

IGNITION SYSTEM

ON-VEHICLE INSPECTION

IG011-01

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 IGNITER AND SPARK TEST

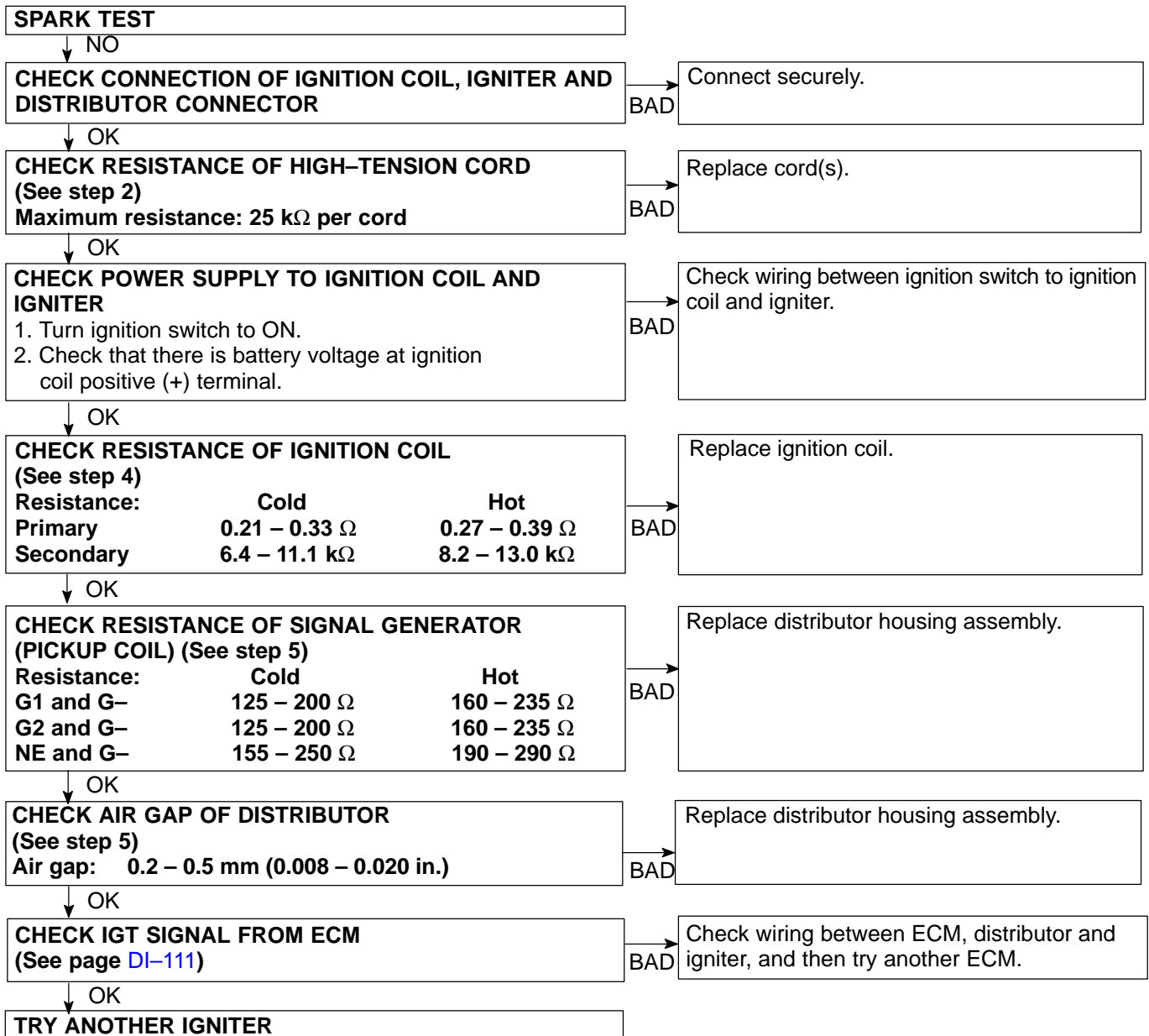
Check that spark occurs.

- (1) Disconnect the high-tension cord (from the ignition coil) from the distributor cap.
- (2) Hold the end approx. 12.5 mm (0.50 in.) from the body ground.
- (3) See if spark occurs while engine is being cranked.

NOTICE:

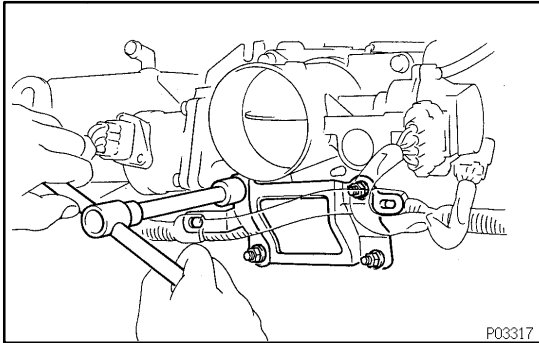
To prevent excess fuel from being injected from injectors during this test, don't crank the engine for more than 5 - 10 seconds at a time.

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

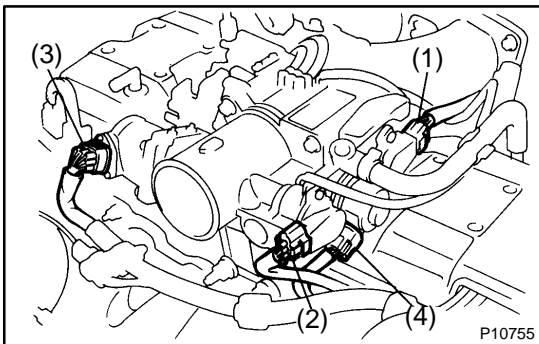


2. INSPECT HIGH-TENSION CORDS

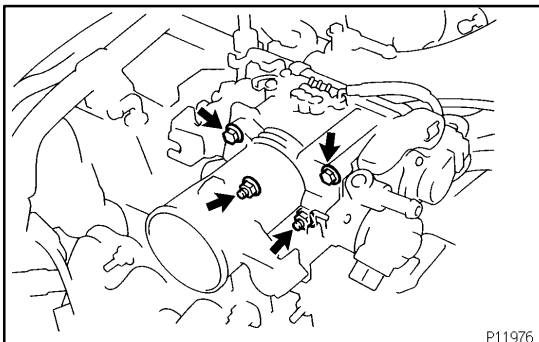
- (a) Disconnect the control cables from the throttle body.
- (b) Remove the intake air connector pipe.



