IGNITION

IGNITION SYSTEM IG–1
IGNITION COIL IG–6
CAMSHAFT POSITION SENSOR IG–8
CRANKSHAFT POSITION SENSOR IG–10

IGNITION SYSTEM

IG081–01

ON–VEHICLE INSPECTION

NOTICE:

"Cold" and "Hot" in these 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 IGNITERS AND SPARK TEST

Check that the spark occurs.

(1) Disconnect the high–tension cord from the spark plug.
(2) Remove the spark plug.
(3) Install the spark plug to the high–tension cord.
(4) Ground the spark plug.
(5) See 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 5 – 10 seconds at time.

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

SPARK TEST

↓ NO

CHECK CONNECTION OF IGNITION COIL WITH IGNITER CONNECTORS → BAD → Connect securely.

↓ OK

CHECK RESISTANCE OF HIGH–TENSION CORDS (See step 2)
Maximum resistance: 25 kΩ per cord → BAD → Replace cord(s).

↓ OK

CHECK POWER SUPPLY TO IGNITION COILS WITH IGNITERS
1. Turn ignition switch to ON.
2. Check that there is battery positive voltage at ignition coil positive (+) terminal.

→ BAD → Check wiring between ignition switch to ignition coils with igniters.

↓ OK

CHECK RESISTANCE OF IGNITION COILS (See step 5)

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

→ BAD → Replace ignition coil(s) with igniter(s). (See page IG–7)

↓ OK

CHECK RESISTANCE OF SENSORS (See steps 6 and 7)

Resistance:	**Cold**	**Hot**
Camshaft position sensor	**835 – 1,400 Ω**	**1,060 – 1,645 Ω**
Crankshaft position sensor	**985 – 1,600 Ω**	**1,265 – 1,890 Ω**

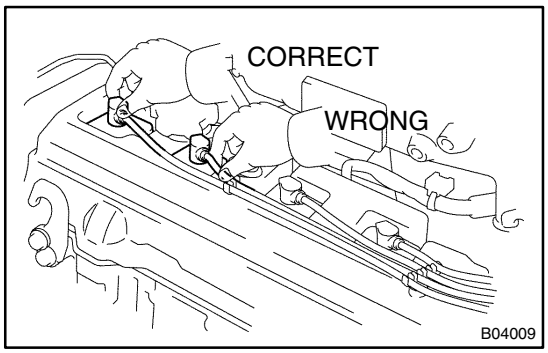
→ BAD → Replace camshaft position sensor. (See page IG–9)
Replace crankshaft position sensor. (See page IG–11)

↓ OK

CHECK IGT SIGNAL FROM ECU (See page DI–76) → BAD → Check wiring between ECU and ignition coil with igniters, and then try another ECU.

↓

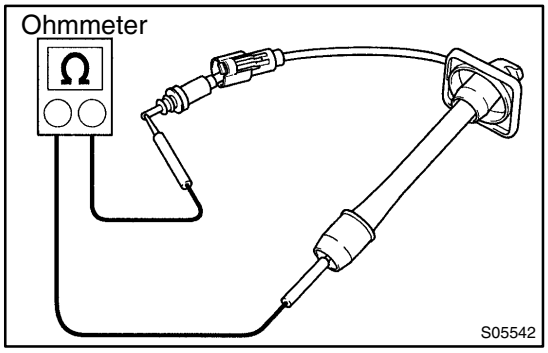
TRY ANOTHER IGNITER



2. INSPECT HIGH–TENSION CORDS

(a) Remove the high–tension cords.
Disconnect the high–tension cords at the rubber boot. Do not pull on the high–tension cords.

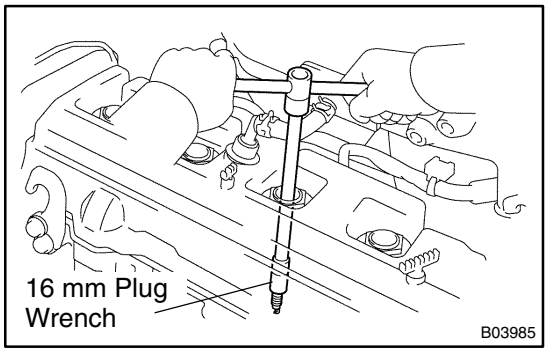
NOTICE:
Pulling on or bending the cords may damage the conductor inside.



