

IGNITION SYSTEM ON-VEHICLE INSPECTION

IG057-01

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 IGNITOR AND SPARK TEST

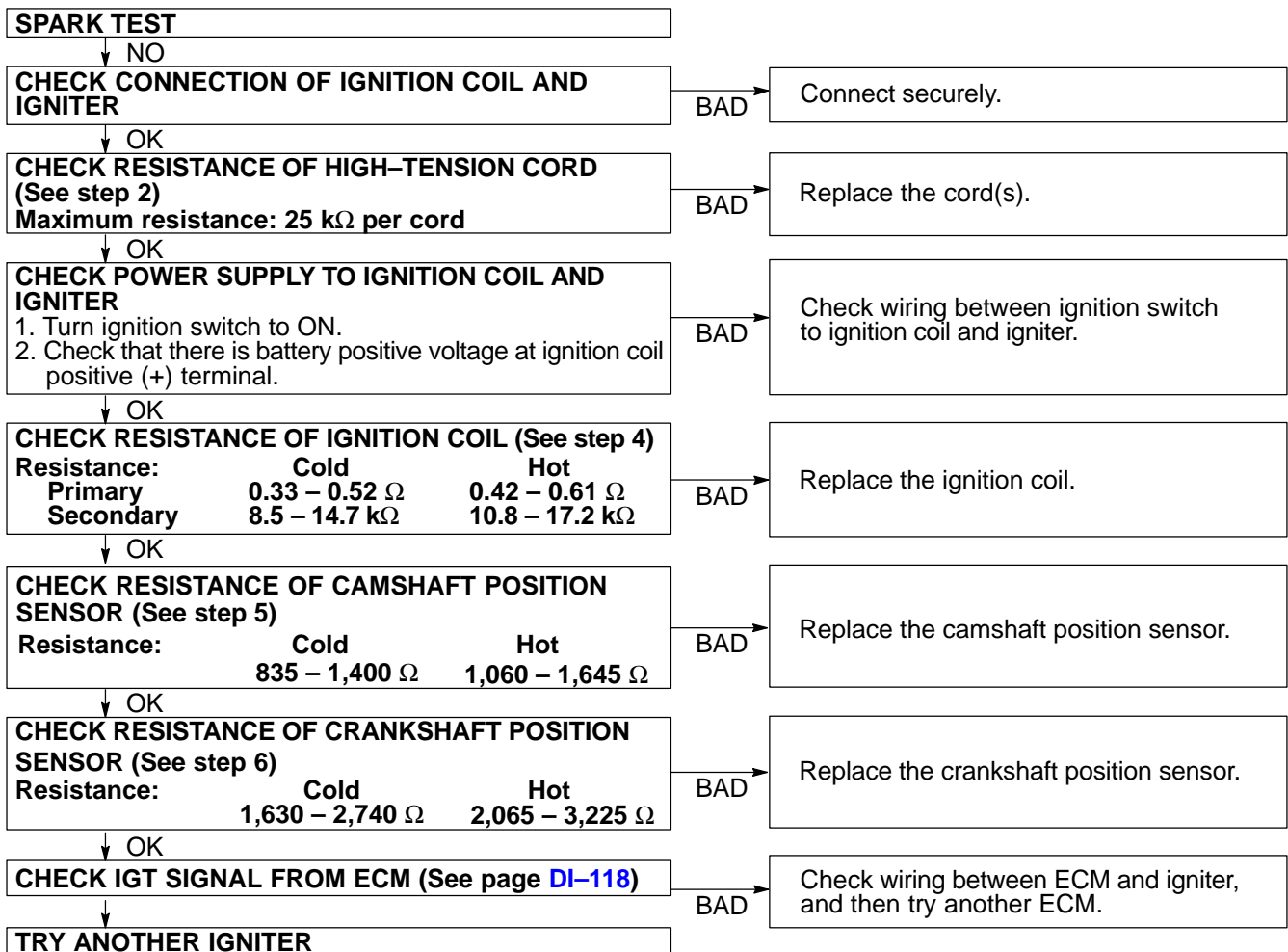
Check that the spark occurs.

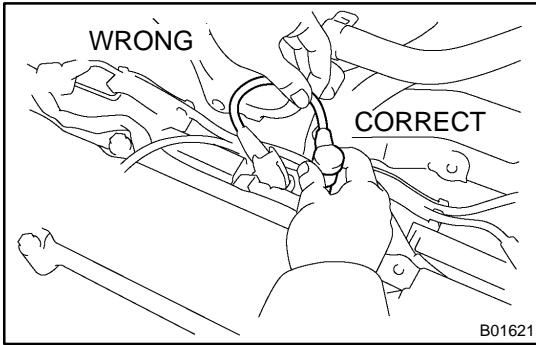
- (1) Remove the ignition coil. (See page IG-7)
- (2) Remove the spark plug.
- (3) Install the spark plug to the ignition coil, and connect the ignition coil connector.
- (4) Ground the spark plug.
- (5) Check if spark occurs while engine is being cranked.

