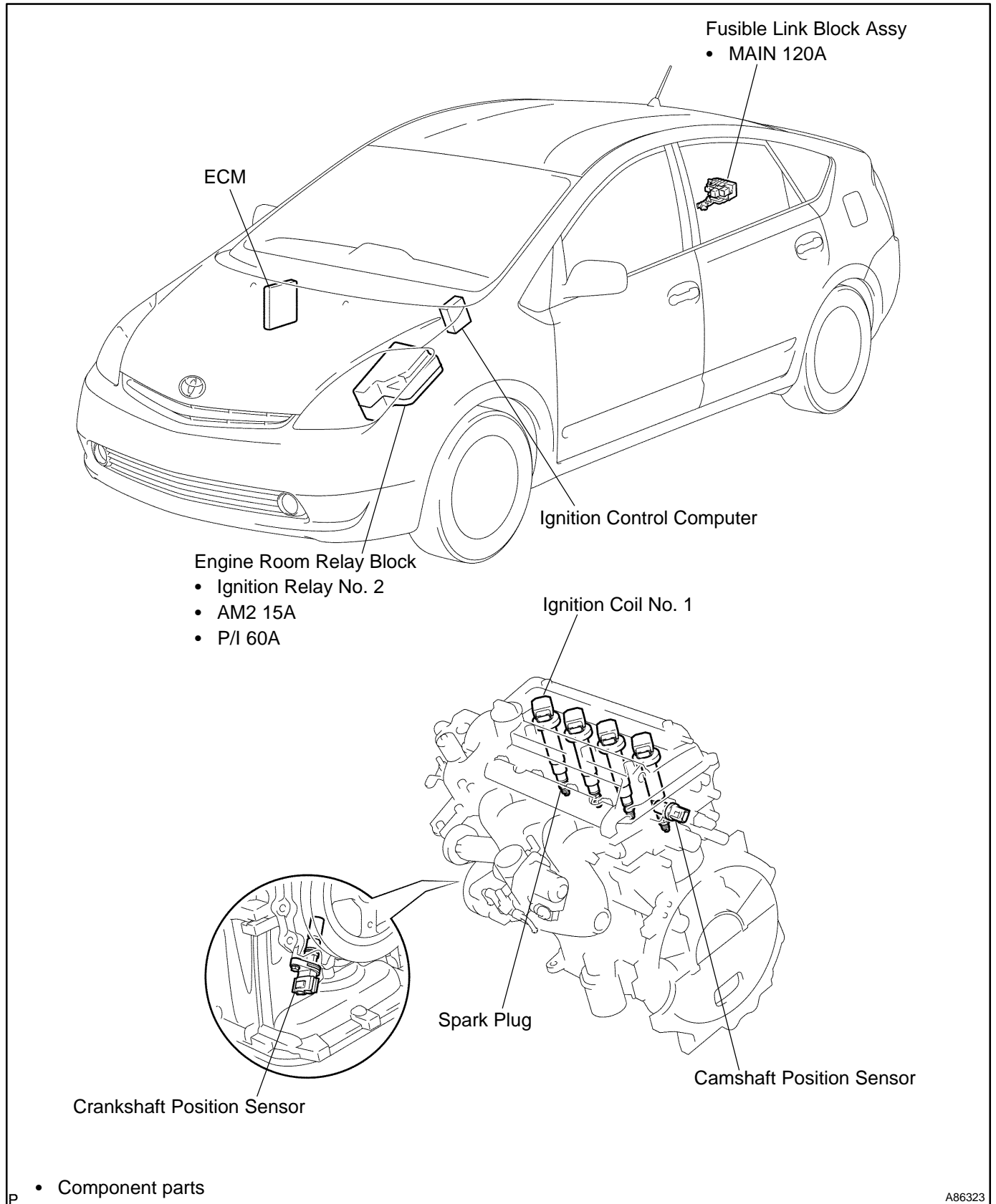


# IGNITION SYSTEM (1NZ-FXE)

## LOCATION

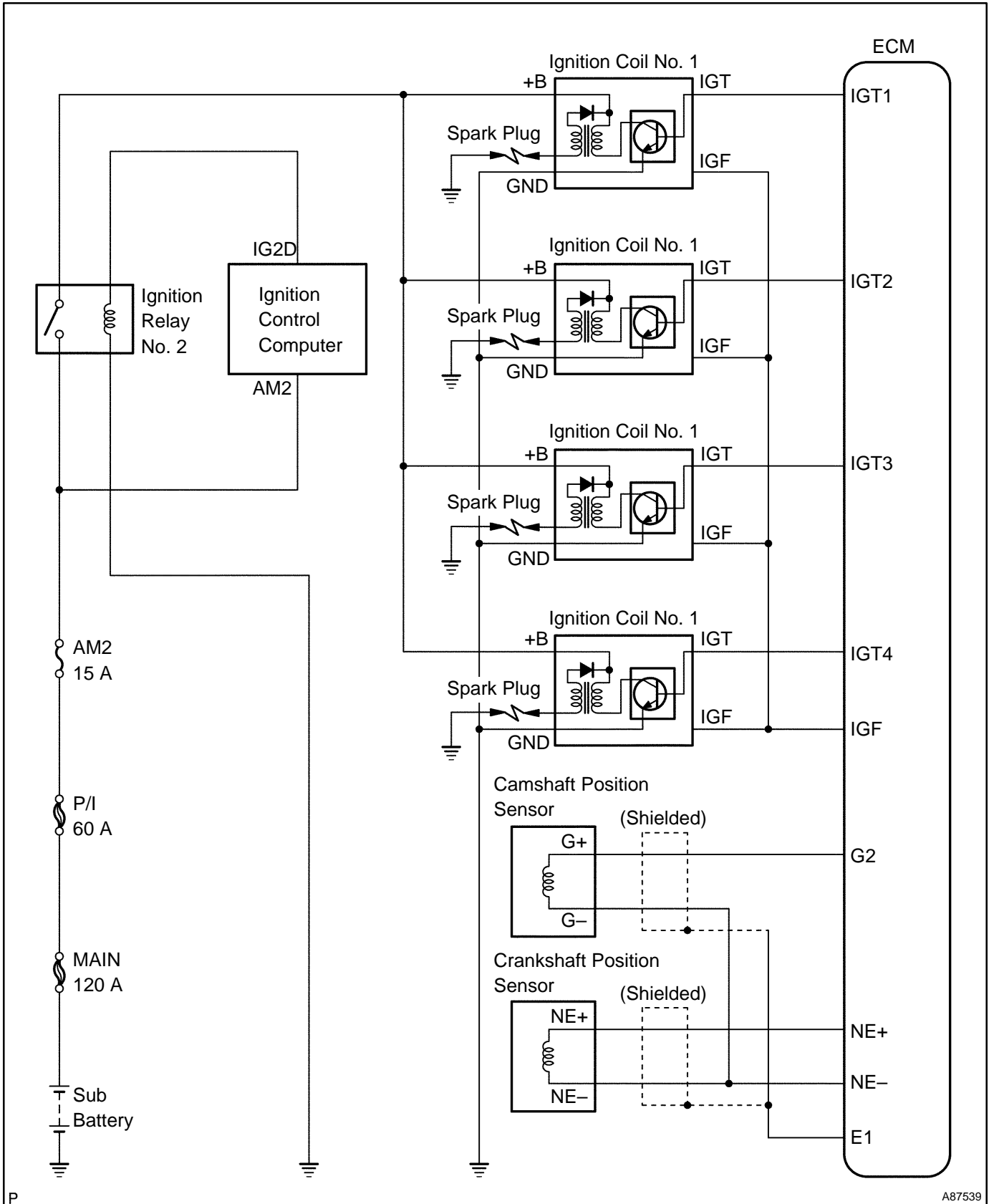
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# SYSTEM DIAGRAM

Ignition timing is determined by the ECM based on signals from various sensors.