(b) Using an ohmmeter, measure the high–tension cord resistance.
Maximum resistance: 25 kΩ per cord

If the resistance is greater than maximum, check the terminals. If necessary, replace the high–tension cord.

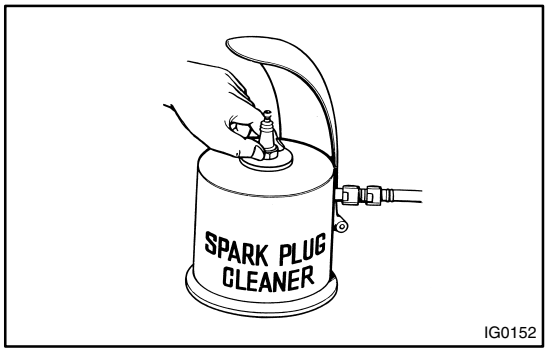
(c) Reinstall the high–tension cords.



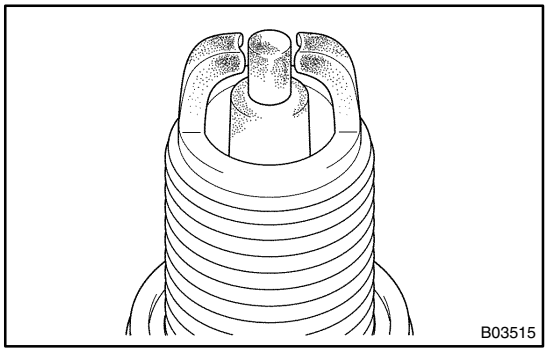
3. Conventional Tipped Type:
INSPECT SPARK PLUGS

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

(b) Using a 16 mm plug wrench, remove the 4 spark plugs.



(c) Using a spark plug cleaner or wire brush, clean the spark plug.

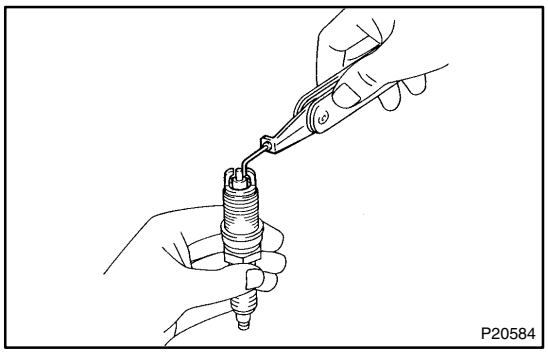


(d) Check the spark plug for electrode wear, thread damage and insulator damage.

If abnormal, replace the spark plug.

Recommended spark plug:

DENSO made	K20TR11
NGK made	BKR6EKB11


P20584

(e) Inspect the electrode gaps.
Carefully bend the outer electrode to obtain the correct electrode gap.
Electrode gap: 1.1 mm (0.043 in.)

(f) Using a 16 mm plug wrench, install the 4 spark plugs.
Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)

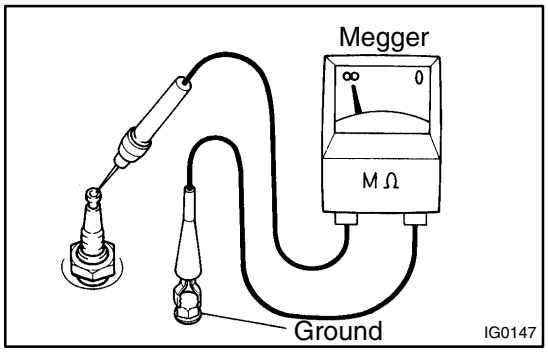
(g) Reconnect the high–tension cords from the spark plugs.

