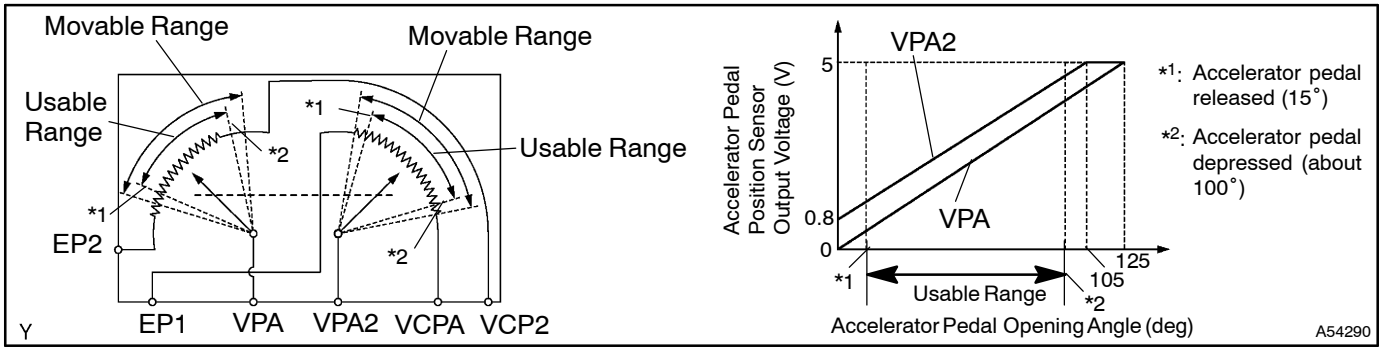
| DTC | P1120/19 | ACCELERATOR PEDAL POSITION SENSOR CIRCUIT MALFUNCTION |
|---|---|---|

HINT:
Specification for the Australian vehicles are ”Accelerator Position Sensor Circuit Malfunction”.

## CIRCUIT DESCRIPTION

Accelerator pedal position sensor is mounted on the accelerator pedal bracket and it has 2 sensors to detects the accelerator position and a malfunction of the accelerator position’s own. In the accelerator pedal position sensor, the voltage applied to the terminals VPA and VPA2 of the ECM changes between 0 V and 5 V in proportion to the opening angle of the accelerator pedal. The ECM judges the current opening angle of the accelerator pedal from these signals input from terminals VPA and VPA2 and the ECM controls the throttle motor based on these signals. If this DTC is stored, the ECM shuts down the power for the throttle motor, and the throttle valve is fully closed by the return spring.