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## ON-VEHICLE INSPECTION

### 1. INSPECT IGNITION COIL AND SPARK TEST

#### NOTICE:

- Check that all the fuel injector connectors are not connected before the spark test.
- Perform the spark test after setting the "CRANKING RQST".

#### HINT:

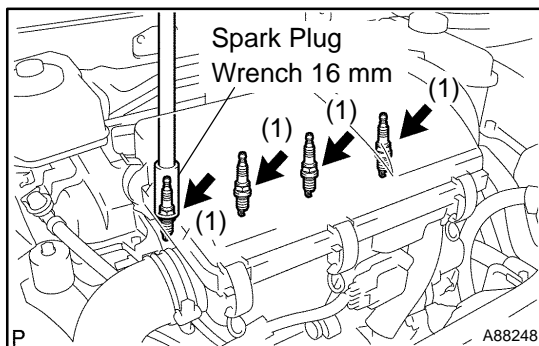
The spark test cannot be performed when the master warning lamp lights up.

- (a) Check the DTCs (see page 05-41).

#### NOTICE:

**If a DTC is present, perform troubleshooting in accordance with procedures for that DTC.**

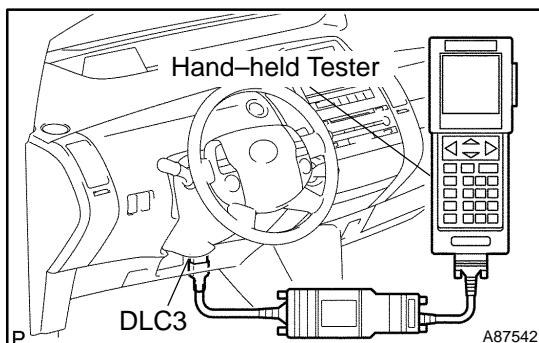
- (b) Remove the rear floor board No. 2 (see page 19-2).  
 (c) Remove the deck floor box rear (see page 19-2).  
 (d) Remove the rear floor board No. 3 (see page 19-2).  
 (e) Disconnect the engine wire No. 3 (battery negative terminal) (see page 19-2).  
 (f) Remove the engine room relay block No. 2 (see page 18-11).  
 (g) Remove all the ignition coils (see page 18-11).



- (h) Remove all the spark plugs.  
 (1) Using a spark plug wrench 16 mm, remove all the spark plugs.

**Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)**

- (i) Remove the air cleaner (see page 10-15).  
 (j) Disconnect all the fuel injector connectors.  
 (k) Install the air cleaner (see page 10-15).  
 (l) Connect the engine wire No. 3 (battery negative terminal) (see page 19-2).



- (m) Connect the hand-held tester to the DLC3.  
 (n) Turn the power switch ON (IG).  
 (o) Turn the hand-held tester ON.  
 (p) On the hand-held tester, select the item: DIAGNOSIS / ENHANCED OBD II / HV ECU / ACTIVE TEST / CRANKING RQST.  
 (q) Forcibly keep the throttle body link fully open by hand.  
 (r) Install the removed spark plug to the ignition coil No. 1, then connect the ignition coil connector.

- (s) Ground the electrode of the spark plug, then check that a spark occurs when pushing the power switch with depressing the brake pedal starts the engine cranking operation.

**NOTICE:**

- **Keep the ignition coil No. 1 straight when checking. If it is laid on its side, keep it straight for over 5 minutes before checking.**
- **Be sure to ground the spark plug when checking.**
- **Replace the ignition coil No. 1 with a new one if it is dropped and impact is given.**

**HINT:**

If a spark does not occur, perform the following test.