4. Platinum Tipped Type:
INSPECT SPARK PLUGS

NOTICE:

- **Never use a wire brush for cleaning.**
- **Never attempt to adjust the electrode gap on a used spark plug.**
- **Spark plugs should be replaced every 100,000 km (60,000 miles).**

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



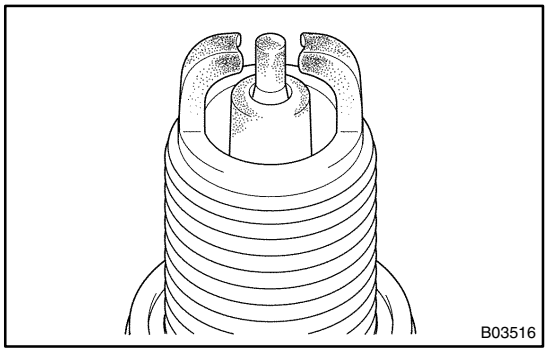
IG0147

(b) Inspect the electrode.
Using a megger (insulation resistance meter), measure the insulation resistance.
Standard correct insulation resistance:
10 MΩ or more

If the resistance is less than specified, proceed to step (d).

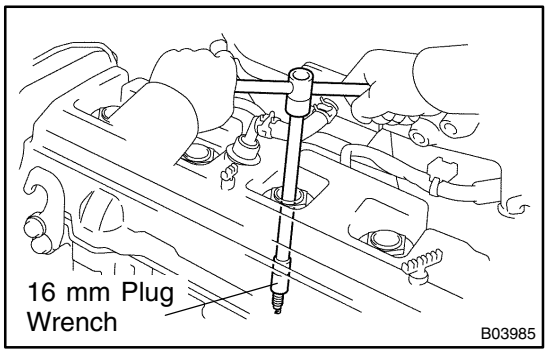
HINT:

If a megger is not available, the following simple method of inspection provides fairly accurate results.


B03516

Simple Method:

- Quickly race the engine to 4,000 rpm 5 times.
- Remove the spark plug. (See step (c))
- Visually check the spark plug.
  If the electrode is dry ... OK
  If the electrode is wet ... Proceed to step (d)
- Reinstall the spark plug. (See step (g))



B03985

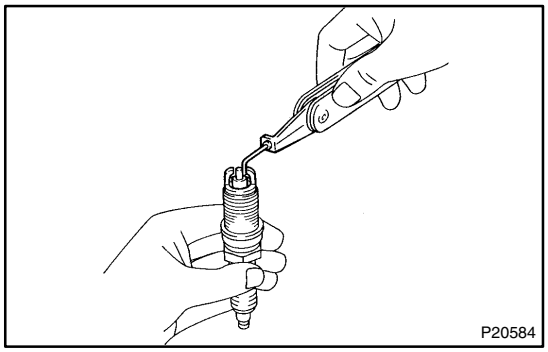
(c) Using a 16 mm plug wrench, remove the 4 spark plugs.

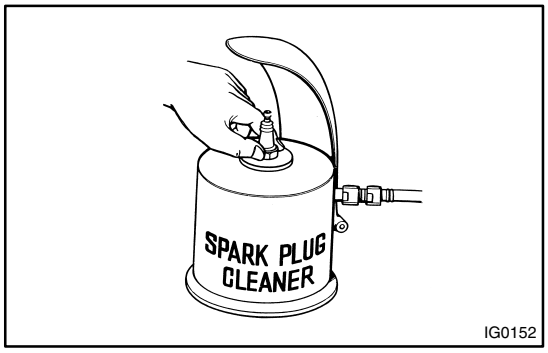
(d) Visually check the spark plug for thread damage and insulator damage.

If abnormal, replace the spark plug.

Recommended spark plug:

DENSO made	PK20TR11
NGK made	BKR6EKPB11


P20584

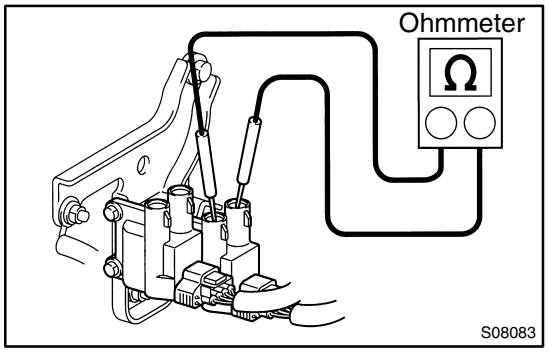


IG0152

(e) Inspect the electrode gaps.
Maximum electrode gap for used spark plug:
1.3 mm (0.051 in.)
If the gap is greater than maximum, replace the spark plug.
Correct electrode gap for new spark plug:
1.1 mm (0.043 in.)

