

# IGNITION SYSTEM

## ON-VEHICLE INSPECTION

IGOKF-01

**NOTICE:**

"Cold" and "Hot" in these sentences express the temperature of the coils and sensors themselves. "Cold" is from  $-10^{\circ}\text{C}$  ( $14^{\circ}\text{F}$ ) to  $50^{\circ}\text{C}$  ( $122^{\circ}\text{F}$ ) and "Hot" is from  $50^{\circ}\text{C}$  ( $122^{\circ}\text{F}$ ) to  $100^{\circ}\text{C}$  ( $212^{\circ}\text{F}$ ).

**1. INSPECT IGNITER AND SPARK TEST**

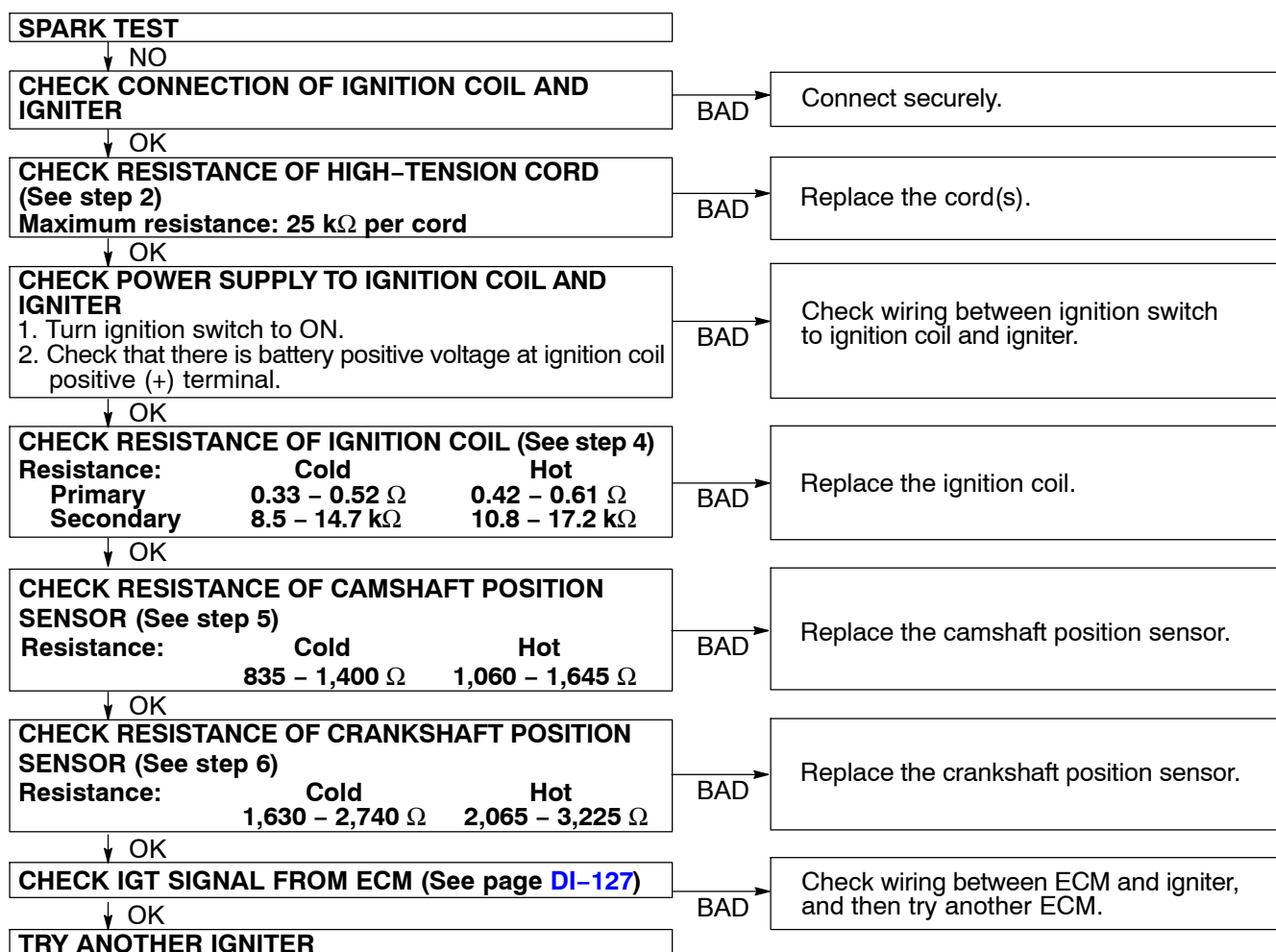
Check that the spark occurs.