NOTICE:

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

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



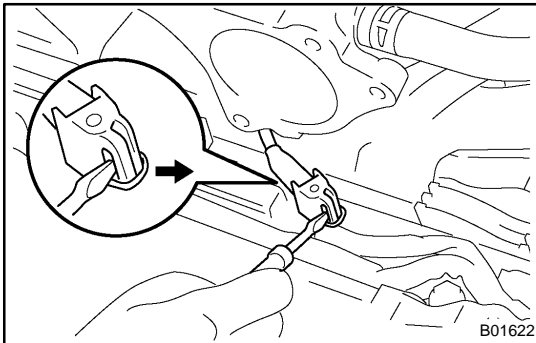


2. INSPECT HIGH-TENSION CORDS

- (a) Remove the No.3 timing belt cover.
- (b) Remove the throttle body gasket. (See page IG-7)
- (c) Disconnect the high-tension cord set from the spark plugs.
Disconnect the high-tension cords at the rubber boot.
DO NOT pull on the cords.

NOTICE:

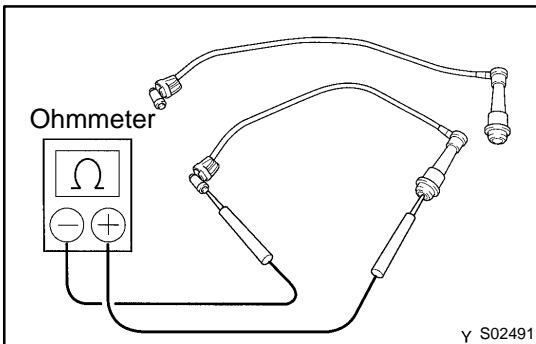
Pulling on or bending the cords may damage the conductor inside.



- (d) Disconnect the high-tension cord set from the ignition coils.
 - (1) Using a screwdriver, lift up the lock claw and disconnect the holder from the ignition coils.
 - (2) Disconnect the high-tension cord at the grommet.
DO NOT pull on the cord.

NOTICE:

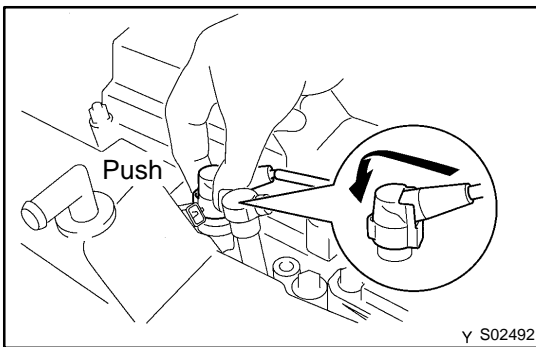
- ◆ **Pulling on or bending the cords may damage the conductor inside.**
- ◆ **Do not wipe any of the oil from the grommet after the high-tension cord is disconnected.**



- (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.

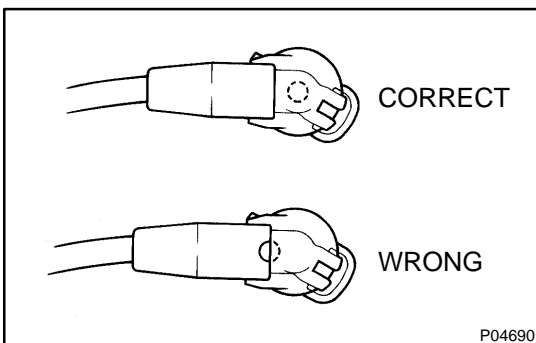


- (f) Reconnect the high-tension cord set to the ignition coils.
 - (1) Assemble the holder and grommet.
 - (2) Align the spline of the ignition coil with the spline of the holder, and push in the cord.

NOTICE:

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

- (3) Check that the lock claw of the holder is engaged by lightly pulling the holder.
- (g) Reconnect the high-tension cord set to the spark plugs.
- (h) Reinstall the throttle body gasket.
(See page IG-9)
- (i) Reinstall the No.3 timing belt cover.

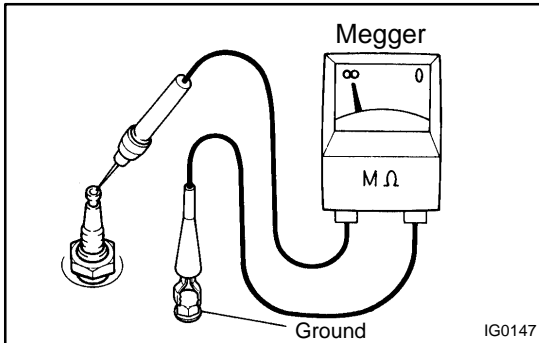


3. INSPECT SPARK PLUGS

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 and high-tension cord set assembly. (See page IG-7)



(b) Inspect the electrode. Using a megger (insulation resistance meter), measure the insulation resistance.

