IGNITION SYSTEM

IG04X-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 IGNITER AND SPARK TEST

Check that the spark occurs.

(1) Remove the ignition coil. (See page IG-6)
(2) Remove the spark plug.
(3) Install the spark plug to the ignition coil, and connect the ignition coil connecter.
(4) Ground the spark plug.
(5) Check if spark occurs while engine is being cranked.

NOTICE:

To prevent excess fuel being injected from the injectors during this test, do not crank the engine for more than 5 - 10 seconds at a time.

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

SPARK TEST

↓ NO

CHECK CONNECTION OF IGNITION COIL AND IGNITER → BAD → Connect securely.

↓ OK

CHECK POWER SUPPLY TO IGNITION COIL AND IGNITER
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 coil and igniter.

↓ OK

CHECK RESISTANCE OF IGNITION COIL (See step 3)
Resistance: Cold Hot
Primary 0.54 - 0.84 Ω 0.68 - 0.98 Ω

→ BAD → Replace ignition coil.

↓ OK

CHECK RESISTANCE OF CAMSHAFT POSITION SENSOR (See step 4)
Resistance: Cold Hot
835 - 1,400 Ω 1,060 - 1,645 Ω

→ BAD → Replace camshaft position sensor.

↓ OK

CHECK RESISTANCE OF CRANKSHAFT POSITION SENSOR (See step 5)
Resistance: Cold Hot
1,630 - 2,740 Ω 2,065 - 3,225 Ω

→ BAD → Replace crankshaft position sensor.

↓ OK

CHECK IGT SIGNAL FROM ECM (See page DI-252)

→ BAD → Check wiring between ECM and igniter, and then try another ECM.

↓

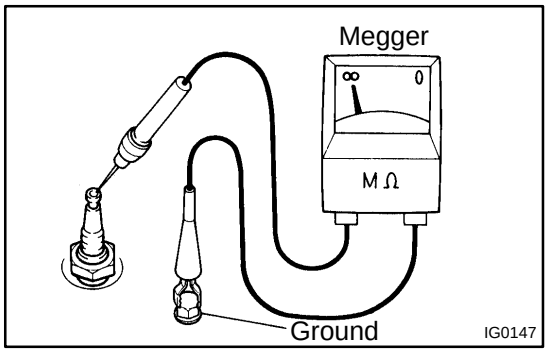
TRY ANOTHER IGNITER

2. INSPECT SPARK PLUGS

NOTICE:

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

(a) Remove the ignition coils assemblies.
(See page IG-6)

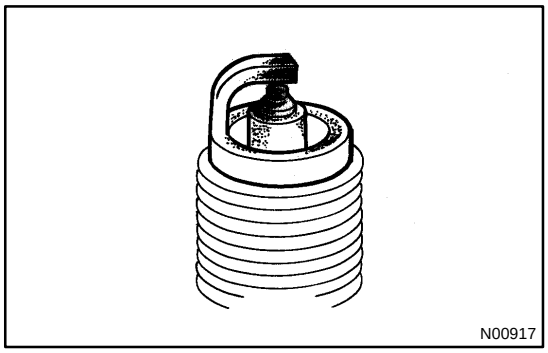


(b) Inspect the electrode.
Using a megger (insulation resistance meter), measure the insulation resistance.
Standard correct insulation resistance:
10 MΩ or more

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

HINT:

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



Simple Method:

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

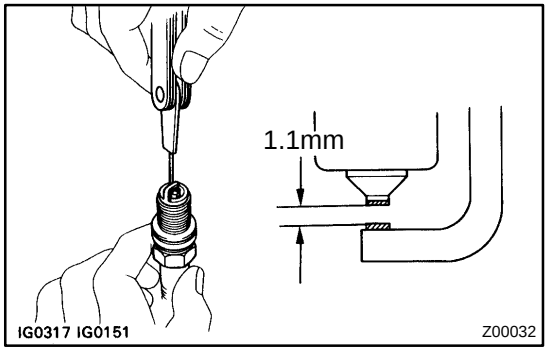
(c) Using a 16 mm plug wrench, remove the 6 spark plugs.

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

If abnormal, replace the spark plug.

