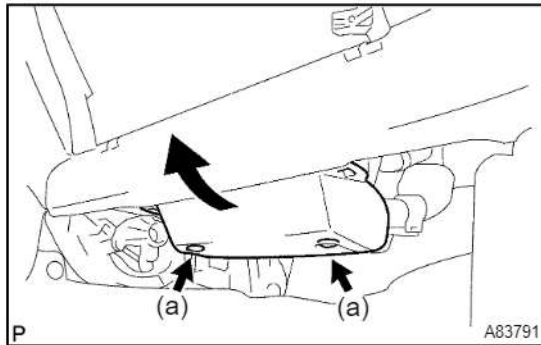


ECM (1ZZ-FE) (April, 2003)

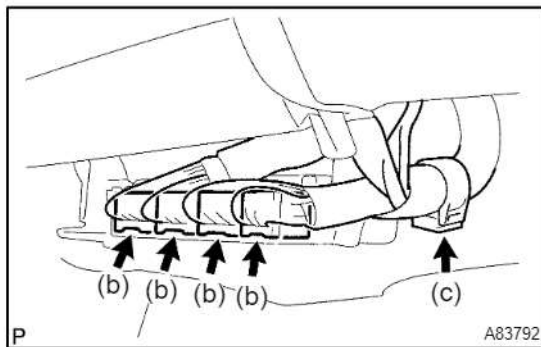
REPLACEMENT

1. DISCONNECT BATTERY NEGATIVE TERMINAL
2. REMOVE GLOVE COMPARTMENT DOOR ASSY (See Page 71-10)

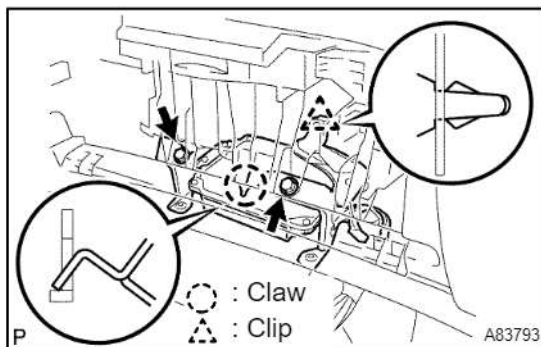


3. REMOVE ECM

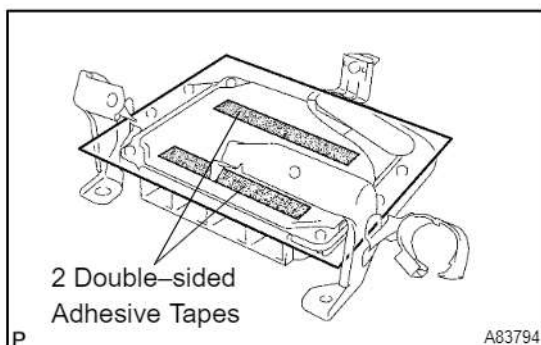
- (a) Remove the 2 clips using a clip remover. Then, open the cover.



- (b) Disconnect the 4 ECM connectors.
- (c) Remove the wire harness from the wire harness clamp.

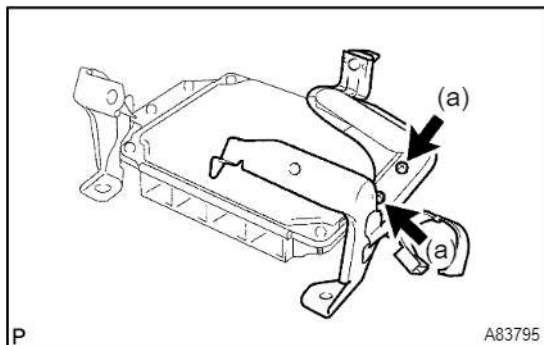


- (d) Remove the 2 bolts.
- (e) Unfasten the claw and clip, then remove the ECM.



4. REMOVE ECM COVER

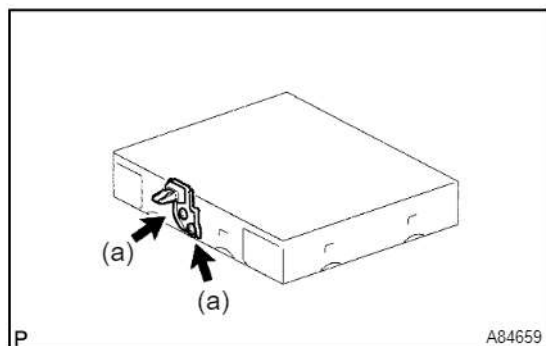
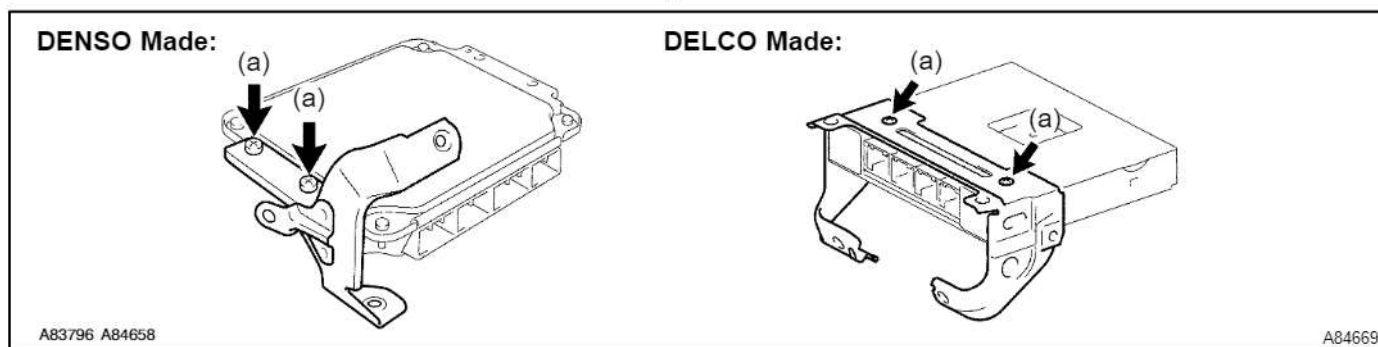
- (a) Take the 2 double-sided adhesive tapes off the ECM, then remove the ECM cover.

