trouble Area	Memory*4	See page
		2. Air conditioning harness 3. A/C amplifier	more)	
B1442/42	Air Inlet Damper Control Servo Motor Circuit	1. Air inlet control servo motor 2. Air conditioning harness 3. A/C amplifier	Memorized (30 sec. or more)	
B1443/43	Air Outlet Damper Control Servo Motor Circuit	1. Air outlet control servo motor 2. Air conditioning harness 3. A/C amplifier	Memorized (30 sec. or more)	
B1471/71	A/C Inverter High Voltage Power Resource System Malfunction	1. Electric vehicle fuse 2. No. 2 engine wire (harness or connector between compressor with motor assembly and inverter with converter assembly) 3. Compressor with motor assembly 4. Hybrid control system 5. CAN communication system	Memorized	
B1472/72	A/C Inverter High Voltage Output System Malfunction	1. Compressor with motor assembly 2. CAN communication system	Memorized	
B1473/73	A/C Inverter Start-up Signal System Malfunction	1. Harness or connector between power management control ECU and compressor with motor assembly 2. Compressor with motor assembly 3. Power management control ECU 4. Hybrid control system 5. CAN communication system	-	
B1474/74	A/C Inverter Malfunction	1. Compressor with motor assembly 2. CAN communication system	Memorized	
B1475/75	A/C Inverter Cooling / Heating System Malfunction	1. Cooling fan system 2. Refrigerant volume	Memorized	

DTC Code	Detection Item	Trouble Area	Memory*4	See page
		3. Compressor with motor assembly 4. CAN communication system		
B1476/76	A/C Inverter Load System Malfunction	1. Refrigerant volume 2. Compressor with motor assembly 3. Cooling fan system 4. CAN communication system	Memorized	
B1477/77	A/C Inverter Low Voltage Power Resource System Malfunction	1. Compressor with motor assembly 2. CAN communication system	Memorized	
B1497/97	BUS IC Communication Malfunction	1. Air conditioning harness 2. A/C amplifier	Memorized (10 sec. or more)	
B1498/98	Communication Malfunction (A/C Inverter Local)	1. Harness or connector between power management control ECU, compressor with motor assembly and body ground 2. Power management control ECU 3. Compressor with motor assembly 4. No. 2 engine wire (harness or connector between compressor with motor assembly and inverter with converter assembly) 5. Electric vehicle fuse 6. CAN communication system 7. Hybrid control system	Memorized	
B14A1*3	Air Purifier Open Circuit	1. Plasmacluster (ion generator) 2. Harness or connector between plasmacluster (ion generator) and A/C amplifier 3. Harness or connector between plasmacluster (ion generator) and battery 4. Harness or connector between plasmacluster (ion generator) and body ground	Memorized (4 sec. or more)	

DTC Code	Detection Item	Trouble Area	Memory*4	See page
		5. A/C amplifier		
B14A2	Driver Side Solar Sensor Short Circuit	1. Solar sensor (automatic light control sensor) 2. Harness or connector between solar sensor (automatic light control sensor) and A/C amplifier 3. Harness or connector between solar sensor (automatic light control sensor) and main body ECU 4. Main body ECU 5. A/C amplifier	Memorized  (4 sec. or more)	
U0100	Lost Communication with ECM	1. CAN communication system 2. ECM	-	
U0101	Lost Communication with TCM	1. CAN communication system 2. TCM	-	
U0131	Lost Communication with Electric Power Steering ECU	1. CAN communication system 2. Electric power steering ECU	-	
U0142	Lost Communication with Main Body ECU	1. CAN communication system 2. Main body ECU	-	
U0155	Lost Communication with Combination Meter	1. CAN communication system 2. Combination meter	-	
U0293	Lost Communication with HV ECU	1. CAN communication system 2. Power management control ECU	-	

### Hybrid Control System

DTC Code	Detection Item	Trouble Area	Memory	See page
P0AA6-611	Hybrid Battery Voltage System Isolation Fault	1. Compressor oil 2. Refrigerant pipe line 3. Compressor with motor assembly 4. CAN communication system	-	

- \*1: If the cabin temperature is approximately  $-18.6^{\circ}\text{C}$  ( $-1.48^{\circ}\text{F}$ ) or lower, DTC B1411/11 may be output even though the system is normal.
- \*2: If the ambient temperature is approximately  $-52.9^{\circ}\text{C}$  ( $-63.22^{\circ}\text{F}$ ) or lower, DTC B1412/12 may be output even though the system is normal.
- \*3: w/ Plasmacluster (Ion Generator)
- \*4: The A/C amplifier stores the DTC of the respective malfunction if it has occurred for the period of time indicated in the brackets.