Recommended spark plug:

DENSO made	PK20R11
NGK made	BKR6EP11

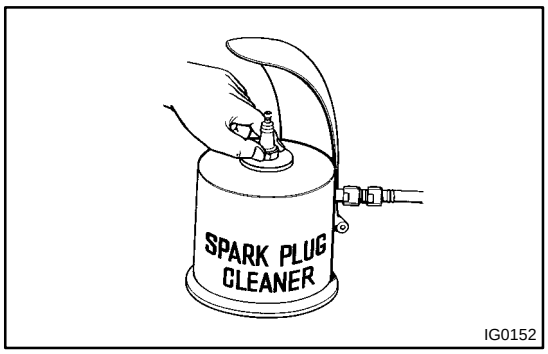


(e) Inspect the electrode gap.
Maximum electrode gap for used spark plug:
1.3 mm (0.051 in.)

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.

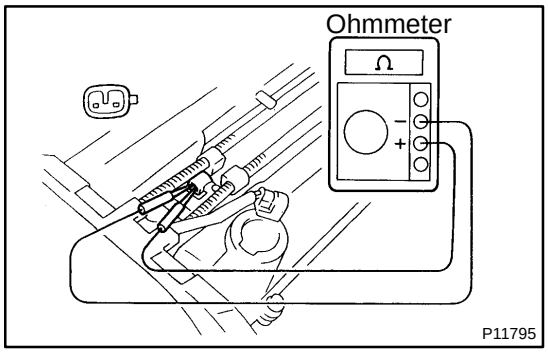
Air pressure: Below 588 kPa (6 kgf/cm^2, 85 psi)
Duration: 20 seconds or less

HINT:

If there are traces of oil, remove it with gasoline before using the spark plug cleaner.

(g) Using a 16 mm plug wrench, reinstall the 6 spark plugs.
Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)

(h) Reinstall the ignition coils assemblies.
(See page IG-7)



3. INSPECT IGNITION COILS

(a) Remove the No.3 timing belt cover.

(b) Disconnect the ignition coil connectors.

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

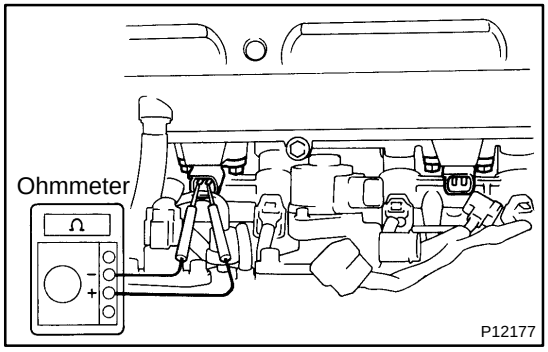
Primary coil resistance:

Cold	0.54 - 0.84 Ω
Hot	0.68 - 0.98 Ω

If the resistance is not as specified, replace the ignition coil.

(d) Reconnect the ignition coil connectors.

(e) Reinstall the No.3 timing belt cover.



4. INSPECT CAMSHAFT POSITION SENSORS

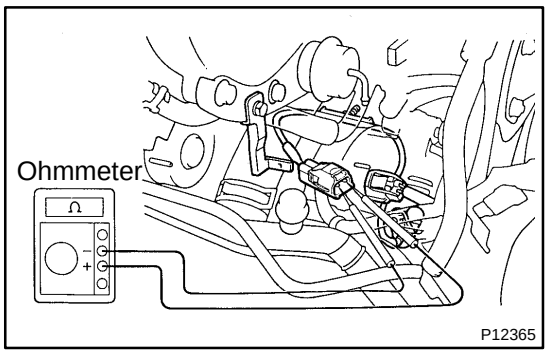
(a) Disconnect the camshaft position sensor connectors.

(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 camshaft position sensor.



(c) Reconnect the camshaft position sensor connectors.

5. INSPECT CRANKSHAFT POSITION SENSOR

(a) Remove the No.2 air tube for the CAC.

(b) Disconnect the crankshaft position sensor connector.

(c) 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.