**5. REMOVE ECM BRACKET NO.2 (DENSO MADE)**

- (a) Remove the 2 screws, then remove the ECM bracket No. 2.

6. REMOVE ECM BRACKET NO.1

- (a) Remove the 2 screws, then remove the ECM bracket No. 1.

**7. REMOVE ECM BRACKET NO.3 (DELCO MADE)**

- (a) Remove the 2 screws, then remove the ECM bracket No. 3.

8. INSTALL ECM BRACKET NO.3 (DELCO MADE)

Torque: 3.2 N·m (33 kgf·cm, 28 in.·lbf)

9. INSTALL ECM BRACKET NO.1

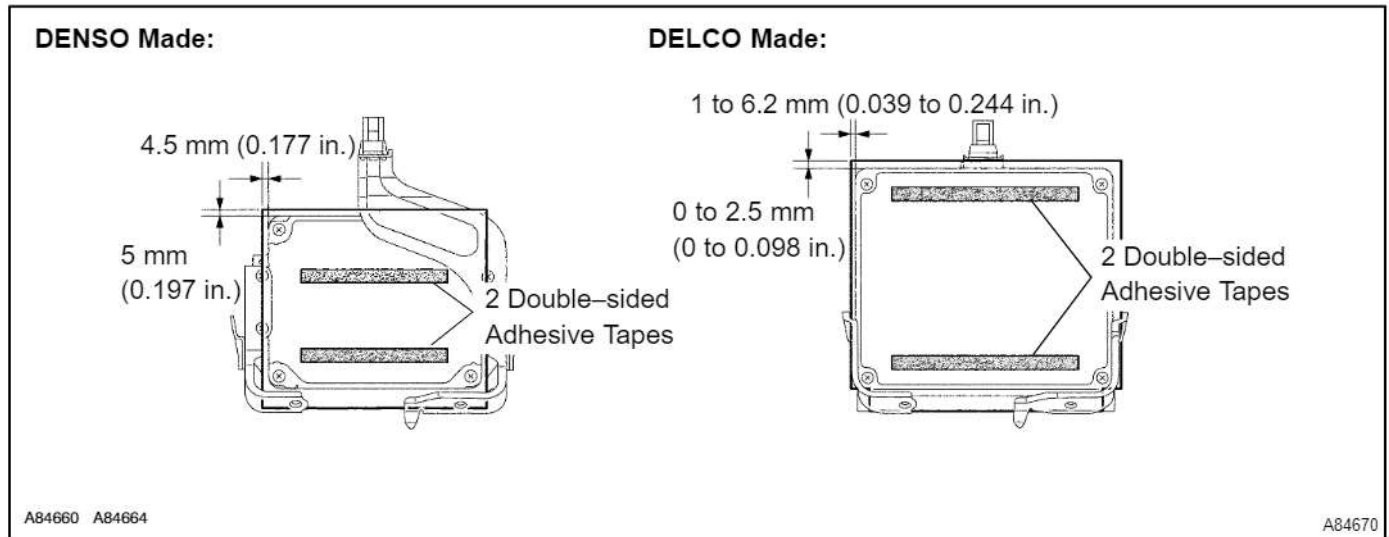
Torque: 3.2 N·m (33 kgf·cm, 28 in.·lbf)

10. INSTALL ECM BRACKET NO.2 (DENSO MADE)

Torque: 3.2 N·m (33 kgf·cm, 28 in.·lbf)

11. INSTALL ECM COVER

- (a) Install a new ECM cover to the ECM as shown in the illustration.

**12. INSTALL ECM**

Torque: 3.0 N·m (31 kgf·cm, 27 in·lbf)

13. INSTALL GLOVE COMPARTMENT DOOR ASSY**14. CONNECT BATTERY NEGATIVE TERMINAL**

Torque: 5.4 N·m (55 kgf·cm, 48 in·lbf)

15. RESET MEMORY (A/T TRANSAXLE)**CAUTION:**

Perform the **RESET MEMORY (AT initialization)** when replacing the **ECM**, engine assembly or automatic transaxle assembly.

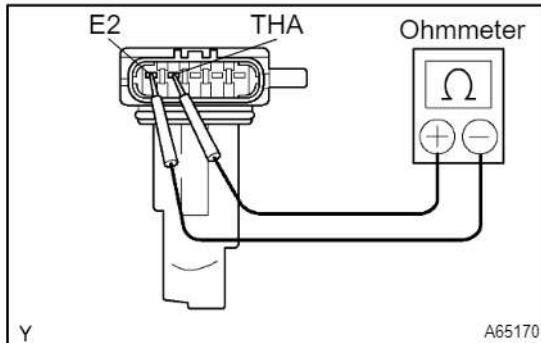
- (a) The hand-held tester only.

