

Last Modified: 7-13-2007		1.6 G
Service Category: Engine/Hybrid System		Section: Engine Control
Model Year: 2008	Model: ES350	Doc ID: RM000001IQS00GX
Title: 2GR-FE IGNITION: IGNITION SYSTEM: ON-VEHICLE INSPECTION (2008 ES350)		

ON-VEHICLE INSPECTION

NOTICE:

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


1. INSPECT IGNITION COIL ASSEMBLY


(a) Check for DTCs.

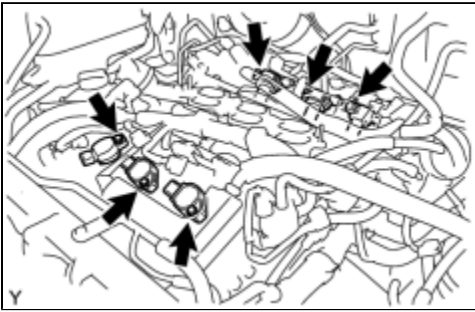
NOTICE:

If any DTC is present, perform troubleshooting in accordance with the procedures for that DTC.

(b) Check that sparks occur.

(1) Remove the intake air surge tank  .

(2) Remove the No. 1 surge tank stay  .

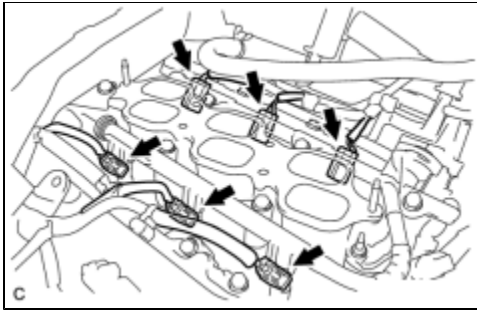


(3) Disconnect the 6 ignition coil connectors and remove the 6 bolts and 6 ignition coils.

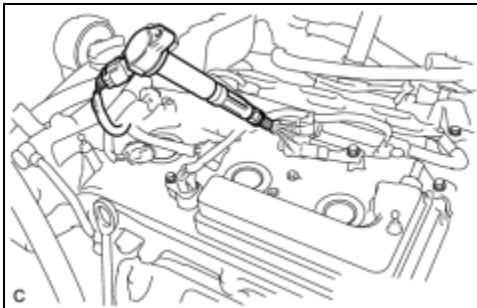


(4) Using a 16 mm (0.63 in.) plug wrench, remove the 6 spark plugs.

(5) Disconnect the 6 fuel injector connectors.



(6) Install the spark plugs to each ignition coil, and connect the ignition coil connectors.



(7) Ground the spark plugs.

(8) Check if a spark occurs at each spark plug while the engine is being cranked.

NOTICE:

- Be sure to ground the spark plugs when checking.
- Replace the ignition coil if it receives an impact.
- Do not crank the engine for more than 2 seconds.

(c) Perform the spark test according to the flowchart below.

(1) Check that the ignition coil connector is securely connected.

Result:

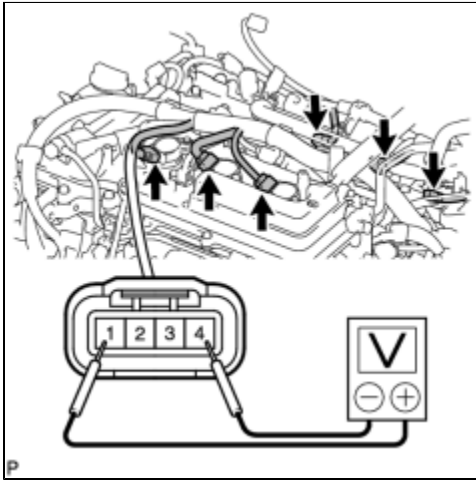
RESULT	PROCEED TO
NG	Connect securely
OK	Go to next step

(2) Perform a speak test on each ignition coil.

- Replace the ignition coil with a normal one.
- Perform the spark test again.

Result:

RESULT	PROCEED TO
OK	Replace ignition coil
NG	Go to next step



(3) Check the power supply to the ignition coil.

- Turn the engine switch on (IG).
- Measure the voltage between the terminals of the wire harness side connector.

Standard voltage:

TESTER CONNECTION	SPECIFIED CONDITION
1 (+B) - 4 (GND)	9 to 14 V

Result:

RESULT	PROCEED TO
NG	Check wiring between engine switch and ignition coil
OK	Go to next step

(4) Measure the resistance of the crankshaft position sensor.