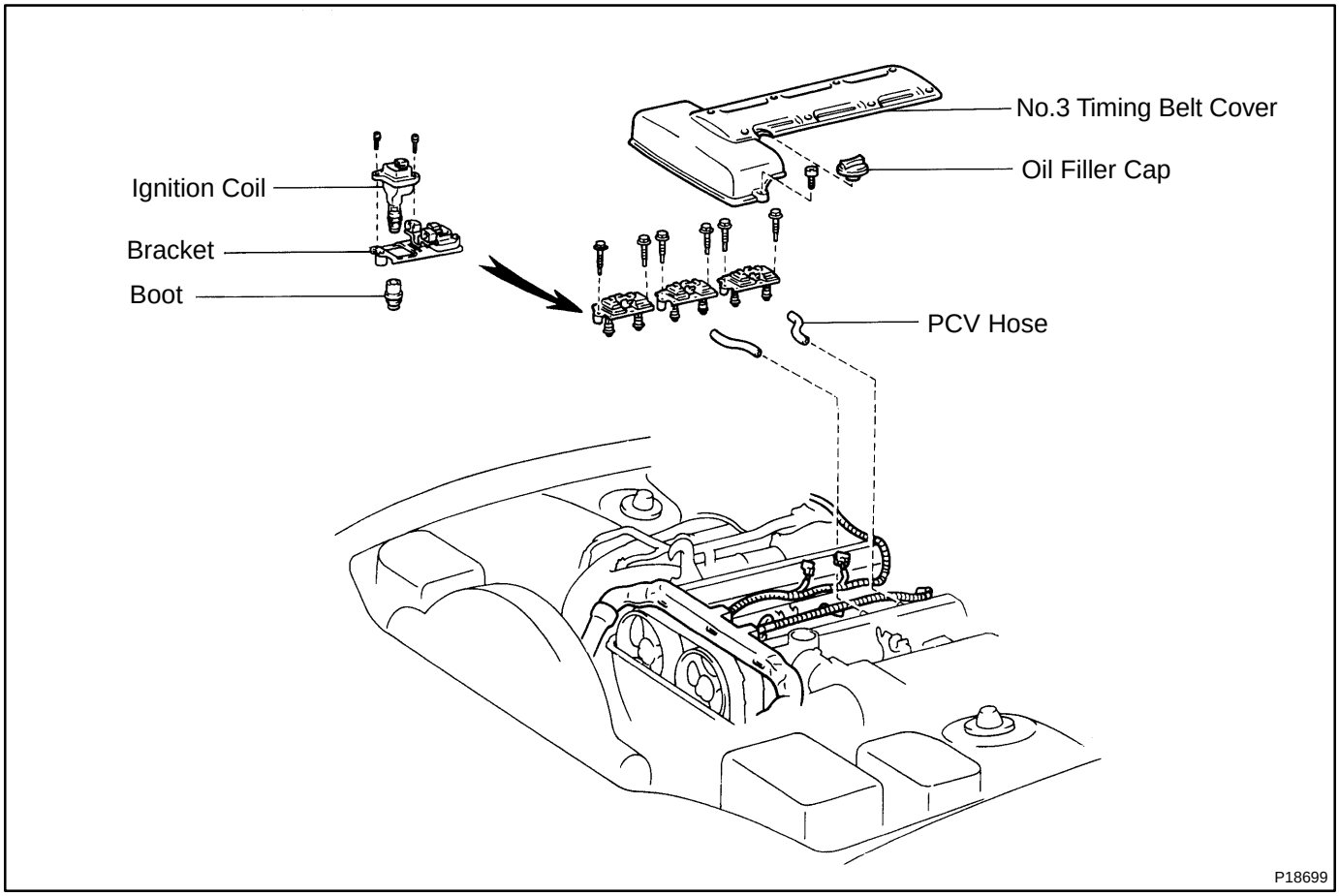
(d) Reconnect the crankshaft position sensor connector.

(e) Reinstall the No.2 air tube for the CAC.

