

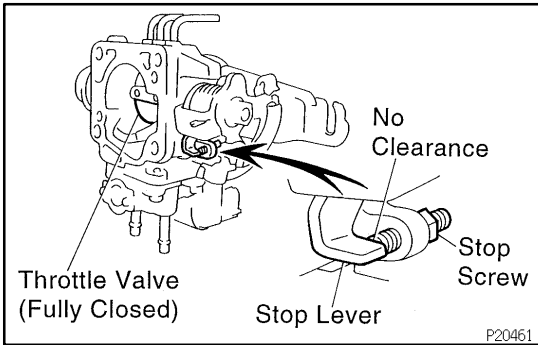
## INSPECTION

### 1. CLEAN THROTTLE BODY

- (a) Wash and clean the cast part with a soft brush and carburetor cleaner.
- (b) Using compressed air, blow all passages and apertures in the throttle body.

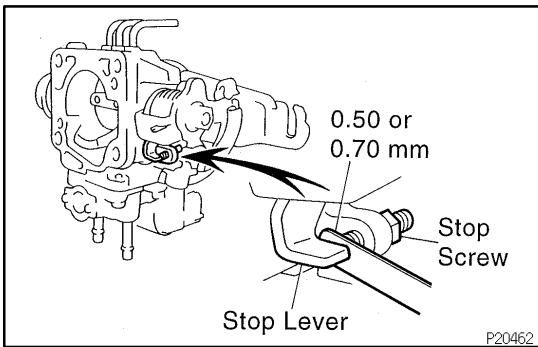
**NOTICE:**

To prevent deterioration, do not clean the throttle position sensor.



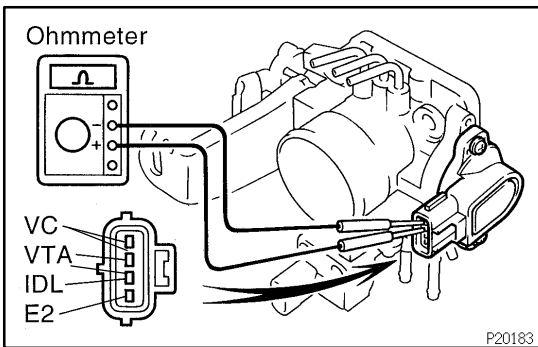
### 2. INSPECT THROTTLE VALVE

Check that there is no clearance between the throttle stop screw and throttle lever when the throttle valve is fully closed.



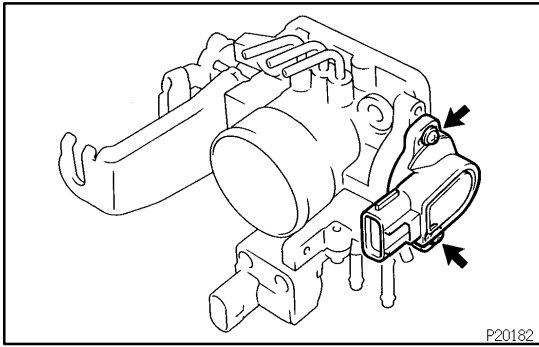
### 3. INSPECT THROTTLE POSITION SENSOR

- (a) Insert a 0.050 mm (0.020 in.) or 0.70 mm (0.028 in.) feeler gauge between the throttle stop screw and stop lever.



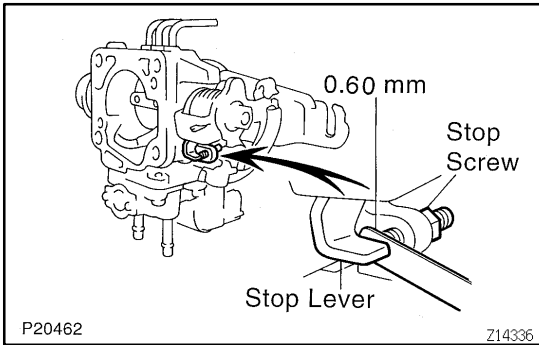
- (b) Using an ohmmeter, measure the resistance between each terminal.

Clearance between lever and stop screw	Between terminals	Resistance
0 mm (0 in.)	VTA - E2	0.2 - 5.7 kΩ
0.50 mm (0.020 in.)	IDL - E2	2.3 kΩ or less
0.70 mm (0.028 in.)	IDL - E2	Infinity
Throttle valve fully open	VTA - E2	2.0 - 10.2 kΩ
-	VC - E2	2.5 - 5.9 kΩ

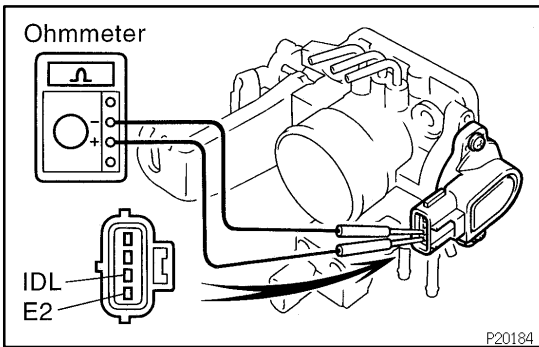


**4. IF NECESSARY, ADJUST THROTTLE POSITION SENSOR**

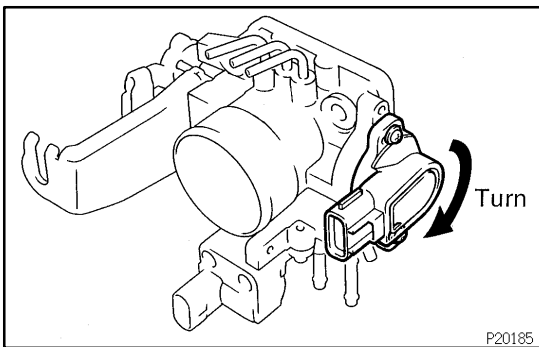
(a) Loosen the 2 set screws of the sensor.



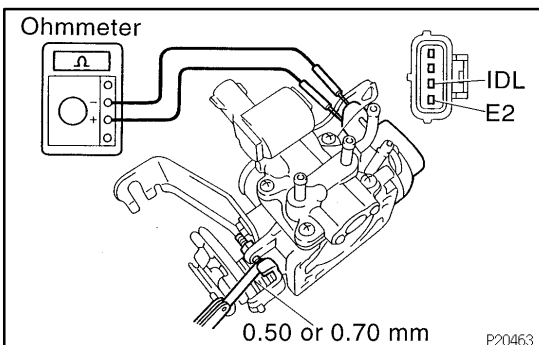
(b) Insert a 0.60 mm (0.024 in.) feeler gauge between the throttle stop screw and stop lever.



(c) Connect the tester probe of an ohmmeter to the terminals IDL and E2 of the sensor.



(d) Gradually turn the sensor clockwise until the ohmmeter deflects, and secure it with the 2 set screws.



(e) Recheck the continuity between terminals IDL and E2.

Clearance between lever and stop screw	Continuity (IDL - E2)
0.50 mm (0.020 in.)	Continuity
0.70 mm (0.028 in.)	No continuity

## INSTALLATION

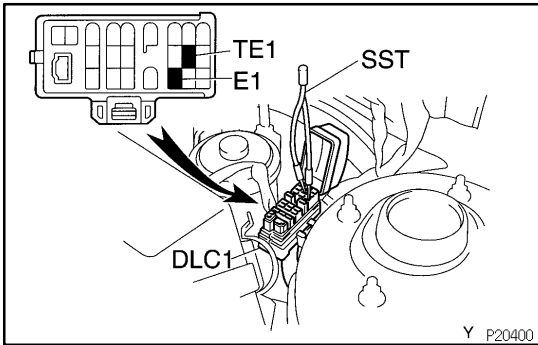
Installation is in the reverse order of removal (See page [MF-28](#)).

# IDLE AIR CONTROL (IAC) VALVE ON-VEHICLE INSPECTION

SF199-02

## 1. INSPECT IAC VALVE OPERATION

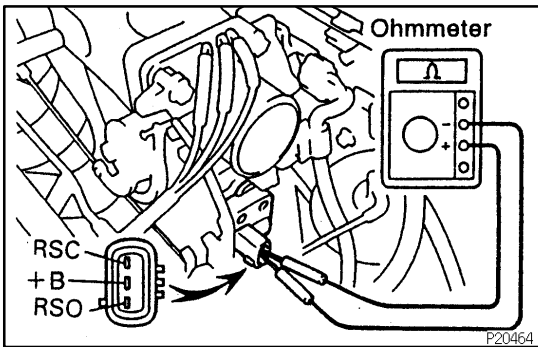
- (a) Initial conditions:
  - Engine at normal operating temperature
  - Idle speed set correctly
  - Transmission in neutral position



- (b) Using SST, connect terminals TE1 and E1 of the DLC1. SST 09843-18020
- (c) After engine rpm is kept at 900 - 1,300 rpm for 5 seconds, check that it returns to idle speed.

If the rpm operation is not as specified, check the IAC valve, wiring and ECM.

- (d) Remove the SST from the DLC1. SST 09843-18020



## 2. INSPECT IAC VALVE RESISTANCE

### NOTICE:

"Cold" and "Hot" in the following sentences express the temperature of the coils themselves. "Cold" is from -10°C (14°F) to 50°C (122°F) and "Hot" is from 50°C (122°F) to 100°C (212°F).

- (a) Disconnect the IAC valve connector.
- (b) Using an ohmmeter, measure the resistance between terminal +B and other terminals (RSC, RSO).