- (1) Connect the hand-held tester to the DLC3.
- (2) Turn the ignition switch ON.
- (3) Perform the RESET MEMORY procedure from the ENGINE menu.

CAUTION:

After performing the **RESET MEMORY**, be sure to perform the **ROAD TEST** as described earlier.

INSPECTION



1. INTAKE AIR FLOW METER SUB-ASSY

(a) Inspect the intake air flow meter resistance.

- (1) Using an ohmmeter, measure the resistance between terminals THA and E2.

Resistance:

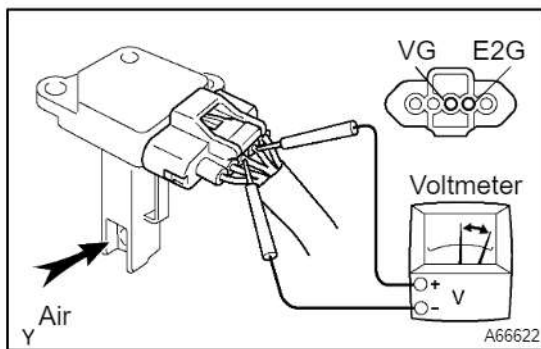
At -20°C (-4°F) 13.6 to 18.4 k Ω

At 20°C (68°F) 2.21 to 2.69 k Ω

At 60°C (140°F) 0.49 to 0.67 k Ω

HINT:

If the resistance is not as specified, replace the intake air flow meter.



(b) Inspect the intake air flow meter operation.

- (1) Connect the intake air flow meter connector.
 (2) Turn the ignition switch to ON.
 (3) Using a voltmeter, connect the positive (+) tester probe to terminal VG, and negative (-) tester probe to terminal E2G.
 (4) Blow air into the intake air flow meter, and check that the voltage fluctuates.

HINT:

If operation is not as specified, replace the intake air flow meter.

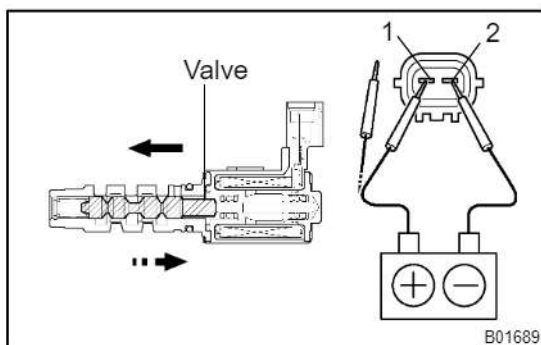
- (5) Turn the ignition switch to LOCK.
 (6) Disconnect the intake air flow meter connector.

2. CAMSHAFT TIMING OIL CONTROL VALVE ASSY

(a) Resistance inspection.

- (1) Using an ohmmeter, measure the resistance between the terminals.

Resistance: 6.9 to 7.9 Ω at 20°C (68°F)



(b) Movement inspection.

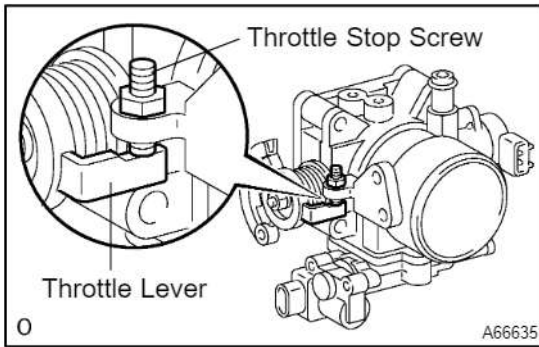
- (1) Connect the positive (+) lead from the battery to terminal 1 and negative (-) lead to terminal 2, and check the movement of the valve.

NOTICE:

Confirm the valve does not adhere.

HINT:

Bad returning of the valve by entrance of foreign objects causes subtle pressure leak to the advanced direction. Then, DTC can be detected.

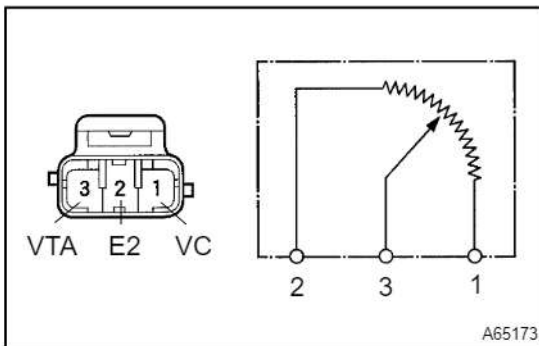


3. THROTTLE BODY ASSY

- (a) Check throttle body.
- (1) Check that throttle valve shaft is not rickety.
 - (2) Check that each port is not stopped up.
 - (3) Check that throttle valve opens and closes smoothly.
 - (4) Check that there is no clearance between the throttle stop screw and throttle lever at the throttle closed position.

NOTICE:

Do not adjust the throttle stop screw.



4. E.F.I. THROTTLE POSITION SENSOR

- (a) Resistance inspection.
- (1) Disconnect the throttle position sensor connector.
 - (2) Using an ohmmeter, measure the resistance between terminals VC and E2.