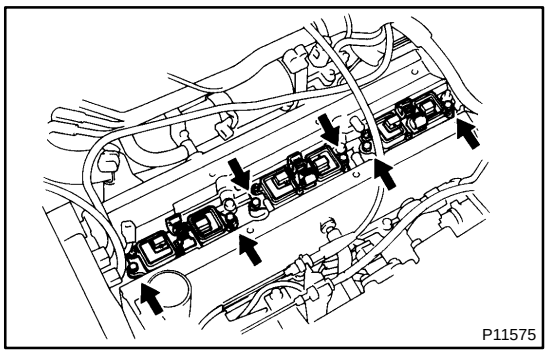
IGNITION COIL

COMPONENTS

IG04Y-01



IG04Z-02



REMOVAL

1. REMOVE NO.3 TIMING BELT COVER

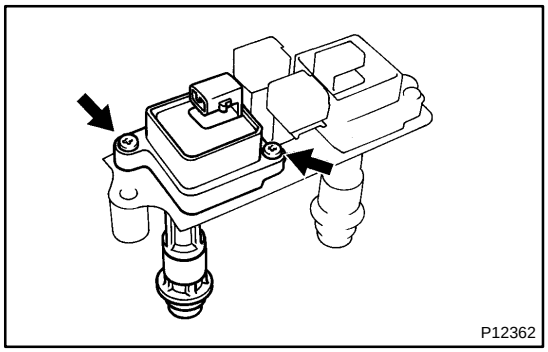
2. REMOVE PCV HOSES

3. DISCONNECT IGNITION COIL CONNECTORS

4. REMOVE BRACKET AND IGNITION COILS ASSEMBLIES

Remove the 2 bolts and 2 ignition coils assembly.

Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)



5. REMOVE IGNITION COILS FROM BRACKET

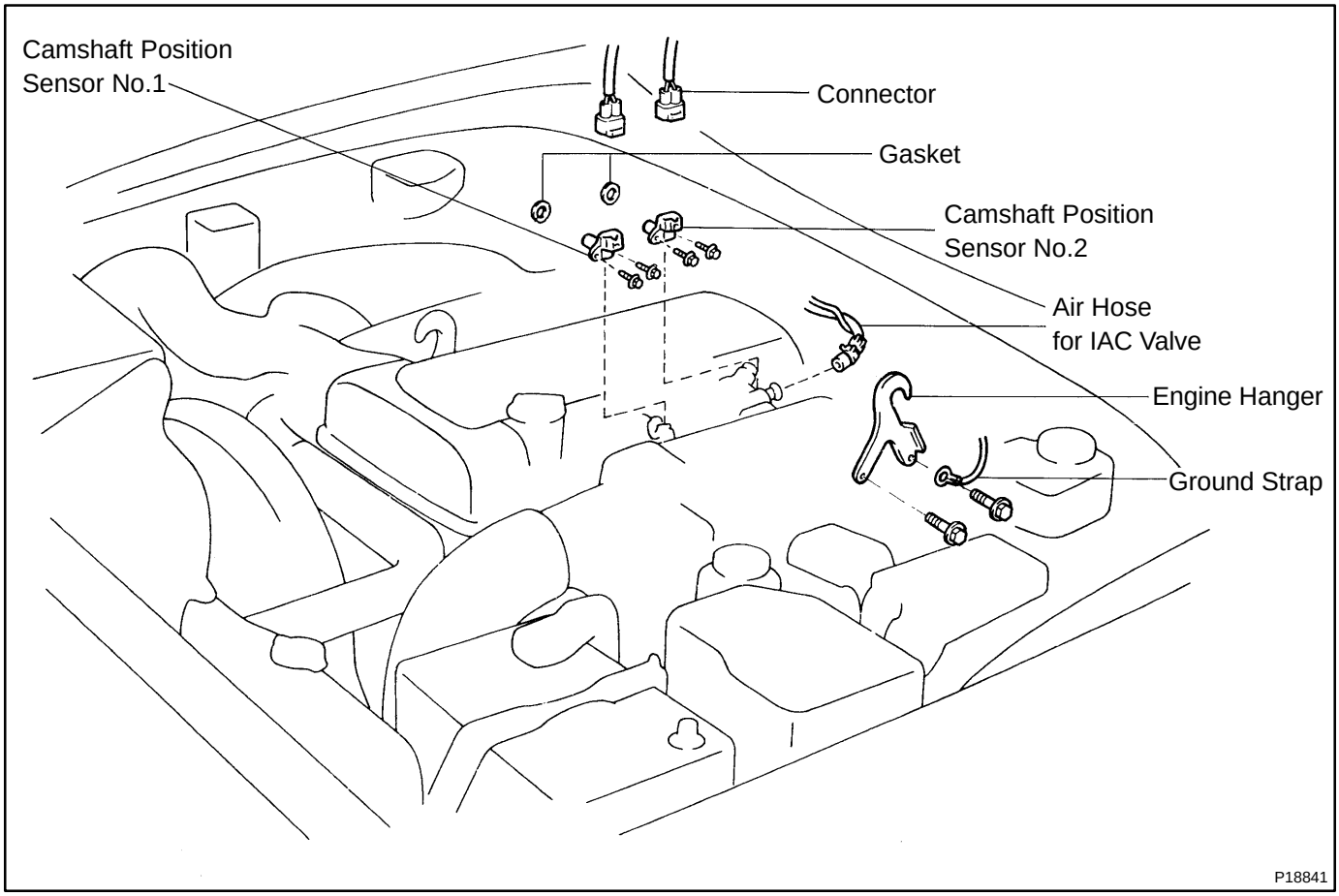
(a) Remove the rubber boot from the ignition coil.