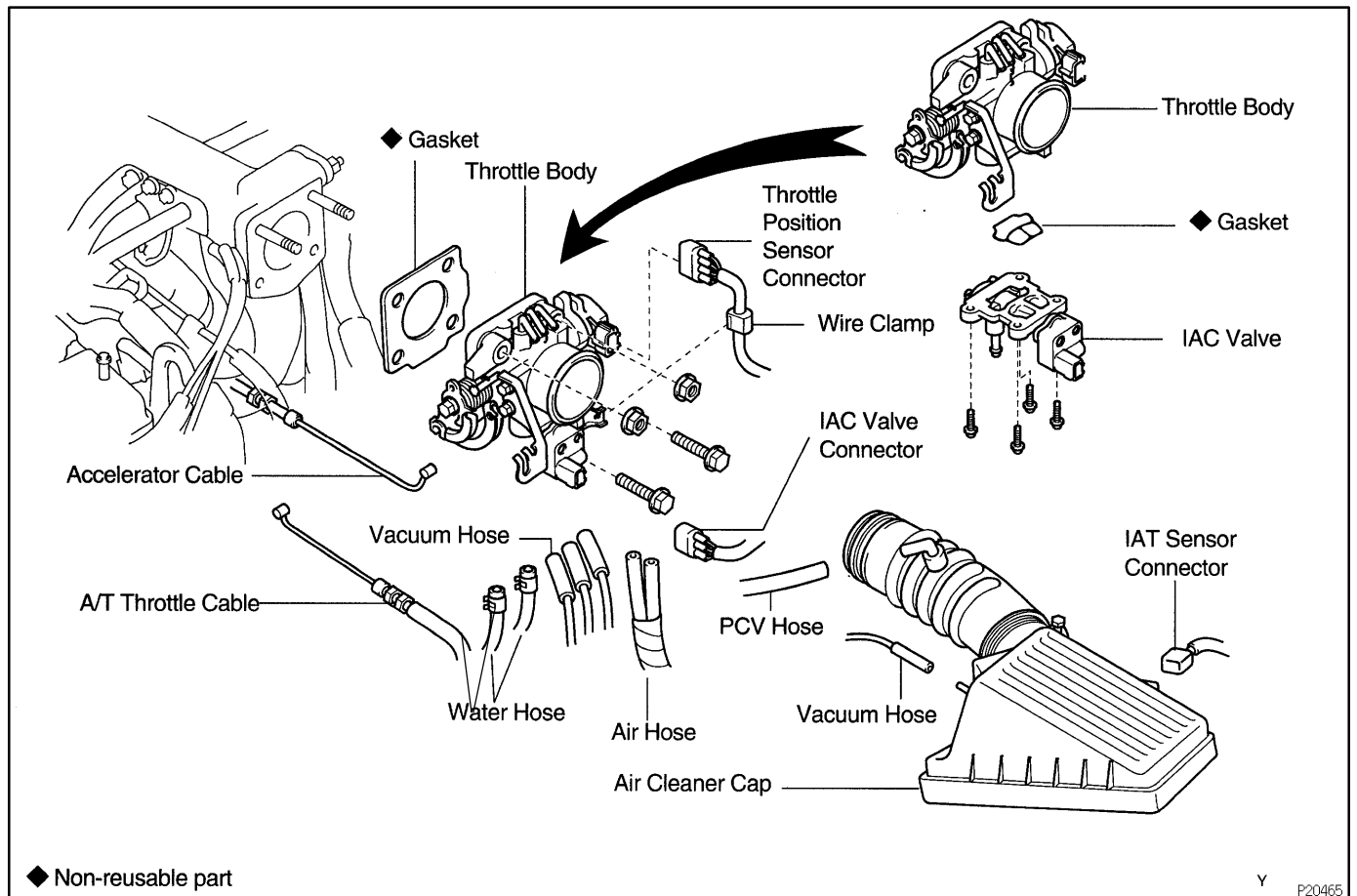
### Resistance:

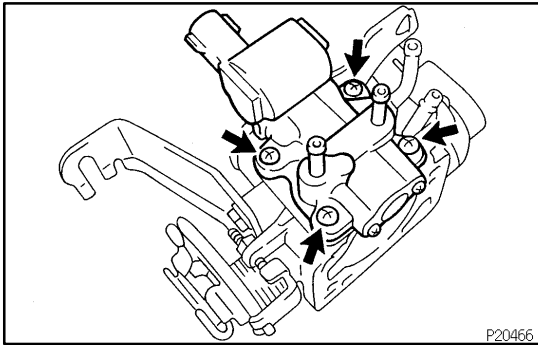
Cold	17.0 - 24.5 Ω
Hot	21.5 - 28.5 Ω

If resistance is not as specified, replace the IAC valve.

- (c) Reconnect the IAC valve connector.

# COMPONENTS





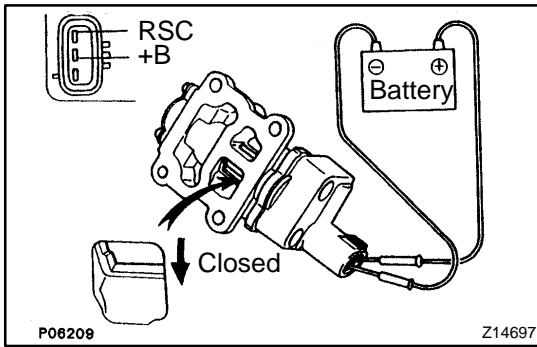
## REMOVAL

1. **REMOVAL THROTTLE BODY (See page [MF-28](#) )**
2. **REMOVE IAC VALVE**

Remove the 4 screws, IAC valve and gasket.

HINT:

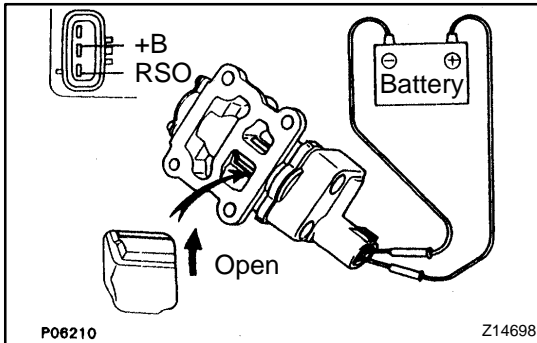
At the time of installation, please refer to the following items.  
Use a new gasket.



## INSPECTION

### INSPECT IAC VALVE OPERATION

- (a) Connect the positive (+) lead from the battery to terminal +B and negative (-) lead to terminal RSC, and check that the valve is closed.



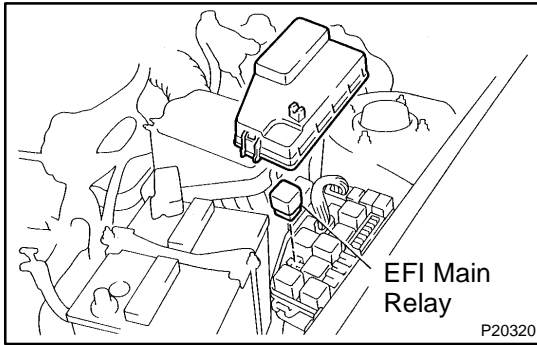
- (b) Connect the positive (+) lead from the battery to terminal +B and negative (-) lead to terminal RSO, and check that the valve is open.

If operation is not as specified, replace the IAC valve.

## INSTALLATION

Installation is in reverse order of removal (See page [MF-35](#)).



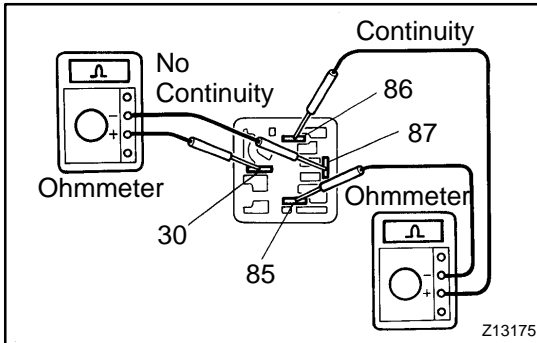


## EFI MAIN RELAY INSPECTION

SF0XI-04

### 1. REMOVE EFI MAIN RELAY (Marking: EFI MAIN)

LOCATION: In the engine compartment relay box.



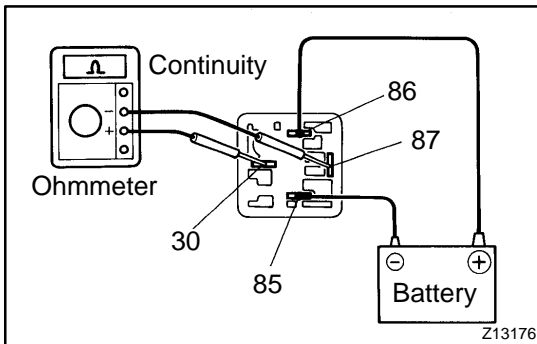
### 2. INSPECT EFI MAIN RELAY CONTINUITY

- (a) Using an ohmmeter, check that there is continuity between terminals 86 and 85.

If there is no continuity, replace the relay.

- (b) Check that there is no continuity between terminals 87 and 30.

If there is continuity, replace the relay.



### 3. INSPECT EFI MAIN RELAY OPERATION

- (a) Apply battery voltage across terminals 86 and 85.

