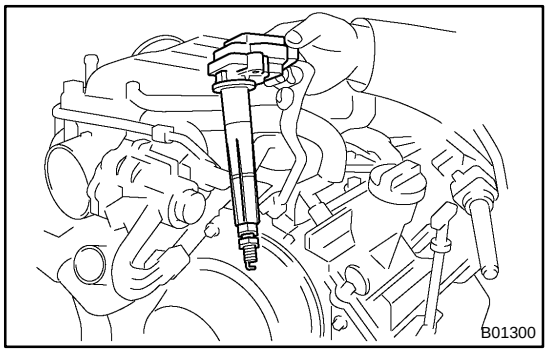
IGNITION SYSTEM

IG04M–02

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).

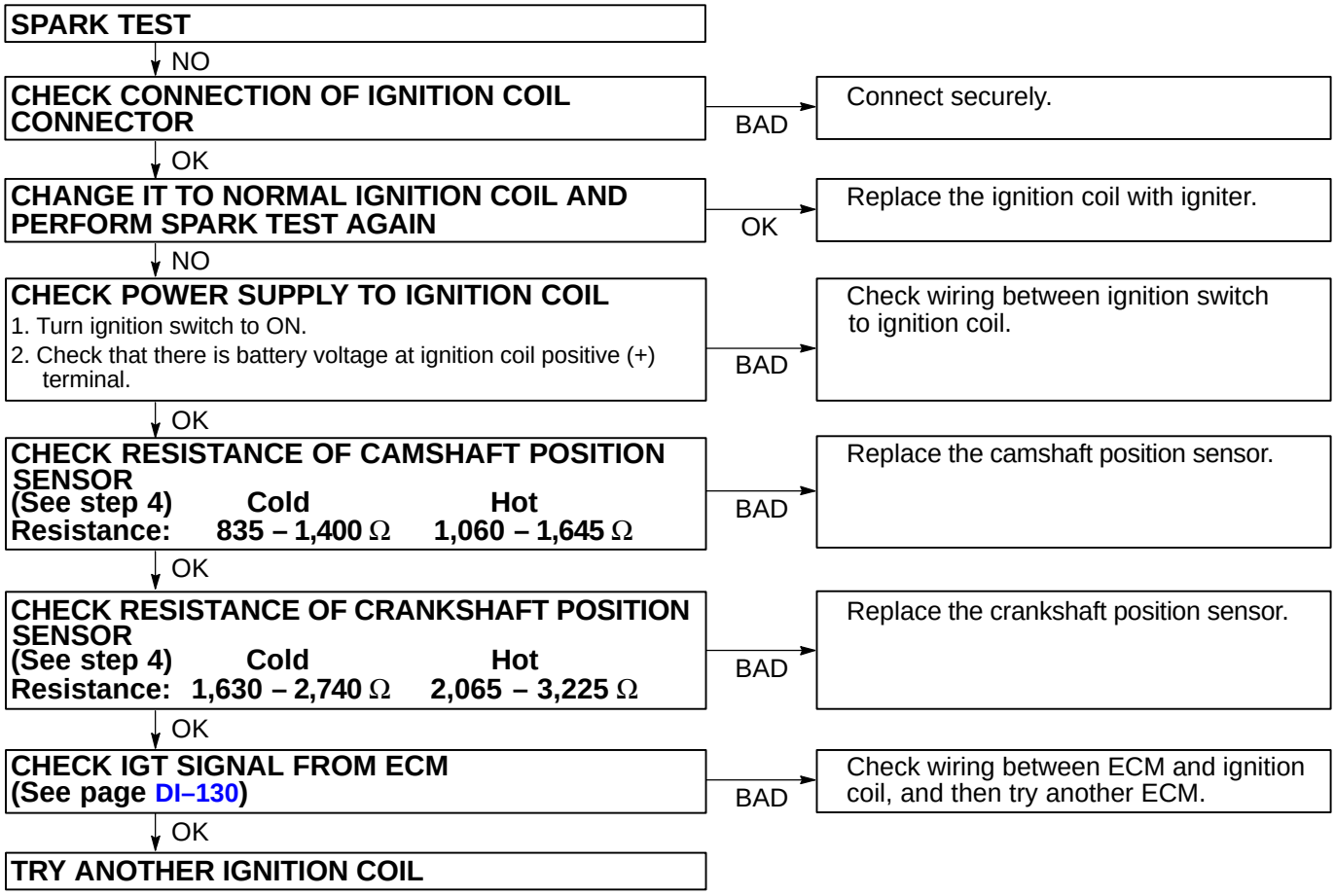


1. INSPECT IGNITION COIL WITH IGNITER AND SPARK TEST

Check that the spark occurs.