(b) Remove the 2 screws and ignition coil.

CAMSHAFT POSITION SENSOR

IG051-01

COMPONENTS



IG052-02

REMOVAL

1. DISCONNECT IAC VALVE CONNECTOR

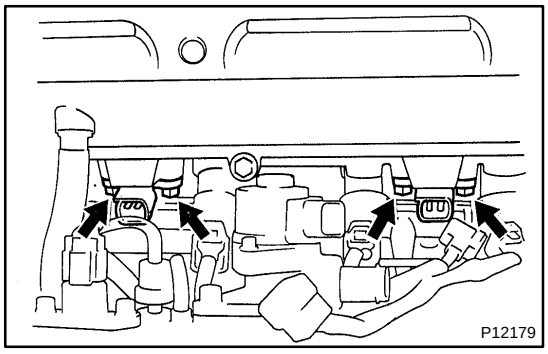
2. DISCONNECT AIR HOSE FROM IAC VALVE

3. REMOVE ENGINE HANGER

Remove the 2 bolts, ground strap and engine hanger.

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

4. DISCONNECT CAMSHAFT POSITION SENSOR CONNECTORS



5. REMOVE CAMSHAFT POSITION SENSORS

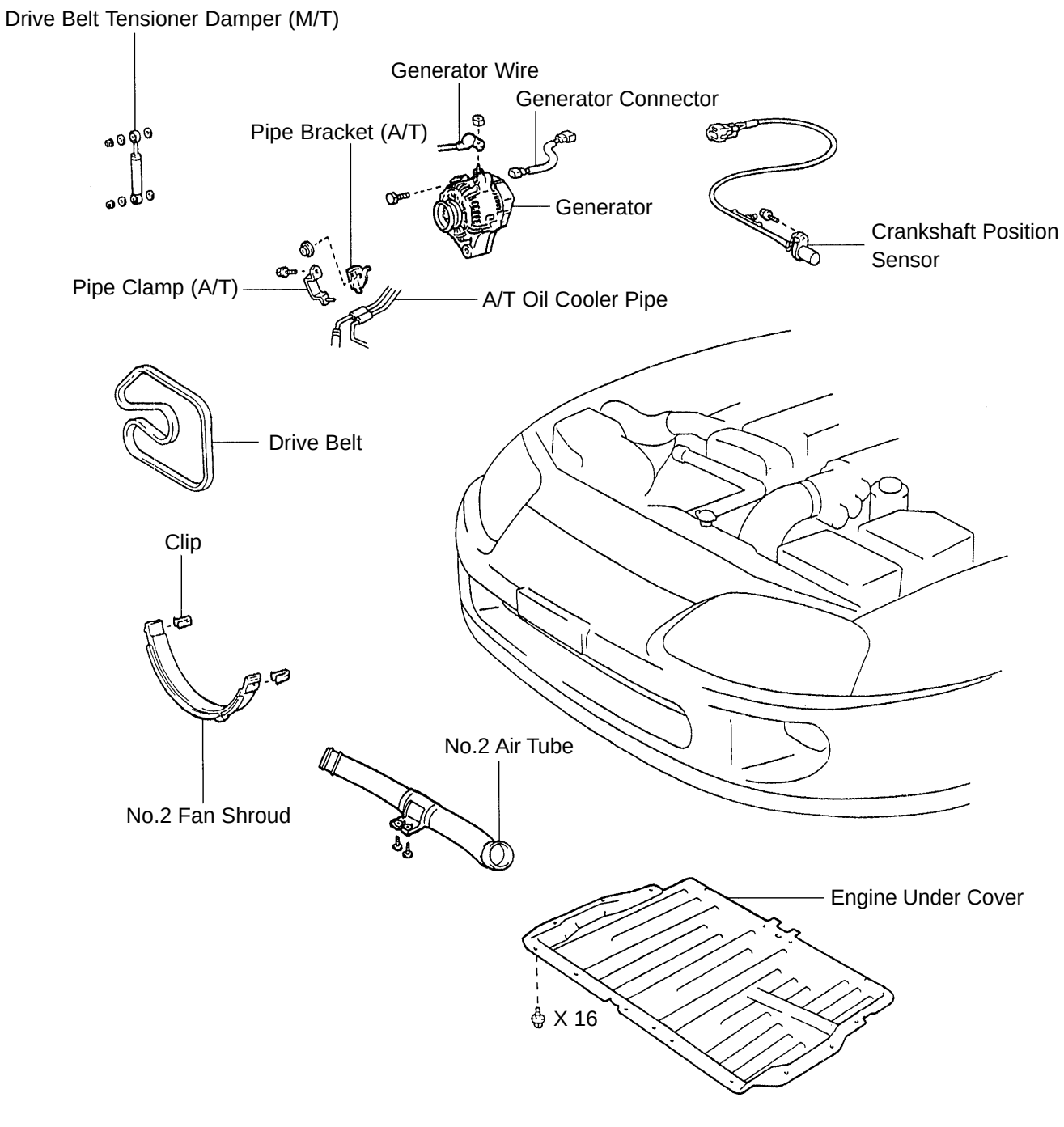
Remove the 4 bolts, 2 camshaft position sensors and 2 gaskets.

Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)

CRANKSHAFT POSITION SENSOR

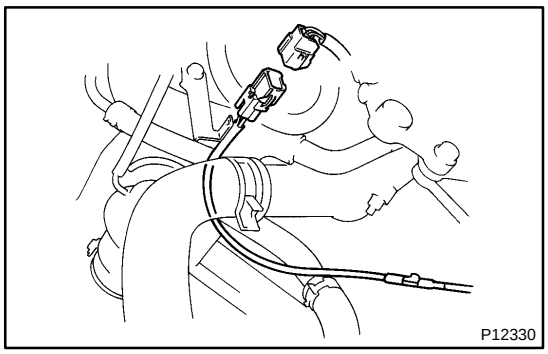
IG054-01

COMPONENTS



IG055-02

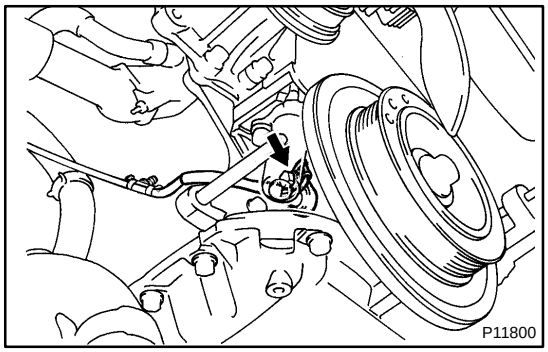
REMOVAL



1. REMOVE GENERATOR
(See page CH-8)

2. DISCONNECT CRANKSHAFT POSITION SENSOR CONNECTOR

(a) Disconnect the sensor connector from the bracket.
(b) Disconnect the sensor connector from the wiring connector.