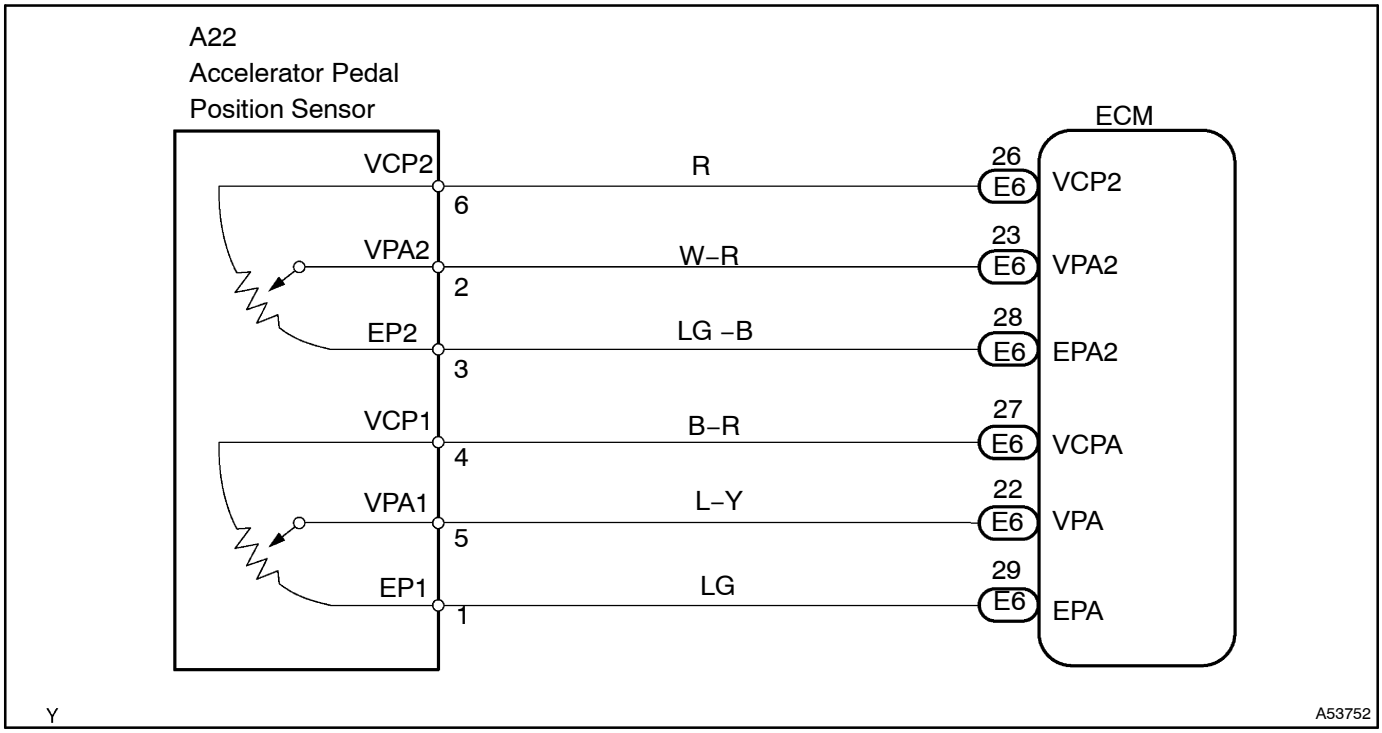



| DTC No. | DTC Detecting Condition | Trouble Area |
|---|---|---|
| P1120/19 | Condition (a), (b), (c), (d) or (e) continues for 0.5 seconds:<br>(Idle is ON: 10 seconds)<br>(a) VPA ≦ 0.2 V<br>(b) VPA2 ≦ 0.5 V<br>(c) VPA ≧ 4.8 V<br>(d) When VPA ≧ 0.2 V and ≦ 3.45 V, and VPA2 ≧ 4.8 V<br>(e) VPA–VPA2 ≦ 0.02 V<br>(f) Idle is OFF | • Open or short in accelerator pedal position sensor circuit<br>• Accelerator pedal position sensor<br>• ECM |
| | Condition (a) or (b) continues for 2.0 seconds:<br>(a) VPA ≦ 0.2 V and VPA2 ≦ 0.5 V | |

HINT:
After confirming DTC P1120/19, use the hand–held tester to confirm the throttle valve opening percentage.

| Accelerator pedal position expressed as voltage | | | | Trouble area |
|---|---|---|---|---|
| Accelerator pedal released | | Accelerator pedal depressed | | |
| ACCEL POS #1 | ACCEL POS #2 | ACCEL POS #1 | ACCEL POS #2 | |
| 0 V | 0 V | 0 V | 0 V | VCPA,VCP2 circuit open |
| 0 V | 0.9 – 2.3 V | 0 V | 3.4 – 5.0 V | VPA circuit open or ground short |
| 0.5 – 1.1 V | 0 V | 3.0 – 4.6 V | 0 V | VPA2 circuit open or ground short |
| 5 V | 5 V | 5 V | 5 V | EP1,EP2 circuit open |

## WIRING DIAGRAM

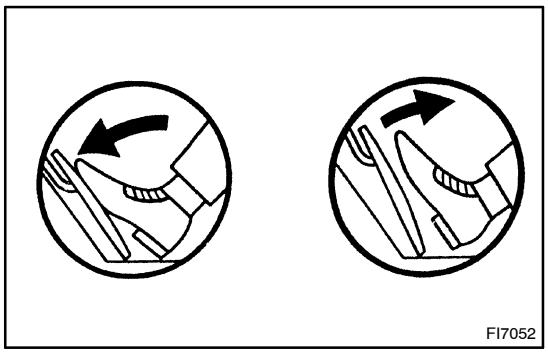



## INSPECTION PROCEDURE

HINT:
Read freeze frame data using hand–held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

### When using Hand–held Tester:

| 1 | READ VALUE OF HAND–HELD TESTER |
|---|---|




(a) Connect the hand–held tester.
(b) Turn the ignition switch ON.
(c) Read the voltage for the accelerator pedal position sensor data.