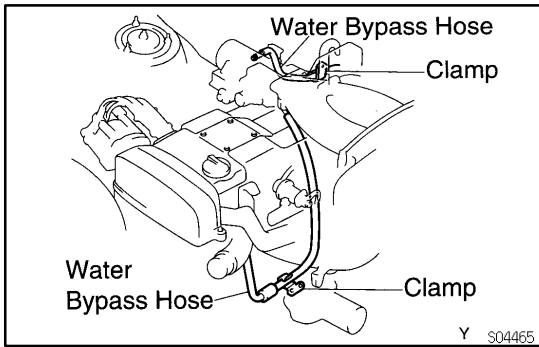
- (c) Remove the 4 nut, and disconnect the throttle body bracket from the throttle body and cylinder head.



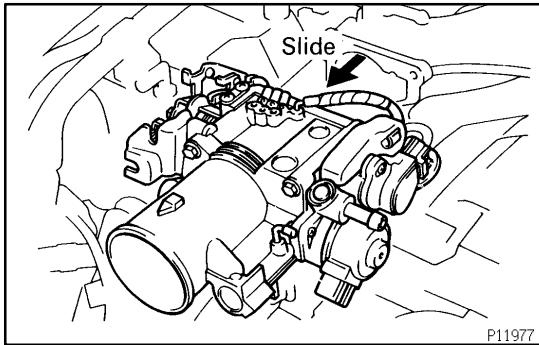
- (d) Disconnect the throttle body from the intake air connector without disconnecting the water bypass hoses.
 - (1) Disconnect the throttle position sensor connector.
 - (2) w/ TRAC: Disconnect the sub-throttle position sensor connector.
 - (3) w/ TRAC: Disconnect the sub-throttle actuator connector.
 - (4) Disconnect the IAC valve connector.
 - (5) Disconnect the 4 vacuum hoses.
 - (6) Disconnect the air hose (from intake manifold).



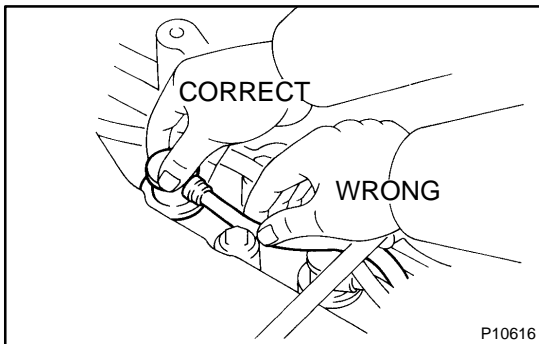
- (7) Remove the 2 bolts and 2 nuts.
Torque: 21 N·m (210 kgf-cm, 15 ft-lbf)



- (8) Disconnect the 2 water bypass hoses from the clamps on the oil filter bracket and engine hanger.



- (9) Slightly slide the throttle body away from the intake air connector.
- (e) Remove the No. 3 timing belt cover.
- (f) Remove the cylinder head rear cover.

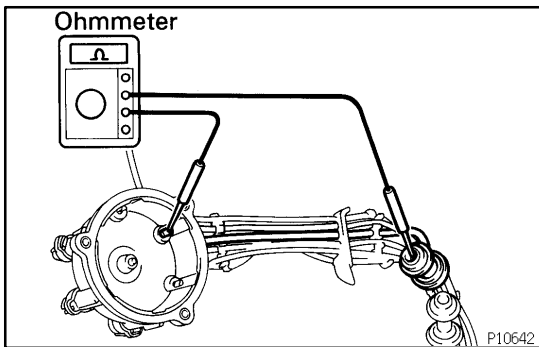


- (g) Disconnect the high-tension cords from the spark plugs and ignition coil.
Disconnect the high-tension cords at the rubber boot. Do not pull on the high-tension cords.

NOTICE:

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

- (h) Remove the distributor cap without disconnecting the high-tension cords.



- (i) Using an ohmmeter, measure the resistance without disconnecting the distributor cap.

Maximum resistance: 25 kΩ per cord

If the resistance is greater than maximum, check the terminals. If necessary, replace the high-tension cord and/or distributor cap.

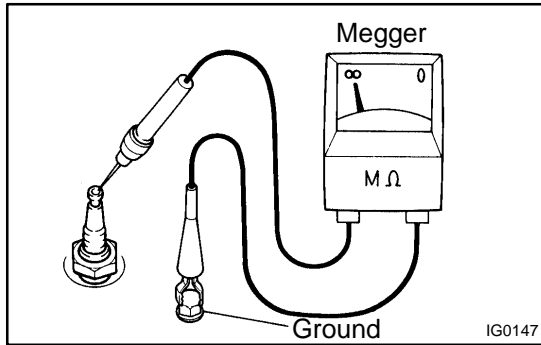
- (j) Reinstall the distributor cap.
- (k) Reconnect the high-tension cords to the spark plugs and ignition coil.
- (l) Reinstall the cylinder head rear cover.
- (m) Reinstall the No. 3 timing belt cover.
- (n) Reinstall the throttle body to the intake air connector.
Torque: 21 N·m (210 kgf-cm, 15 ft-lbf)
- (o) Reinstall the throttle body bracket.
Torque: 21 N·m (210 kgf-cm, 15 ft-lbf)
- (p) Reinstall the intake air connector pipe.
- (q) Reconnect the control cables to the throttle body.

3. 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 (See step 2).



(b) Inspect the electrode.

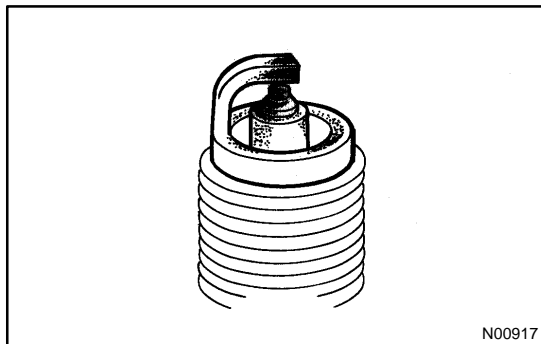
- Using a megger (insulation resistance meter), measure the insulation resistance.

