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 to each ignition coil, and connect the ignition coil connectors.

(4) Disconnect the 6 injector connectors.

(5) Ground the spark plugs.

(6) Check if sparks occur at each spark plug while the engine is being cranked.

NOTICE:

- **Be sure to ground the spark plug when checking.**
- **Replace the ignition coil if it receives an 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 connector.

Result

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

(2) Perform spark test on each ignition coil with igniter.

1.Replace ignition coil with igniter with a normal one.

2.Perform spark test again.

Result

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

(3) Check power supply to ignition coil.

1.Turn ignition switch ON.

2.Check that there is battery positive (+) voltage at ignition coil positive (+) terminal.

Result

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

(4) Check resistance in VVT sensor out put voltage (see step 2).

Result

Result	Proceed to
NG	Following test 1 and 2.
OK	Go to next step.

1. Check that the wiring between VVT sensor and ECM.

Result

Result	Proceed to
NG	Repair wiring between VVT sensor and ECM.
OK	Repair VVT sensor

(5) Check resistance in crankshaft position sensor.

Standard resistance

Standard condition	Specified condition
at 20°C (68°F)	1850 to 2450 Ω

Result

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

(6) Check IGT signal from 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.

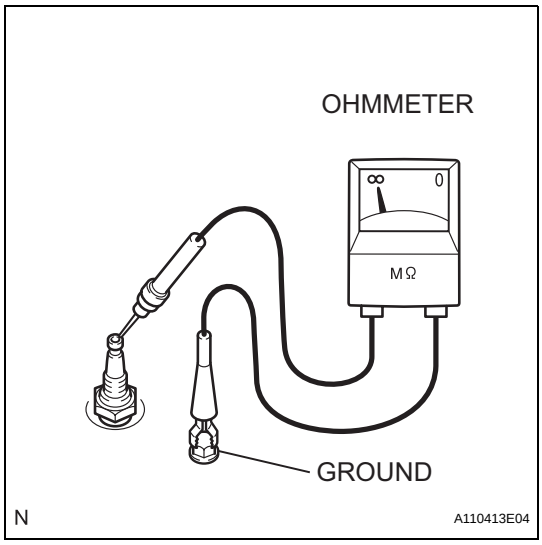
2. CHECK SPARK PLUG

NOTICE:

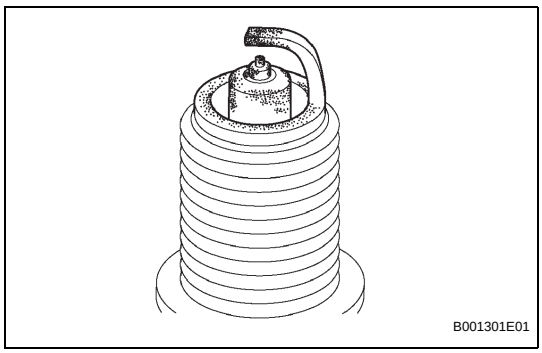
- **Never use a wire brush for cleaning.**
- **Never attempt to adjust the electrode gap on a used spark plug.**
- **The spark plug should be replaced every 200,000 km (120,000 miles).**

(a) Remove the engine cover.
(b) Remove the air cleaner.
(c) Remove the ignition coil.
(d) Remove the spark plug.

IG



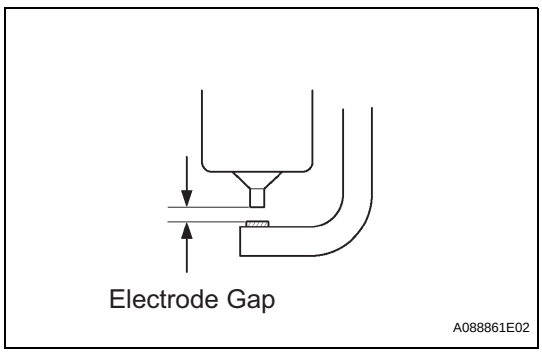
(e) Check the electrode.
(1) Using an ohmmeter, measure the insulation resistance.
Correct insulation resistance:
10 MΩ or more
If the resistance is below the specified range, remove the spark plug.
HINT:
If an ohmmeter is not available, perform the following simple inspection.



(f) 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.

(g) Check the spark plug for any damage on its threads and insulator.
If there is damage, replace the spark plug. If not, reinstall the spark plug.
Recommended spark plug

Manufacturer	Spark Plug Type
DENSO	K20HR-U11
NGK	LFR6C11



(h) Check the spark plug electrode gap.
Standard electrode gap:
1.0 to 1.1 mm (0.039 to 0.043 in.)
If the electrode gap is larger than the standard, replace the spark plug.