Resistance: 2.5 to 6.0 kΩ

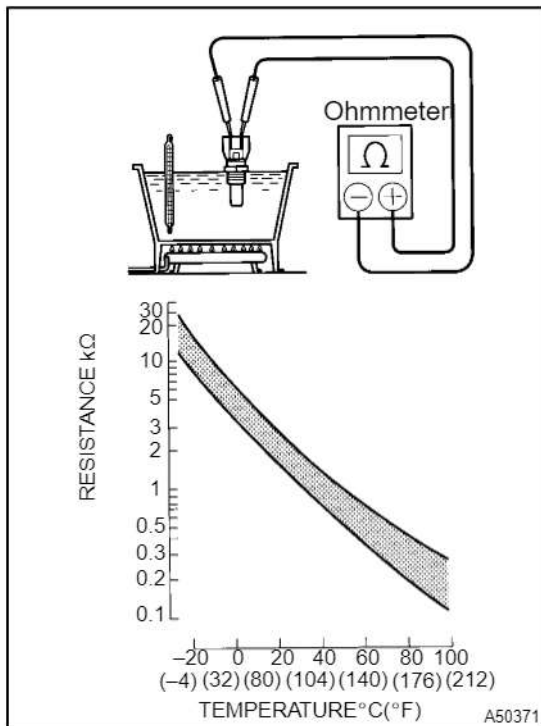
- (3) Check the change of resistance between terminals VTA and E2.

Change of resistance:

The resistance value increases in proportion to the throttle lever opening value.

HINT:

Throttle valve	Resistance
Fully close	0.2 to 5.7 kΩ
Fully open	2.0 to 10.2 kΩ



5. E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

(a) Resistance inspection.

- (1) Using an ohmmeter, measure the resistance between each terminal.

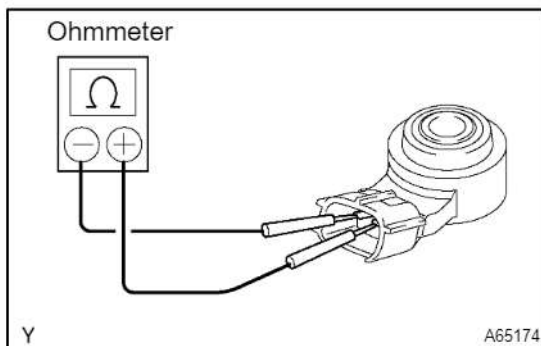
Resistance:

At 20°C (68°F) 2.32 – 2.59 kΩ

At 80°C (176°F) 0.310 – 0.326 kΩ

NOTICE:

In case of checking the water temperature sensor in the water, be careful not to allow water to go into the terminals, and after checking, wipe out the sensor.



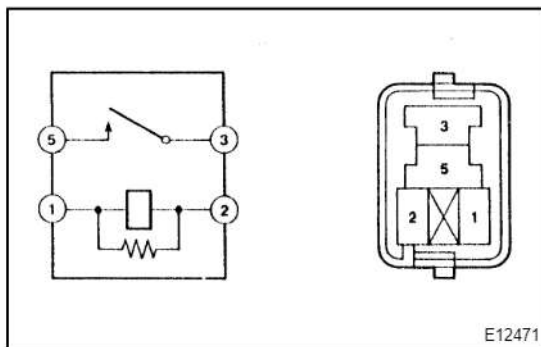
6. KNOCK CONTROL SENSOR

- (a) Using an ohmmeter, measure the resistance between terminals.

Resistance: 120 – 280 kΩ at 20°C (68°F)

HINT:

If the resistance is not specified, replace the sensor.



7. E.F.I. CIRCUIT OPENING RELAY ASSY

- (a) Continuity inspection.

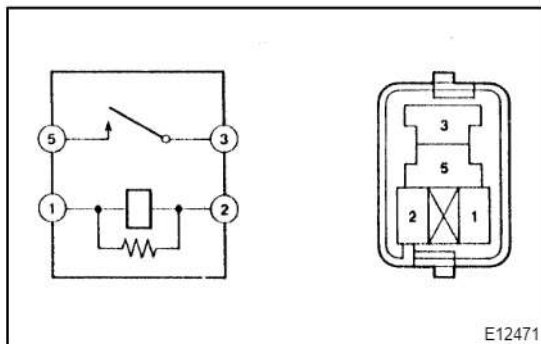
- (1) Using an ohmmeter, check that continuity exists between each terminal.

Specified condition:

Between terminals 1 and 2 Continuity

Between terminals 3 and 5 No continuity

- (2) Using an ohmmeter, check that continuity exists between terminals 3 and 5 when the battery voltage is applied across terminals 1 and 2.



8. E.F.I. ECU RELAY

- (a) Continuity inspection.

- (1) Using an ohmmeter, check that continuity exists between each terminal.

