

DTC	P1121	Coolant Flow Control Valve Position Sensor Circuit Stuck
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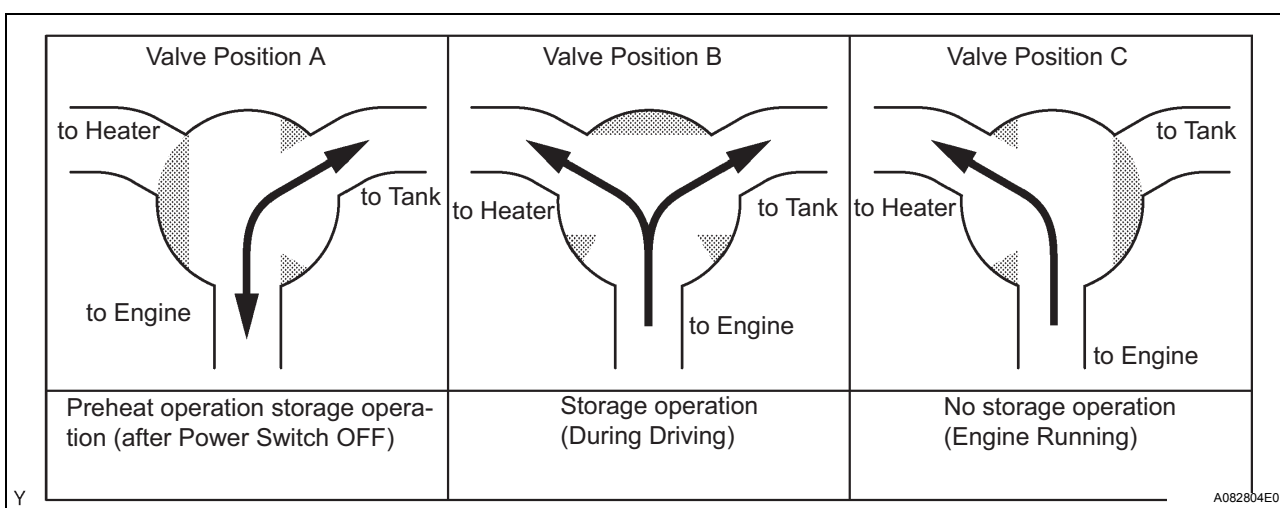
DESCRIPTION

Refer to DTC P1120 (see page [ES-298](#)).

DTC No.	DTC Detection Condition	Trouble Area
P1121	<ul style="list-style-type: none"> Water valve position sensor output voltage: No change despite the ECM sending a valve control signal or slow response CHS tank outlet temperature sensor output: 60°C (140°F) or more (when hot coolant recovering starts) CHS tank outlet temperature sensor output: No change despite the hot coolant is recovered 	<ul style="list-style-type: none"> Water valve Cooling system (clogging) ECM

ES

MONITOR DESCRIPTION



The ECM monitors the position of the water valve based on the valve position signal that is output by the water valve position sensor (potentiometer), which is coupled coaxially to the valve. The water valve effects control in three steps as indicated above, and the ECM determines the position of the valve according to the voltage of the respective step.

In order to ensure the proper monitoring of the water valve, the ECM checks for malfunctions with the combination of the output of the potentiometer and CHS tank outlet temperature sensor.

If no changes occur in the valve position signal that is being input into the ECM or if the response signal from the water valve is very slow, despite of the ECM commanding the water valve motor to operate the ECM determines that malfunction has occurred in the water valve position sensor circuit, and sets a DTC.