**1 SPARK TEST**

**NG**

**2 CHECK CONNECTION OF IGNITION COIL CONNECTOR**

**NG** → **CONNECT SECURELY**

**OK**

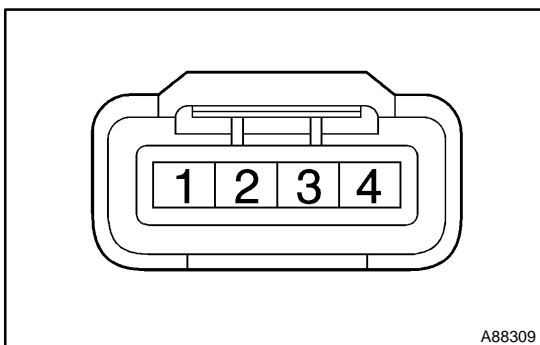
**3 REPLACE IGNITION COIL NO. 1**

- (a) Replace the ignition coil No. 1 with a normal ignition coil No. 1, then perform the test again.

**OK** → **REPLACE IGNITION COIL NO. 1 (See page 18-11)**

**NG**

**4 CHECK POWER SUPPLY TO IGNITION COIL No. 1**



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- (a) Disconnect the ignition coil connector.
- (b) Turn the power switch ON (IG).
- (c) Using a voltmeter, measure the voltage between the terminals.

**Standard:**

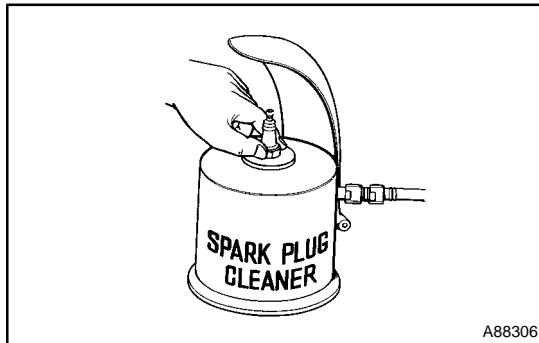
Tester Connection	Specified Condition
1 (+B) - 4 (GND)	9.0 to 14 V

**NG** → **CHECK WIRE HARNESS (BETWEEN IGNITION CONTROL COMPUTER AND IGNITION COIL No. 1)**

**OK**

**5 INSPECT CAMSHAFT POSITION SENSOR (See page 18-6)****NG****REPLACE CAMSHAFT POSITION SENSOR  
(See page 18-8)****OK****6 INSPECT CRANKSHAFT POSITION SENSOR (See page 18-6)****NG****REPLACE CRANKSHAFT POSITION SENSOR  
(See page 18-10)****OK****7 INSPECT ECM (IGT SIGNAL) (See page 05-35)****NG****REPLACE ECM (See page 10-24)****OK****REPAIR WIRE HARNESS (BETWEEN IGNITION COIL ASSY AND ECM)**

# INSPECTION



## 1. INSPECT SPARK PLUG

### NOTICE:

- Do not clean the spark plug with a wire brush.
- Do not adjust the gap of the used spark plug.

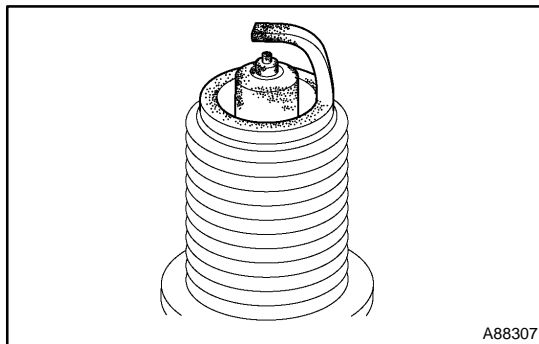
#### (a) Clean the spark plug.

- (1) Using a spark plug cleaner, clean the spark plug.

Air Pressure	Duration
588 kPa (6.0 kgf/cm <sup>2</sup> , 85 psi)	20 second or shorter

### HINT:

- If the electrode is wet, dry it first, then clean it with a spark plug cleaner.
- If the spark plug is wet with oil, remove the oil with gasoline before using a spark plug cleaner.