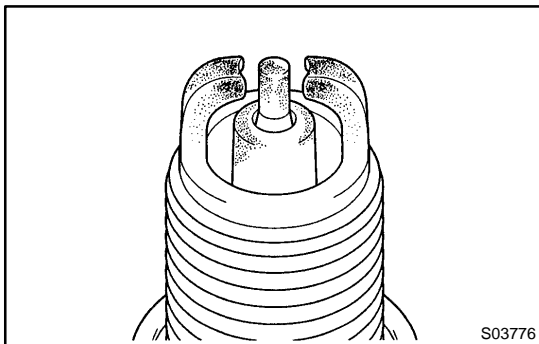
Standard correct insulation resistance:

10 MΩ or more

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

HINT:

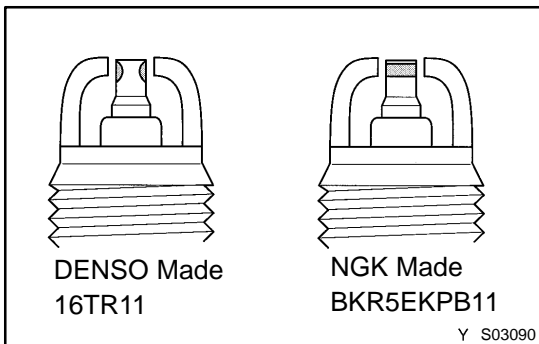
If a megger is not available, the following simple method of inspection provides fairly accurate results.



Simple Method:

- ◆ Quickly race the engine 5 times to 4,000 rpm.
- ◆ 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
- ◆ Reinstall the spark plug. (See step g)

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

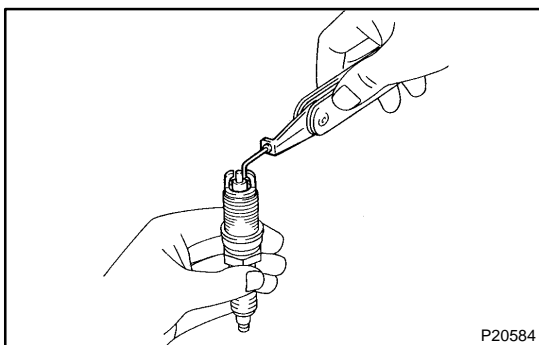


(d) Visually check the spark plug for thread damage and insulator damage.

If abnormal, replace the spark plug.

Recommended spark plug:

DENSO made	PK16TR11
NGK made	BKR5EKP11



(e) Inspect the electrode gap.

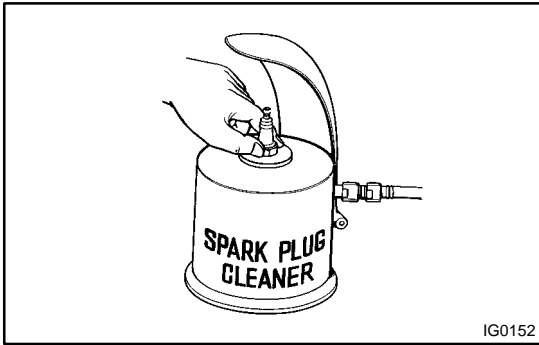
**Maximum electrode gap for used spark plug:
1.3 mm (0.051 in.)**

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/cm², 85 psi)

Duration: 20 seconds or less

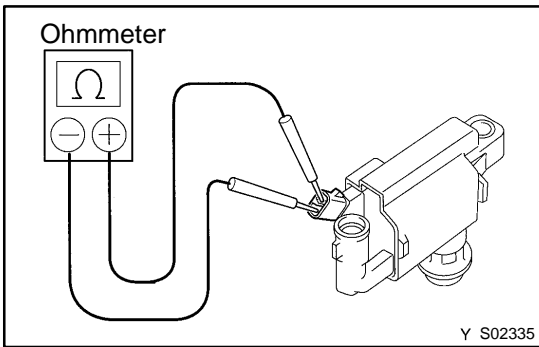
HINT:

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 and high-tension cord set assembly. (See page IG-9)

4. INSPECT IGNITION COILS

- (a) Remove the ignition coil assembly. (See page IG-7)

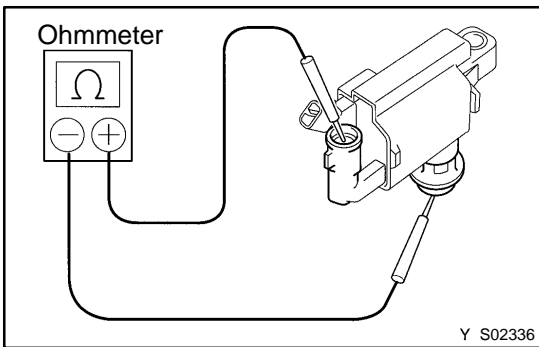


- (b) Using an ohmmeter, measure the resistance between the positive (+) and negative (-) terminals.