Specified condition:

Between terminals 1 and 2 Continuity

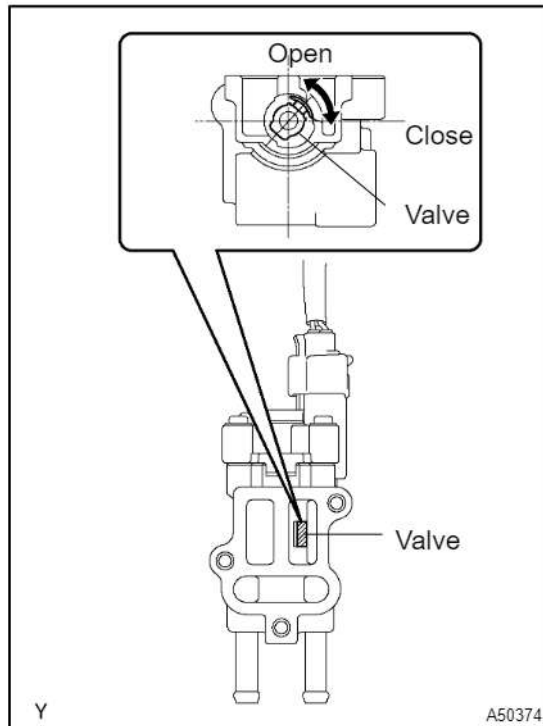
Between terminals 3 and 5 No continuity

- (2) Using an ohmmeter, check that continuity exists between terminals 3 and 5 when the battery voltage is applied across terminals 1 and 2.

SFI SYSTEM

ON-VEHICLE INSPECTION

1008D-01



1. INSPECTION THROTTLE BODY IDLE SPEED CONTROL VALVE ASSY

NOTICE:

- It is impossible to check the resistor value and the operation of ISC valve by itself, because the ISC valve has an IC circuit inside it, which transforms the duty signal from the ECM to the derive signal.
- After checking, erase the DTC.
- Clear the DTC after inspection.

HINT:

When the ISC valve system has malfunctions except for its adherence, DTC P0505 is detected.

(a) Operation inspection.

- (1) Connect the ISC connector to the ISC valve.
- (2) Check the ISC valve movement when the ignition switch is turned ON.

Movement:

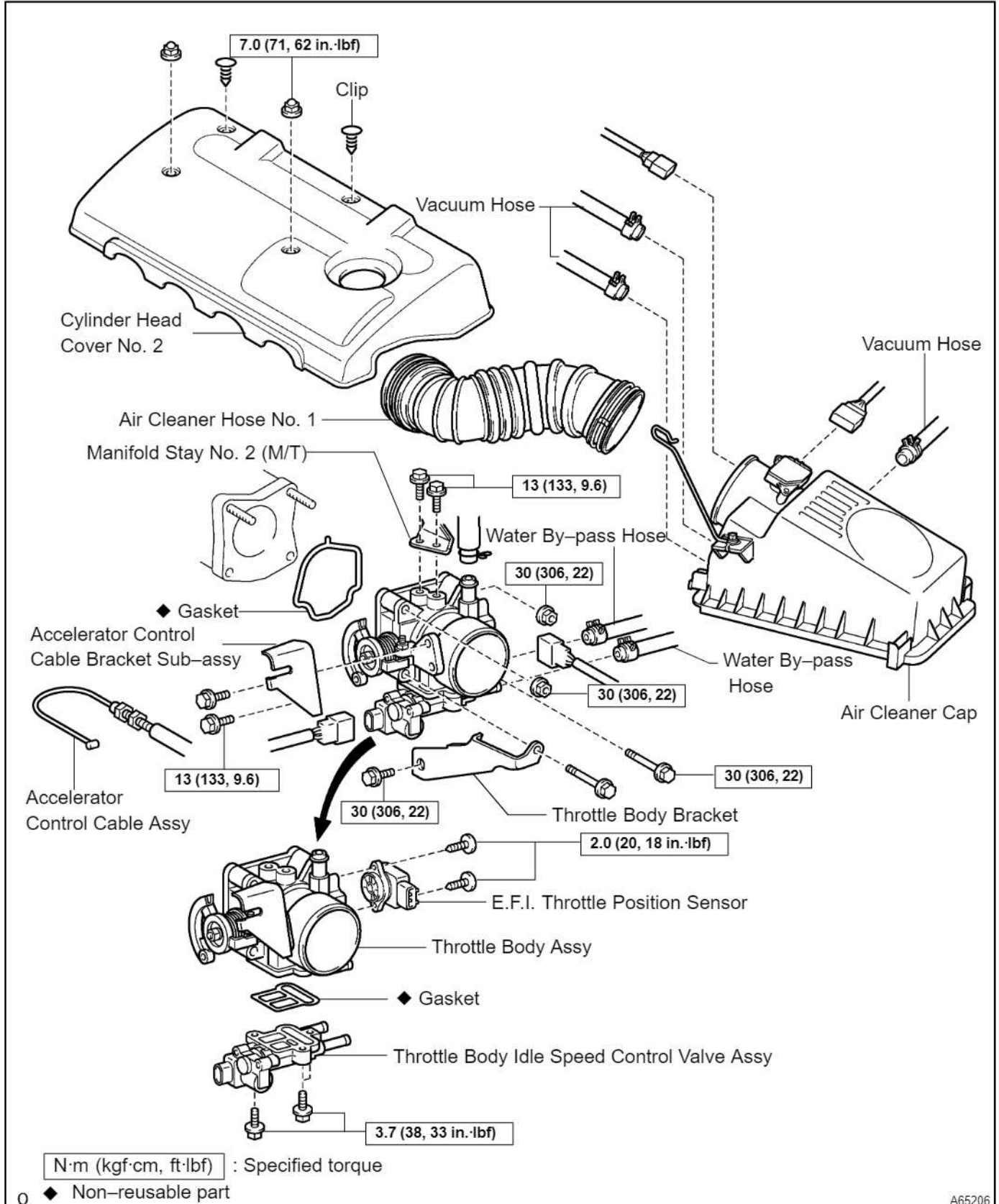
Half open → fully close → fully open → half open

HINT:

ISC valve moves within 0.5 second.