**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.



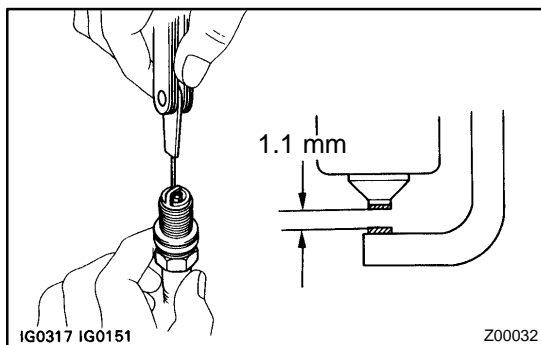
- **Simple Method:**
 - Quickly race the engine 5 times to 4,000 rpm.
 - Remove the spark plug (See step (c)).
 - Visually check the spark plug.
 - If the electrode is dry ... OK
 - If the electrode is wet ... Proceed to step (d)
 - Reinstall the spark plug (See step (g)).

(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	PK16R11
NGK made	BKR5EP11



(e) Inspect the electrode gap.

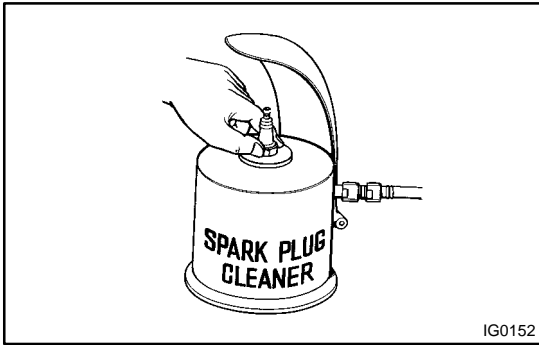
**Maximum electrode gap for used spark plug:
1.3 mm (0.051 in.)**

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

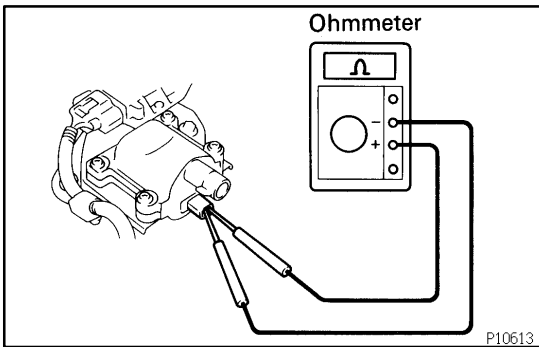
HINT:

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

- (g) Reinstall the spark plugs.
Torque: 18 N·m (180 kgf-cm, 13 ft-lbf)
- (h) Reconnect the high-tension cords to the spark plugs (See step 2).

4. INSPECT IGNITION COIL

- (a) Disconnect the ignition coil connector.
- (b) Disconnect the high-tension cord from the ignition coil.

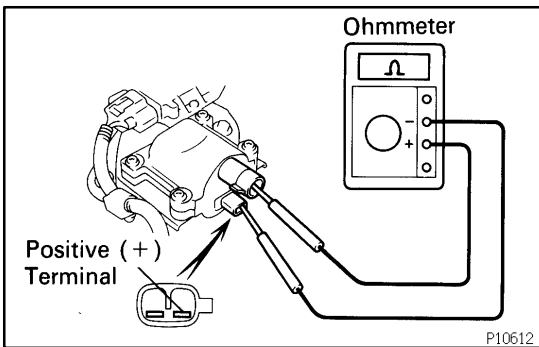


- (c) Inspect the primary coil resistance.
Using an ohmmeter, measure the resistance between the positive (+) and negative (-) terminals.

Primary coil resistance:

Cold	0.21 – 0.33 Ω
Hot	0.27 – 0.39 Ω

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



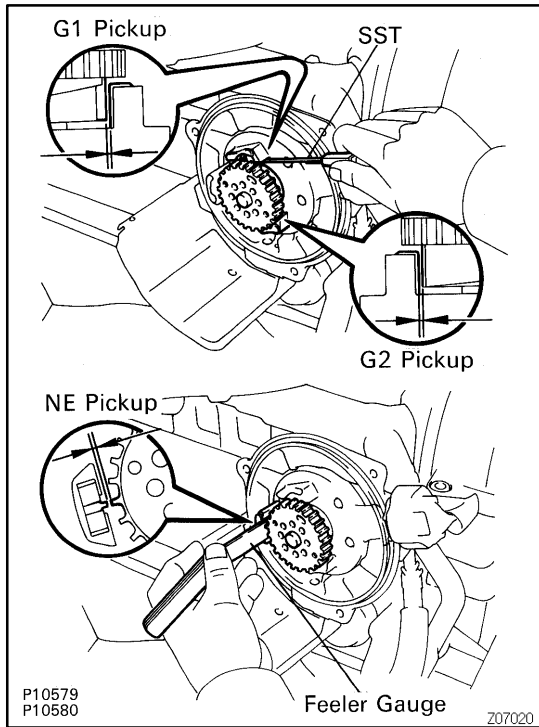
- (d) Inspect the secondary coil resistance.
Using an ohmmeter, measure the resistance between the positive (+) and high-tension terminal.

Secondary coil resistance:

Cold	6.4 – 11.1 kΩ
Hot	8.2 – 13.0 kΩ

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

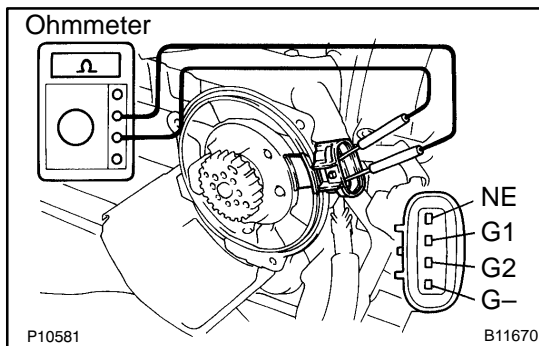
- (e) Reconnect the high-tension cord to the ignition coil.
- (f) Reconnect the ignition coil connector.



