

IGNITION SYSTEM

ON-VEHICLE INSPECTION

IGOK5-04

NOTICE:

”Cold” and ”Hot” in these 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).

1. INSPECT IGNITER AND SPARK TEST

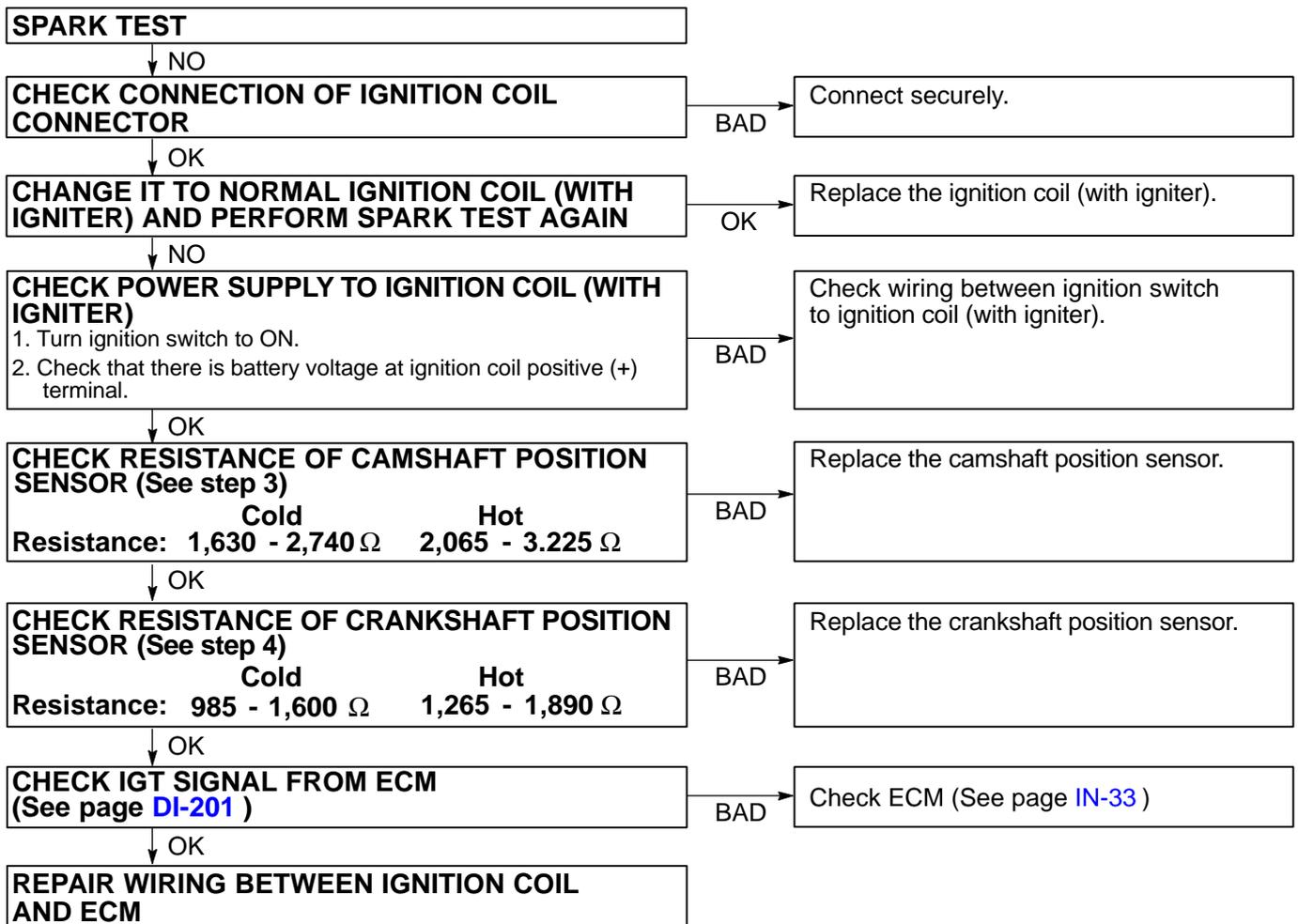
Check that the spark occurs.

- (1) Remove the ignition coil (See page IG-7).
- (2) Using a 16 mm plug wrench, remove the spark plug.
- (3) Install the spark plug to the ignition coil, and connect the ignition coil connector.
- (4) Ground the spark plug.
- (5) Check if spark occurs while engine is being cranked.