(1) Remove the ignition coils. (See page IG–7)
(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 connector.
(4) Disconnect the injector connector.
(5) Ground the spark plug.
(6) 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 5 – 10 seconds at time. If the spark done not occur, do the test as follows:

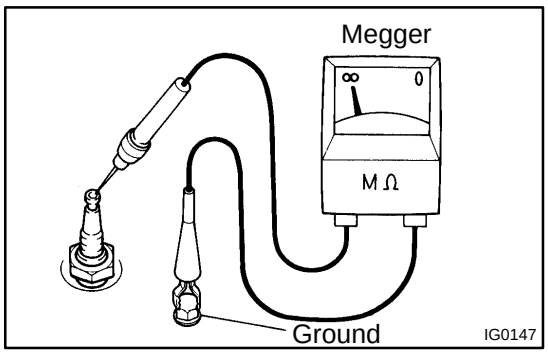


(7) Using a 16 mm plug wrench, install the spark plugs.
Torque: 17.5 N·m (180 kgf·cm, 13 ft·lbf)
(8) Reinstall the ignition coil. (See page IG–8)

2. INSPECT SPARK PLUGS

NOTICE:
- **Never use a wire brush for cleaning.**
- **Never attempt to adjust the electrode gap on used spark plug.**
- **Spark plug should be replaced every 144,000 km (90,000 miles).**

(a) Remove the ignition coils. (See page IG–7)



(b) Check the electrode.

- Using a megger (insulation resistance meter), measure the insulation resistance.

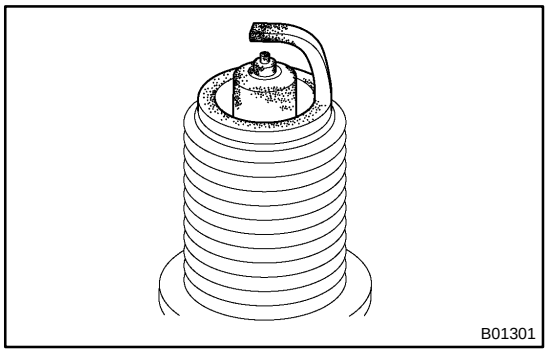
Correct insulation resistance: 10 MΩ or more

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

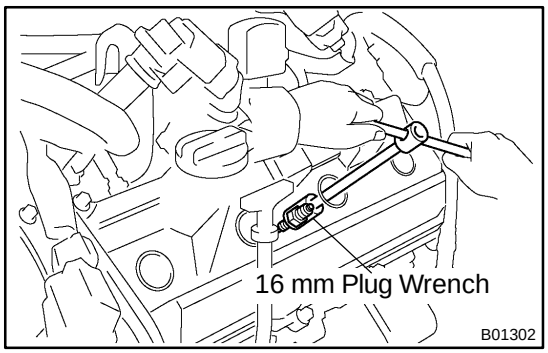
HINT:

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

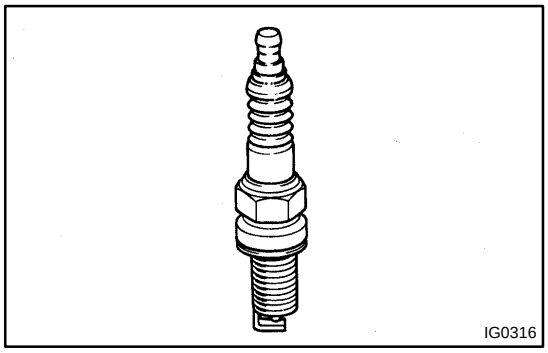
- Simple Method:
  - Quickly race the engine to 4,000 rpm 5 times.
  - Remove the spark plug. (See step (c))



  - Visually check the spark plug.
    If the electrode is dry ... Okay.
    If the electrode is wet ... Proceed to step (d).
  - Reinstall the spark plug. (See step (g))



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

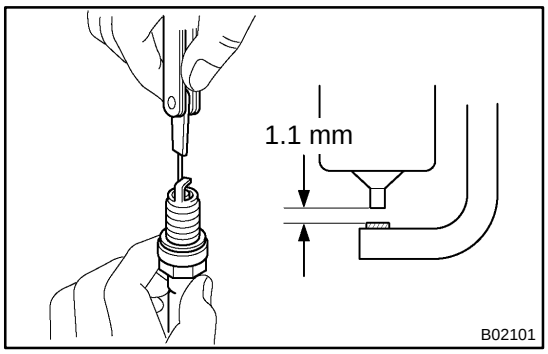


(d) Check the spark plug for thread damage and insulator damage.