MONITOR STRATEGY

Potentiometer detection

Related DTCs	P1121: Coolant flow control valve position sensor circuit stuck
Required sensors/components	Main: Water valve Related: CHS tank outlet temperature sensor
Frequency of operation	Once per driving cycle

Duration	20 seconds
MIL operation	2 driving cycle
Sequence of operation	None

Tank outlet coolant temperature detection

Related DTCs	P1121: Coolant flow control valve position sensor circuit stuck
Required sensors/components	Main: Water valve Related: CHS tank outlet temperature sensor
Frequency of operation	Once per driving cycle
Duration	10 seconds
MIL operation	2 driving cycle
Sequence of operation	None

ES

TYPICAL ENABLING CONDITIONS

Potentiometer detection

The monitor will run whenever the following DTCs are not present	None
Coolant heat storage system malfunction	Not detected
Battery voltage	10 V or more
Engine coolant temperature	0°C (32°F) or more
Water valve operation	Commanded
Response time of valve movement	Time under calculation with valve position

Tank outlet coolant temperature detection

The monitor will run whenever the following DTCs are not present	None
Coolant heat storage system malfunction	Not detected
Battery voltage	10 V or more
System status	During recovering
CHS tank outlet temperature difference between preheating start and engine start	20°C (36°F) or more
Difference between engine coolant temperature and CHS tank outlet temperature	More than 30°C (54°F)

TYPICAL MALFUNCTION THRESHOLDS

Potentiometer detection

Either of the following conditions is met:	(a) or (b)
(a) Potentiometer output difference [D divided C] C: Difference between previous and current target D: Difference between potentiometer output and previous target	10% or more
(b) Potentiometer output deviation from target	0.1 V or more

Tank outlet coolant temperature detection

Either of the following conditions is met:	(a) or (b)
(a) Heat storage tank outlet coolant temperature when recover starts	60°C (108°F) or more
(b) Heat storage tank outlet coolant temperature difference during water valve check	Less than 3°C (5.4°F)

WIRING DIAGRAM

Refer to DTC P1120 (see page [ES-301](#)).

INSPECTION PROCEDURE**HINT:**

- Although each DTC title says "Coolant Flow Control Valve", these DTCs are related to the water valve.
- CHS stands for Coolant Heat Storage.

CAUTION:

Be careful when replacing any part in the system or changing the coolant because the coolant in the heat storage tank is hot even if the engine is cold.

HINT:

- If DTCs P1121 and P1150 are detected simultaneously, there may be malfunction in the water valve system.
- If DTC P1121 is detected, coolant passages may be clogged.
- To check the coolant heat storage (CHS) system, the ECM may cause the water pump of the CHS system to operate 5 hours after the power switch has been turned OFF.
- Read freeze frame data using the intelligent tester. Freeze frame data records the engine condition when malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air-fuel ratio was lean or rich, and other data from the time the malfunction occurred.

ES**1 CHECK OTHER DTC OUTPUT (IN ADDITION TO DTC P1121)**

- Connect the intelligent tester to the DLC3.
- Turn the power switch ON (IG).
- Turn the tester ON.
- Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
- Read DTCs.

Result

Display (DTC Output)	Proceed to
P1121	A
P1121 and other DTCs	B

HINT:

If any other codes besides P1121 are output, perform troubleshooting for those DTCs first.

B**GO TO RELEVANT DTC CHART****A****2 PERFORM ACTIVE TEST BY INTELLIGENT TESTER**

- Connect the intelligent tester to the DLC3.
- Turn the power switch ON (IG).
- Turn the tester ON.
- Put the engine in inspection mode (see page [ES-1](#)).
- Start the engine and warm it up.
- Enter the following menus: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / WATER FLW VLV3, WATER FLW VLV4 or WATER FLW VLV5.
- Measure the voltage between terminals WBAD and E2 of the ECM connector.

Standard voltage

Tester Operation	Specified Condition
"WATER FLW VLV 3" ON	Approximately 2.5 V
"WATER FLW VLV 4" ON	Approximately 3.5 V
"WATER FLW VLV 5" ON	Approximately 4.5 V

NG → **REPLACE WATER W/BRACKET VALVE ASSEMBLY**

OK

ES **3** **CHECK COOLING SYSTEM (CHECK FOR CLOGGING IN THE COOLANT SYSTEM)**

OK:
Coolant passages are not clogged.

NG → **REPAIR OR REPLACE COOLING SYSTEM**

OK

REPLACE ECM