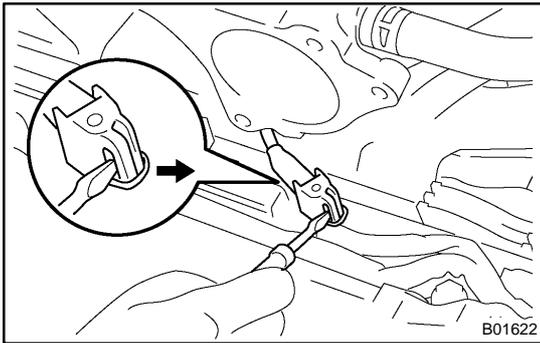
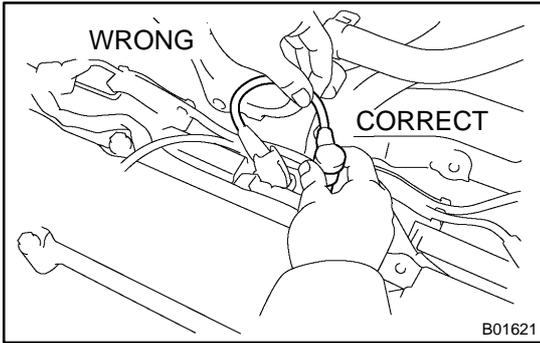
NOTICE:

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:



- (6) Using a 16 mm plug wrench, reinstall the spark plug.
Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)
- (7) Reinstall the ignition coil (See page IG-9).



2. INSPECT HIGH-TENSION CORDS

- (a) Remove the No.3 timing belt cover.
- (b) Remove the throttle body gasket (See page IG-7).
- (c) 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.

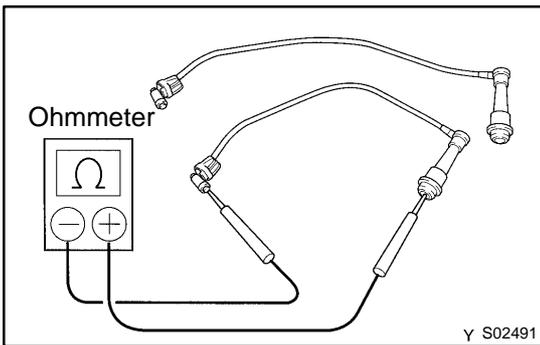
NOTICE:

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

- (d) Disconnect the high-tension cord set from the ignition coils.
 - (1) Using a screwdriver, lift up the lock claw and disconnect the holder from the ignition coils.
 - (2) Disconnect the high-tension cord at the grommet. **DO NOT** pull on the cord.

NOTICE:

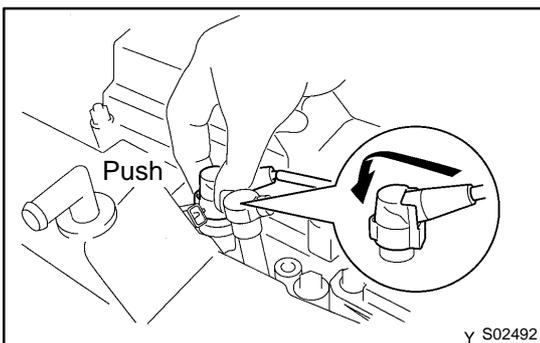
- **Pulling on or bending the cords may damage the conductor inside.**
- **Do not wipe any of the oil from the grommet after the high-tension cord is disconnected.**



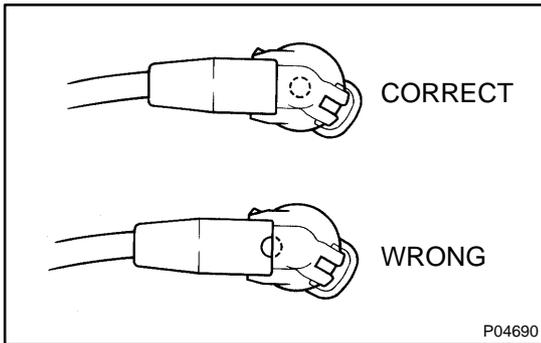
- (e) Using an ohmmeter, measure the resistance.

Maximum resistance: 25 kΩ per cord

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



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



NOTICE:

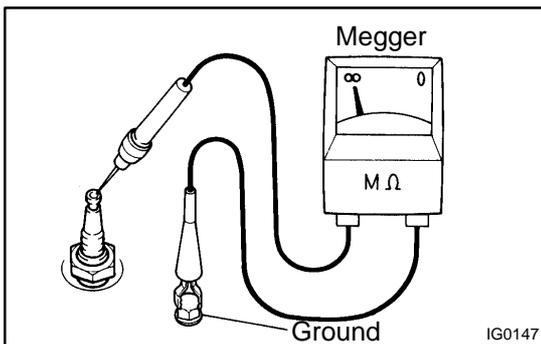
Check that the holder is correctly installed to the grommet as shown in the illustration.