Primary coil resistance :

Cold	0.33 – 0.52 Ω
Hot	0.42 – 0.61 Ω

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



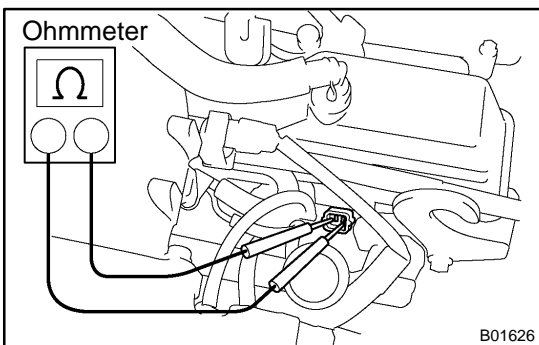
- (c) Using an ohmmeter, measure the resistance between the positive (+) and high-tension terminals.

Secondary coil resistance:

Cold	8.5 – 14.7 kΩ
Hot	10.8 – 17.2 kΩ

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

- (d) Reinstall the ignition coil assembly. (See page IG-9)



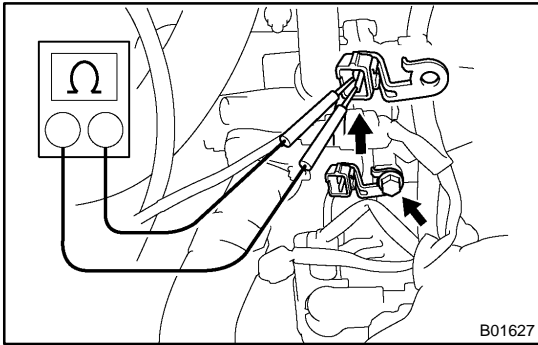
5. INSPECT CAMSHAFT POSITION SENSOR

- (a) Disconnect the camshaft position 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 camshaft position sensor.



- (c) Reconnect the camshaft position sensor connector.
- 6. INSPECT CRANKSHAFT POSITION SENSOR**
- (a) Disconnect the crankshaft position sensor connector.
- (b) Remove the bolt holding the connector bracket to the water pump.
- (c) Using an ohmmeter, measure the resistance between terminals.

Resistance:

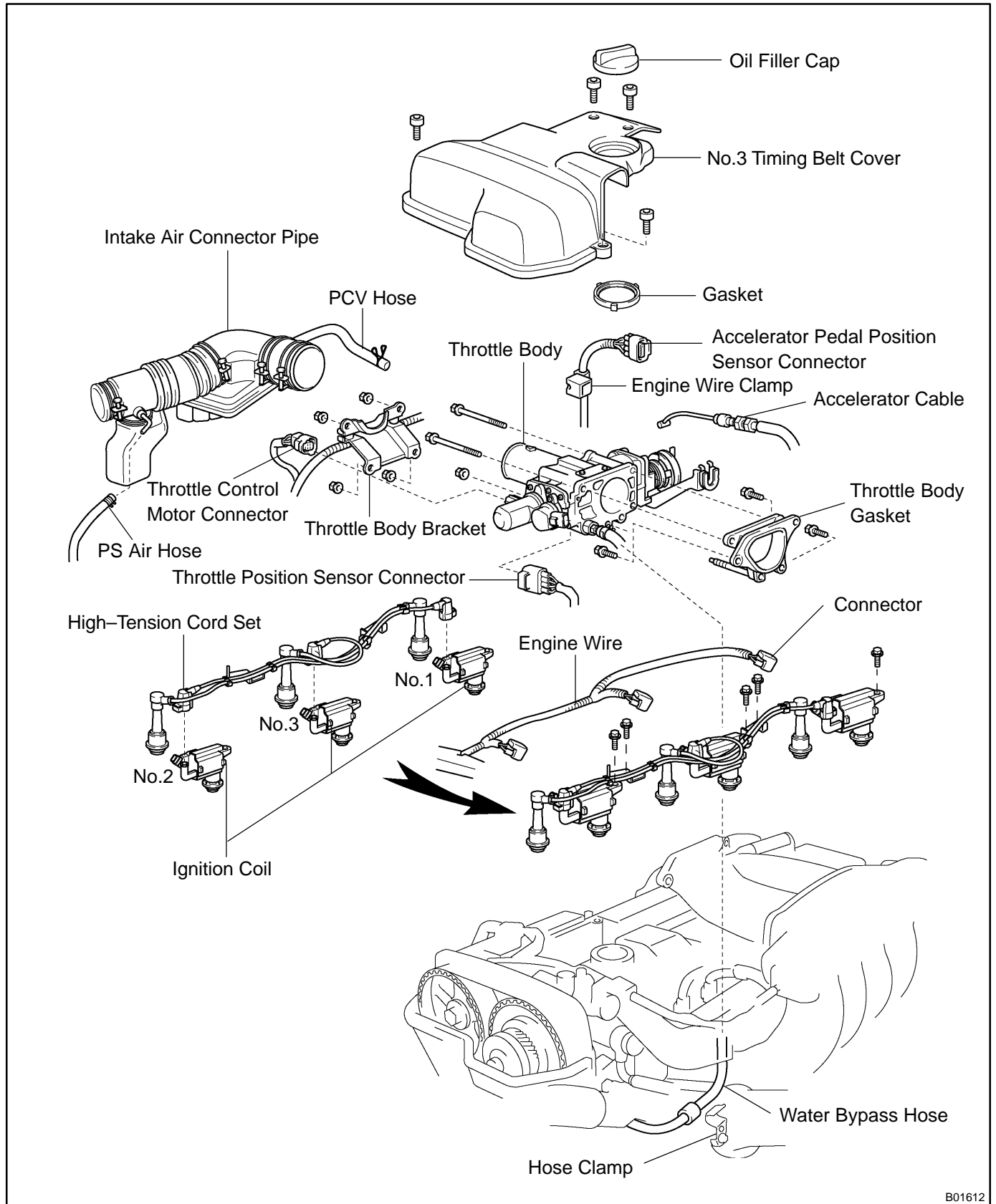
Cold	1,630 – 2,740 Ω
Hot	2,065 – 3,225 Ω