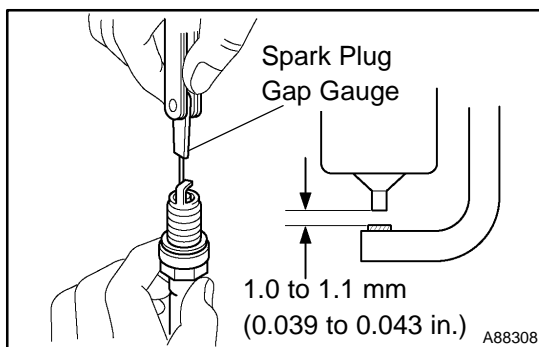


#### (b) Check the appearance.

- (1) Check that the threads or insulator of the spark plug are not damaged.

### Recommendes spark plug:

Supplier	Type
DENSO	SK16R11
NGK	IFR5A11



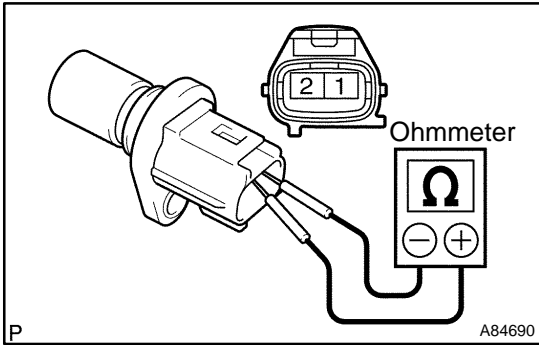
#### (c) Inspect the gap.

- (1) Using a spark plug gap gauge, measure the gap of the spark plug.

**Standard: 1.0 to 1.1 mm (0.039 to 0.043 in.)**

**Maximum: 1.2 mm (0.047 in.)**

If the gap is greater than maximum, replace the spark plug.



**2. INSPECT CAMSHAFT POSITION SENSOR**

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

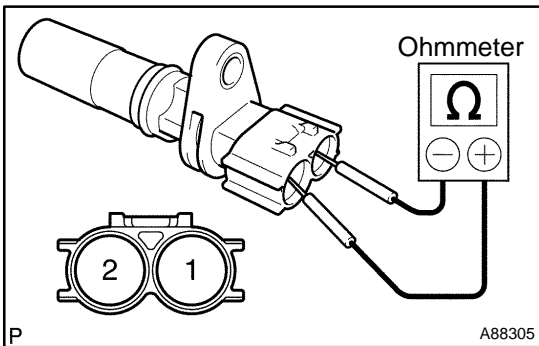
**Standard:**

Tester Connection	Specified Condition
1 (G+) - 2 (G-)	1,630 to 2,740 Ω (Hot)
1 (G+) - 2 (G-)	2,065 to 3,225 Ω (Cold)

**NOTICE:**

"Cold" and "Hot" mean the temperature of the parts themselves. "Cold" is from -10 to 50°C (from 14 to 122°F) and "Hot" is from 50 to 100°C (from 122 to 212°F).

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



**3. INSPECT CRANKSHAFT POSITION SENSOR**

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

**Standard:**

Tester Connection	Specified Condition
1 (NE+) - 2 (NE-)	985 to 1,600 Ω (Cold)
1 (NE+) - 2 (NE-)	1,265 to 1,890 Ω (Hot)

**NOTICE:**

"Cold" and "Hot" mean the temperature of the parts themselves. "Cold" is from -10 to 50°C (from 14 to 122°F) and "Hot" is from 50 to 100°C (from 122 to 212°F).