THROTTLE BODY ASSY COMPONENTS

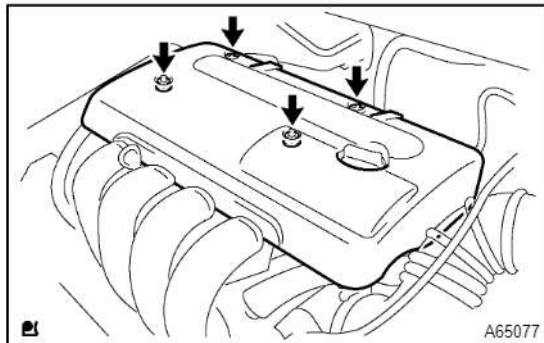
1008F-01



A65206

Removal & Installation and Disassembly & Reassembly

1. DRAIN COOLANT(See page 16-7)

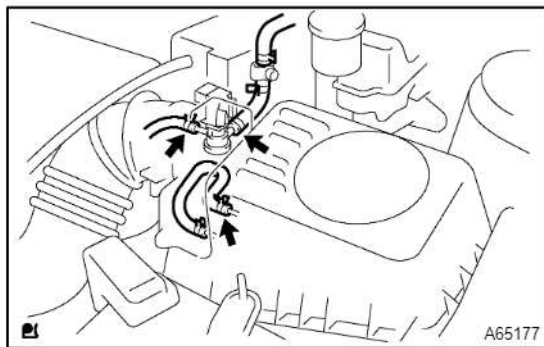


2. REMOVE CYLINDER HEAD COVER NO.2

- (a) Remove 2 nuts, 2 clips and the cylinder head cover No. 2.

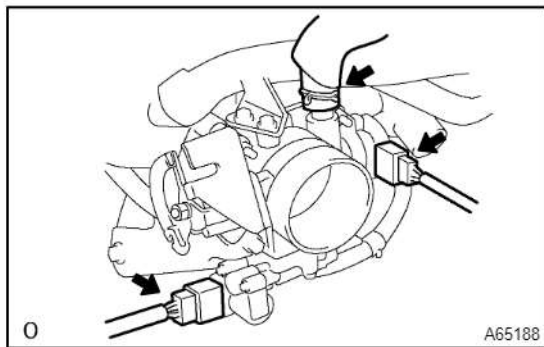
3. REMOVE AIR CLEANER CAP SUB-ASSY

- (a) Disconnect the MAF connector.
 (b) Disconnect the VSV connector.
 (c) Disconnect 3 vacuum hoses, as shown in the illustration.
 (d) Loosen an air cleaner hose clump and disconnect an air cleaner hose No. 1.
 (e) Remove the air cleaner cap.



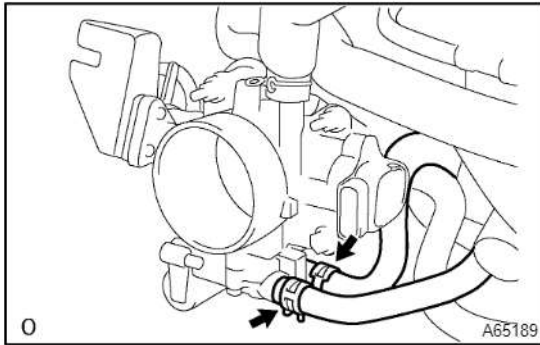
4. REMOVE AIR CLEANER HOSE NO.1

5. SEPARATE ACCELERATOR CONTROL CABLE ASSY

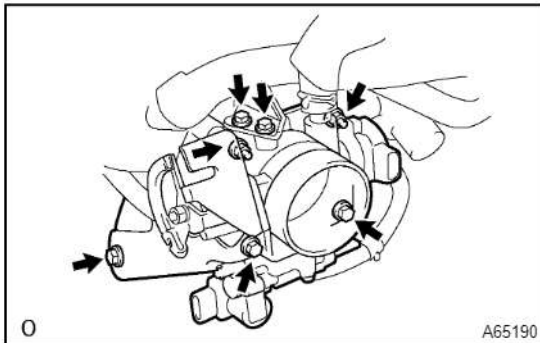


6. REMOVE THROTTLE BODY ASSY

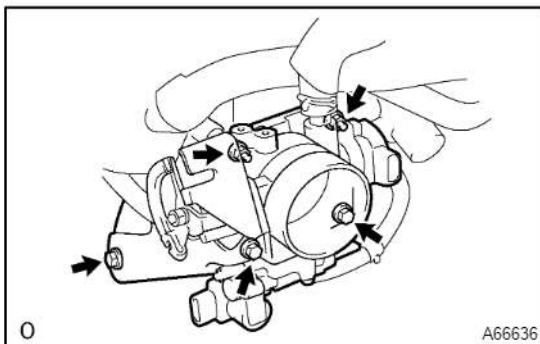
- (a) Disconnect an throttle position sensor connector.
 (b) Disconnect a throttle body ISC valve assy connector.
 (c) Disconnect a PCV hose.