NOTICE:
If 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 on the used plug.

(f) Clean the spark plugs.
If the electrode has traces of wet carbon, allow it to dry and then clean with a spark plug cleaner.
Air pressure: Below 588 kPa (6 kgf/cm^2, 85 psi)
Duration: 20 seconds or less
HINT:
If there are traces of oil, remove it with gasoline before using the spark plug cleaner.
(g) Using a 16 mm plug wrench, install the 4 spark plugs.
Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)
(h) Reconnect the high–tension cords from the spark plugs.

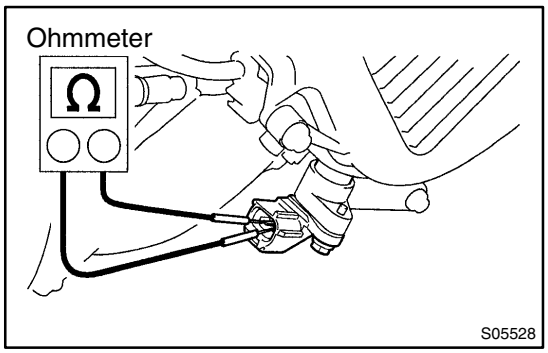


S08083

5. INSPECT IGNITION COILS WITH IGNITERS
(a) Disconnect the high–tension cords from the ignition coils.
(b) Inspect the secondary coil resistance.
Using an ohmmeter, measure the resistance between the 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. (See page IG–7)
(c) Reconnect the high–tension cords to the ignition coils.
(d) Inspect the igniters. (See step 1)



6. INSPECT CAMSHAFT POSITION SENSOR

(a) Disconnect the sensor connector.

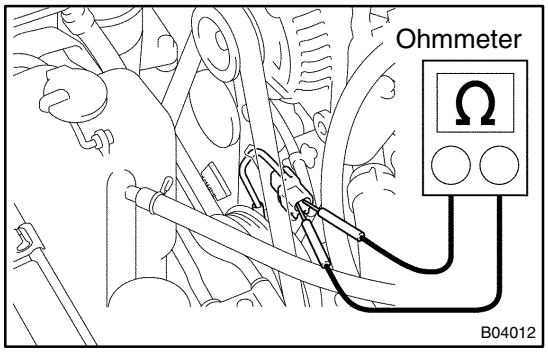
(b) Using an ohmmeter, measure the resistance between terminals.

Resistance:

Cold	835 – 1,400 Ω
Hot	1,060 – 1,645 Ω

If the resistance is not as specified, replace the sensor.
(See page IG–9)

(c) Reconnect the sensor connector.



7. INSPECT CRANKSHAFT POSITION SENSOR

(a) Disconnect the sensor connector.

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

Resistance:

Cold	985 – 1,600 Ω
Hot	1,265 – 1,890 Ω

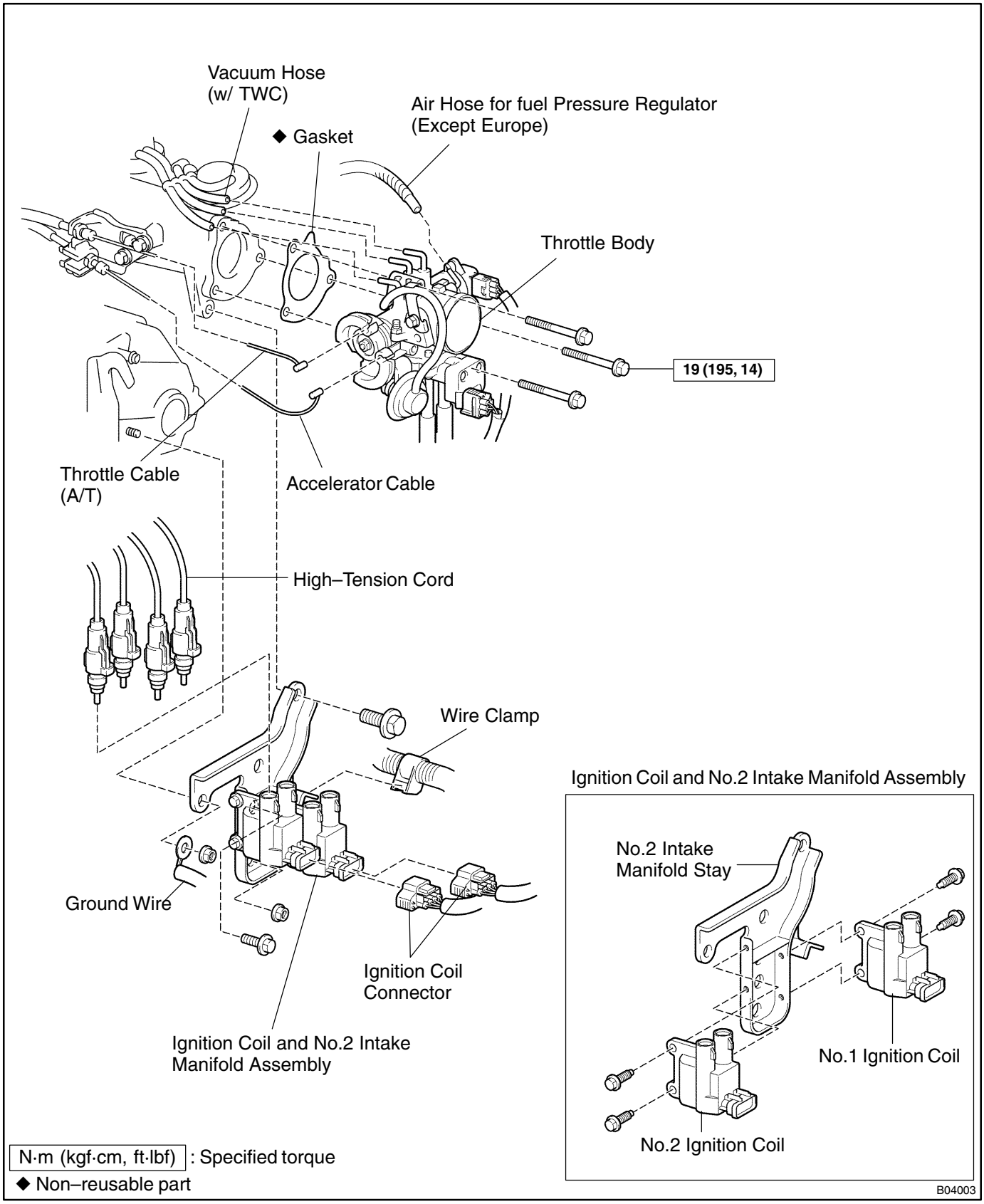
If the resistance is not as specified, replace the sensor.
(See page IG–11)

(c) Reconnect the sensor connector.