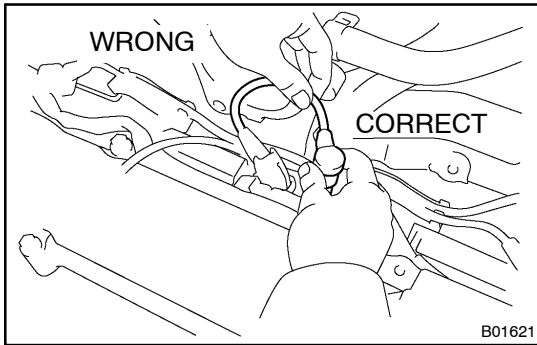
- (1) Disconnect the 6 injector connectors.
- (2) Remove the ignition coil (See page IG-7).
- (3) Remove the spark plug.
- (4) Install the spark plug to the ignition coil, and connect the ignition coil connector.
- (5) Ground the spark plug.
- (6) Check if spark occurs while engine is being cranked.

**NOTICE:**

To prevent excess fuel being injected from the injectors during this test, do not crank the engine for more 5 – 10 seconds at a time.

If the spark does not occur, do the test as follows:





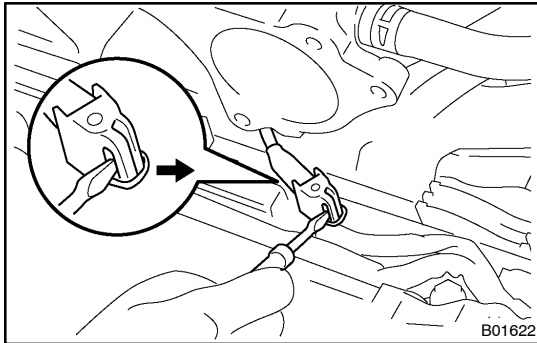
## 2. INSPECT HIGH-TENSION CORDS

- Remove the No.3 timing belt cover.
- Remove the throttle body gasket (See page IG-7).
- Disconnect the high-tension cord set from the spark plugs.

Disconnect the high-tension cords at the rubber boot.  
DO NOT pull on the cords.

### NOTICE:

**Pulling on or bending the cords may damage the conductor inside.**

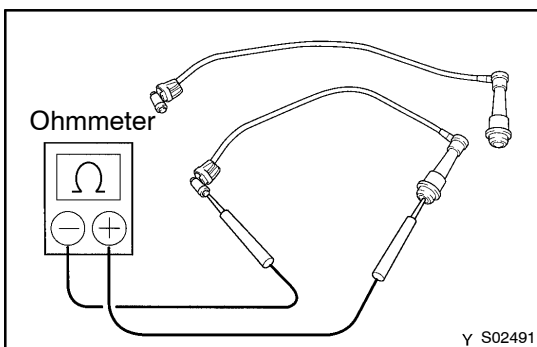


- Disconnect the high-tension cord set from the ignition coils.

- Using a screwdriver, lift up the lock claw and disconnect the holder from the ignition coils.
- Disconnect the high-tension cord at the grommet.  
DO NOT pull on the cord.

### NOTICE:

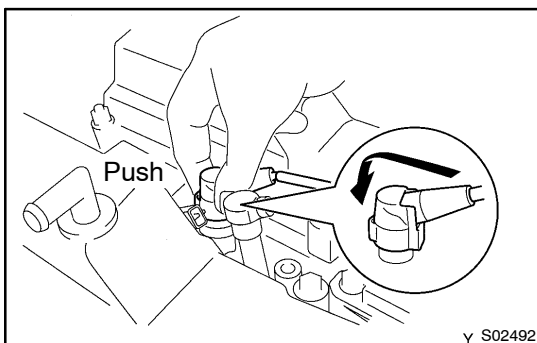
- Pulling on or bending the cords may damage the conductor inside.**
- Do not wipe any of the oil from the grommet after the high-tension cord is disconnected.**



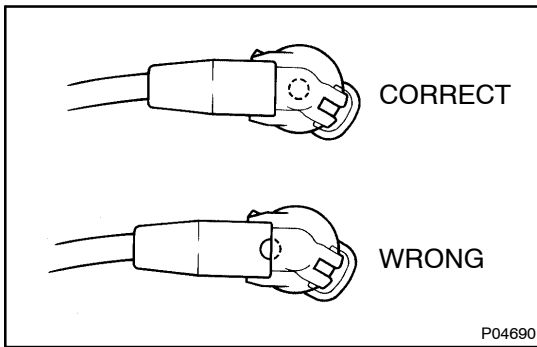
- Using an ohmmeter, measure the resistance.