5. INSPECT DISTRIBUTOR

- (a) Remove the distributor cap without disconnecting the high-tension cords.
- (b) Remove the rotor.
- (c) Inspect the air gap.
Using SST (G1 and G2 pickups) and a feeler gauge (NE pickup), measure the air gap between the signal rotor and pickup coil projection.
SST 09240-00020 for G1 and G2 pickups
Air gap: 0.2 – 0.5 mm (0.008 – 0.020 in.)
- (d) Disconnect the distributor connector.

If the air gap is not as specified, replace the distributor housing assembly (See page IG-14).



- (e) Inspect the signal generator (pickup coil) resistance.
Using an ohmmeter, measure resistance between the terminals.

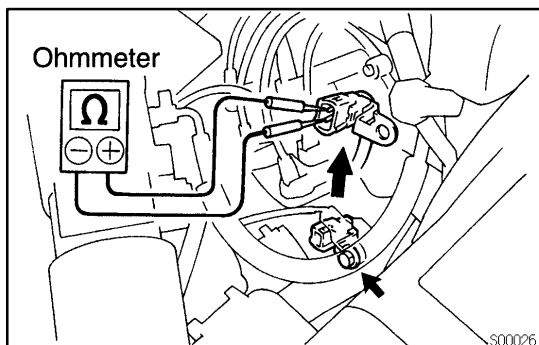
Terminals	Cold	Hot
G1 and G-	125 – 200 Ω	160 – 235 Ω
G2 and G-	125 – 200 Ω	160 – 235 Ω
NE and G-	155 – 250 Ω	190 – 290 Ω

If the resistance is not as specified, replace the distributor housing assembly (See page IG-14).

- (f) Reconnect the distributor connector.
- (g) Reinstall the rotor.
- (h) Reinstall the distributor cap.

6. INSPECT CRANKSHAFT POSITION SENSOR

- (a) Disconnect the crankshaft position sensor connector.
 - (1) Disconnect the sensor connector.
 - (2) Remove the bolt holding the connector bracket to the water pump.



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

Resistance:

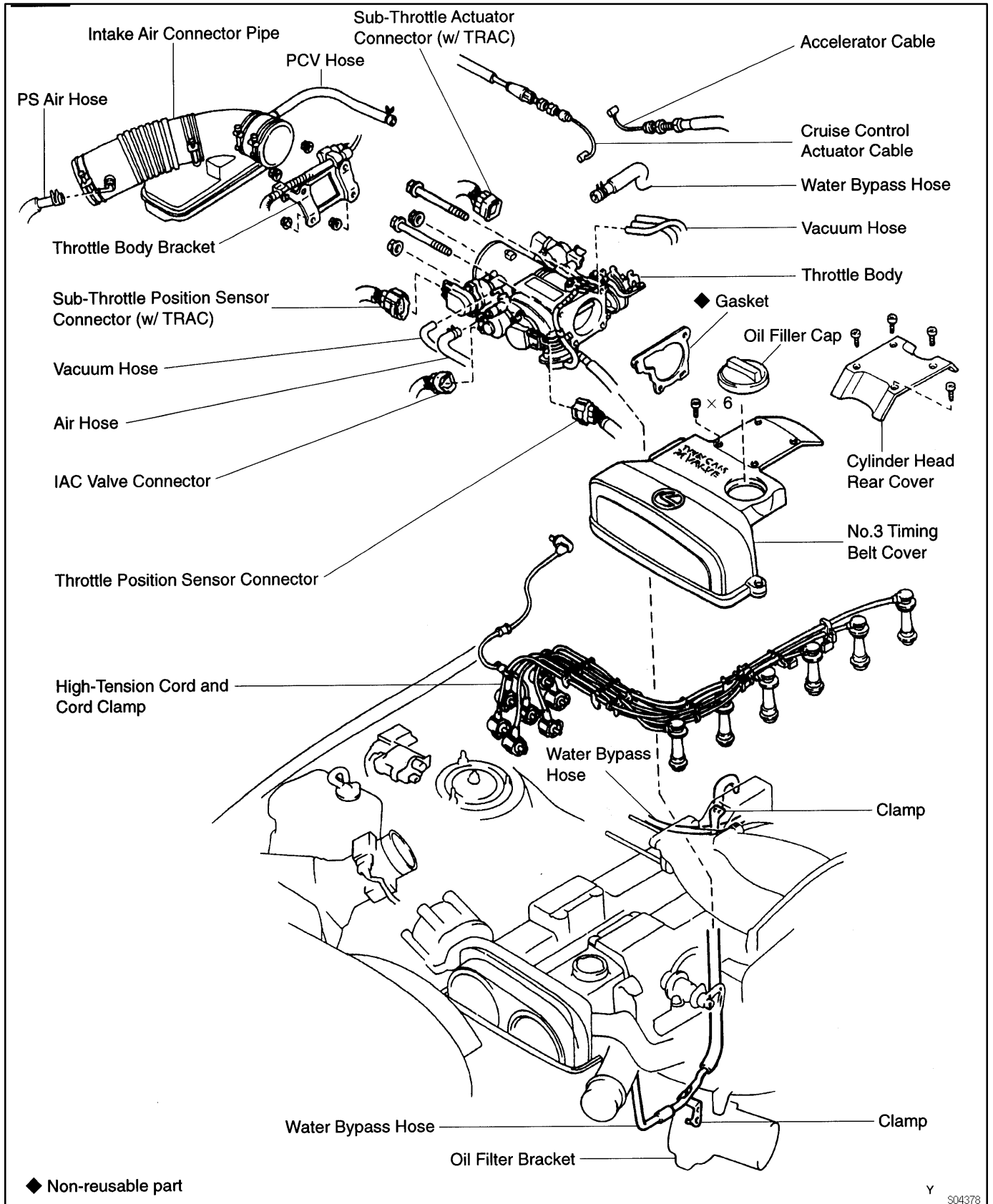
Cold	1,630 – 2,740 Ω
Hot	2,065 – 3,225 Ω

If the resistance is not as specified, replace the sensor (See page IG-20).

- (c) Reconnect the crankshaft position sensor connector.