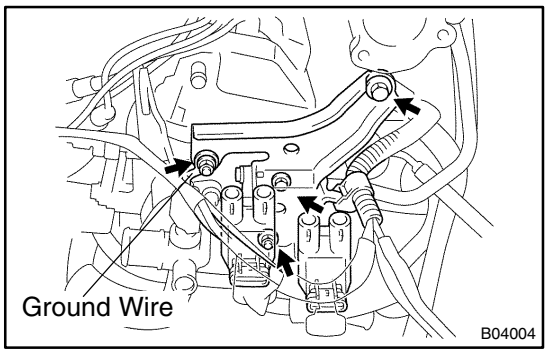
IGNITION COIL

COMPONENTS

IG07Z–01



IG080–01

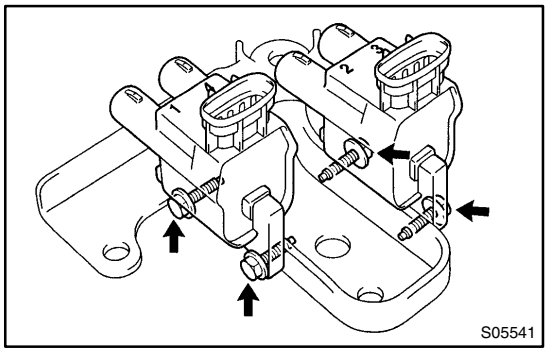


REPLACEMENT

1. DISCONNECT THROTTLE BODY FROM INTAKE MANIFOLD (See page FI–37)

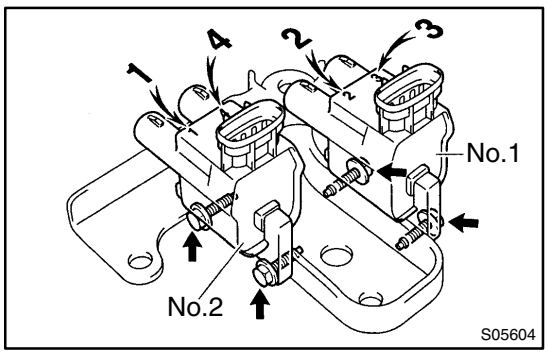
2. REMOVE IGNITION COILS AND NO.2 INTAKE MANIFOLD STAY ASSEMBLY

(a) Disconnect the 2 ignition coil connectors.
(b) Disconnect the wire clamp from the manifold stay.
(c) Remove the 2 nuts and 2 bolts.
(d) Disconnect the ground wire from the stud bolt.
(e) Remove the 2 ignition coils and manifold stay assembly.



3. REMOVE IGNITION COILS FROM NO.2 INTAKE MANIFOLD STAY

Remove the 2 bolts and ignition coil. Remove the 2 ignition coils.