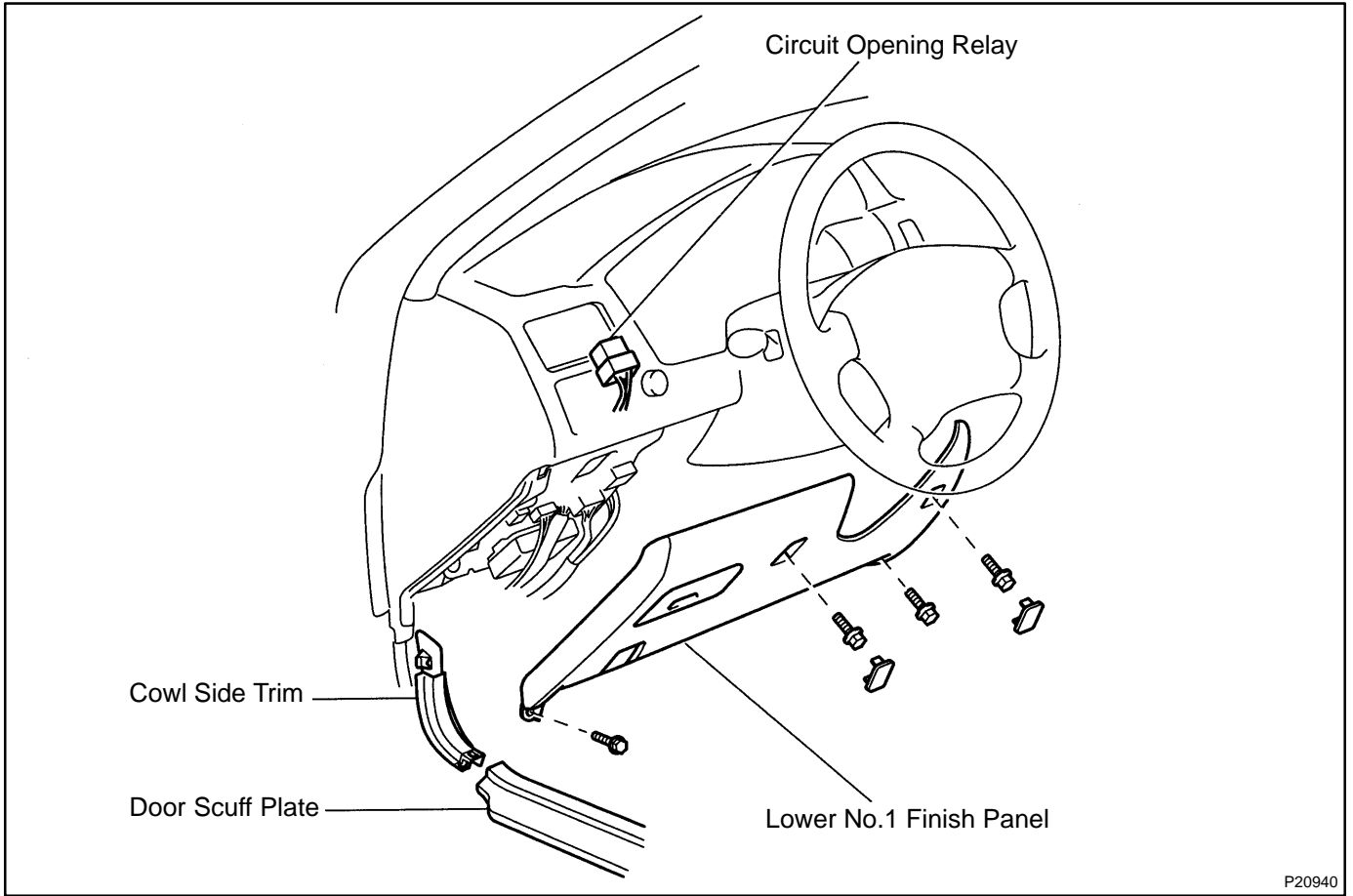
- (b) Using an ohmmeter, check that there is continuity between terminals 87 and 30.

If there is no continuity, replace the relay.

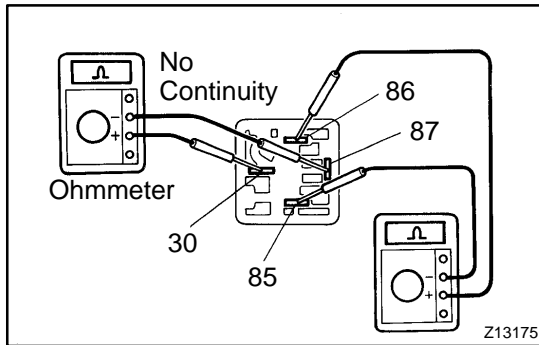
### 4. REINSTALL EFI MAIN RELAY

# CIRCUIT OPENING RELAY COMPONENTS

SFOXJ-01

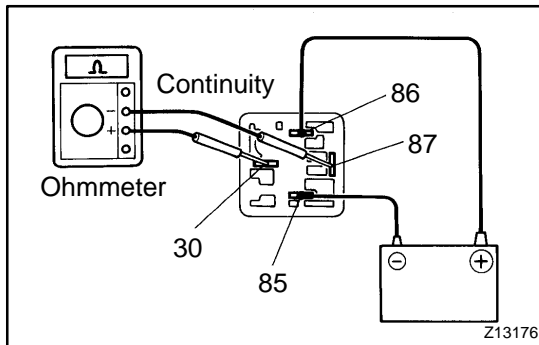


P20940



## INSPECTION

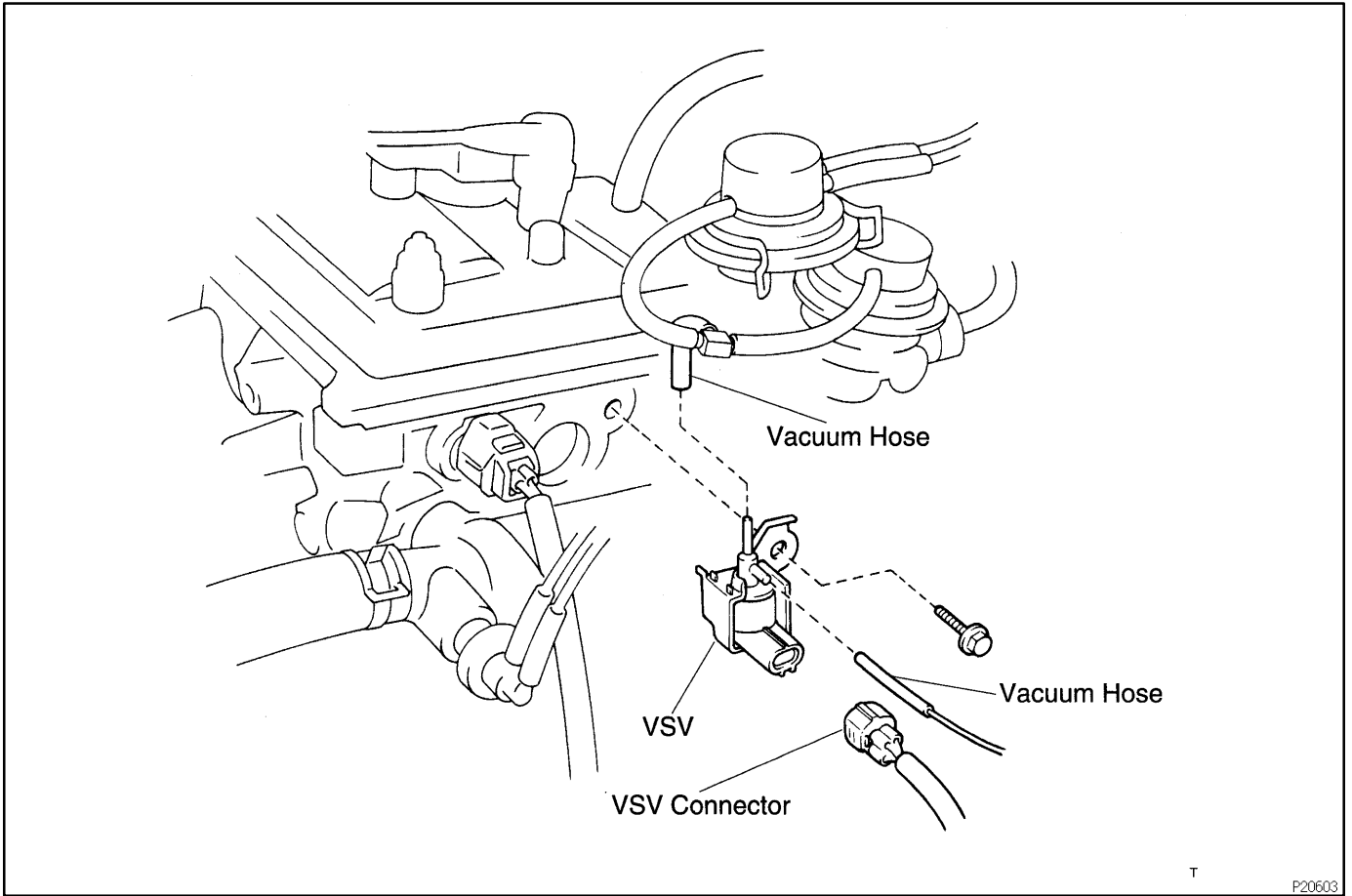
1. **REMOVE CIRCUIT OPENING RELAY**
2. **INSPECT CIRCUIT OPENING RELAY CONTINUITY**
  - (a) Using an ohmmeter, check that there is continuity between terminals 86 and 85.  
If there is no continuity, replace the relay.
  - (b) Check that there is no continuity between terminals 87 and 30.  
If there is continuity, replace the relay.