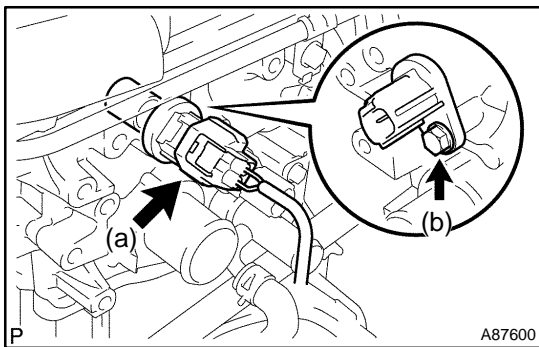
If the resistance is not as specified, replace the crankshaft position sensor.

# CAMSHAFT POSITION SENSOR (1NZ-FXE)

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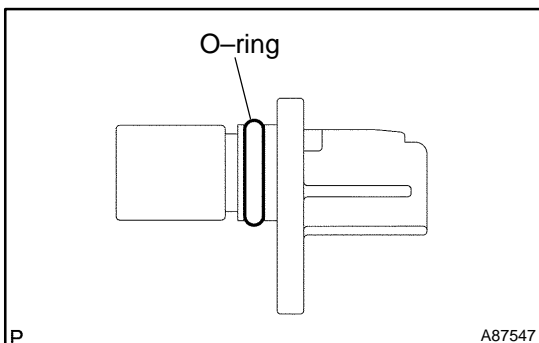
## REPLACEMENT

1. PRECAUTION (See page 21-7)
2. REMOVE RADIATOR SUPPORT OPENING COVER (See page 10-15)
3. REMOVE ENGINE UNDER COVER LH
4. REMOVE ENGINE UNDER COVER RH
5. DRAIN HV COOLANT (See page 22-4)
6. REMOVE REAR FLOOR BOARD NO.2 (See page 19-2)
7. REMOVE DECK FLOOR BOX REAR (See page 19-2)
8. REMOVE REAR FLOOR BOARD NO.3 (See page 19-2)
9. DISCONNECT ENGINE WIRE NO.3 (BATTERY NEGATIVE TERMINAL) (See page 19-2)
10. REMOVE SERVICE PLUG GRIP (See page 21-116)
11. REMOVE WINDSHIELD WIPER ARM COVER
12. REMOVE FR WIPER ARM RH (See page 66-14)
13. REMOVE FR WIPER ARM LH (See page 66-14)
14. REMOVE HOOD TO COWL TOP SEAL (See page 66-14)
15. REMOVE COWL TOP VENTILATOR LOUVER LH (See page 66-14)
16. REMOVE COWL TOP VENTILATOR LOUVER RH (See page 66-14)
17. REMOVE WINDSHIELD WIPER LINK ASSY (See page 66-14)
18. REMOVE COWL TOP PANEL SUB-ASSY OUTER FRONT (See page 11-15)
19. REMOVE INVERTER COVER (See page 21-23)
20. VERIFY THAT VOLTAGE OF W/CONVERTER INVERTER ASSY IS 0V (See page 21-23)
21. DISCONNECT INVERTER COOLING HOSE NO.2 (See page 21-23)
22. DISCONNECT INVERTER COOLING HOSE NO.1 (See page 21-23)
23. DISCONNECT INVERTER COOLING HOSE NO.6 (See page 21-23)
24. SEPARATE CIRCUIT BREAKER SENSOR NO.1 (See page 21-23)
25. DISCONNECT FRAME WIRE NO.2 (See page 21-23)
26. REMOVE W/CONVERTER INVERTER ASSY (See page 21-23)



### 27. REMOVE CAMSHAFT POSITION SENSOR

- (a) Disconnect the camshaft position sensor connector.
- (b) Remove the bolt, then remove the camshaft position sensor.



### 28. INSTALL CAMSHAFT POSITION SENSOR

- (a) Apply a light coat of engine oil to the O-ring of the camshaft position sensor.
- (b) Install the camshaft position sensor with the bolt.

**Torque: 8.0 N·m (82 kgf·cm, 71 in.-lbf)**

#### NOTICE:

**Be careful that the O-ring is not cracked or jammed when installing.**

- (c) Connect the camshaft position sensor connector.