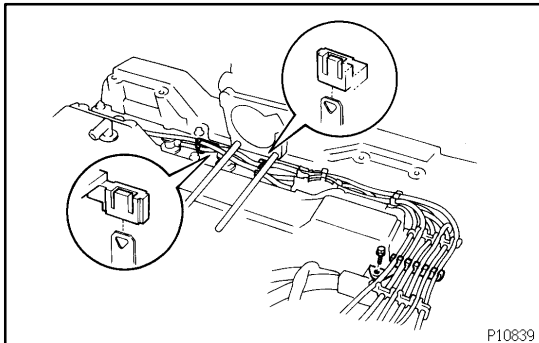
HIGH-TENSION CORD AND CORD CLAMP COMPONENTS

IG012-01



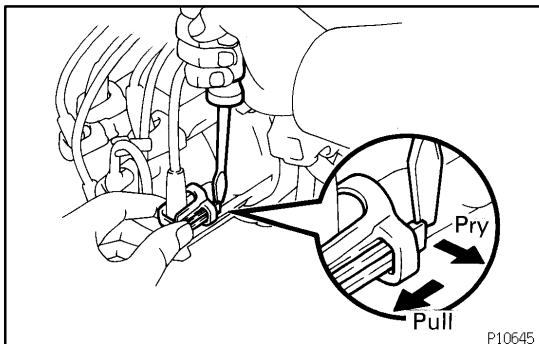
REMOVAL

1. DISCONNECT THROTTLE BODY FROM INTAKE AIR CONNECTOR WITHOUT DISCONNECT WATER BY-PASS HOSES (See page IG-1)
2. REMOVE NO. 3 TIMING BELT COVER
3. REMOVE CYLINDER HEAD REAR COVER



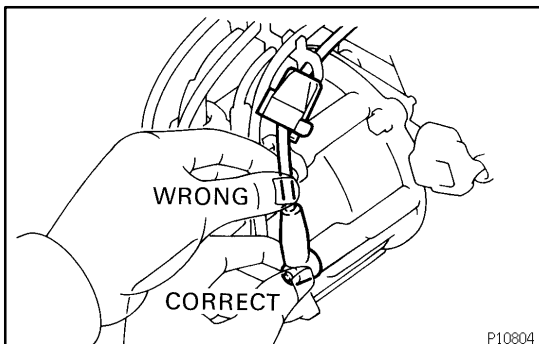
4. REMOVE HIGH-TENSION CORDS AND CORD CLAMPS ASSEMBLY

- (a) Disconnect the 2 high-tension cord clamps from the claws of the No. 3 cylinder head cover.
- (b) Remove the bolt holding the high-tension cord clamp to No. 2 cylinder head cover.



- (c) Disconnect the high-tension cords from the distributor and ignition coil.

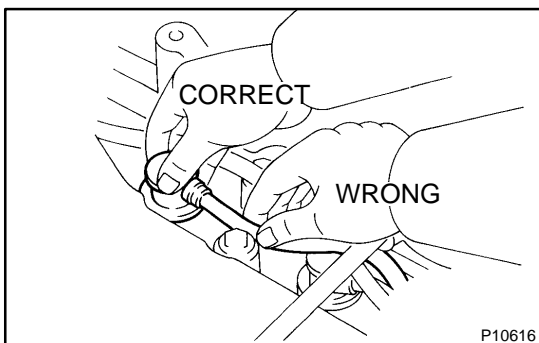
- (1) Using a screwdriver, lift up the lock claw and disconnect the holder from the distributor (ignition coil).



- (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.



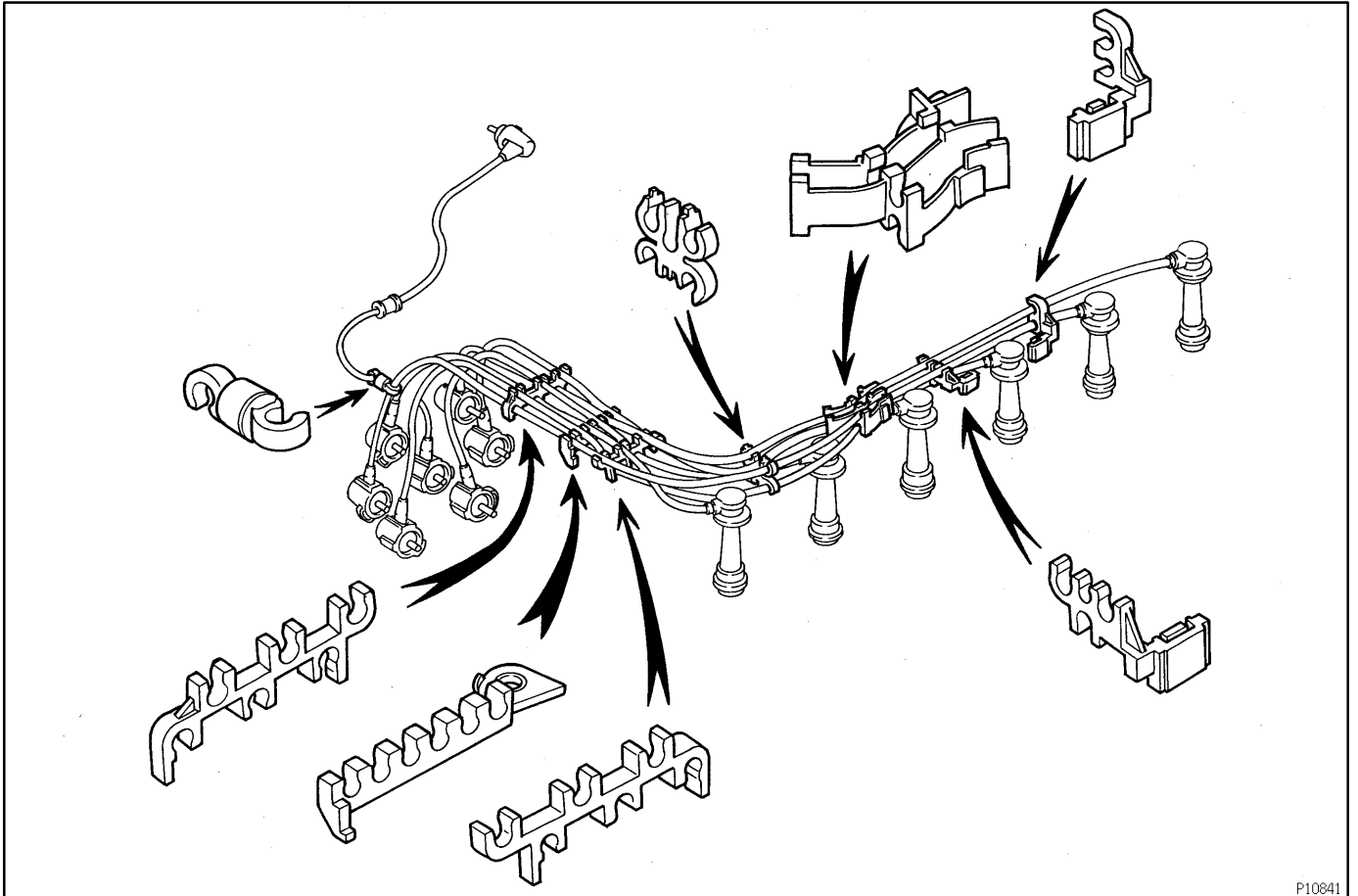
- (d) Disconnect the high-tension cords from the spark plugs. Disconnect the high-tension cords at the rubber boot. Do not pull on the cords.