If abnormal, replace the spark plug.

Recommended spark plug:

DENSO made	SK20R11
NGK made	IFR6A11



(e) Check the spark plug electrode gap.

Maximum electrode gap for used spark plug:
1.2 mm (0.047 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 a used plug.

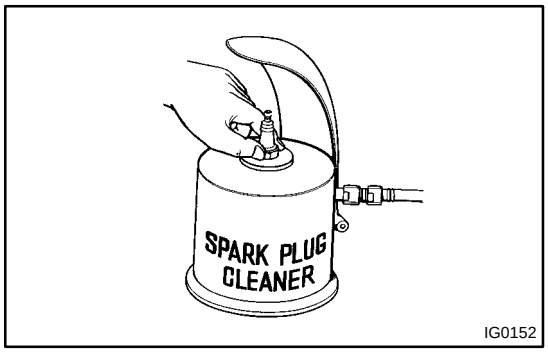
(f) Clean the spark plugs.

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.



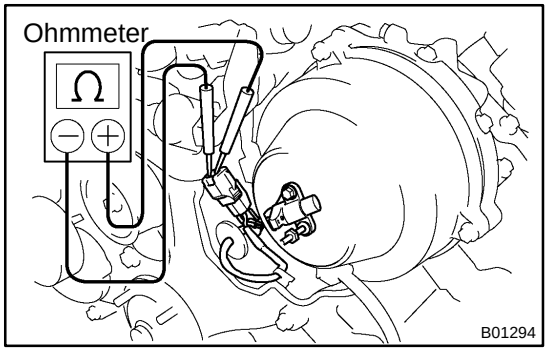
(g) Using a 16 mm plug wrench, install the spark plugs.

Torque: 17.5 N·m (180 kgf·cm, 13 ft·lbf)

(h) Reinstall the ignition coils. (See page IG–8)

3. INSPECT CAMSHAFT POSITION SENSOR

(a) Remove the V–bank cover.
(b) Remove the battery clamp cover.
(c) Remove the air cleaner inlet.
(d) Disconnect the camshaft position sensor connector.



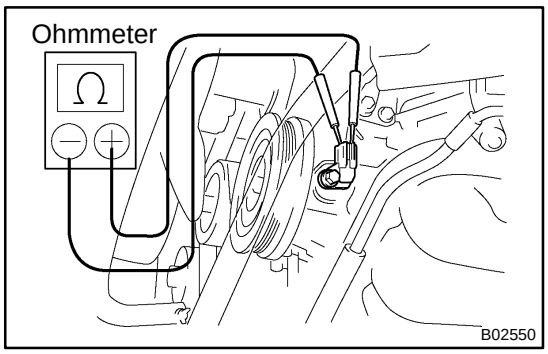
(e) Using an ohmmeter, measure the resistance between terminals.

Resistance:

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

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

(f) Reconnect the camshaft position sensor connector.
(g) Reinstall the air cleaner inlet.
(h) Reinstall the battery clamp cover.
(i) Reinstall the V–bank cover.



4. INSPECT CRANKSHAFT POSITION SENSOR

(a) Remove the oil pan protector and engine under cover.

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

Resistance:

Cold	1,630 – 2,740 Ω
Hot	2,065 – 3,225 Ω

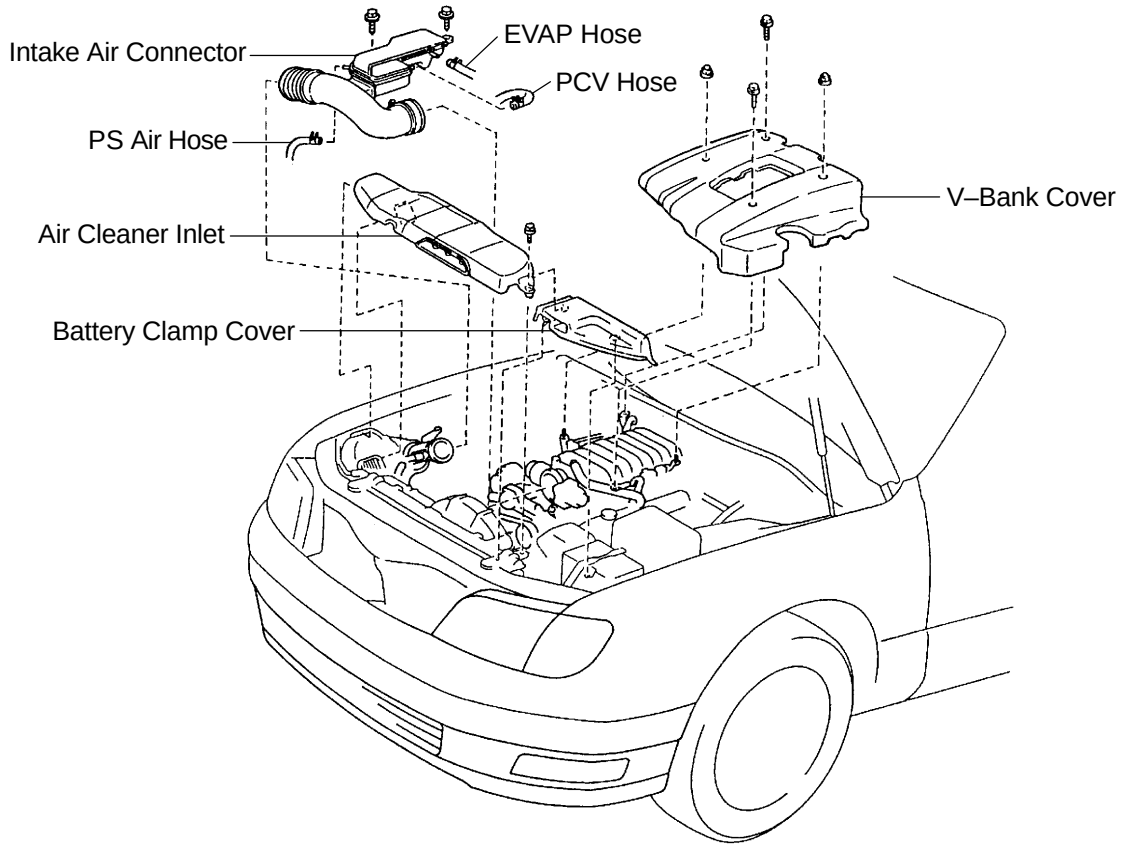
If the resistance is not as specified, replace the crankshaft position sensor.

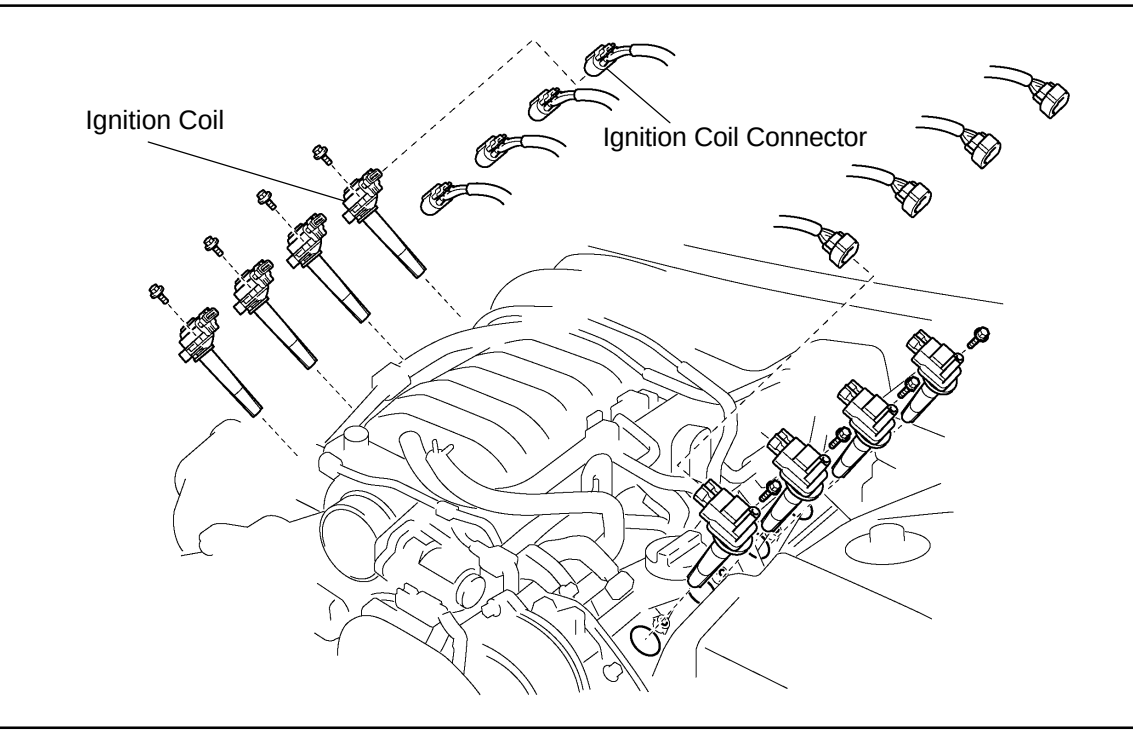
(c) Reinstall the engine under cover and oil pan protector.