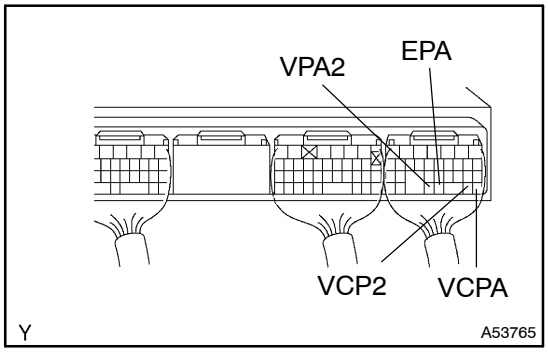
**Standard voltage:**

| Accelerator pedal | VPA | VPA2 |
|---|---|---|
| Released | 0.5 – 1.1 V | 0.9 – 2.3 V |
| Depressed | 3.0 – 4.6 V | 3.4 – 5.0 V |

**OK** → **CHECK AND REPLACE ECM**

**NG**

## 2 CHECK ECM(VCPA–EPA,VCP2–EPA2)



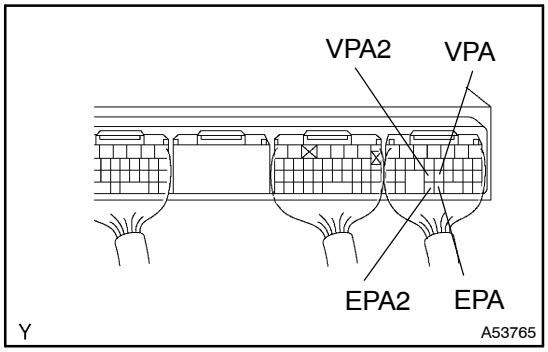

(a) Turn the ignition switch ON.
(b) Measure the voltage between E6 ECM terminals.
**Standard voltage:**

| Tester (+) | Tester (–) | Voltage |
|---|---|---|
| VCPA | EPA | 4.5 – 5.5 V |
| VCP2 | EPA2 | |

**NG** → **CHECK AND REPLACE ECM**

**OK**

## 3 CHECK ECM(VPA–EPA,VPA2–EPA2)



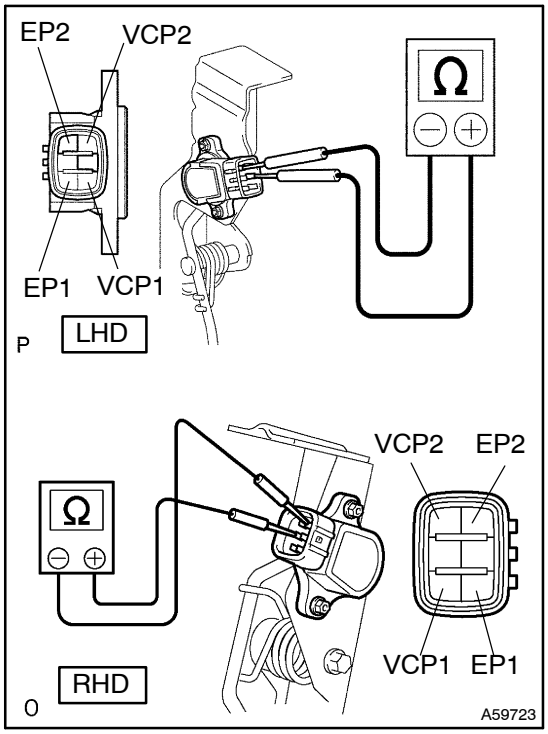

(a) Turn the IG switch ON.
(b) Measure the voltage between E6 ECM terminals.
**Standard voltage:**

| Accelerator pedal | Voltage | |
|---|---|---|
| | VPA – EPA | VPA2 – EPA2 |
| Released | 0.5 – 1.1 V | 0.9 – 2.3 V |
| Depressed | 3.0 – 4.6 V | 3.4 – 5.0 V |