NOTICE:

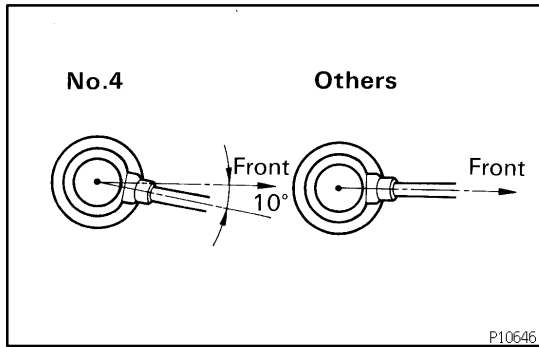
Pulling on or bending the cords may damage the conductor inside.

- (e) Remove the 7 high-tension cords and 8 cord clamps assembly.

5. REMOVE CORD CLAMPS FROM HIGH-TENSION CORDS



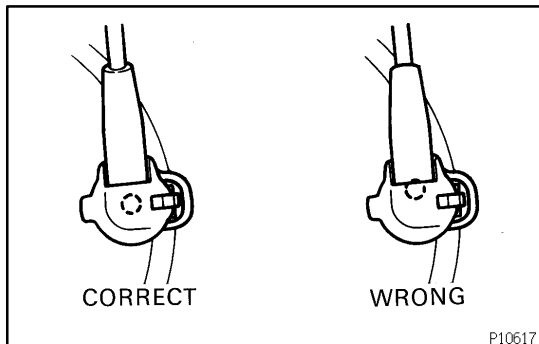
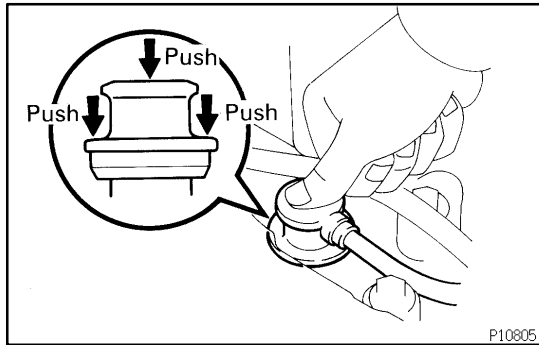
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INSTALLATION

1. INSTALL HIGH-TENSION CORDS

- (a) Connect the high-tension cords to the spark plugs.
 - (1) Face the cord of the high-tension cord as shown in the illustration.
 - (2) Fit the high-tension cord by pushing the center and its outer ring.
- (b) Connect the high-tension cords to the distributor and ignition coil.
 - (1) Align the spline of the distributor (ignition coil) with the spline groove of the holder.
 - (2) Push in the holder together with the grommet until the claw of the holder locks securely.