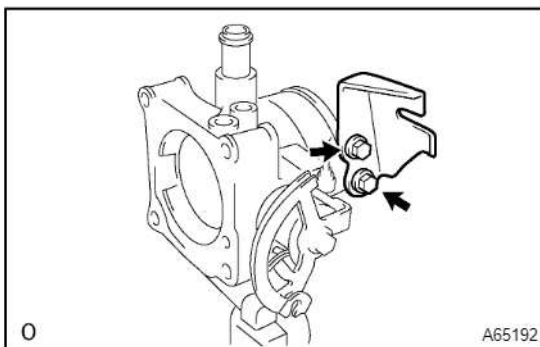
(d) Disconnect 2 water by-pass hoses.



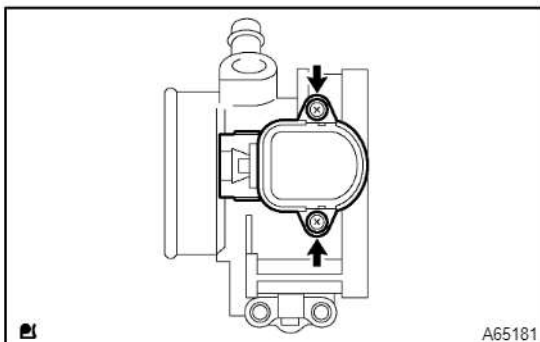
(e) Remove 5 bolts, 2 nuts, throttle body bracket and throttle body. (Transaxle M/T)



(f) Remove 3 bolts, 2 nuts and throttle body. (Transaxle A/T)

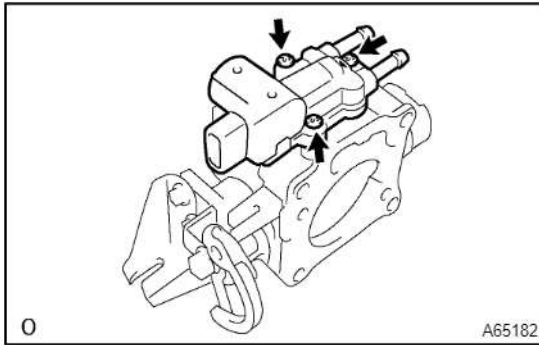


(g) Remove 2 bolts and accelerator cable bracket.



7. REMOVE E.F.I. THROTTLE POSITION SENSOR

(a) Remove 2 screws and the throttle position sensor as shown in the illustration.



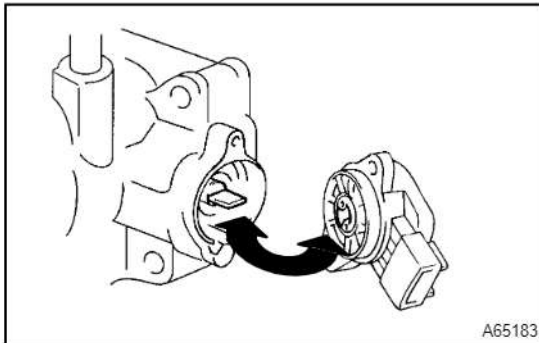
8. REMOVE THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY

- (a) Remove 3 screws and the idle speed control valve assy.
- (b) Remove the gasket from the throttle body.

9. INSTALL THLOTTLE BODY IDLE SPEED CONTROL VALVE ASSY

- (a) Install a new gasket on the throttle body.
- (b) Install the idle speed control valve assy with 3 screws.

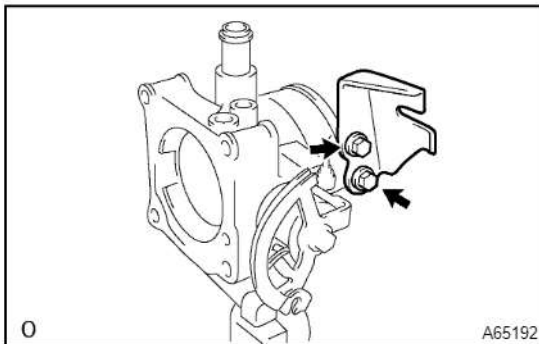
Torque: 3.7 N·m (38 kgf·cm, 33 in·lbf)



10. INSTALL E.F.I. THROTTLE POSITION SENSOR

- (a) Check that the throttle valve is fully close.
- (b) insert the throttle position sensor to the throttle body with it turned counterclockwise by 30° to 90° against the fully close valve position.
- (c) By turning the throttle position sensor clockwise, tighten 2 screws.

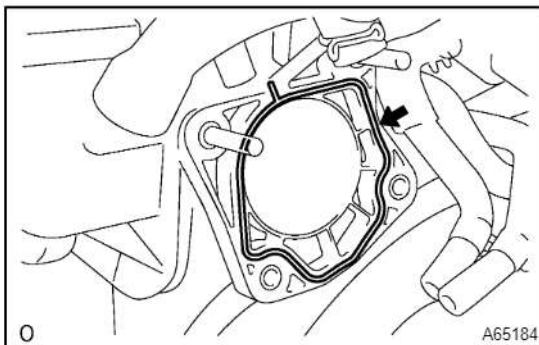
Torque: 2.0 N·m (20 kgf·cm, 18 in·lbf)



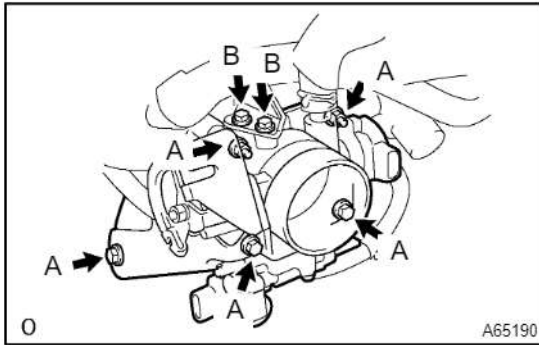
11. INSTALL THROTTLE BODY ASSY

- (a) Install the accelerator control bracket with 2 bolts.