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

- (d) Reinstall the bolt holding the connector bracket to the water pump.
- (e) Reconnect the crankshaft position sensor connector.

IGNITION COIL COMPONENTS

IG058-01



B01612

REMOVAL

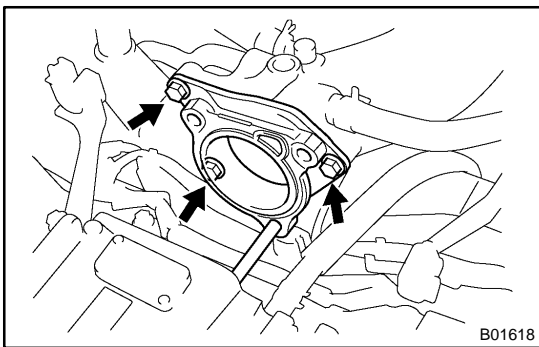
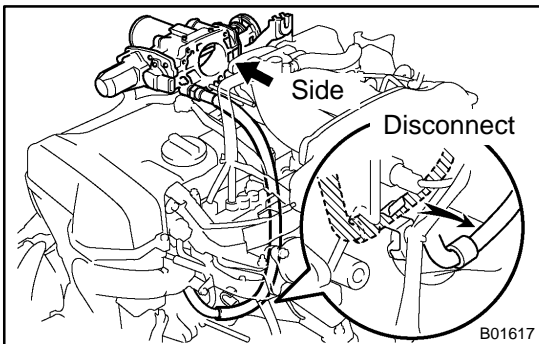
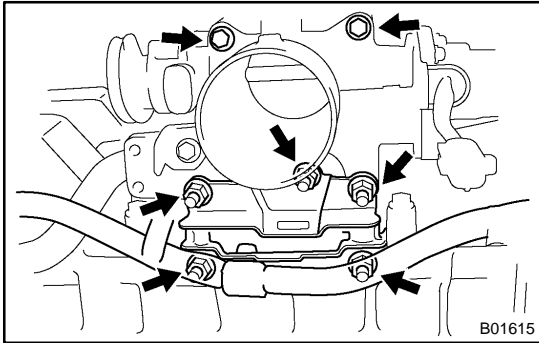
1. REMOVE INTAKE AIR CONNECTOR PIPE

2. REMOVE NO.3 TIMING BELT COVER

Using a 5 mm hexagon wrench, remove the 4 bolts, oil filler cap, No.3 timing belt cover and gasket.

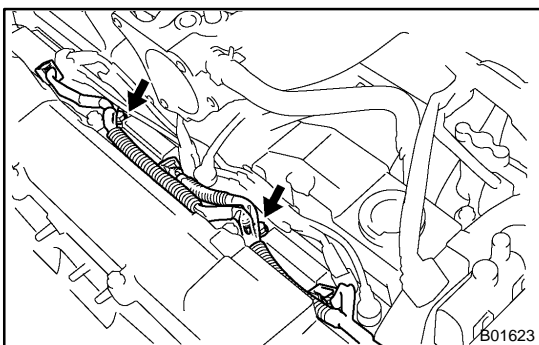
3. DISCONNECT THROTTLE BODY FROM INTAKE AIR CONNECTOR WITHOUT DISCONNECTING WATER BYPASS HOSES

- (a) Disconnect the accelerator cable.
- (b) Disconnect these connectors and clamp:
 - ◆ Throttle position sensor connector
 - ◆ Throttle control motor connector
 - ◆ Accelerator pedal position sensor connector
 - ◆ Engine wire clamp from clamp bracket of throttle body
- (c) Remove the 2 bolts and nut holding the throttle body to the intake air connector.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)
- (d) Remove the 4 nuts and the throttle body bracket.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)
- (e) Disconnect the water bypass hose from the hose clamp on the oil filter bracket.
- (f) Slightly slide the throttle body away from the intake air connector.