Standard resistance:

TEMPERATURE	SPECIFIED CONDITION
Cold	1,630 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

(5) Check the IGT signal from the ECM.

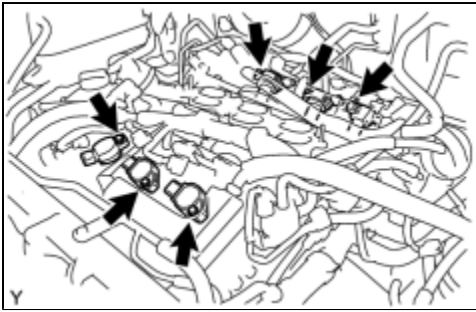
Result:

RESULT	PROCEED TO
NG	Check ECM INFO
OK	Repair wiring between ignition coil and ECM

(d) Using a 16 mm (0.63 in.) plug wrench, install the spark plugs.

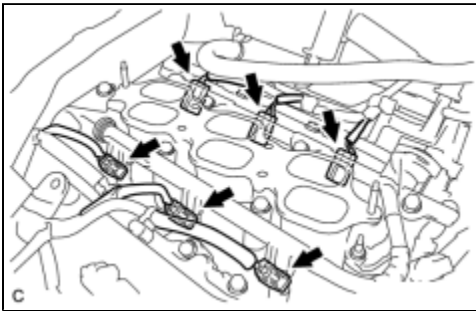


Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)



(e) Install the 6 ignition coils with the 6 bolts and connect the 6 ignition coil connectors.

Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)



(f) Connect the 6 fuel injector connectors.

(g) Install the No. 1 surge tank stay INFO.

(h) Install the intake air surge tank INFO.

2. INSPECT SPARK PLUG

NOTICE:

- Never use a wire brush for cleaning.
- Never attempt to adjust the electrode gap on a used spark plug.

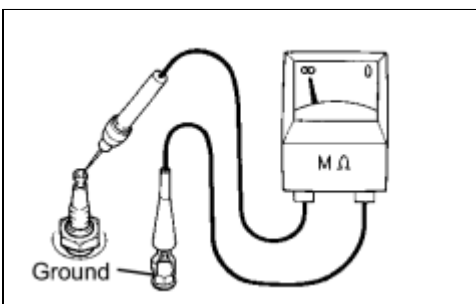
(a) Check the electrode.

(1) Using a megohmmeter, measure the insulation resistance.

Standard insulation resistance:
10 MΩ or higher

HINT:

- If the result is 10 MΩ or less, clean the plug and measure the resistance again.



- 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 plugs.
- (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.

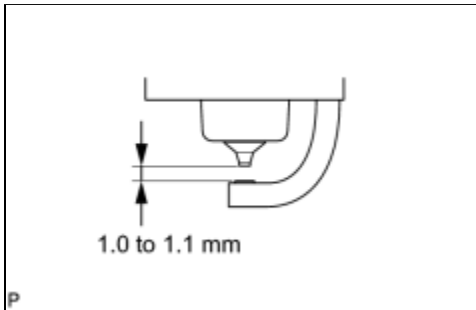
(c) Check the spark plug for any damage to its threads and insulator. If there is damage, replace the spark plug.

Require spark plug:

MANUFACTURER	SPARK PLUG TYPE
DENSO made	FK20HR11

NOTICE:

Use only the listed spark plug or equivalent to ensure engine performance and smooth driveability.



(d) Check the spark plug electrode gap.

Maximum electrode gap for a used spark plug:

1.4 mm (0.055 in.)

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

Electrode gap for a new spark plug:

1.0 to 1.1 mm (0.039 to 0.043 in.)

(e) Clean the spark plugs.

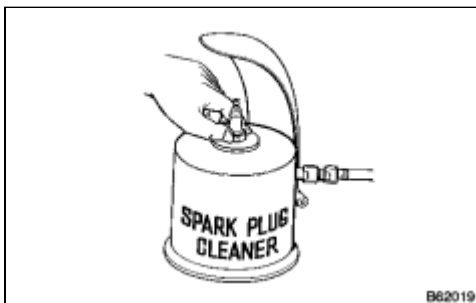
If the electrode has traces of wet carbon, clean the electrode with a spark plug cleaner and then dry it.

Standard air pressure:

588 kPa (6 kgf*cm², 85 psi)

Standard 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.