**Maximum resistance: 25 kΩ per cord**

If the resistance is greater than the maximum, check the terminals. If necessary, replace the high-tension cord.



- Reconnect the high-tension cord set to the ignition coils.
- Assemble the holder and grommet.
  - Align the spline of the ignition coil with the spline of the holder, and push in the cord.

**NOTICE:**

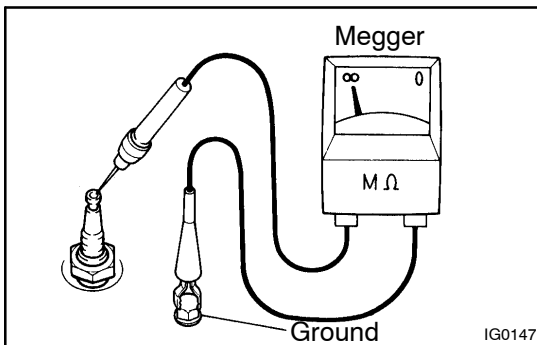
**Check that the holder is correctly installed to the grommet as shown in the illustration.**

- (3) Check that the lock claw of the holder is engaged by lightly pulling the holder.
- (g) Reconnect the high-tension cord set to the spark plugs.
- (h) Reinstall the throttle body gasket (See page IG-9).
- (i) Reinstall the No.3 timing belt cover.

**3. INSPECT SPARK PLUGS****NOTICE:**

- **Never use a wire brush for cleaning.**
- **Never attempt to adjust the electrode gap on used a spark plug.**
- **spark plugs should be replaced every 100,000 km (60,000 miles).**

- (a) Remove the ignition coils and high-tension cord set assembly (See page IG-7).



- (b) Inspect the electrode.
  - Using a megger (insulation resistance meter), measure the insulation resistance.

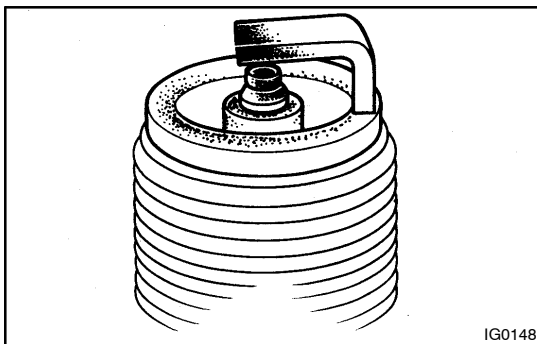
**Standard correct insulation resistance:**

**10 MΩ or more**

If the resistance is less than specified, proceed to step (d).

**HINT:**

If a megger is not available, the following simple method of inspection provides fairly accurate results.



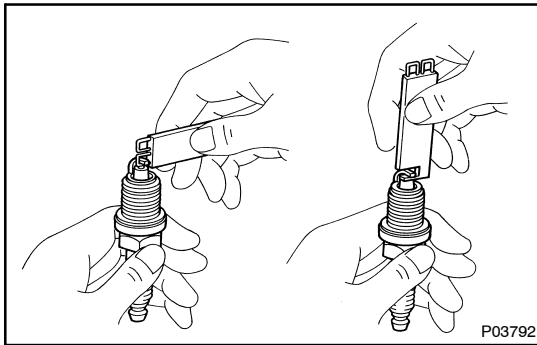
- **Simple Method:**
  - Quickly race the engine 5 times to 4,000 rpm.
  - Remove the spark plug. (See step c)
  - Visually check the spark plug.
    - If the electrode is dry...OK
    - If the electrode is wet...Proceed to step (d)
  - Reinstall the spark plug. (See step g)

- (c) Using a 16 mm plug wrench, remove the 6 spark plugs.
- (d) Visually check the spark plug for thread damage and insulator damage.

If abnormal, replace the spark plug.

**Recommended spark plug:**

DENSO made	SK16R-P11
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- (e) Inspect the electrode gap.

**Maximum electrode gap for used spark plug:**  
**1.2 mm (0.047 in.)**

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

**Correct electrode gap for new spark plug:**  
**1.0 – 1.1 mm (0.039 – 0.043 in.)**

**NOTICE:**

**If adjusting the gap of a new spark plug, bend only the base of the ground electrode. Do not touch the tip. Never attempt to adjust the gap on the used plug.**

- (f) Clean the spark plugs.

If the electrode has traces of wet carbon, allow it to dry and then clean with a spark plug cleaner.