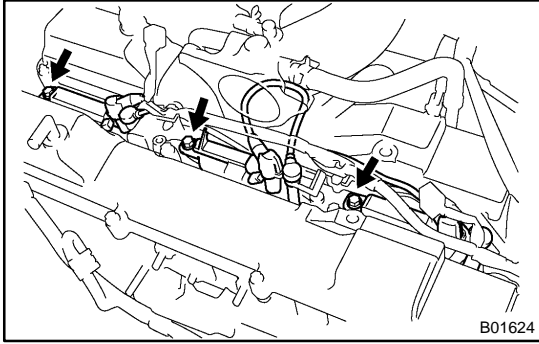
4. REMOVE THROTTLE BODY GASKET

Remove the 3 bolts and throttle body gasket.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

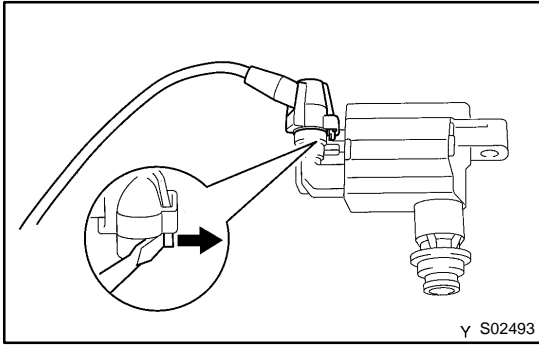


5. REMOVE IGNITION COILS AND HIGH - TENSION CORDS SET ASSEMBLY

- (a) Disconnect the 3 connectors from the ignition coils.
- (b) Remove the 2 bolts, and disconnect the clamps from the engine wire.



- (c) Remove the 3 bolts, the ignition coils and high – tension cord set assembly.
Torque: 8.0 N·m (80 kgf·cm, 70 in.-lbf)