**OK** → **CHECK AND REPLACE ECM**

**NG**

## 4 INSPECT ACCELERATOR PEDAL ASSY(POSITION SENSOR)



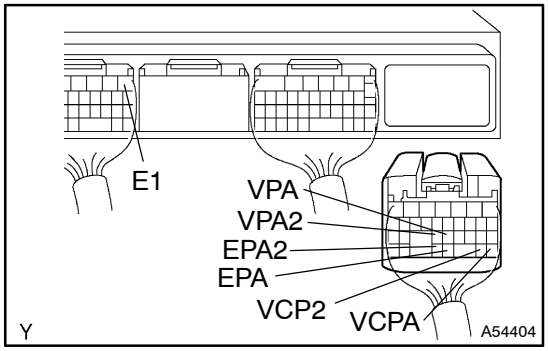

(a) Disconnect the accelerator pedal position sensor connector.
(b) Measure the resistance between each terminal.
**Standard resistance at 20°C (68°F):**

| Terminals | Resistance |
|---|---|
| VCP1 – EP1 | 1.5 – 6.0 kΩ |
| VCP2 – EP2 | |

NG → REPLACE ACCELERATOR PEDAL ASSY

OK

## 5 CHECK WIRE HARNESS(ECM–ACCELERATOR POSITION SENSOR)

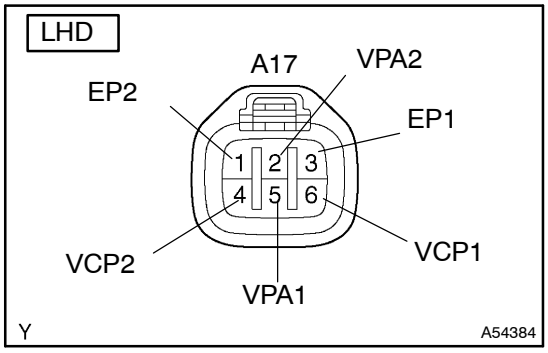



(a) Disconnect the E6 ECM connector.
(b) Disconnect the accelerator position sensor connector.
(c) Check the continuity between the terminal E6 ECM connector and A17 accelerator position sensor connector .

**Standard (LHD):**

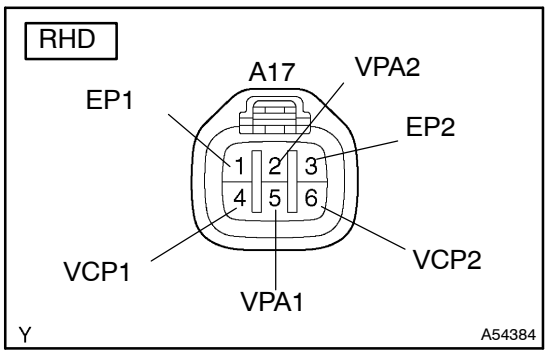
**(Check for open)**

| E6 ECM connector terminal | A17 Accelerator position sensor connector | Continuity |
|---|---|---|
| VCP2 (27) | VCP2 (4) | Continuity |
| VPA2 (23) | VPA2 (2) | Continuity |
| EPA2 (29) | EP2 (1) | Continuity |
| VCPA (26) | VCP1 (6) | Continuity |
| VPA (22) | VPA (5) | Continuity |
| EPA (28) | EP1 (3) | Continuity |




**(Check for short)**

| A17 Accelerator position sensor connector | E8 ECM connector | Continuity |
|---|---|---|
| VCP2 (4) | E1 (1) | No continuity |
| VPA2 (2) | | No continuity |
| EP2 (1) | | No continuity |
| VCP1 (6) | | No continuity |
| VPA (5) | | No continuity |
| EP1 (3) | | No continuity |




**Standard (RHD):**

**(Check for open)**

| E6 ECM connector terminal | A17 Accelerator position sensor connector | Continuity |
|---|---|---|
| VCP2 (27) | VCP2 (6) | Continuity |
| VPA2 (23) | VPA2 (2) | Continuity |
| EPA2 (29) | EP2 (3) | Continuity |
| VCPA (26) | VCP1 (4) | Continuity |
| VPA (22) | VPA (5) | Continuity |
| EPA (28) | EP1 (1) | Continuity |

**(Check for short)**

| A17 Accelerator position sensor connector | E8 ECM connector | Continuity |
|---|---|---|
| VCP2 (6) | E1 (1) | No continuity |
| VPA2 (2) | | No continuity |
| EP2 (3) | | No continuity |
| VCP1 (4) | | No continuity |
| VPA (5) | | No continuity |
| EP1 (1) | | No continuity |

NG → REPAIR OR REPLACE WIRE HARNESS

OK

CHECK AND REPLACE ECM

## When not using Hand–held Tester:

Perform the step 2 to 5.