4. REINSTALL IGNITION COILS TO NO.2 INTAKE MANIFOLD STAY

Install the ignition coil with the 2 bolts. Install the 2 ignition coils.

Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)

NOTICE:

The installation positions of the ignition coils are different for No.1 and No.2.

5. REINSTALL IGNITION COILS AND NO.2 INTAKE MANIFOLD STAY ASSEMBLY

(a) Install the 2 ignition coils, manifold stay assembly and ground wire with the 2 nuts and 2 bolts.

Torque:
21 N·m (214 kgf·cm, 15 ft·lbf) for 12 mm head
42 N·m (428 kgf·cm, 31 ft·lbf) for 14 mm head

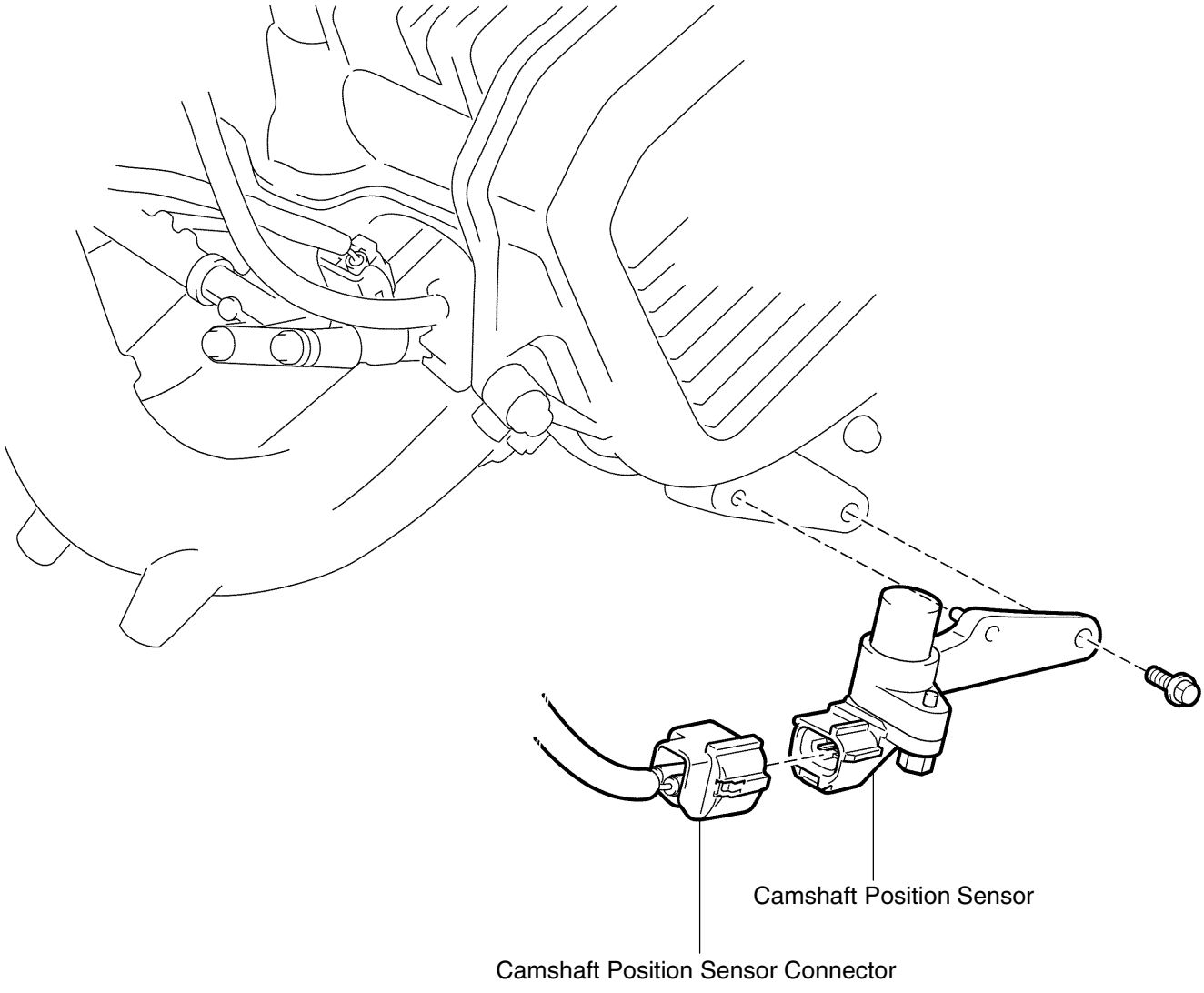
(b) Install the wire clamp to the manifold stay.
(c) Connect the 2 ignition coil connectors.