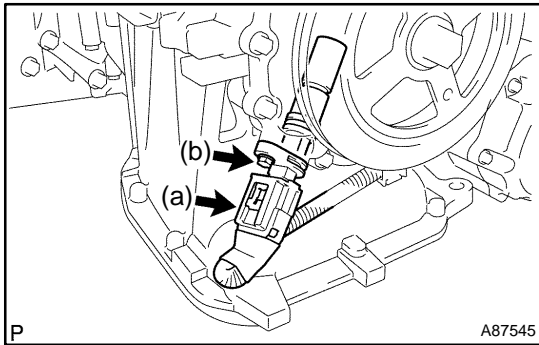
29. INSTALL W/CONVERTER INVERTER ASSY (See page 21-23)
30. CONNECT FRAME WIRE NO.2 (See page 21-23)
31. CONNECT CIRCUIT BREAKER SENSOR NO.1 (See page 21-23)
32. CONNECT INVERTER COOLING HOSE NO.6
33. CONNECT INVERTER COOLING HOSE NO.1
34. CONNECT INVERTER COOLING HOSE NO.2
35. INSTALL INVERTER COVER (See page 21-23)
36. INSTALL COWL TOP PANEL SUB-ASSY OUTER FRONT (See page 11-15)
37. INSTALL WINDSHIELD WIPER LINK ASSY (See page 66-14)
38. INSTALL SERVICE PLUG GRIP (See page 21-116)
39. CONNECT ENGINE WIRE NO.3 (BATTERY NEGATIVE TERMINAL) (See page 19-2)
40. ADD HV COOLANT (See page 22-4)
41. CHECK FOR HV COOLANT LEAKS
42. CHECK FOR ENGINE OIL LEAKS
43. INSTALL COWL TOP VENTILATOR LOUVER RH
44. INSTALL COWL TOP VENTILATOR LOUVER LH
45. INSTALL HOOD TO COWL TOP SEAL
46. INSTALL FR WIPER ARM LH (See page 66-14)
47. INSTALL FR WIPER ARM RH (See page 66-14)
48. INSTALL WINDSHIELD WIPER ARM COVER
49. INSTALL REAR FLOOR BOARD NO.3
50. INSTALL DECK FLOOR BOX REAR
51. INSTALL REAR FLOOR BOARD NO.2
52. INSTALL ENGINE UNDER COVER RH
53. INSTALL ENGINE UNDER COVER LH
54. INSTALL RADIATOR SUPPORT OPENING COVER
55. POWER WINDOW CONTROL SYSTEM INITIALIZE (See page 01-28)

# CRANKSHAFT POSITION SENSOR (1NZ-FXE)

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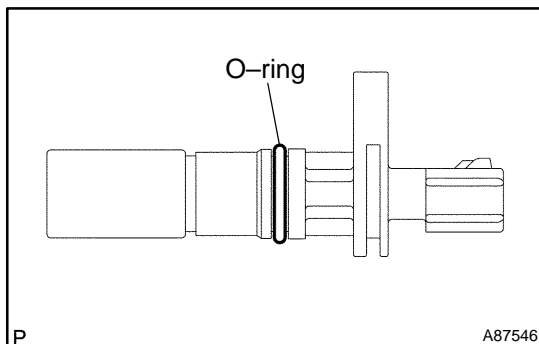
## REPLACEMENT

1. REMOVE REAR FLOOR BOARD NO.2 (See page 19-2)
2. REMOVE DECK FLOOR BOX REAR (See page 19-2)
3. REMOVE REAR FLOOR BOARD NO.3 (See page 19-2)
4. DISCONNECT ENGINE WIRE NO.3 (BATTERY NEGATIVE TERMINAL) (See page 19-2)



### 5. REMOVE CRANKSHAFT POSITION SENSOR

- (a) Disconnect the crankshaft position sensor connector.
- (b) Remove the bolt, then remove the crankshaft position sensor.