**Air pressure: Below 588 kPa (6 kgf/cm<sup>2</sup>, 85 psi)**

**Duration: 20 seconds or less**

**HINT:**

If there are traces of oil, remove it with gasoline before using the spark plug cleaner.

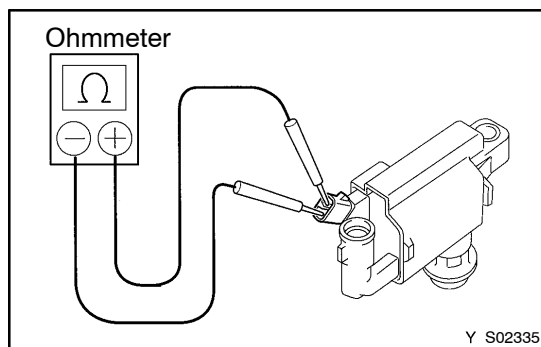
- (g) Using a 16 mm plug wrench, reinstall the 6 spark plugs.

**Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)**

- (h) Reinstall the ignition coils and high-tension cord set assembly (See page [IG-9](#)).

**4. INSPECT IGNITION COILS**

- (a) Remove the ignition coil assembly (See page [IG-7](#)).

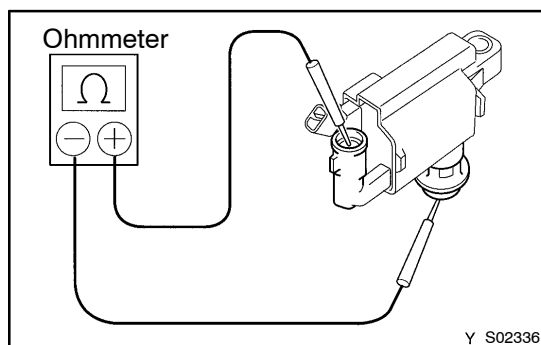


- (b) Using an ohmmeter, measure the resistance between the positive (+) and negative (–) terminals.

**Primary coil resistance :**

Cold	0.33 – 0.52 Ω
Hot	0.42 – 0.61 Ω

If the resistance is not as specified, replace the ignition coil.



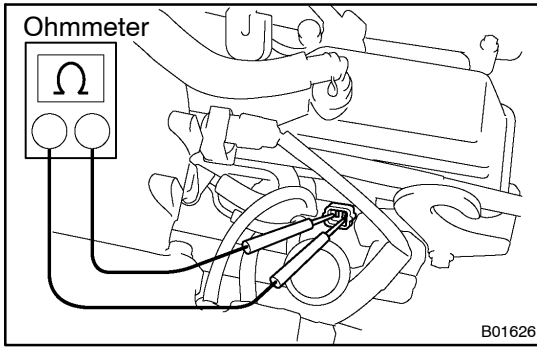
- (c) Using an ohmmeter, measure the resistance between the positive (+) and high-tension terminal.

**Secondary coil resistance:**

Cold	8.5 – 14.7 kΩ
Hot	10.8 – 17.2 kΩ

If the resistance is not as specified, replace the ignition coil.

- (d) Reinstall the ignition coil assembly (See page [IG-9](#)).



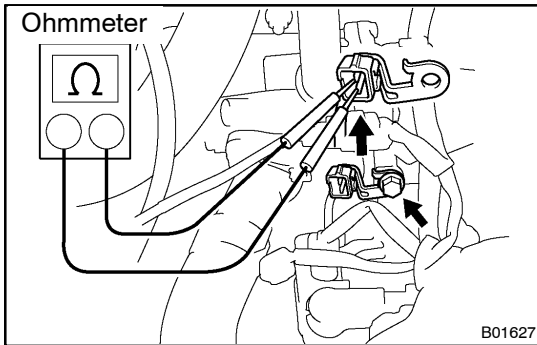
### 5. INSPECT CAMSHAFT POSITION SENSOR

- (a) Disconnect the camshaft position sensor connector.
- (b) Using an ohmmeter, measure the resistance between terminals.

#### Resistance:

Cold	835 – 1,400 Ω
Hot	1,060 – 1,645 Ω

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



- (c) Reconnect the camshaft position sensor connector.

### 6. INSPECT CRANKSHAFT POSITION SENSOR

- (a) Disconnect the crankshaft position sensor connector.
- (b) Remove the bolt holding the connector bracket to the water pump.
- (c) Using an ohmmeter, measure the resistance between terminals.

#### Resistance:

Cold	1,630 – 2,740 Ω
Hot	2,065 – 3,225 Ω

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

- (d) Reinstall the bolt holding the connector bracket to the water pump.
- (e) Reconnect the crankshaft position sensor connector.