3. **INSPECT CIRCUIT OPENING RELAY OPERATION**
  - (a) Apply battery voltage across terminals 86 and 85.
  - (b) Using an ohmmeter, check that there is continuity between terminals 87 and 30.  
If there is no continuity, replace the relay.
4. **REINSTALL CIRCUIT OPENING RELAY**

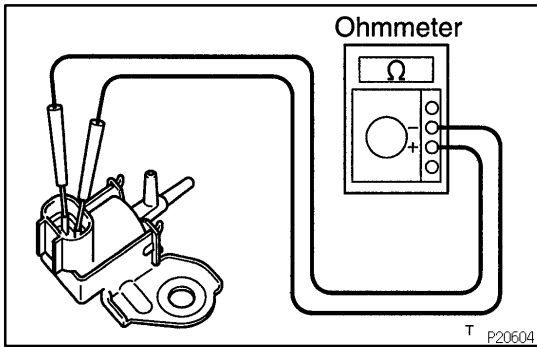
# VSV FOR EVAPORATIVE EMISSION (EVAP) COMPONENTS

SFOXL-03



T

P20603



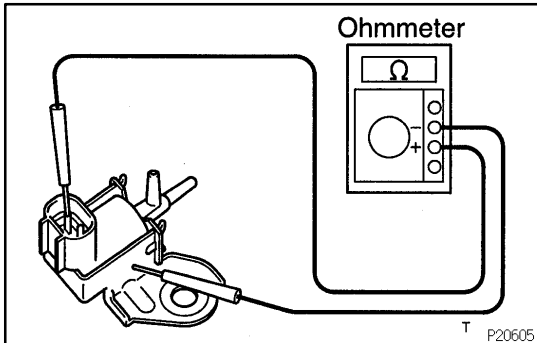
## INSPECTION

1. REMOVE VSV
2. INSPECT VSV FOR OPEN CIRCUIT

Using an ohmmeter, check that there is continuity between the terminals.

**Resistance: 33 - 39  $\Omega$  at 20°C (68°F)**

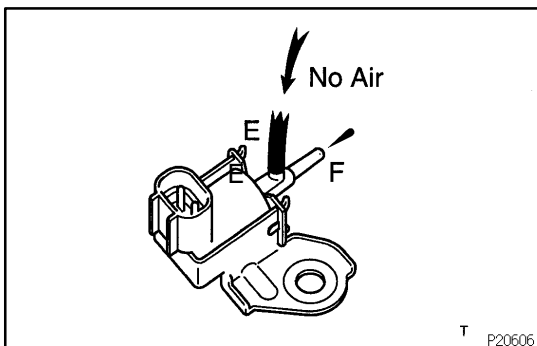
If there is no continuity, replace the VSV.



3. INSPECT VSV FOR GROUND

Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.

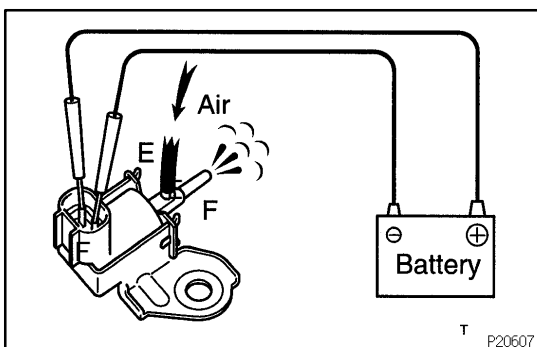


4. INSPECT VSV OPERATION

(a) Check that air does not flow from ports E to F.

### NOTICE:

**Never apply more than 60 kPa (0.61 kgf/cm<sup>2</sup>, 8.7 psi) of pressure compressed air to the VSV.**



(b) Apply battery positive voltage across the terminals.

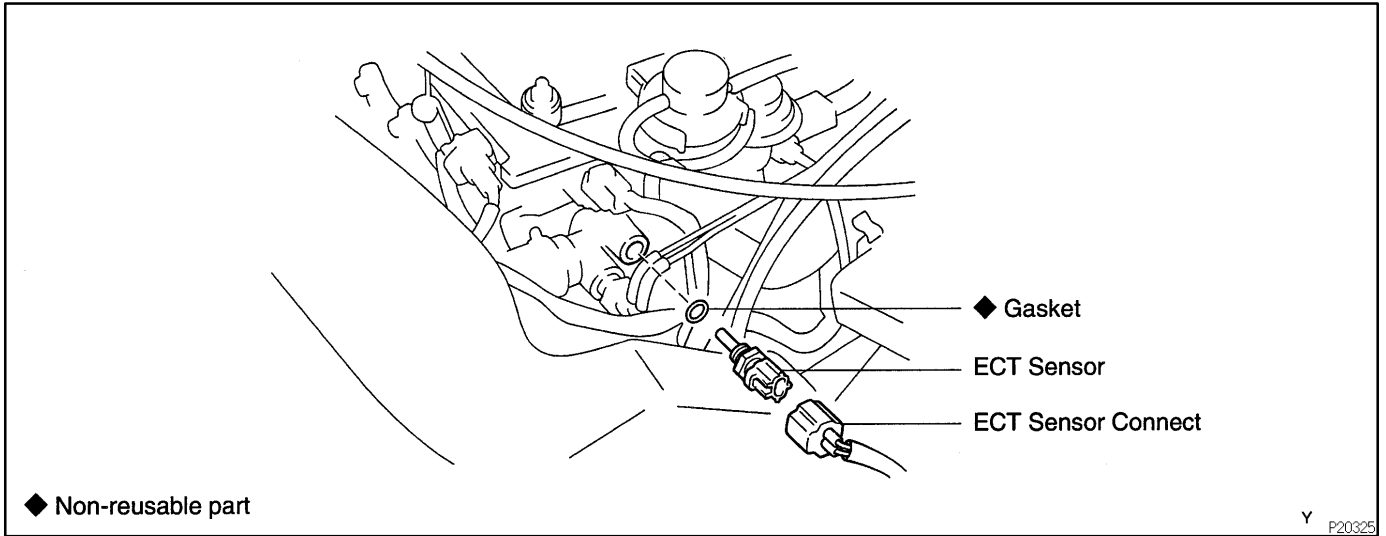
(c) Check that air flows from ports E to F.

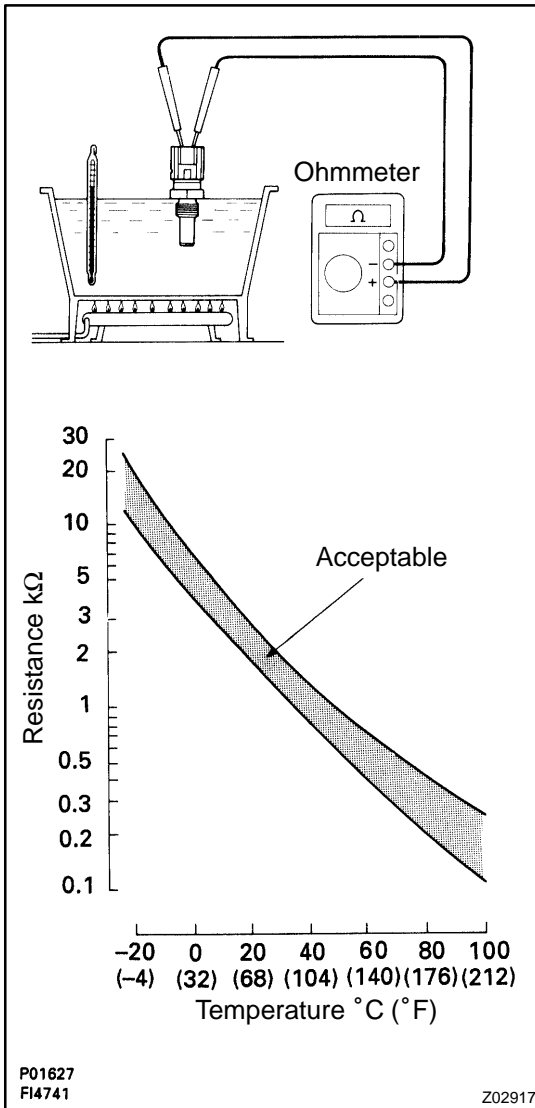
If operation is not as specified, replace the VSV.

5. REINSTALL VSV

# ENGINE COOLANT TEMPERATURE (ECT) SENSOR COMPONENTS

SFOXP-05





## INSPECTION

1. DRAIN ENGINE COOLANT
2. REMOVE ECT SENSOR
3. INSPECT ECT SENSOR

Using an ohmmeter, measure the resistance between the terminals.

