

## ON-VEHICLE INSPECTION

### 1. CHECK IGNITION COIL ASSEMBLY AND PERFORM SPARK TEST

- (a) Check for DTCs.

**NOTICE:**

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

- (b) Check that sparks occur.
- (1) Remove the ignition coils.
  - (2) Using a 16 mm plug wrench, remove the spark plugs.
  - (3) Install the spark plugs onto the ignition coils, and connect the ignition coil connectors.
  - (4) Disconnect the 6 injector connectors.
  - (5) Ground the spark plugs.
  - (6) Check that sparks occur at each spark plug while the engine is being cranked.

**NOTICE:**

- **Be sure to ground the spark plugs when checking.**
- **Replace any ignition coils that have been subjected to any physical impact.**
- **Do not crank the engine for more than 2 seconds.**

If sparks do not occur, perform the following test:

- (c) Spark test flow chart.
- (1) Check that the wire harness side connector of ignition coil with igniter is securely connected.

**Result**

Result	Proceed to
NG	Connect securely.
OK	Go to next step.

- (2) Perform the spark test on each ignition coil with igniter.
  1. Replace the ignition coil with igniter with a functioning one.
  2. Perform the spark test again.

**Result**

Result	Proceed to
OK	Replace ignition coil with igniter.
NG	Go to next step.

- (3) Check that the power is supplied to the ignition coil.
  1. Turn the ignition switch ON.
  2. Check that the positive (+) battery voltage is applied to the positive (+) terminal of the ignition coil.

**Result**

Result	Proceed to
NG	Check wiring between ignition switch and ignition coil assembly.
OK	Go to next step.

- (4) Measure the output voltage of the VVT sensor.  
 1. Inspect the VVT sensor in accordance with the procedure (See page ES-192).

**Result**

Result	Proceed to
NG	Replace VVT sensor
OK	Go to next step.

- (5) Check the resistance in crankshaft position sensor.

**Standard resistance**

Standard condition	Specified condition
at 20°C (68°F)	1,850 to 2,450 Ω

**Result**

Result	Proceed to
NG	Replace the crankshaft position sensor.
OK	Go to next step.

- (6) Check the IGT signal from the ECM.

**Result**

Result	Proceed to
NG	Check ECM
OK	Repair wiring between ignition coil and ECM.

- (d) Using a 16 mm plug wrench, install the spark plugs.  
 (e) Install the ignition coils.

**2. INSPECT SPARK PLUG**

**NOTICE:**

**Do not use a wire brush for cleaning.**

- (a) Check the electrode.  
 (1) Using a megaohmmeter, measure the insulation resistance.

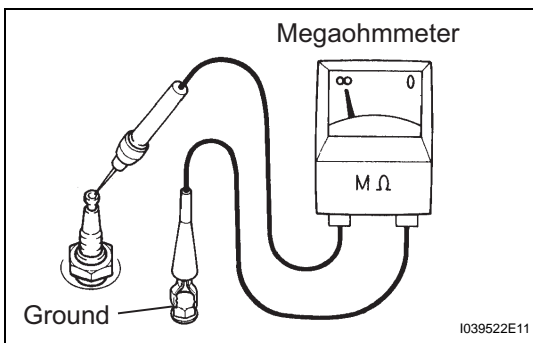
**Standard resistance:**

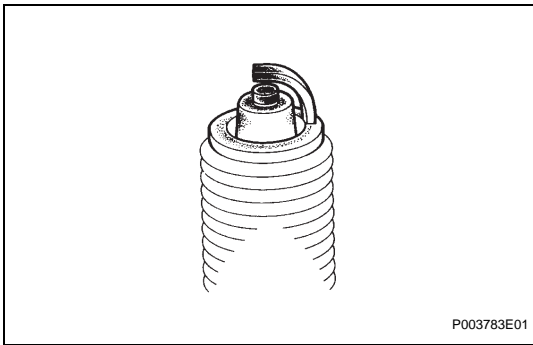
**10 MΩ or more**

**HINT:**

- If the result is not as specified, clean the spark plug with a spark plug cleaner and measure the resistance again.
- If a megaohmmete is not available, perform the following simple inspection instead.

- (b) Alternative inspection method.  
 (1) Quickly accelerate the engine to 4,000 rpm 5 times.  
 (2) Remove the spark plug.

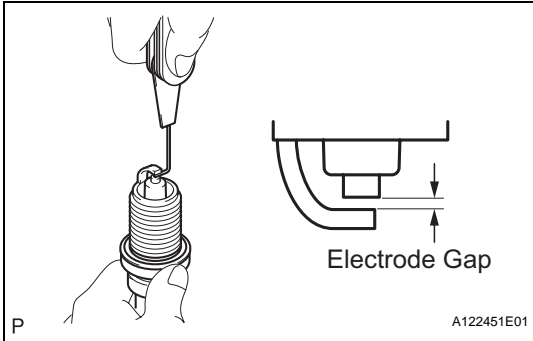




- (3) Visually check the spark plug.  
If the electrode is dry, the spark plug is functioning properly. If the electrode is damp, proceed to the next step.
- (c) Check the spark plug for any damage to its thread and insulator.  
If there is damage, replace the spark plug.

**Recommended spark plug**

Manufacturer	Product
DENSO	K20HR-U11
NGK	LFR6C11



- (d) Check the spark plug electrode gap.  
**Maximum electrode gap for used spark plug**

Product	Electrode gap
K20HR-U11	1.1 mm (0.043 in.)
LFR6C11	1.1 mm (0.043 in.)

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

**Electrode gap for new spark plug**

Product	Electrode gap
K20HR-U11	1.0 to 1.1 mm (0.039 to 0.043 in.)
LFR6C11	1.0 to 1.1 mm (0.039 to 0.043 in.)

- (e) Clean the spark plug.  
If the electrode has traces of wet carbon, clean the electrode with a spark plug cleaner and then dry it.

**Air pressure:**

**Below 588 kPa (6 kg/cm<sup>2</sup>, 85 psi)**

**Duration:**

**20 seconds or less**

**HINT:**

Only use the spark plug cleaner when the electrode is free of oil. If the electrode has traces of oil, use gasoline to clean off the oil before using the spark plug cleaner.