### 6. INSTALL CRANKSHAFT POSITION SENSOR

- (a) Apply a light coat of engine oil to the O-ring of the crankshaft position sensor.
- (b) Install the crankshaft position sensor with the bolt.

**Torque: 7.5 N·m (76 kgf·cm, 66 in.·lbf)**

#### NOTICE:

**Be careful that the O-ring is not cracked or jammed when installing.**

- (c) Connect the crankshaft position sensor connector.

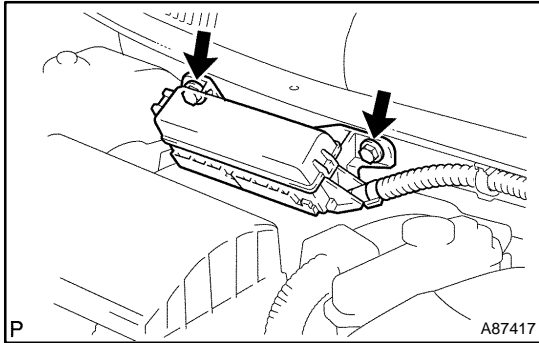
7. CONNECT ENGINE WIRE NO.3 (BATTERY NEGATIVE TERMINAL) (See page 19-2)
8. CHECK FOR ENGINE OIL LEAKS
9. INSTALL REAR FLOOR BOARD NO.3
10. INSTALL DECK FLOOR BOX REAR
11. INSTALL REAR FLOOR BOARD NO.2
12. POWER WINDOW CONTROL SYSTEM INITIALIZE (See page 01-28)

# IGNITION COIL NO.1 (1NZ-FXE)

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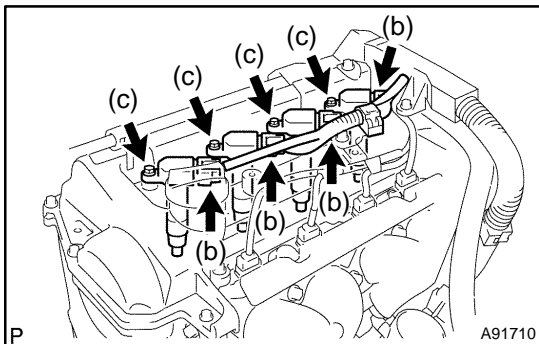
## REPLACEMENT

1. REMOVE REAR FLOOR BOARD NO.2 (See page 19-2)
2. REMOVE DECK FLOOR BOX REAR (See page 19-2)
3. REMOVE REAR FLOOR BOARD NO.3 (See page 19-2)
4. DISCONNECT ENGINE WIRE NO.3 (BATTERY NEGATIVE TERMINAL) (See page 19-2)



### 5. REMOVE IGNITION COIL NO.1

- (a) Remove the 2 bolts, then remove the engine room relay block No. 2.



- (b) Disconnect the 4 ignition coil connectors.
- (c) Remove the 4 bolts, then remove the 4 ignition coils.

HINT:

Each ignition coil is installed with 1 bolt.

### 6. INSTALL IGNITION COIL NO.1

- (a) Install the 4 ignition coils with the 4 bolts.  
**Torque: 9.0 N·m (92 kgf·cm, 82 in·lbf)**

HINT:

Each ignition coil is installed with 1 bolt.

- (b) Connect the 4 ignition coil connectors.
- (c) Install the engine room relay block No. 2 with the 2 bolts.

**Torque: 8.4 N·m (86 kgf·cm, 74 in·lbf)**

7. CONNECT ENGINE WIRE NO.3 (BATTERY NEGATIVE TERMINAL) (See page 19-2)
8. INSTALL REAR FLOOR BOARD NO.3
9. INSTALL DECK FLOOR BOX REAR
10. INSTALL REAR FLOOR BOARD NO.2
11. POWER WINDOW CONTROL SYSTEM INITIALIZE (See page 01-28)