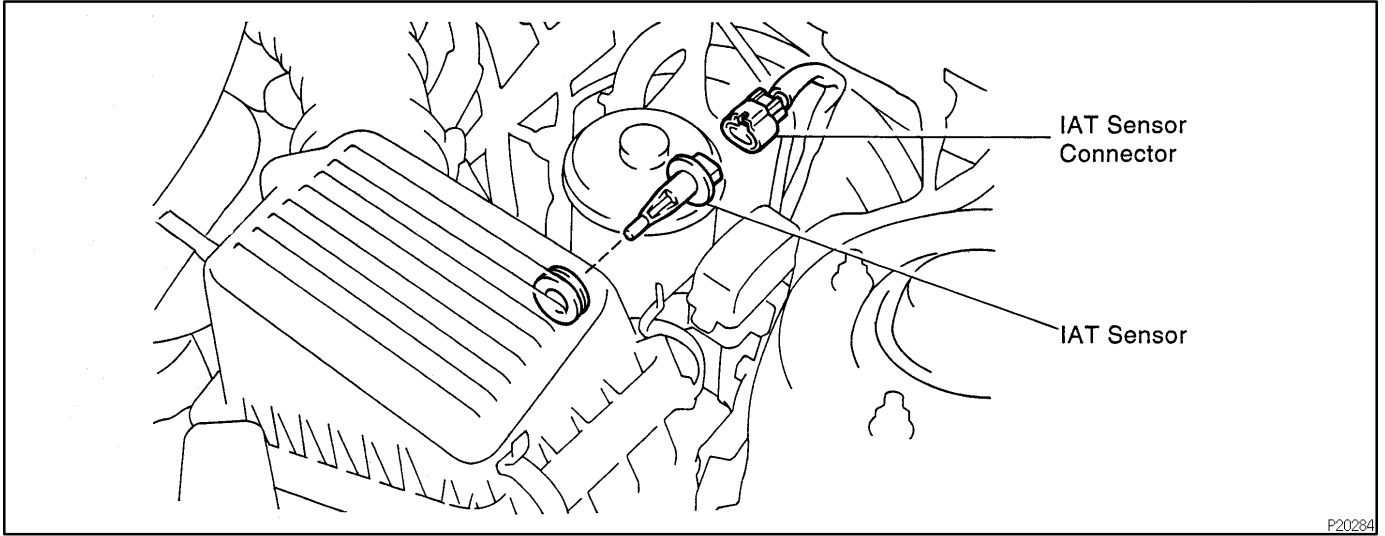
**Resistance: Refer to the graph**

If the resistance is not as specified, replace the ECT sensor.

4. REINSTALL ECT SENSOR
5. REFILL WITH ENGINE COOLANT

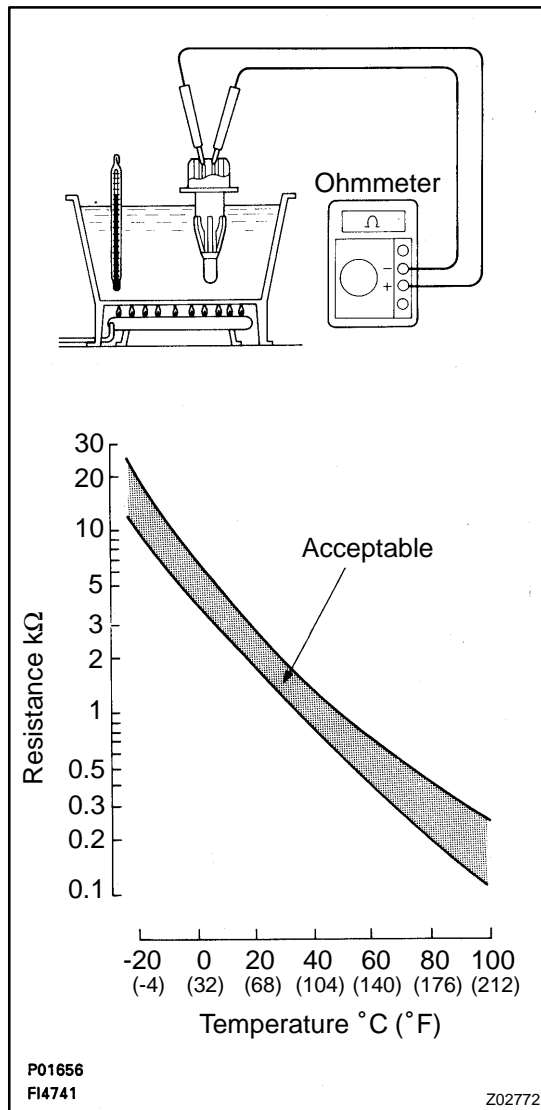
# INTAKE AIR TEMPERATURE (IAT) SENSOR COMPONENTS

SFOX-03



P20284





## INSPECTION

1. REMOVE IAT SENSOR
2. INSPECT IAT SENSOR

Using an ohmmeter, measure the resistance between the terminals.

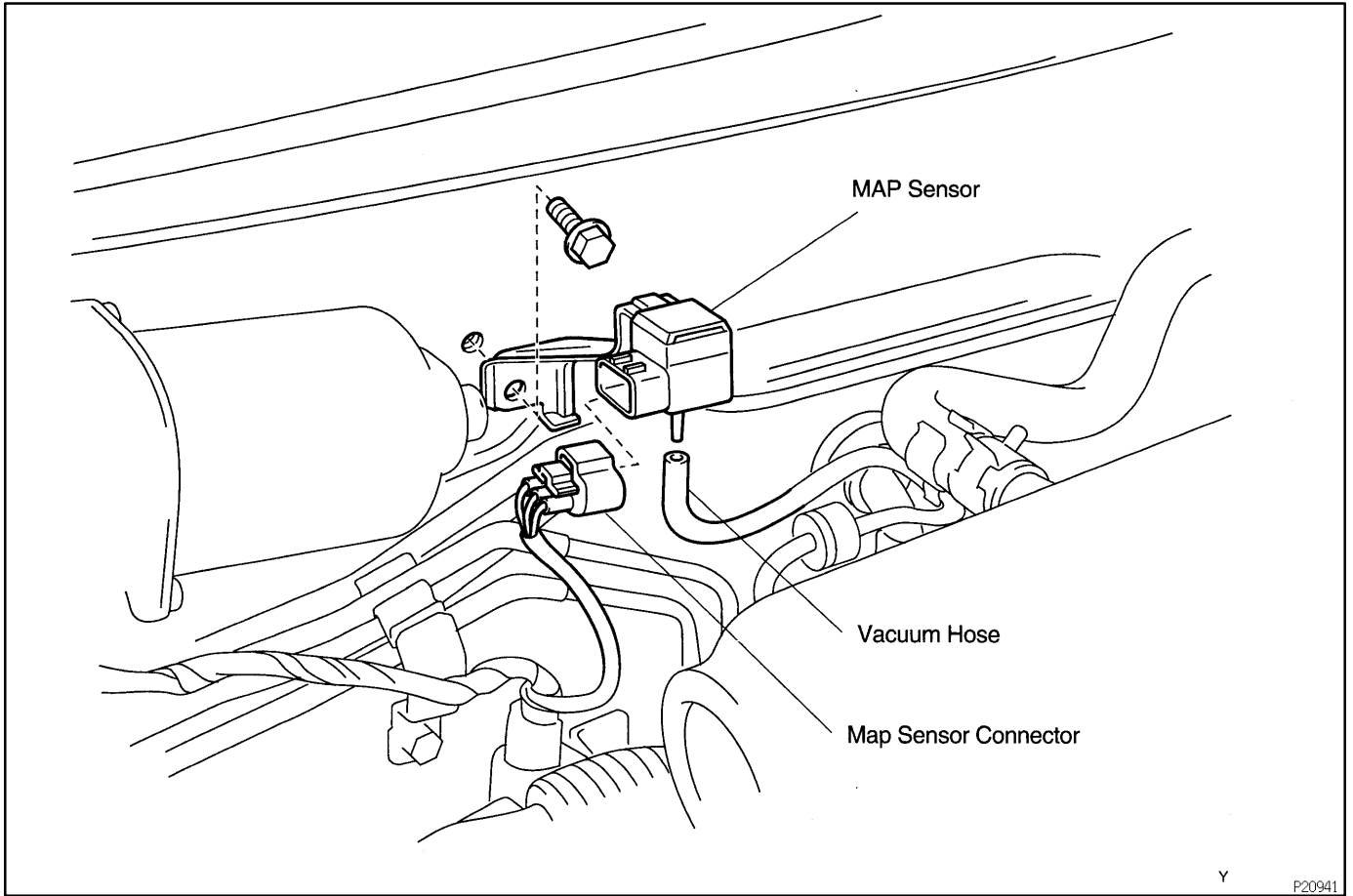
**Resistance: Refer to the graph**

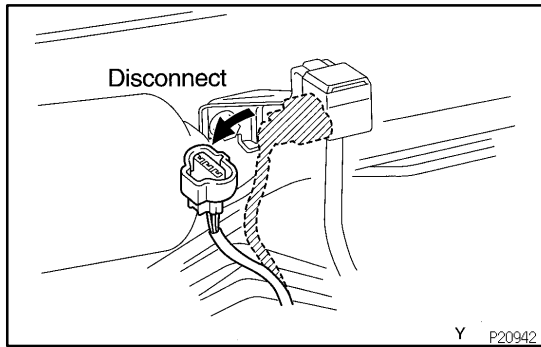
If the resistance is not as specified, replace the sensor.

3. REINSTALL IAT SENSOR

# MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR COMPONENTS

SF0W0-03

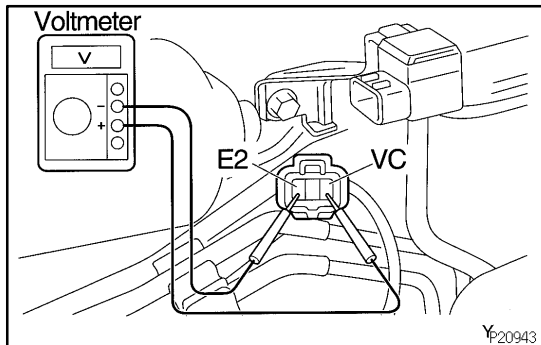




## INSPECTION

### 1. INSPECT POWER SOURCE VOLTAGE OF MAP SENSOR

- (a) Disconnect the MAP sensor connector.
- (b) Turn the ignition switch ON.



