IGNITION SYSTEM (2RZ–FE, 3RZ–FE)

IGD4B–01

ON–VEHICLE INSPECTION

NOTICE:

"Cold" and "Hot" in the following 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 IGNITOR AND SPARK TEST

Check that the spark occurs.

(1) Disconnect the high–tension cords from the spark plugs.
(2) Remove the spark plugs.
(3) Install the spark plugs to each high–tension cord.
(4) Ground the spark plug.
(5) Check if spark occurs while engine is being cranked.

NOTICE:

To prevent gasoline from being injected from injectors during this test, crank the engine for no more than 1 – 2 seconds at a time.

If the spark does not occur, perform the test as follows:

SPARK TEST
↓ NO
CHECK CONNECTION OF IGNITION COIL AND IGNITER → BAD → Connect securely.
↓ OK
CHECK RESISTANCE OF HIGH–TENSION CORD (See step 2.)
Maximum resistance: 25 kΩ per cord → BAD → Replace the cord(s).
↓ OK
CHECK POWER SUPPLY TO IGNITION COIL AND IGNITER
1. Turn ignition switch to ON.
2. Check that there is battery voltage at ignition coil positive (+) terminal.
→ BAD → Check wiring between ignition switch to ignition coil and igniter.
↓ OK
CHECK RESISTANCE OF IGNITION COIL (See step 4.)

Resistance:	Cold	Hot
Secondary	9.7 – 16.7 kΩ	12.4 – 19.6 kΩ

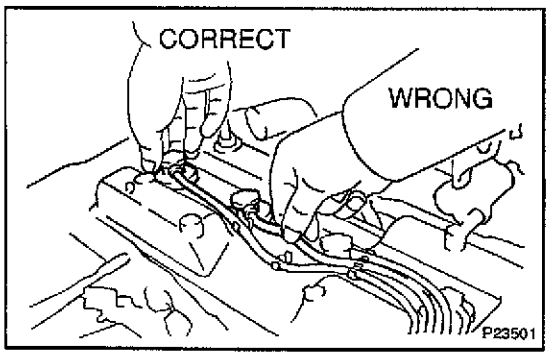
→ BAD → Replace the ignition coil.
↓ OK
CHECK RESISTANCE OF CAMSHAFT POSITION SENSOR (See step 5.)

Resistance:	Cold	Hot
G⊕ and G⊖	835 – 1,400 Ω	1,060 – 1,645 Ω

→ BAD → Replace the camshaft position sensor.
↓ OK
CHECK RESISTANCE OF CRANKSHAFT POSITION SENSOR (See page IG–12)

Resistance:	Cold	Hot
NE⊕ and NE⊖	1,630 – 2,740 Ω	2,065 – 3,225 Ω

→ BAD → Replace the crankshaft position sensor.
↓ OK
CHECK IGT SIGNAL FROM ECU (See page DI–157) → BAD → Check wiring between ECU, ignition coil with igniter, and then try another ECU.
↓ OK
TRY ANOTHER IGNITER



2. INSPECT HIGH–TENSION CORDS

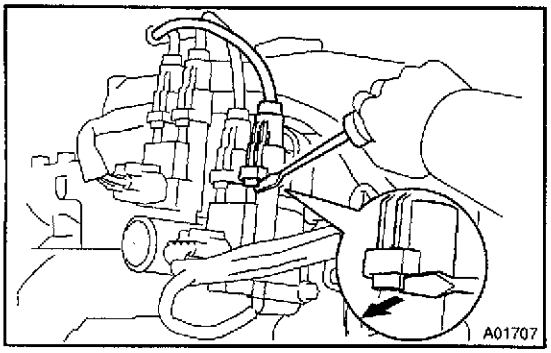
(a) Remove the air cleaner cap and MAF meter assembly.

(b) Remove the intake air connector.

(c) Disconnect the high–tension cords from the spark plugs.