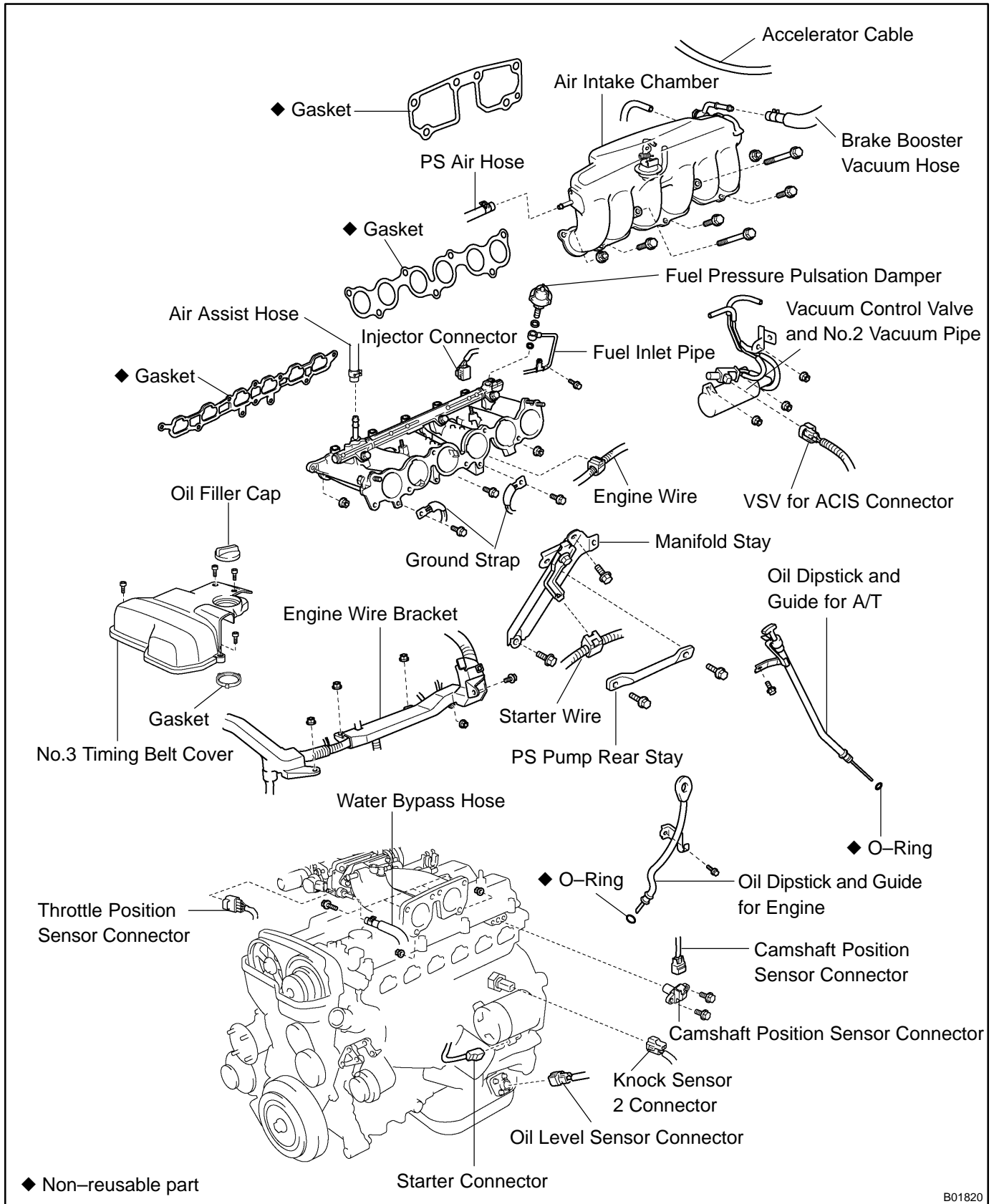
- 6. REMOVE IGNITION COILS FROM HIGH – TENSION CORD SET

INSTALLATION

Installation is in the reverse order of removal (See page [IG-7](#)).

CAMSHAFT POSITION SENSOR COMPONENTS

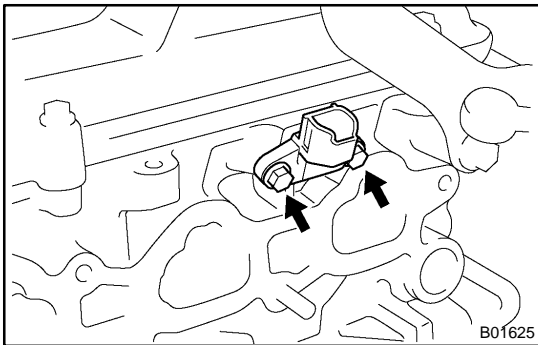
IG05F-01



B01820

REMOVAL

1. DRAIN ENGINE COOLANT
2. REMOVE OIL DIPSTICK AND GUIDE FOR ENGINE
(See page [LU-8](#))
3. REMOVE OIL DIPSTICK AND GUIDE FOR A/T
(See page [SF-45](#))
4. REMOVE AIR INTAKE CHAMBER (See page [SF-45](#))
5. REMOVE VACUUM CONTROL VALVE SET AND NO.2 VACUUM PIPE (See page [SF-25](#))
6. REMOVE NO.3 TIMING BELT COVER
7. DISCONNECT HOSES AND ENGINE WIRE
 - (a) Disconnect the air assist hose from the intake manifold.
 - (b) Disconnect the water bypass hose (from the water outlet) from the throttle body.
 - (c) Disconnect the 2 ground terminals from the intake manifold.
 - (d) Disconnect these connectors:
 - ◆ Throttle position sensor connector
 - ◆ 6 injector connectors
 - ◆ Camshaft position sensor connector
 - ◆ Knock sensor 2 connector
 - ◆ Starter connector
 - ◆ Oil level sensor connector
 - ◆ VSV connector for ACIS
 - (e) Disconnect the engine wire clamp from the clamp bracket on the intake manifold.
 - (f) Remove the 4 nuts, and disconnect the engine wire protector from the intake manifold.
8. REMOVE FUEL PRESSURE PULSATION DAMPER
(See page [SF-25](#))
9. REMOVE PS PUMP REAR STAY
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
10. REMOVE INTAKE MANIFOLD ASSEMBLY
(See page [EM-31](#))
11. REMOVE CAMSHAFT POSITION SENSOR
Remove the 2 bolts and camshaft position sensor.
Torque: 9.0 N·m (90 kgf·cm, 80 in.·lbf)