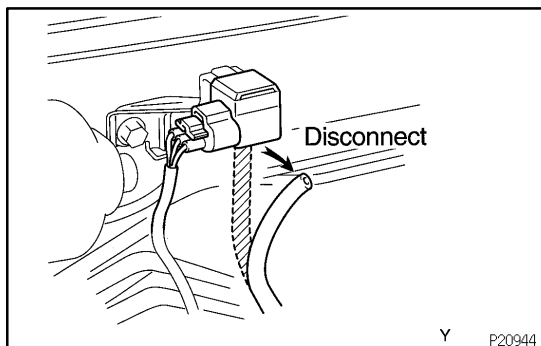
- (c) Using a voltmeter, measure the voltage between connector terminals VC and E2 of the wiring harness side.

**Voltage: 4.5 - 5.5 V**

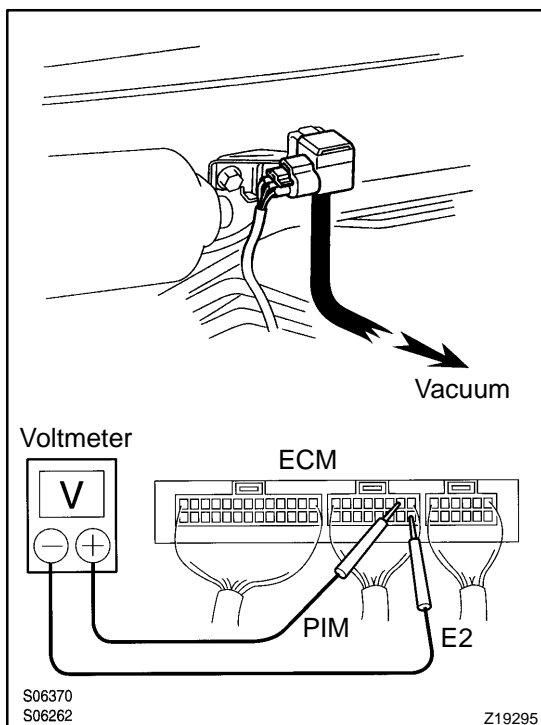
- (d) Turn the ignition switch to LOCK.
- (e) Reconnect the MAP sensor connector.

### 2. INSPECT POWER OUTPUT OF MAP SENSOR

- (a) Turn the ignition switch ON.



- (b) Disconnect the vacuum hose from the MAP sensor.



- (c) Connect a voltmeter to terminals PIM and E2 of the ECM, and measure the output voltage under ambient atmospheric pressure.

- (d) Apply vacuum to the MAP sensor in 13.3 kPa (100 mmHg, 3.94 in.Hg) segments to 66.7 kPa (500 mmHg, 19.69 in.Hg).

- (e) Measure the voltage drop from step (c) above for each segment.

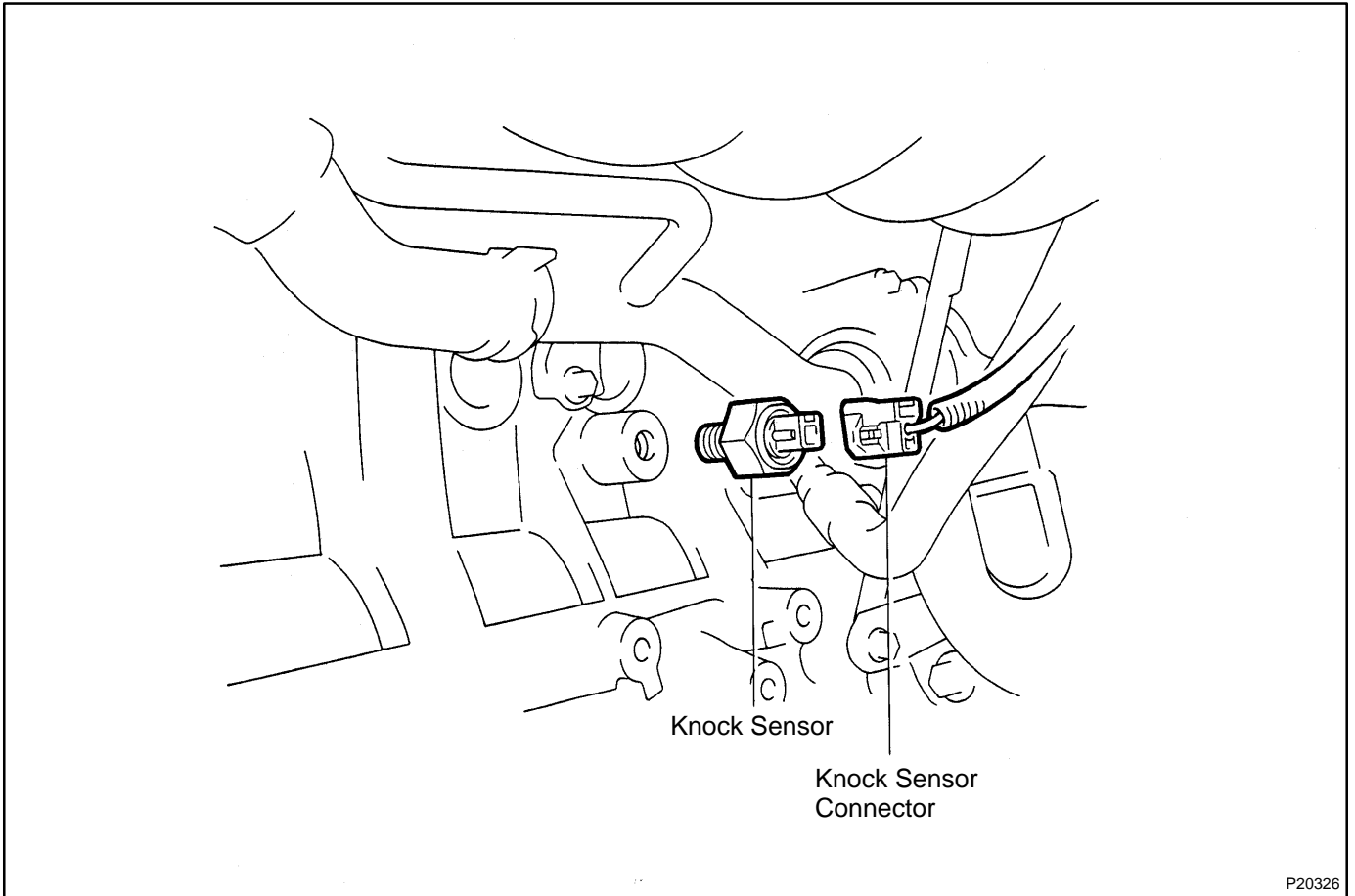
#### Voltage Drop:

Applied Vacuum kPa	13.3	26.7	40.0	53.5	66.7
(mmHg)	( 100 )	( 200 )	( 300 )	( 400 )	( 500 )
(in.Hg)	( 3.94 )	( 7.87 )	( 11.81 )	( 15.75 )	( 19.69 )
Voltage drop V	0.3 - 0.5	0.7 - 0.9	1.1 - 1.3	1.5 - 1.7	1.9 - 2.1

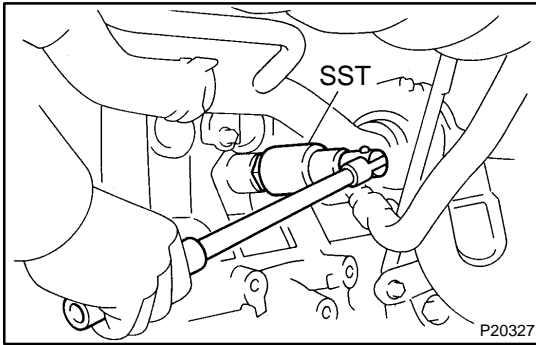
- (f) Reconnect the vacuum hose to the MAP sensor.

# KNOCK SENSOR COMPONENTS

SF0WM-03



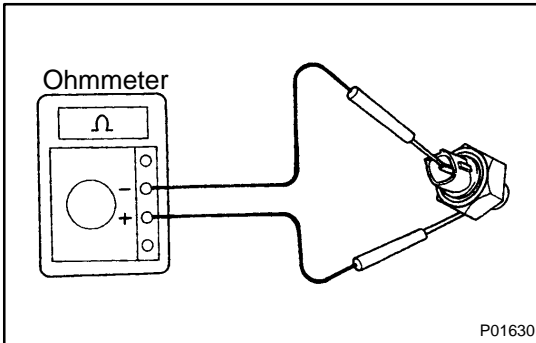
P20326



## INSPECTION

### 1. REMOVE KNOCK SENSOR

- (a) Disconnect the knock sensor connector.
- (b) Using SST, remove the knock sensor.  
SST 09816-30010



### 2. INSPECT KNOCK SENSOR

Using an ohmmeter, check that there is no continuity between the terminal and body.