NOTICE:

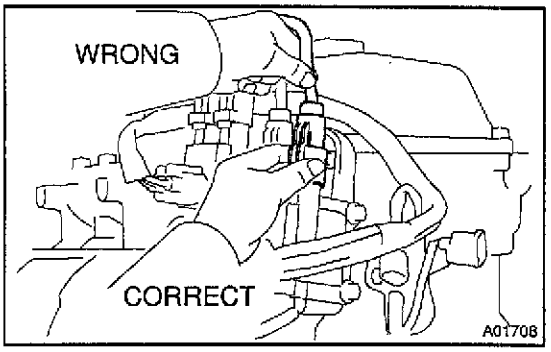
Pulling on or bending the cords may damage the conductor inside.



(d) Disconnect the high–tension cords from the ignition coils.

(1) Using a screwdriver, lift up the lock claw and disconnect the holder from the ignition coils.

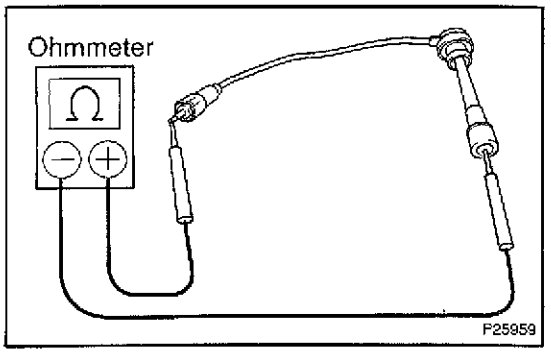
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(2) Disconnect the high–tension cord at the grommet.

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.**

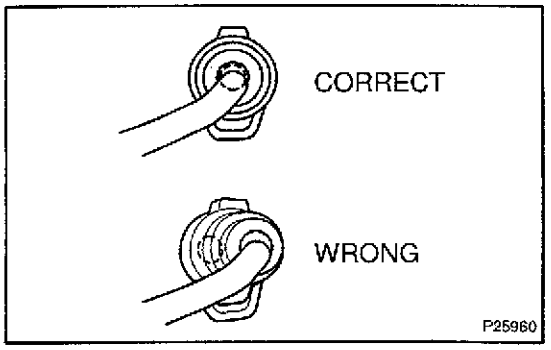


(e) Using an ohmmeter, measure the resistance.

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) Connect the high–tension cords to the ignition coils.

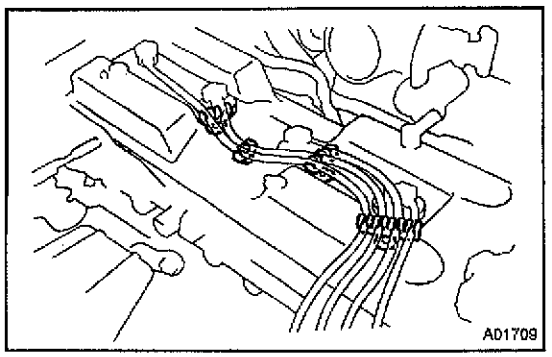
(1) Assemble the holder and grommet.

(2) Align the spline of the ignition coil with the spline of the holder, and push in the cord.

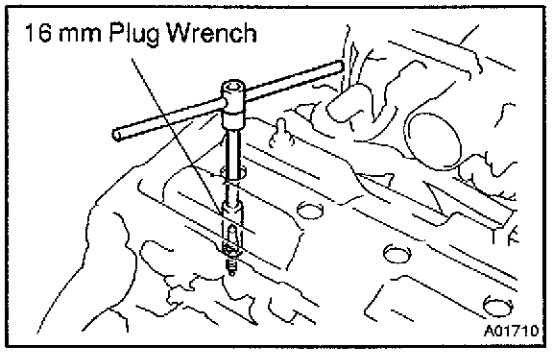
NOTICE:

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

(3) Check that the lock claw of the holder is engaged by lightly pulling the holder.