IGNITION COIL

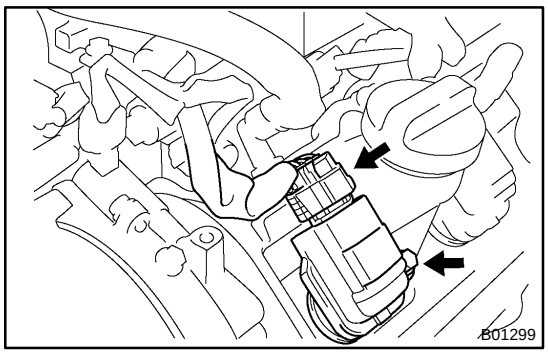
COMPONENTS

IG04N–02





IG04O–02



REMOVAL

1. **REMOVE V–BANK COVER**
2. **REMOVE BATTERY CLAMP COVER**
3. **REMOVE AIR CLEANER INLET**
4. **REMOVE INTAKE AIR CONNECTOR**
5. **DISCONNECT IGNITION COIL CONNECTORS**
6. **REMOVE IGNITION COILS FROM SPARK PLUGS**

Remove the 8 bolt and 8 ignition coils.

Torque: 7.5 N·m (80 kgf·cm, 66 in.·lbf)

IG04P–02

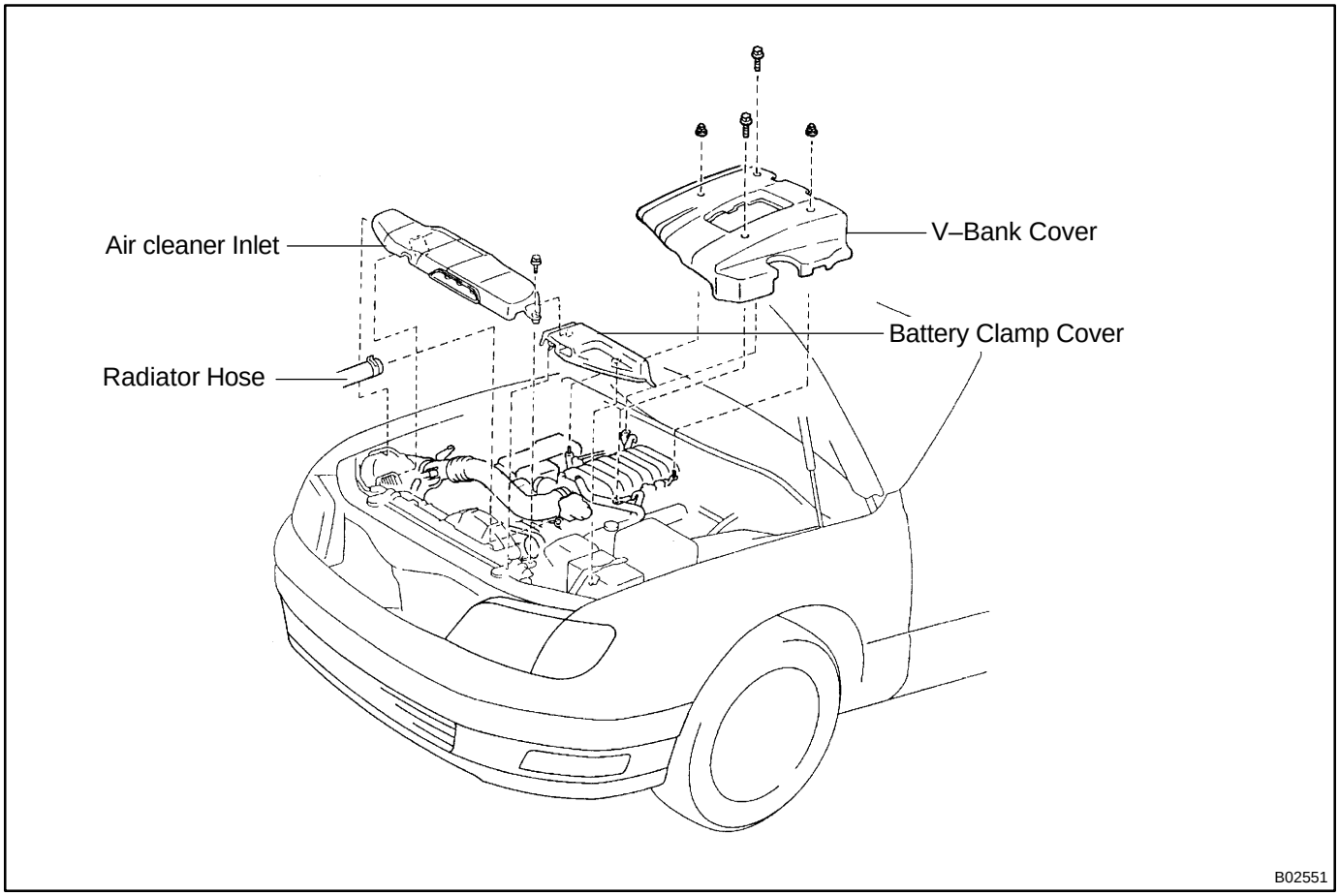
INSTALLATION

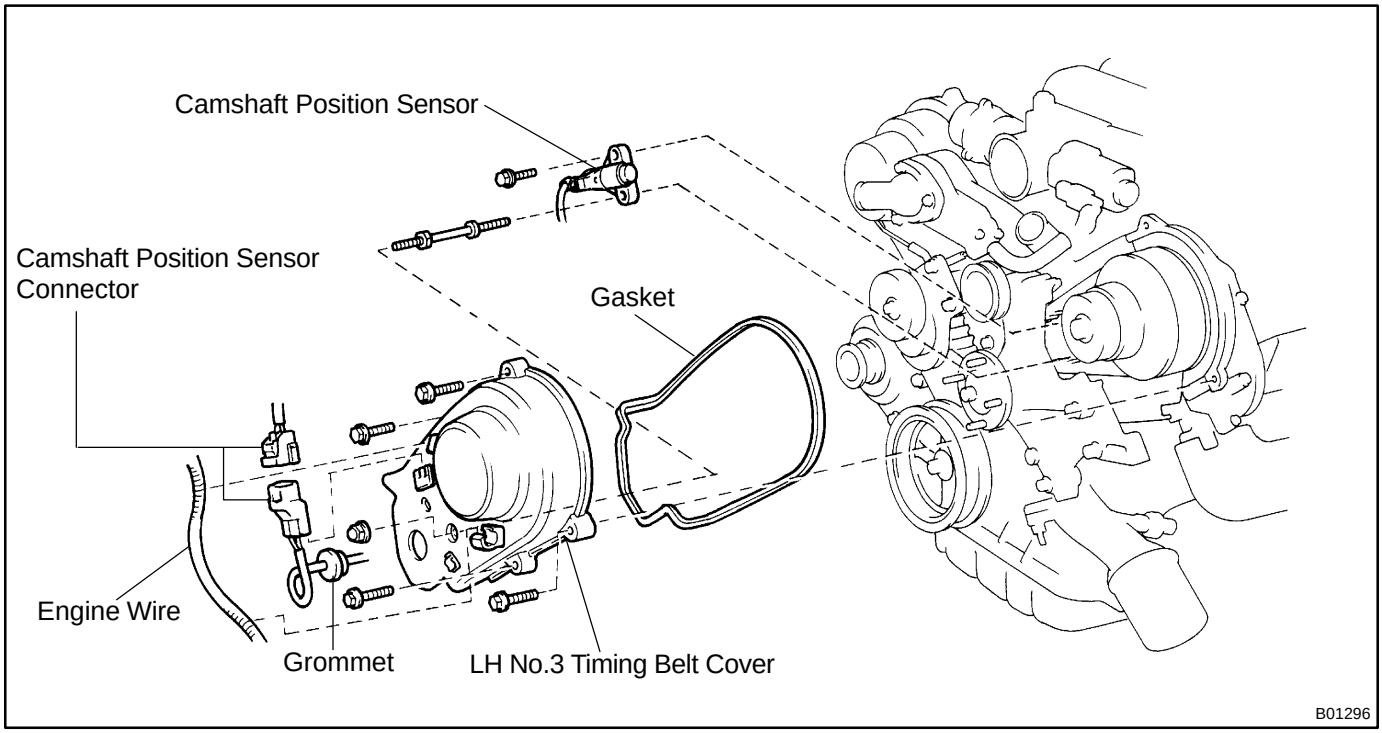
Installation is in the reverse order of removal. (See page IG–7)