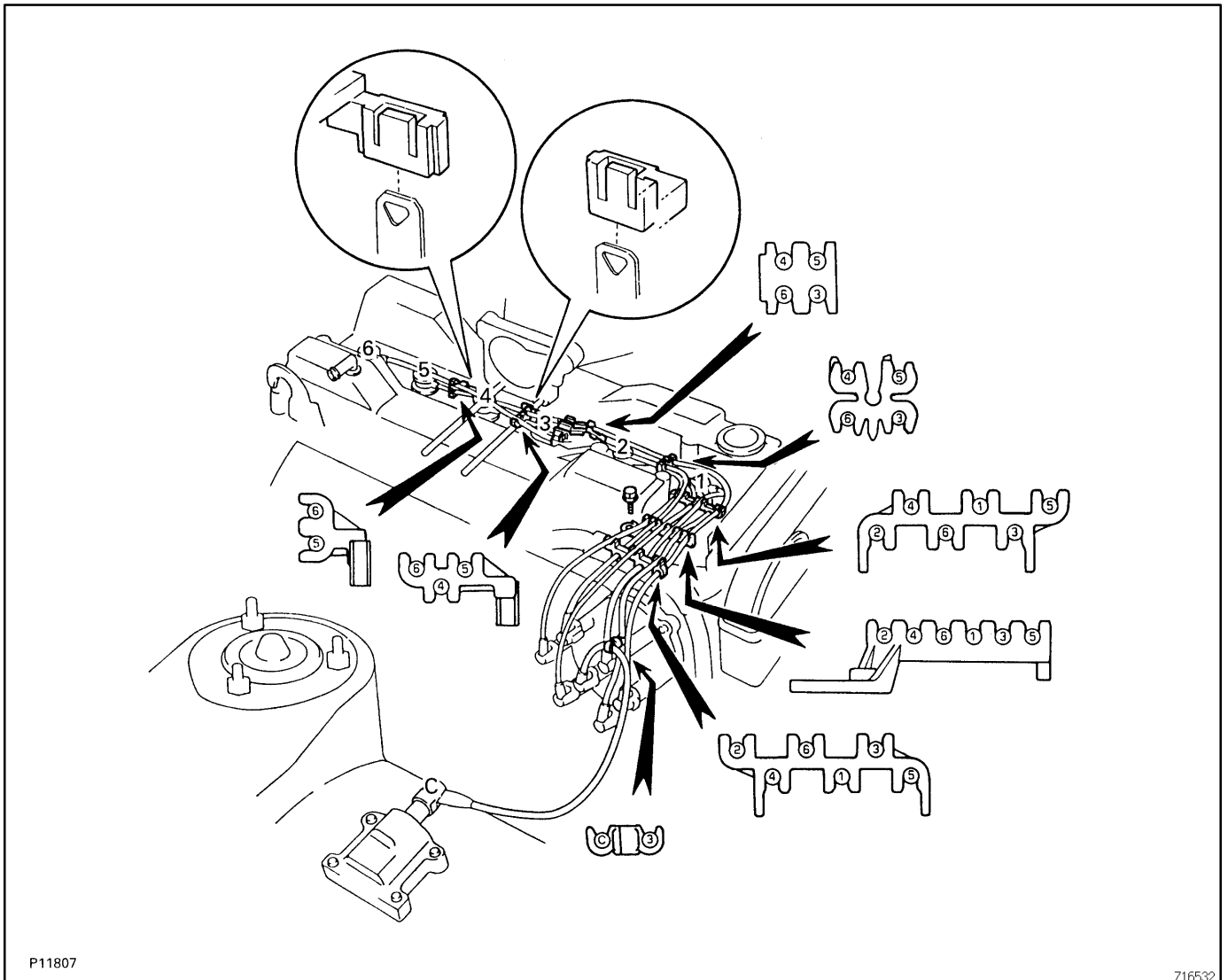


NOTICE:

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

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

- (c) Secure the high-tension cords with the 8 cord clamps as shown in the illustration.



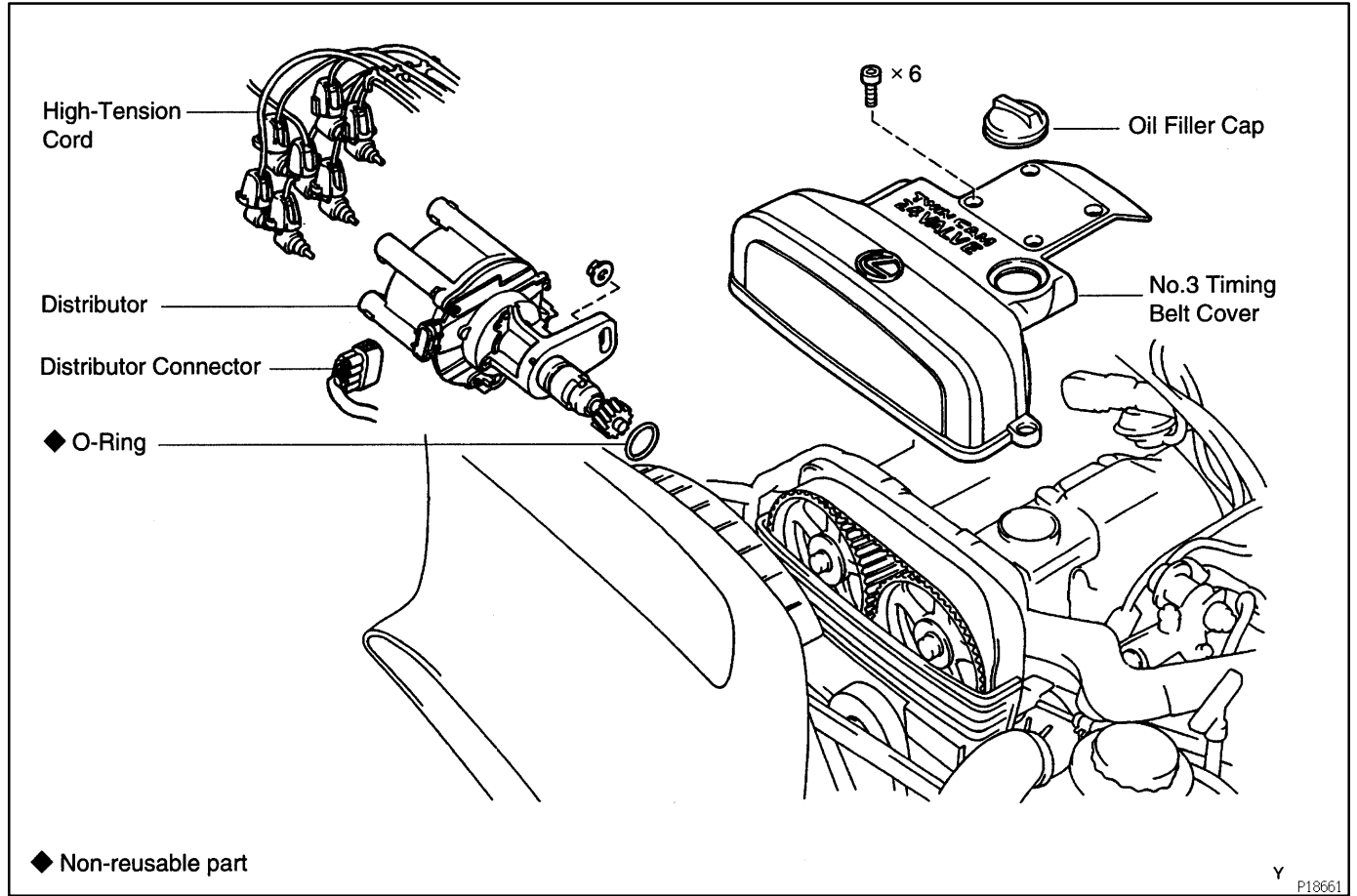
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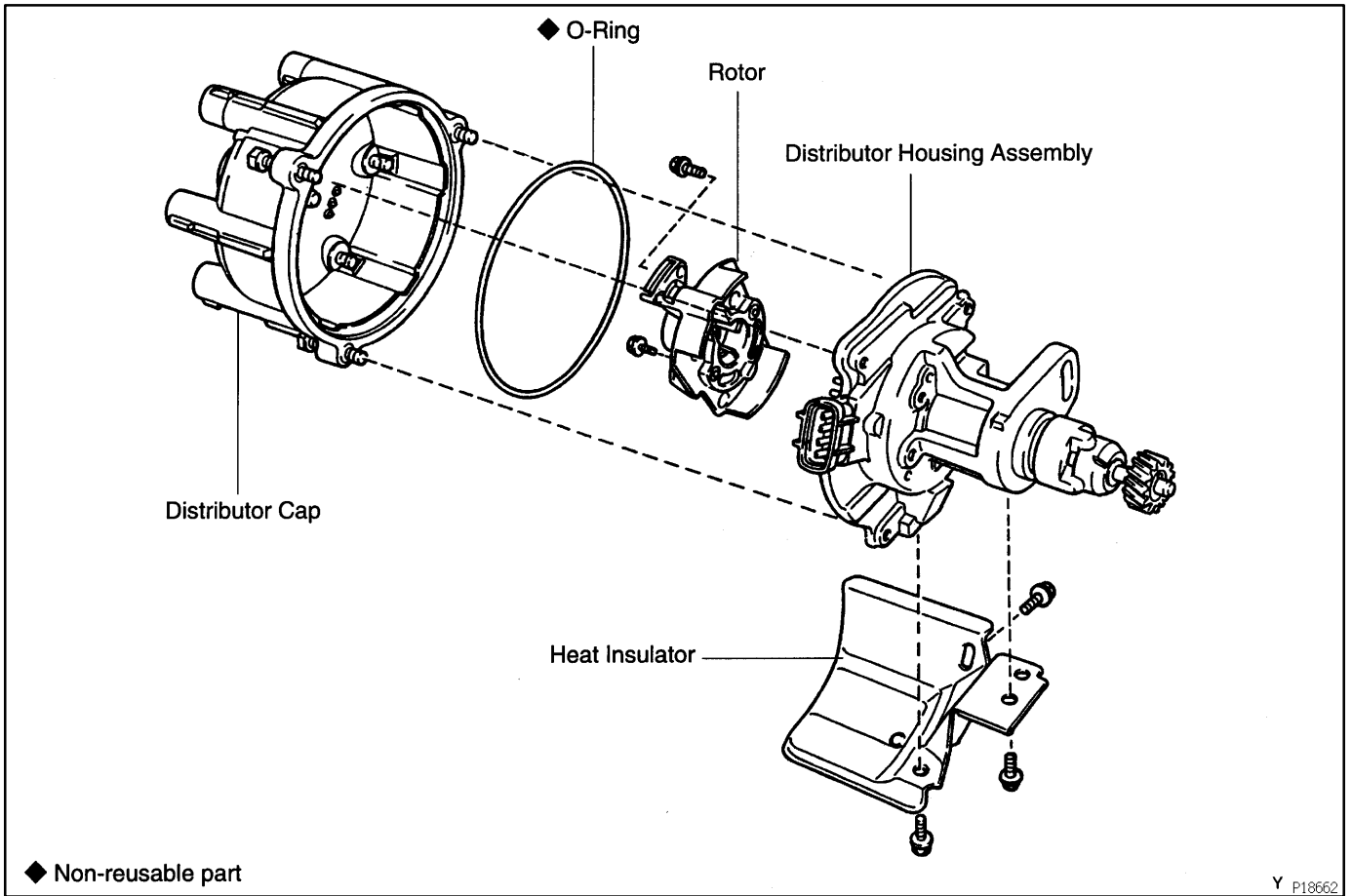
2. INSTALL CYLINDER HEAD REAR COVER
3. INSTALL NO. 3 TIMING BELT COVER
4. INSTALL THROTTLE BODY TO INTAKE AIR CONNECTOR (See page [IG-1](#))