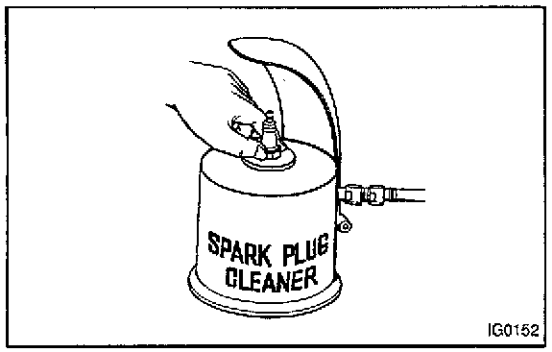


(g) Connect the high–tension cords to the spark plugs. Secure the high–tension cords with the clamps as shown in the illustration.
(h) Install the intake air connector.
(i) Install the air cleaner cap and MAF meter assembly.



3. INSPECT SPARK PLUGS

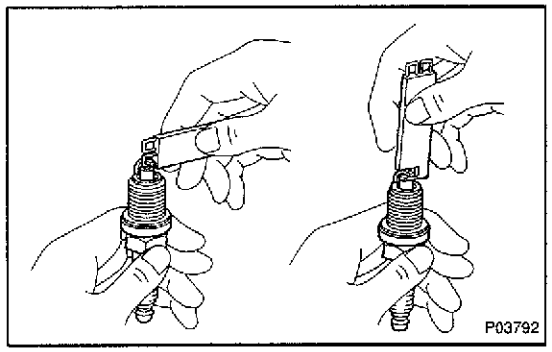
(a) Disconnect the high–tension cords from the spark plugs.
(b) Using a 16 mm plug wrench, remove the spark plug.



(c) Using a spark plug cleaner or wire brush, clean the spark plug.
(d) Check the spark plug for electrode wear, threads damage and insulator damage.

If abnormal, replace the plugs.

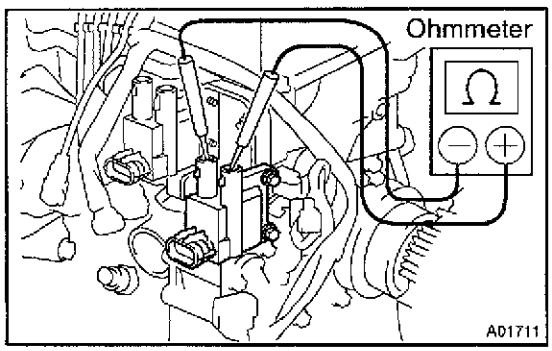
Recommended spark plugs:
ND: K16R–U
NGK: BKR5EYA



(e) Carefully bend the outer electrode to obtain the correct electrode gap.
Correct electrode gap: 0.8 mm (0.031 in.)
(f) Using a 16 mm plug wrench, install the spark plug.
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)
(g) Connect the high–tension cords to the spark plugs.

4. INSPECT IGNITION COIL

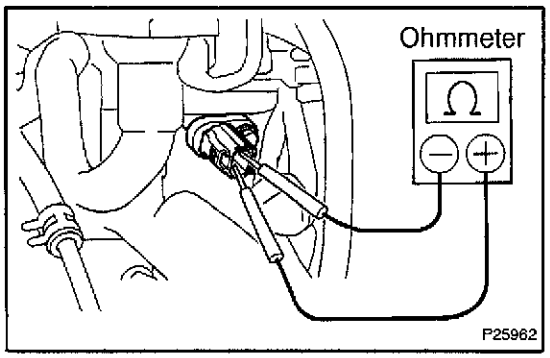
(a) Disconnect the high–tension cords from the ignition coil.
(b) Disconnect the ignition coil connectors.



(c) Using an ohmmeter, measure the secondary coil resistance between the positive (+) and high–tension terminals.
Secondary coil resistance:
Cold: 9.7 – 16.7 kΩ
Hot: 12.4 – 19.6 kΩ

If the resistance is not as specified, replace the ignition coil.
(d) Connect ignition coil connectors.
(e) Connect the high–tension cords from the ignition coils.

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5. INSPECTION CAMSHAFT POSITION SENSOR

(a) Disconnect the camshaft position sensor connector.

(b) Using an ohmmeter, measure the camshaft position sensor resistance between terminals.

Resistance:

Cold: 835 – 1,400 Ω

Hot: 1,060 – 1,645 Ω

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

(c) Connect the camshaft position sensor connector.