CAMSHAFT POSITION SENSOR

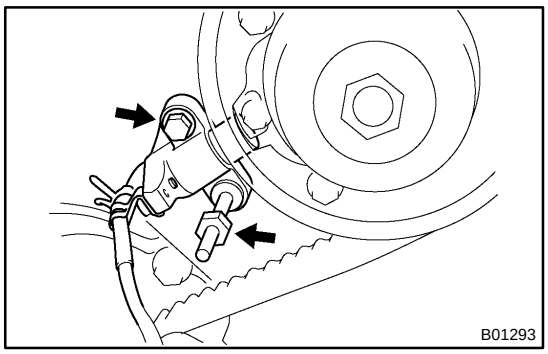
IG04Q–02

COMPONENTS





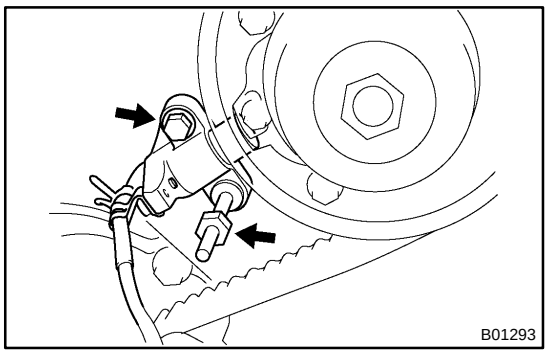
IG04R–02



REMOVAL

1. **REMOVE V–BANK COVER**
2. **REMOVE BATTERY CLAMP COVER**
3. **REMOVE AIR CLEANER INLET**
4. **DRAIN ENGINE COOLANT (See page CO–2)**
5. **DISCONNECT RADIATOR HOSE**
6. **REMOVE NO.3 TIMING BELT COVER (See page EM–15)**
7. **DISCONNECT CAMSHAFT POSITION SENSOR CONNECTOR**
8. **REMOVE CAMSHAFT POSITION SENSOR**
   Remove the bolt, stud bolt and camshaft position sensor.

