ON-VEHICLE INSPECTION

NOTICE:
In this section, the terms "cold" and "hot" refer to the temperature of the coils. "Cold" means approximately -10 to 50°C (14 to 122°F). "Hot" means approximately 50 to 100°C (122 to 212°F).

1. PERFORM SPARK TEST

(a) Check for DTCs.
NOTICE:
If a DTC is present, perform troubleshooting procedures for that DTC.

(b) Check if sparks occur.
(1) Remove the ignition coil.
(2) Remove the spark plug.
(3) Install the spark plug to the ignition coil and connect the ignition coil connector.
(4) Disconnect the 4 injector connectors.
(5) Ground the spark plug.
(6) Visually check that sparks occur while the engine is being cranked.
NOTICE:
- **Be sure to ground the spark plug when checking.**
- **If the ignition coil has been struck or dropped, replace it.**
- **Do not crank the engine for more than 2 seconds.**

(c) Spark test flow chart.
(1) Check that the wire harness side connector of the ignition coil with igniter is securely connected.
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
OK	Replace ignition coil with igniter
NG	Go to next step

(3) Check power supply to ignition coil with igniter.
1. Turn the ignition switch ON.

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

Result	Proceed to
NG	Check wiring between engine switch and ignition coil with igniter
OK	Go to next step

(4) Check resistance of camshaft position sensor.
Standard resistance

Temperature	Specified Condition
Cold	835 to 1,400 Ω
Hot	1,060 to 1,645 Ω

Result

Result	Proceed to
NG	Replace camshaft position sensor
OK	Go to next step

(5) Check resistance of crankshaft position sensor.
Standard resistance

Temperature	Specified Condition
Cold	1,690 to 2,740 Ω
Hot	2,065 to 3,225 Ω

Result

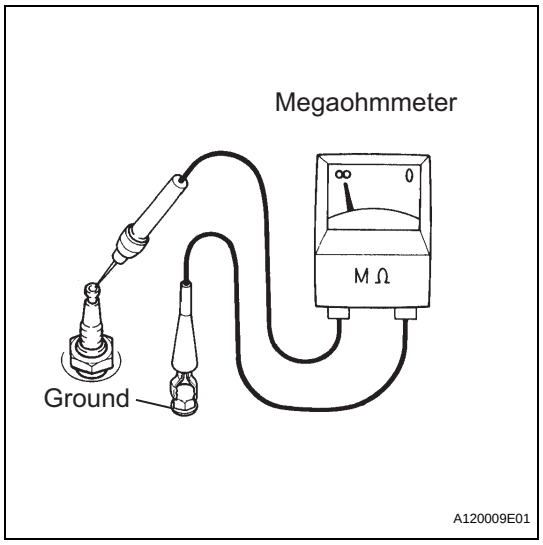
Result	Proceed to
NG	Replace crankshaft position sensor.
OK	Go to next step

(6) Check IGT signal from ECM.
Result

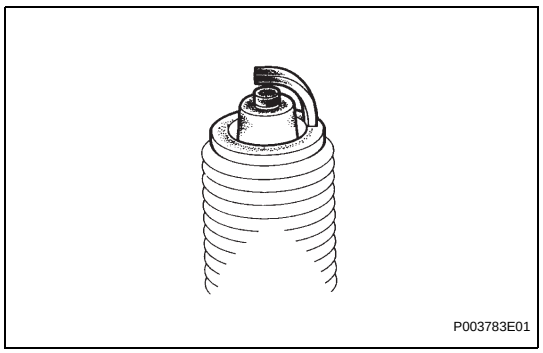
Result	Proceed to
NG	Check ECM
OK	Repair wiring between ignition coil and ECM

(d) Using a 16 mm plug wrench, install the spark plug.
Torque: 18 N*m (183 kgf*cm, 13 ft.*lbf)
(e) Install the ignition coil.
Torque: 9.0 N*m (92 kgf*cm, 80 in.*lbf)

2. CHECK SPARK PLUG
NOTICE:
- **Do not use a wire brush for cleaning.**
- **Do not attempt to adjust the electrode gap of a used spark plug.**



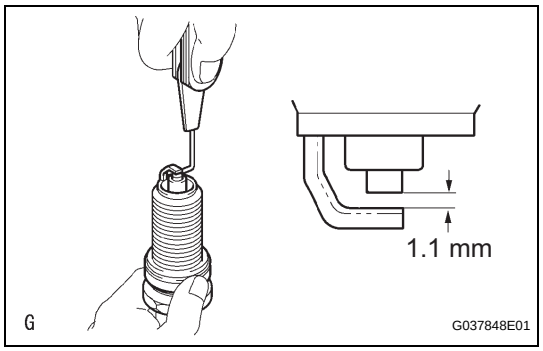
(a) Check the electrode.
(1) Using a megohmmeter, measure the insulation resistance.
Insulation resistance:
10 MΩ or more
HINT:
If a megohmmeter is not available, perform the following simple inspection instead.



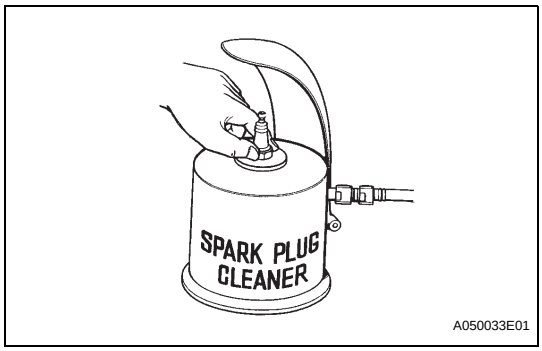
(b) Alternative inspection method:
(1) Quickly accelerate the engine to 4,000 rpm 5 times.
(2) Remove the spark plug.
(3) Visually check the spark plug.
If the electrode is dry, the spark plug is functioning properly. If the electrode is damp, proceed to the next step.

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

Manufacturer	Spark Plug Type
DENSO made	SK20R11
NGK made	ILFR6C11



(d) Check the spark plug electrode gap.
Maximum electrode gap for used spark plug:
1.3 mm (0.051 in.)
If the gap is greater than the maximum, replace the spark plug.
Electrode gap for new spark plug:
1.1 mm (0.043 in.)
NOTICE:
When 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 of a used plug.



(e) Clean the spark plugs.
If the electrode has traces of wet carbon, clean the electrode with a spark plug cleaner and then dry it.
Air pressure:
588 kPa (6 kgf/cm^2, 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.