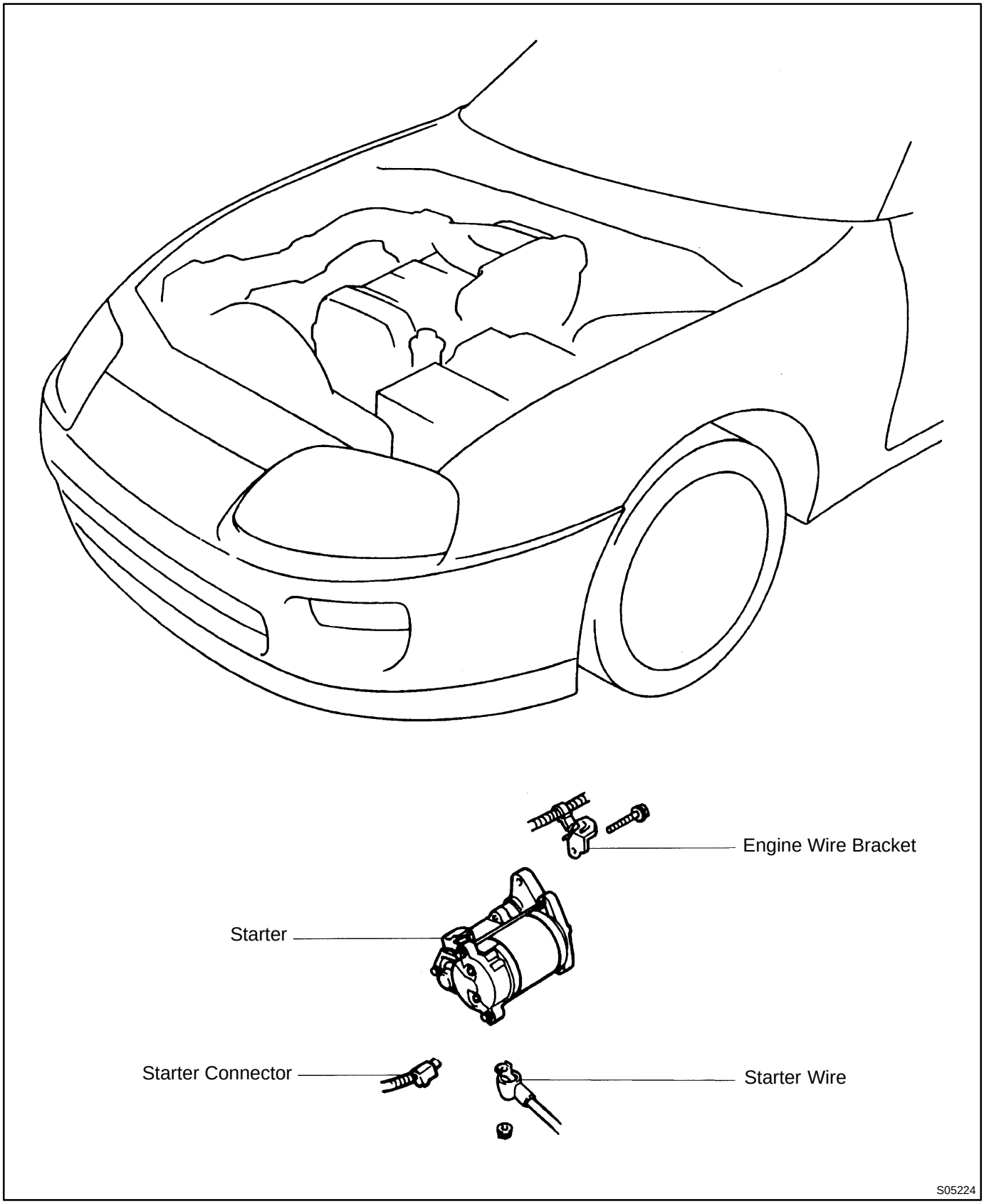
3. REMOVE CRANKSHAFT POSITION SENSOR

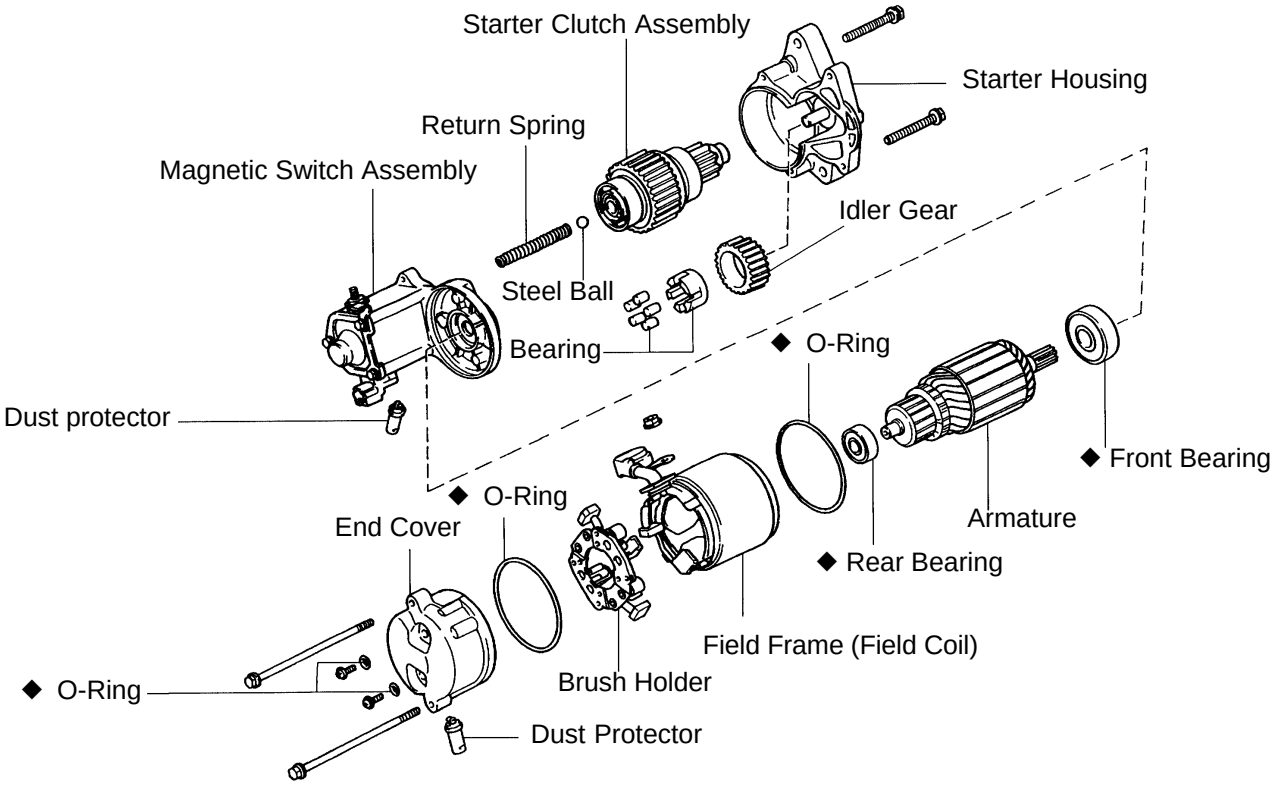
(a) Disconnect the wire clamp from the cylinder block.
(b) Remove the bolt and crankshaft position sensor.
Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)

STARTER

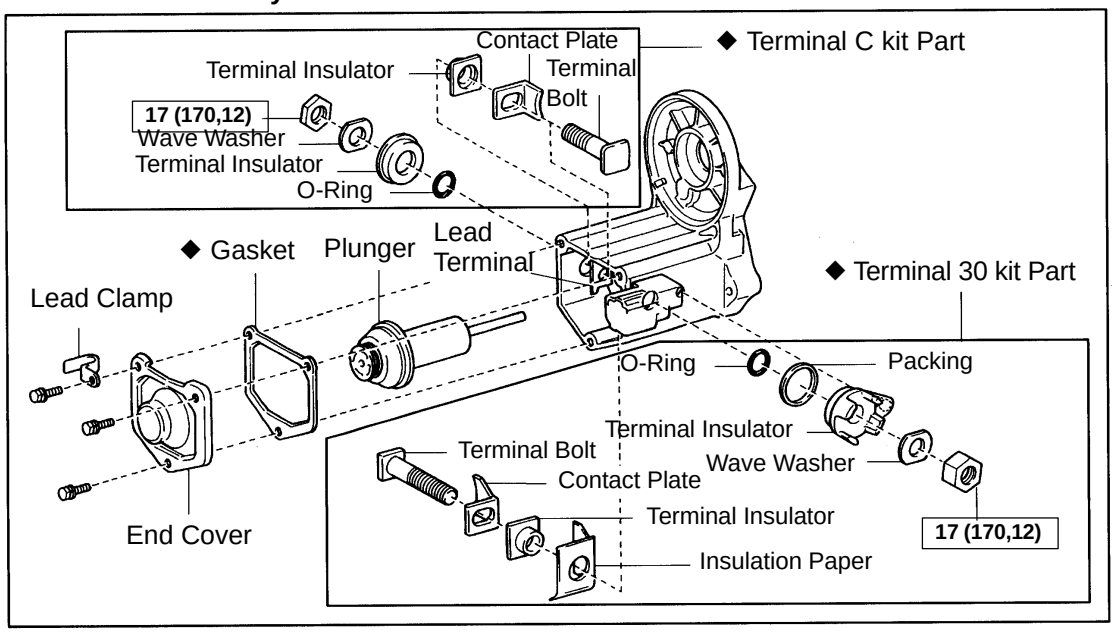
COMPONENTS

ST04C-02





Magnetic Switch Assembly



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non-reusable part

Z18832