Torque: 13 N·m (133 kgf·cm, 9.6 ft·lbf)



- (b) Install a new gasket on the intake manifold, as shown in the illustration.

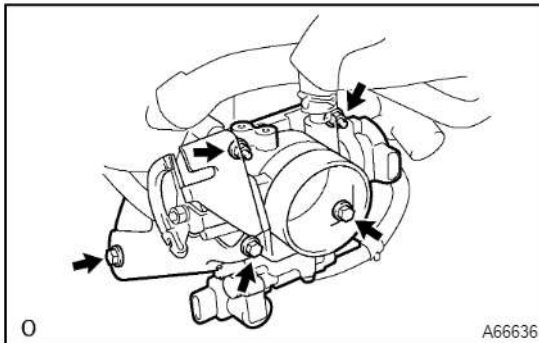


- (c) Install the throttle body with 5 bolts and 2 nuts.(Transaxle M/T)

Torque:

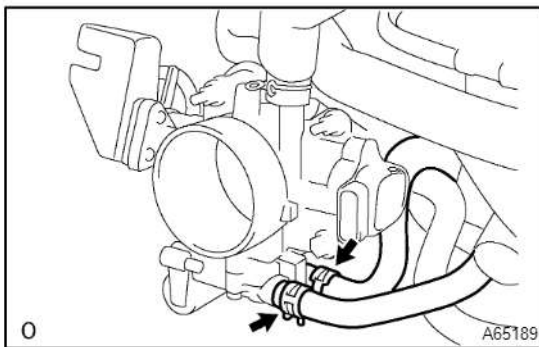
A 30 N·m (306 kgf·cm, 22 ft·lbf)

B 13 N·m (133 kgf·cm, 9.6 ft·lbf)

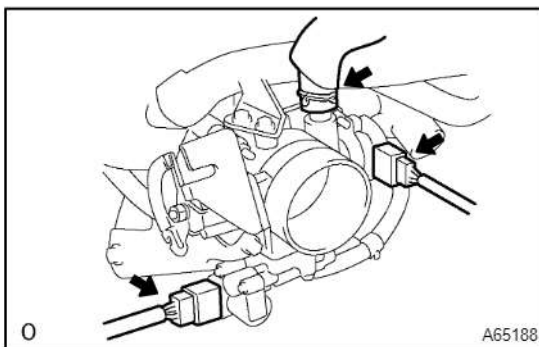


- (d) Install the throttle body with 3 bolts and 2 nuts.(Transaxle A/T)

Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)



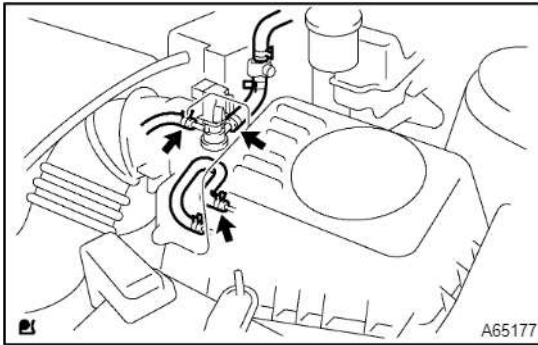
- (e) Connect 2 water by-pass hoses to the throttle body.



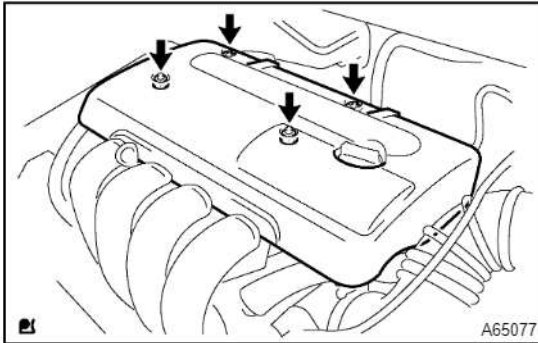
- (f) Connect the PCV hose to the throttle body.
 (g) Connect the throttle body idle speed control valve assy connector to the throttle body.
 (h) Connect the throttle position sensor connector to the throttle body.

12. INSTALL AIR CLEANER CAP SUB-ASSY

- (a) Install the air cleaner cap.
 (b) Connect the air cleaner hose.



- (c) Connect 3 vacuum hoses, as shown in the illustration.
- (d) Connect the VSV connector.
- (e) Connect the intake air flow meter connector.



13. INSTALL CYLINDER HEAD COVER NO.2

- (a) Install the cylinder head cover No. 2 with 2 nuts and 2 clips.

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

14. ADD COOLANT(See page 16-7)

15. CHECK ENGINE COOLANT LEAK(See page 16-1)