P1589：Analysis of Acceleration Sensor Learning Value

DTC Explanation:

DTC	Explanation
P1589	Acceleration sensor learning value

NOTE: After replacement of automatic driving axle assembly and valve body assembly, engine control module, fuel pressure sensor and airbag sensor assembly (yaw rate and acceleration sensor), make sure to perform Reset Memory, Deceleration Sensor Zero Point Calibration and CVT Fuel Pressure Calibration.

Analysis:

Test Condition:

- When replacing engine control module, etc., if "Deceleration Sensor Zero Point Calibration" not performed, or calibration failed, engine control module will store DTC P1589: Acceleration Sensor Learning Value.
- When vehicle speed is 2km/h(1.2mph) or higher, deceleration sensor zero point calibration not completed.
- Perform deceleration sensor zero point calibration and it is abnormal.

Possible Reasons:

- When performing deceleration sensor zero point calibration, car is not on horizontal surface or not stable.
- Airbag Sensor Assembly (Yaw rate and acceleration sensor) is faulty.
- Engine control module is faulty.

Diagnostic Procedure:

1).Deceleration Sensor Zero Point Calibration

NOTE:

- If CVT fuel pressure is calibrated before performing deceleration sensor zero point calibration and DTC P1589 exists, carry out following 5 steps.
- During calibration, car is on horizontal.
- During calibration, do not vibrate the car.

A).Turn ignition switch to OFF

B).Gear at position P and is parked.

C).Connect diagnostic tool to diagnostic socket, turn ignition switch to ON.
Note: Do not start engine.
D).Perform "Reset Memory" of Engine and ECT System.
E).Perform "Deceleration Sensor Zero Point Calibration" of Engine and ECT System.
Reminder:
- If calibration failed, deceleration sensor circuit may have error.
- If car vibrated during calibration, perform Step (E) again.

F).If calibration finished abnormally, please read DTC with diagnostic tool.
- Calibration completed correctly: Go to Step 2.
- Detected DTC P1589: Go to Step 3.

2).Perform CVT Fuel Pressure Calibration
NOTE: Do not perform Reset Memory to clear learning value.
A).Turn ignition switch to OFF. Wait for at least 30s.
B).Connect diagnostic tool.
C).Turn ignition switch to ON. Wait for at least 2s.
NOTE: Do not start engine.
Reminder: Perform CVT fuel pressure calibration when ignition switched OFF (engine stop). But calibration cannot be performed in following conditions:
- Fuel pressure sensor value is above or equal to 0.065Mpa (0.663kgf/c ㎡, 9.43psi).
- Fuel pressure temperature is under or equal to 0℃（32℉）, or above or equal to 120℃（248℉）.

D).Access Engine and ECT System function menu, start engine and wait for at least 5s.
NOTE:
- Start engine at position P.
- After engine startup, do not operate acceleration pedal.

E).Perform "CVT Fuel Pressure Calibration" of Engine and ECT System.
Reminder:
- During CVT fuel pressure calibration, engine idle will increase.
- Disconnect and re-connect battery negative (-) cannot clear learning value.

F).Read out DTC via diagnostic tool once again.
- Diagnostic finished.

3).Check Airbag Sensor Assembly
A).Check whether Airbag Sensor Assembly (yaw rate and acceleration sensor) is: Tilt, distorted, not installed?
- YES: Calibrate. Go to Step 4.
- NO: Go to Step 4.

4).Read out acceleration sensor (G Sensor) data stream value with diagnostic tool.

A).Connect diagnostic tool to diagnostic socket.

B).Turn ignition switch to ON.

C).Read out Engine and ECT System's acceleration sensor data stream value.

D).Acceleration sensor data stream is voltage signal, minimum 0V and maximum 7.9998V.

Value Check List:

Value range when car on horizontal	2.31V-2.69V
Value range during deceleration	1.88V-2.5V
Value range during acceleration	2.5V-3.11V
Acceleration sensor error	1.87V
Communication error	1.87V

- When acceleration sensor value is within the normal range: Go to Step 5.
- When acceleration sensor value is out of range: Go to Step 7.

5).Replace engine control module, then go to Step 6.

6).Perform initialization.

NOTE:

- Performing "Reset Memory" will clear learning values of yaw rate, acceleration sensor and CVT fuel pressure. Therefore, after replacement of automatic driving axle assembly and valve body assembly, engine control module, fuel pressure sensor and airbag sensor assembly (yaw rate and acceleration sensor), make sure to perform memory reset, yaw rate and acceleration sensor zero point calibration and CVT fuel pressure calibration.
- After performing "Reset Memory", yaw rate and acceleration sensor (deceleration sensor zero point) calibration must be firstly performed and then perform CVT fuel pressure learning.
- Always keep car on horizontal during calibration.
- During calibration, do not vibrate the car.

A).Perform Reset Memory, Deceleration Sensor Zero Point Calibration and CVT Fuel Pressure Calibration with diagnostic tool.

B).Check DTC again.

- Diagnostic finished.

7).Replace Airbag Sensor Assembly (yaw rate and acceleration sensor), then go to Step 8.

8).Perform initialization.

NOTE:

- Performing "Reset Memory" will clear learning values of yaw rate, acceleration sensor and CVT fuel pressure. Therefore, after replacement of automatic driving axle assembly and valve body assembly, engine control module, fuel pressure sensor and airbag sensor assembly (yaw rate and acceleration sensor), make sure to perform memory reset, yaw rate and acceleration sensor zero point calibration and CVT fuel pressure calibration.
- After performing "Reset Memory", yaw rate and acceleration sensor (deceleration sensor zero point) calibration must be firstly performed and then perform CVT fuel pressure learning.
- Always keep car on horizontal during calibration.
- During calibration, do not vibrate the car.

A).Perform Reset Memory, Deceleration Sensor Zero Point Calibration and CVT Fuel Pressure Calibration with diagnostic tool.

B).Check DTC again.

- Diagnostic finished.