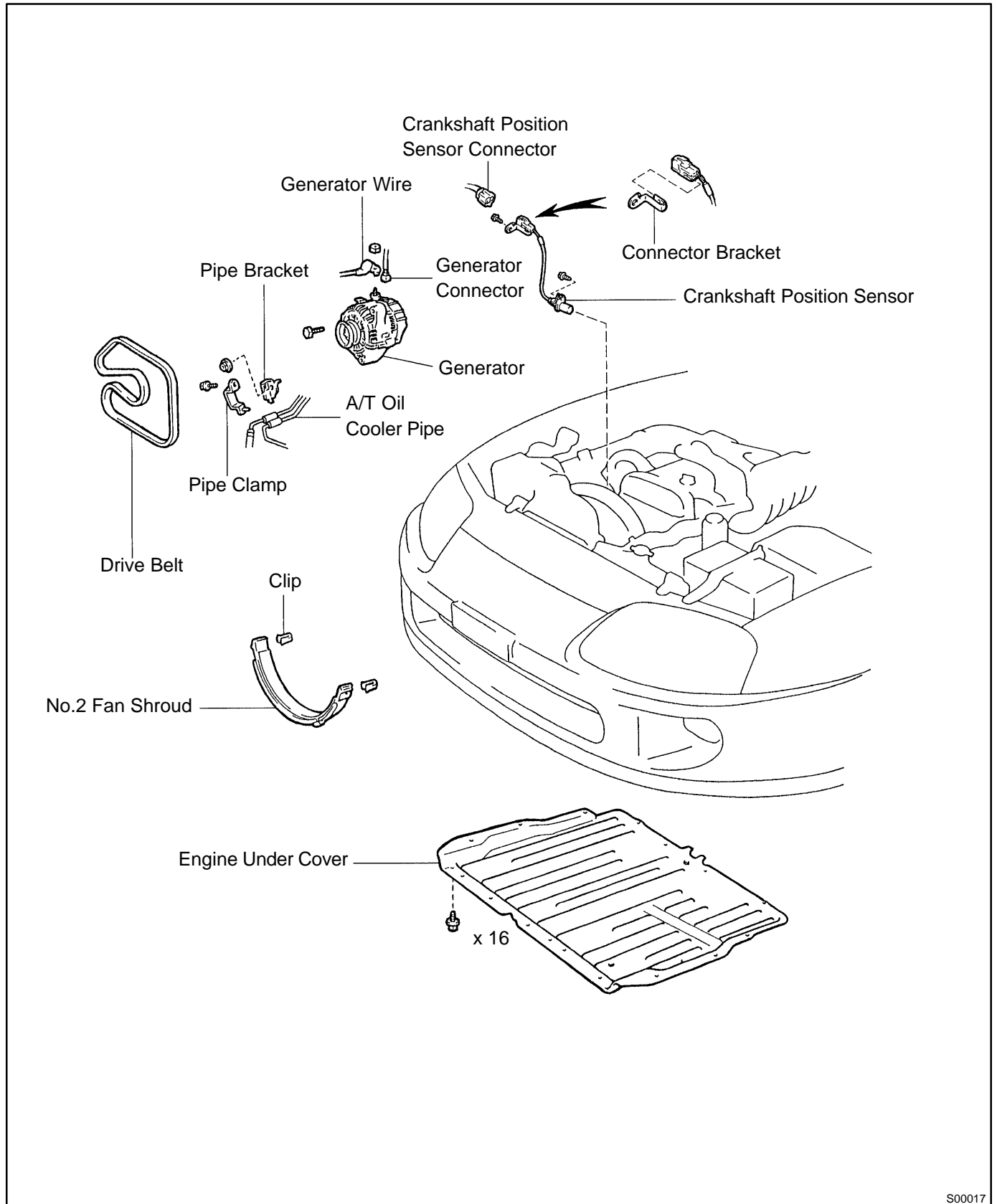
B01625

INSTALLATION

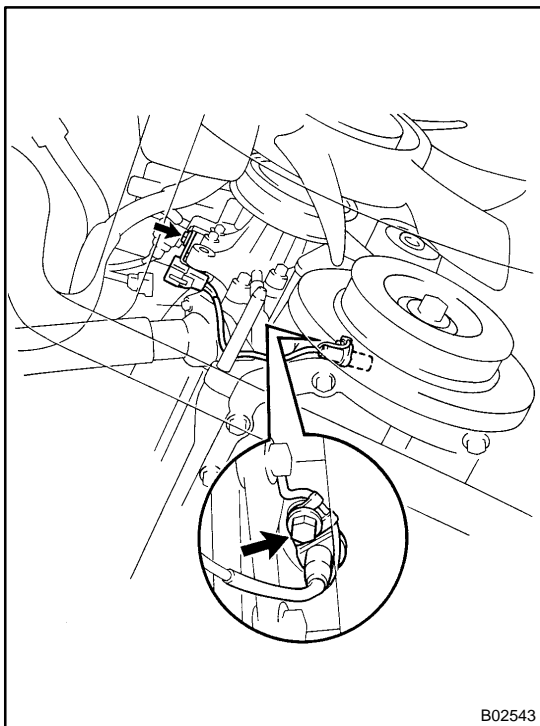
Installation is in the reverse order of removal (See page [IG-11](#)).

CRANKSHAFT POSITION SENSOR COMPONENTS

IG05B-01



S00017



REMOVAL

1. **REMOVE GENERATOR** (See page [CH-8](#))
2. **DISCONNECT CRANKSHAFT POSITION SENSOR CONNECTOR**
 - (a) Disconnect the sensor connector.
 - (b) Remove the bolt holding the connector bracket to the water pump.
3. **REMOVE CRANKSHAFT POSITION SENSOR**
 - (a) Remove the bolt and crankshaft position sensor.
Torque: 9.0 N·m (90 kgf·cm, 80 in.-lbf)
 - (b) Remove the connector bracket from the connector.

INSTALLATION

Installation is in the reverse order of removal (See page [IG-14](#)).