6. REINSTALL THROTTLE BODY (See page FI–39)

CAMSHAFT POSITION SENSOR

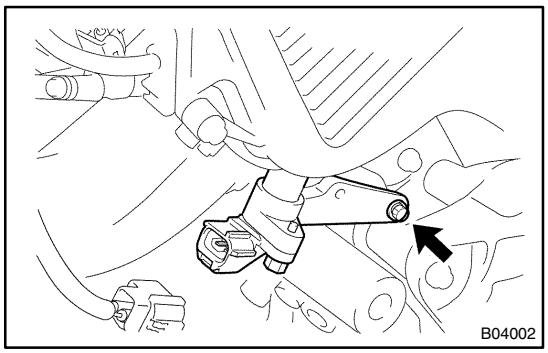
IG07X–01

COMPONENTS



B04001

IG07Y–01



REPLACEMENT

1. REMOVE CAMSHAFT POSITION SENSOR

(a) Disconnect the sensor connector.

(b) Remove the bolt and sensor.

2. REINSTALL CAMSHAFT POSITION SENSOR

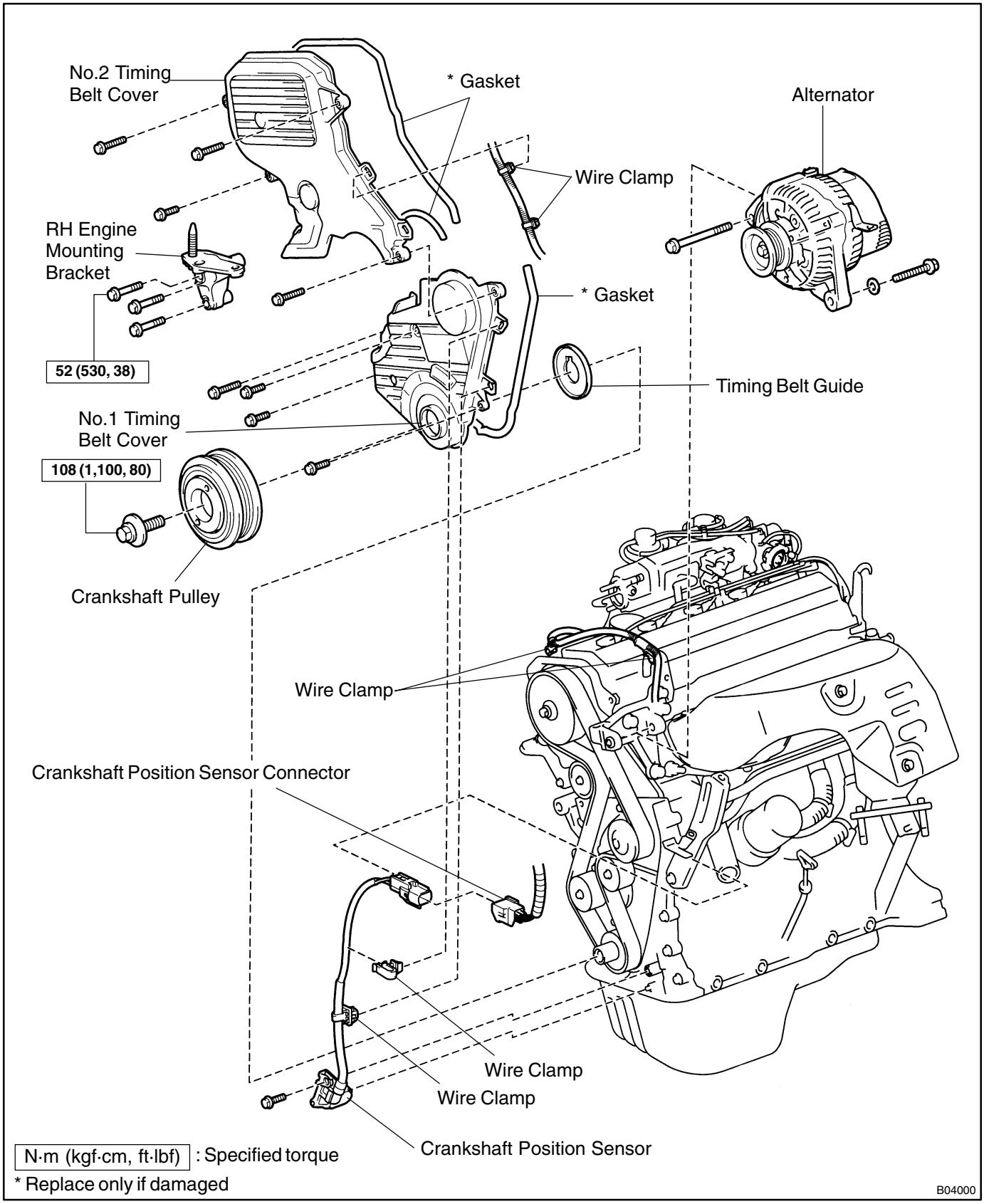
(a) Install the sensor with the bolt.
Torque: 9.5 N·m (97 kgf·cm, 84 in.·lbf)

(b) Connect the sensor connector.

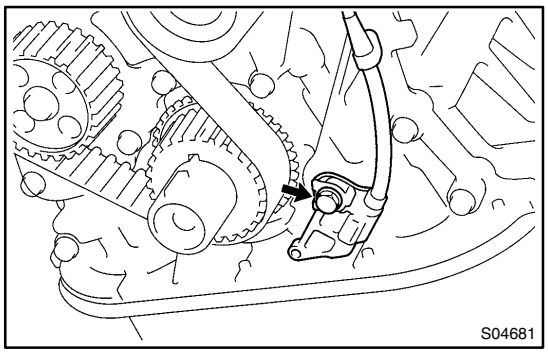
CRANKSHAFT POSITION SENSOR

COMPONENTS

IG07V–01



IG07W–01



REPLACEMENT

1. REMOVE NO.1 TIMING BELT COVER

2. REMOVE CRANKSHAFT POSITION SENSOR

(a) Disconnect the sensor connector.

(b) Disconnect the sensor connector from the generator drive belt adjusting bar.

(c) Remove the bolt and sensor.

3. REINSTALL CRANKSHAFT POSITION SENSOR

(a) Install the sensor with the bolt.

Torque: 9.5 N·m (97 kgf·cm, 84 in.·lbf)

(b) Install the sensor connector to the generator drive belt adjusting bar.

(c) Connect the sensor connector.

4. REINSTALL NO.1 TIMING BELT COVER