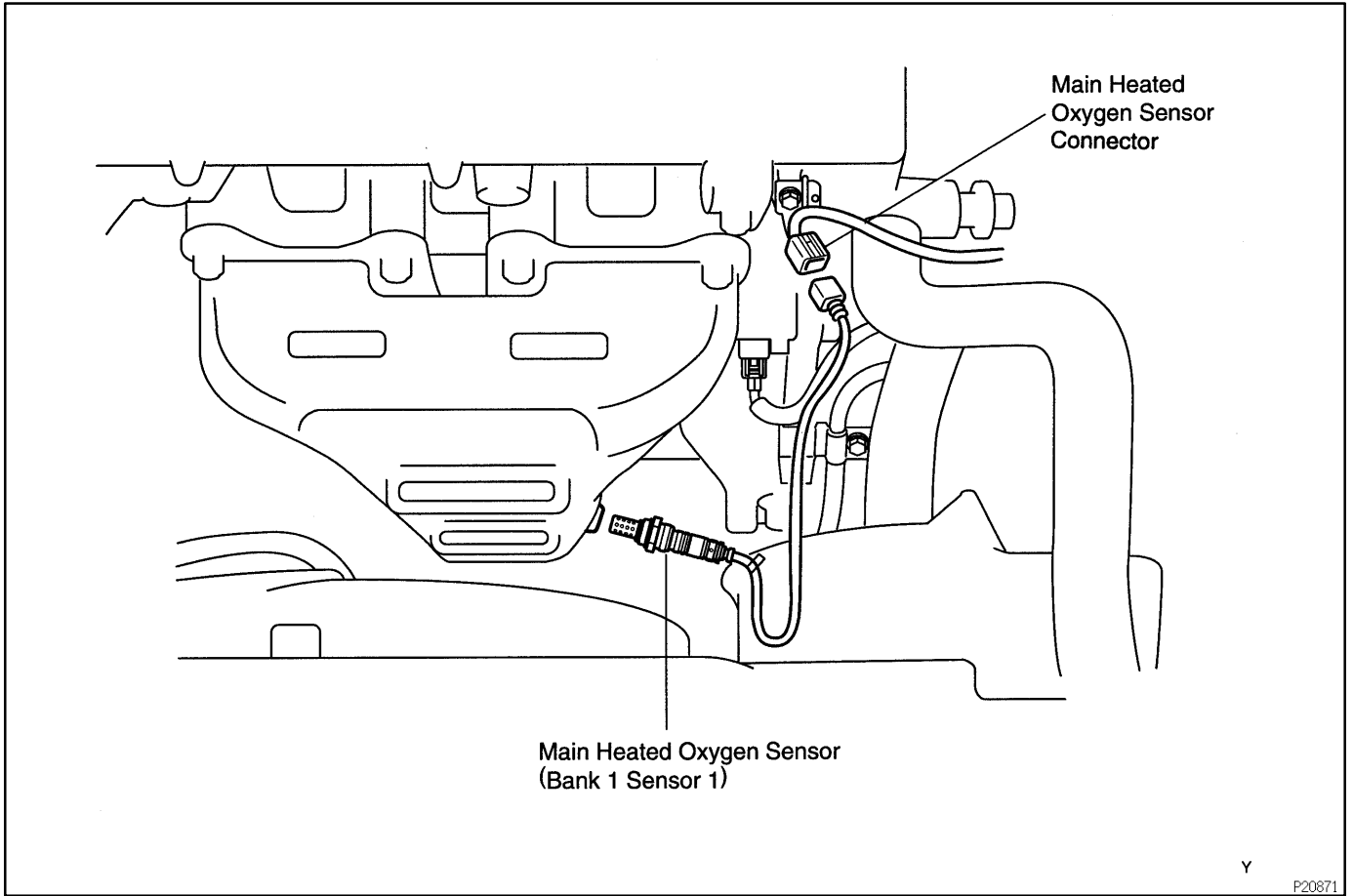
If there is continuity, replace the sensor.

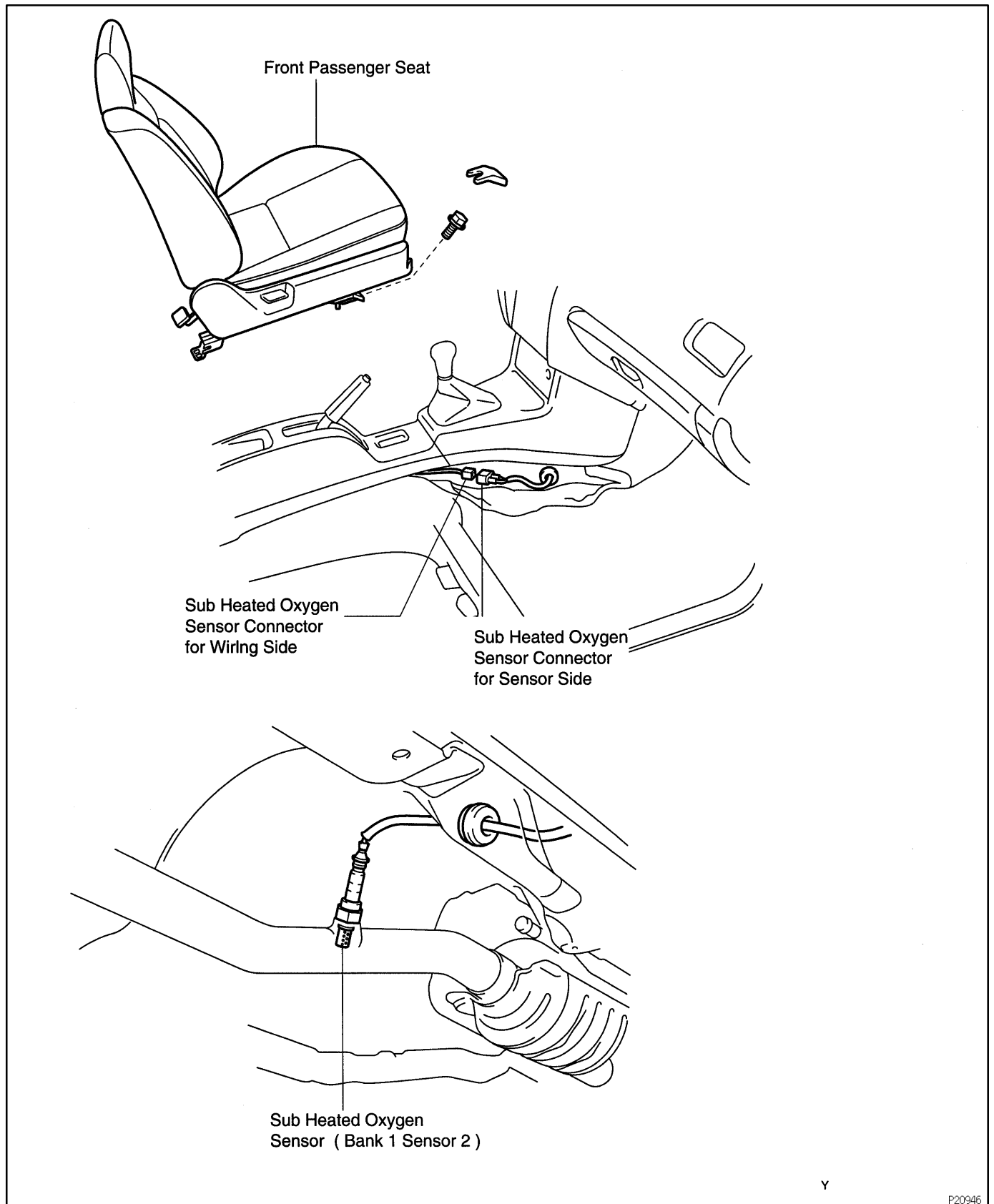
### 3. REINSTALL KNOCK SENSOR

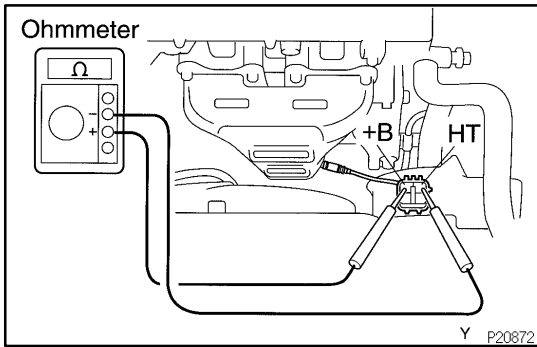
**Torque: 45 N·m (450 kgf·cm, 33 ft·lbf)**

# HEATED OXYGEN SENSOR COMPONENTS

SF0WK-03







## INSPECTION

### 1. INSPECT HEATER RESISTANCE OF MAIN HEATED OXYGEN SENSOR (BANK 1 SENSOR 1)

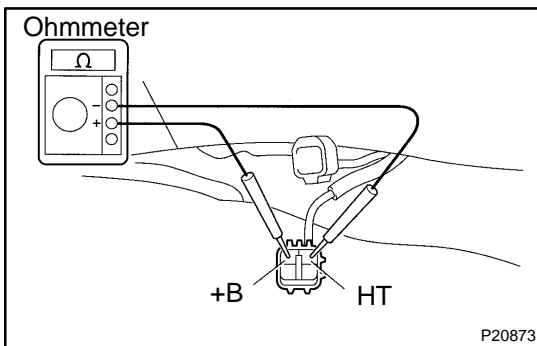
- (a) Disconnect the oxygen sensor connectors.
- (b) Using an ohmmeter, measure the resistance between the terminals +B and HT.

**Resistance: 11 - 16 Ω at 20°C (68°F)**

If the resistance is not as specified, replace the sensor.

**Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)**

- (c) Reconnect the oxygen sensor connectors.



### 2. INSPECT HEATER RESISTANCE OF SUB HEATED OXYGEN SENSOR (BANK 1 SENSOR 2)

- (a) Remove the passenger's seat.
- (b) Take out the console box side of the floor carpet.
- (c) Disconnect the oxygen sensor connector.
- (d) Using an ohmmeter, measure the resistance between the terminals +B and HT.

**Resistance: 11 - 16 Ω at 20°C (68°F)**

If the resistance is not as specified, replace the sensor.

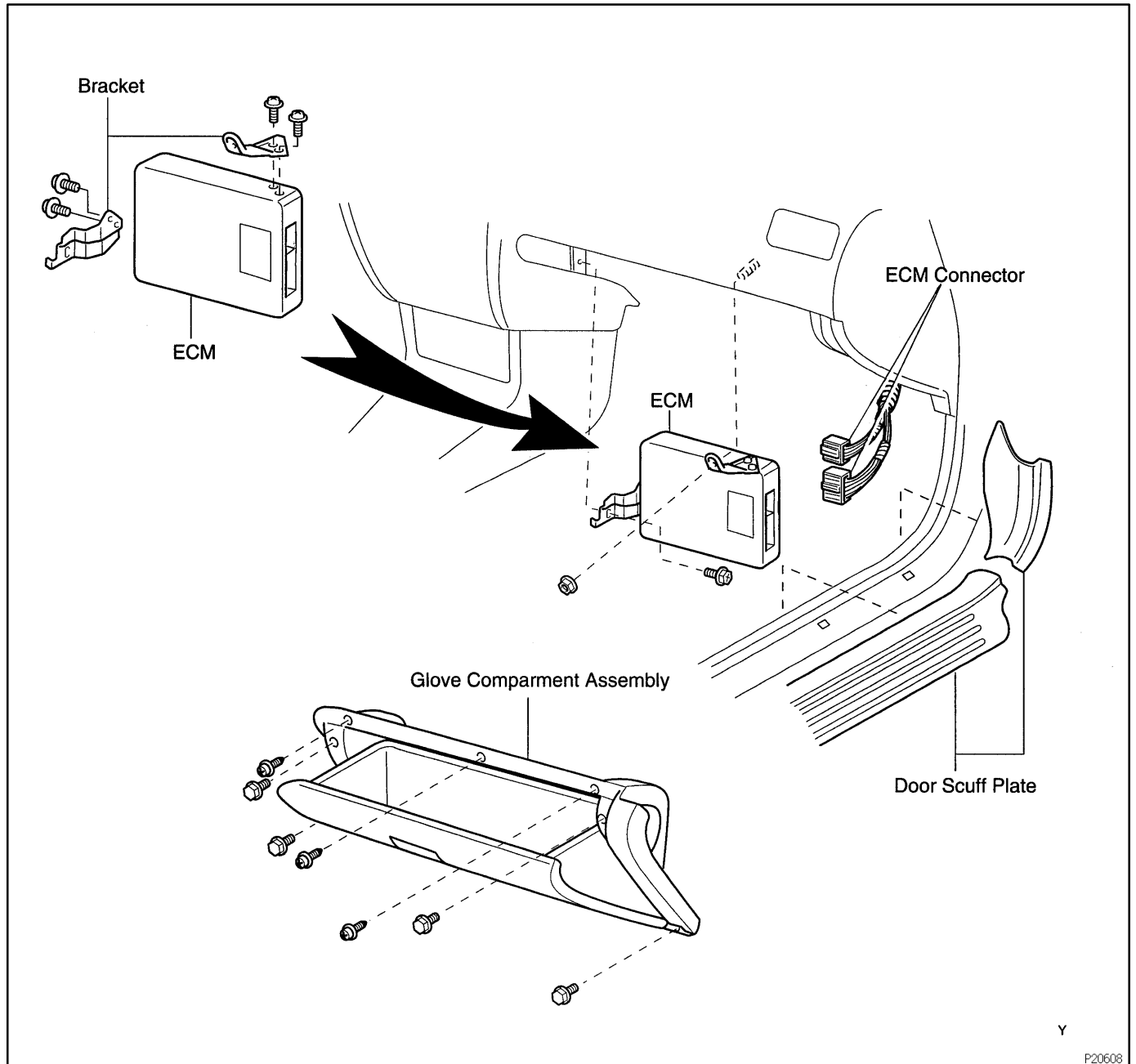
**Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)**

- (e) Reconnect the oxygen sensor connectors.
- (f) Reinstall the floor carpet.
- (g) Reinstall the passenger's seat.



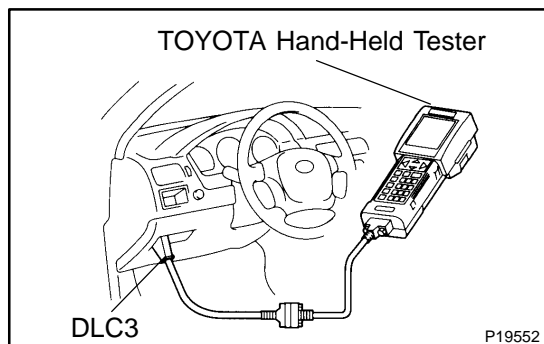
# ENGINE CONTROL MODULE (ECM) COMPONENTS

SF011-05



## INSPECTION

1. REMOVE ECM
2. INSPECT ECM (See page [DI-17](#))
3. REINSTALL ECM



## FUEL CUT RPM INSPECTION

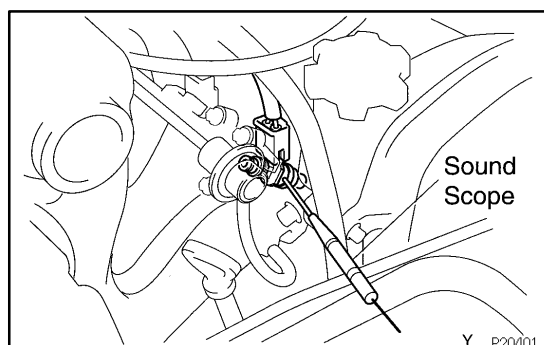
SF0WH-03

### 1. WARM UP ENGINE

Allow the engine to warm up to normal operating temperature.

### 2. CONNECT TOYOTA HAND-HELD TESTER OR OBDII SCAN TOOL

- (a) Remove the fuse cover on the instrument panel.
- (b) Connect the TOYOTA hand-held tester or OBDII scan tool to the DLC3.
- (c) Please refer to the TOYOTA hand-held tester or OBDII scan tool operator's manual for further details.



### 3. INSPECT FUEL CUT OFF PRM

- (a) Increase the engine speed to at least 2,500 rpm.
- (b) Use a sound scope to check for injector operating noise.
- (c) Check that when the throttle lever is released, injector operation noise stops momentarily and then resumes.

HINT:

Measure with the A/C OFF.

**Fuel return rpm: 900 rpm**

### 4. DISCONNECT TOYOTA HAND-HELD TESTER OR OBDII SCAN TOOL

# COOLANT INSPECTION

CO0HQ-03

## 1. CHECK ENGINE COOLANT LEVEL AT RADIATOR RESERVOIR

The engine coolant level should be between the "LOW" and "FULL" lines.

If low, check for leaks and add engine coolant up to the "FULL" line, "when the engine is cold."

## 2. CHECK ENGINE COOLANT QUALITY

(a) Remove the radiator cap.

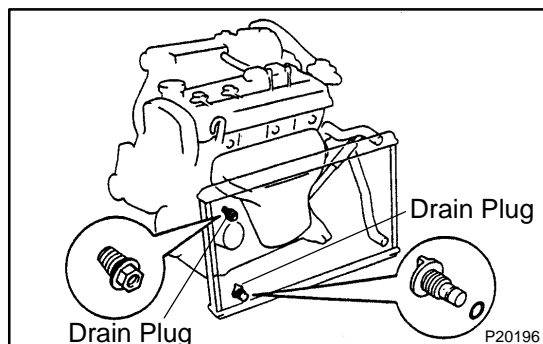
### CAUTION:

**To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.**

(b) There should not be any excessive deposits of rust or scale around the radiator cap or radiator filler hole, and the coolant should be free from oil.

If excessively dirty, replace the coolant.

(c) Reinstall the radiator cap.



## REPLACEMENT

### 1. DRAIN ENGINE COOLANT

- (a) Remove the radiator cap.

#### CAUTION:

**To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.**

- (b) Loosen the radiator drain plug (on the right side of the radiator lower tank) and engine drain plug (on the left front of the cylinder block), and drain the coolant.
- (c) Close the drain plugs.

**Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)**

### 2. FILL ENGINE COOLANT

- (a) Slowly fill the system with coolant.
- Use a good brand of ethylene-glycol base coolant and mix it according to the manufacturer's directions.
  - Using coolant which includes more than 50 % ethylene-glycol (but not more than 70 %) is recommended.

#### NOTICE:

- Do not use an alcohol type coolant.
- The coolant should be mixed with demineralized water or distilled water.

#### Capacity (w/ Heater):

M/T	4.9 liters (5.2 US qts, 4.3 Imp. qts)
A/T	5.3 liters (5.6 US qts, 4.7 Imp. qts)

- (b) Install the radiator cap.
- (c) Start the engine, and bleed the cooling system.
- (d) Refill the radiator reservoir with coolant until it reaches the "FULL" line.

### 3. CHECK ENGINE COOLANT FOR LEAKS