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



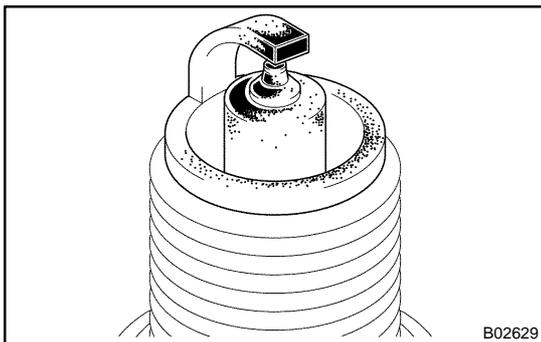
- (b) Inspect the electrode.
 - Using a megger (insulation resistance meter), measure the insulation resistance.

**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.



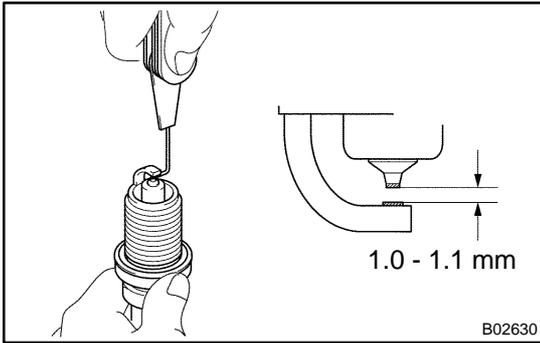
- **Simple Method:**
 - Quickly race the engine 5 times to 4,000 rpm.
 - Remove the spark plug (See step c).
 - Visually check the spark plug.
 - If the electrode is dry ... OK
 - If the electrode is wet ... Proceed to step (d)
 - Reinstall the spark plug (See step g).

- (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:
 1.1 mm (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/cm², 85 psi)

Duration: 20 seconds or less

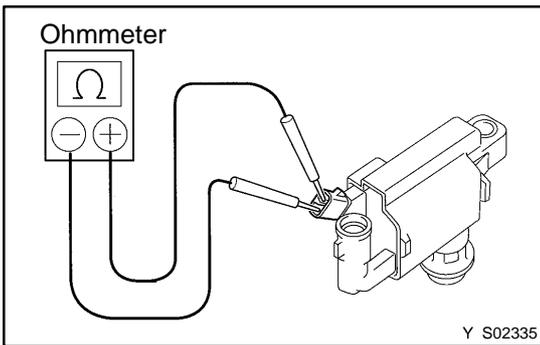
HINT:

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).

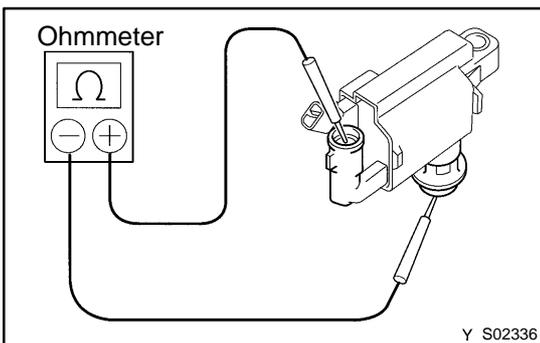


- (b) Using an ohmmeter, measure the resistance between the positive (+) and negative (-) terminals.

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.



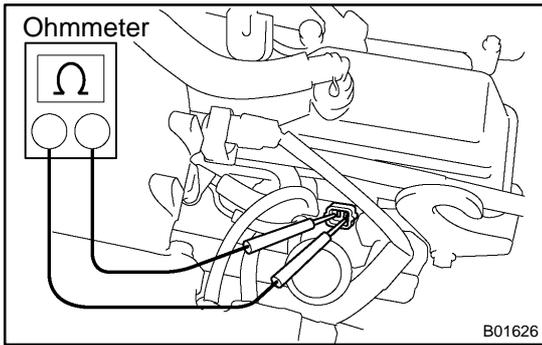
- (c) Using an ohmmeter, measure the resistance between the positive (+) and high-tension terminal.

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

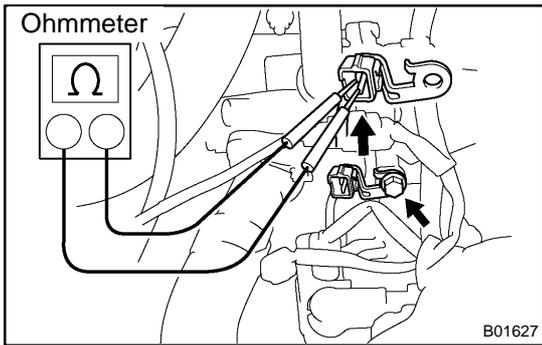
- (a) Disconnect the sensor connector.
- (b) Using an ohmmeter, measure the resistance between terminals.

Resistance:

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

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

- (c) Reconnect the camshaft position sensor connector.



6. INSPECT CRANKSHAFT POSITION SENSOR

- (a) Disconnect the 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 sensor connector.