IG04S–02



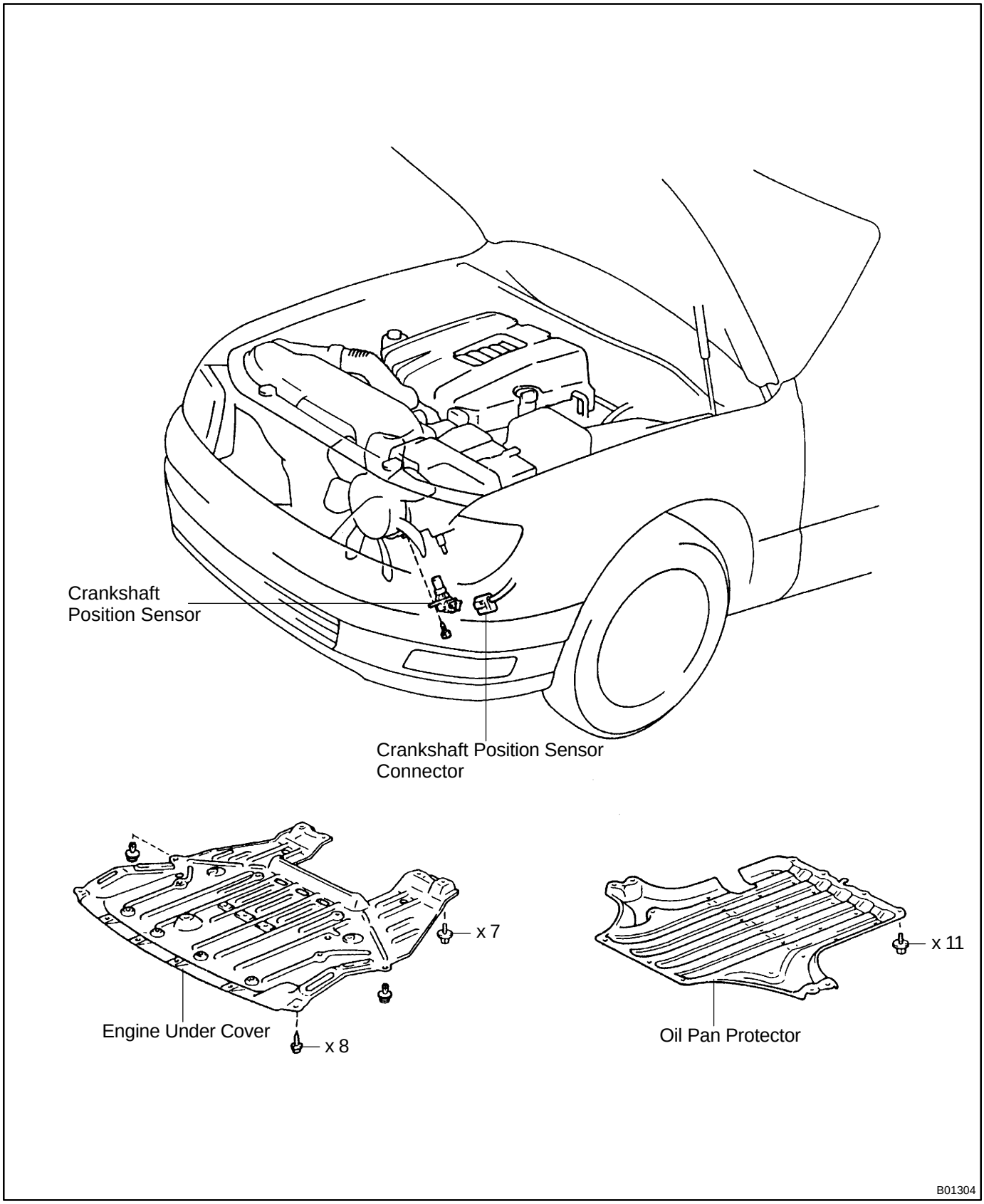
INSTALLATION

1. INSTALL CAMSHAFT POSITION SENSOR
   Torque: 7.5 N·m (80 kgf·cm, 66 in.·lbf)
2. CONNECT CAMSHAFT POSITION SENSOR CONNECTOR
3. INSTALL NO.3 TIMING BELT COVER
   (See page EM–22)
4. CONNECT RADIATOR HOSE
5. INSTALL AIR CLEANER INLET
6. INSTALL BATTERY CLAMP COVER
7. INSTALL V–BANK COVER
8. FILL ENGINE COOLANT (See page CO–2)
9. CHECK ENGINE COOLANT FOR LEAKS
10. CHECK IGNITION TIMING (See page EM–9)

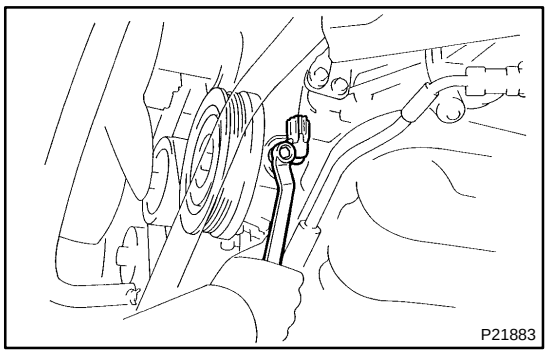
CRANKSHAFT POSITION SENSOR

IG04T–02

COMPONENTS



IG04U–02



REMOVAL

1. **REMOVE OIL PAN PROTECTOR**
2. **REMOVE ENGINE UNDER COVER**
3. **DISCONNECT CRANKSHAFT POSITION SENSOR CONNECTOR**
4. **REMOVE CRANKSHAFT POSITION SENSOR**

Remove the bolt and crankshaft position sensor.

Torque: 6.5 N·m (65 kgf·cm, 58 in.·lbf)

IG04V–02

INSTALLATION

Installation is in the reverse order of removal. (See page IG–13)