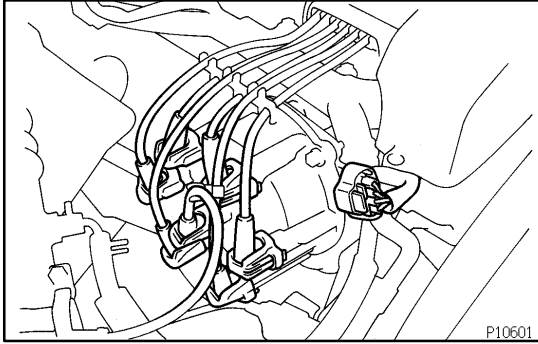
DISTRIBUTOR COMPONENTS

IG015-01



IGNITION - DISTRIBUTOR





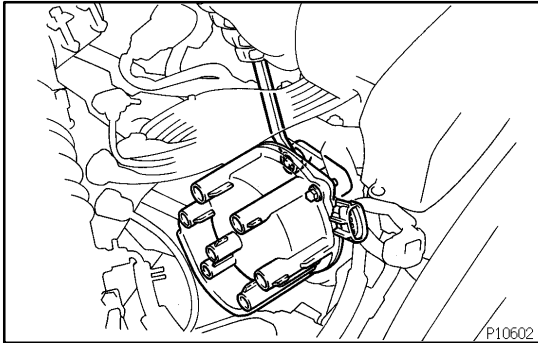
REMOVAL

1. DISCONNECT DISTRIBUTOR CONNECTOR
2. DISCONNECT HIGH-TENSION CORDS FROM DISTRIBUTOR

Disconnect the 7 high-tension cords from the distributor.

NOTICE:

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



3. REMOVE DISTRIBUTOR

- (a) Remove the nut.
- (b) Pull out the distributor.
- (c) Remove the O-ring from the distributor housing.

DISASSEMBLY

1. REMOVE HEAT INSULATOR

Remove the 3 screws and heat insulator.

2. REMOVE DISTRIBUTOR CAP

Loosen the 3 bolts, and remove the distributor cap and O-ring.

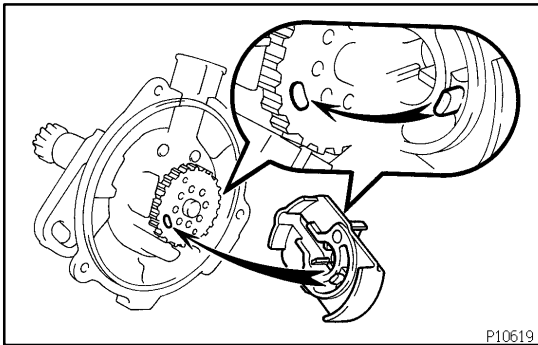
At the time of reassemble, please refer to the following item.

Use a new O-ring.

3. REMOVE ROTOR

HINT:

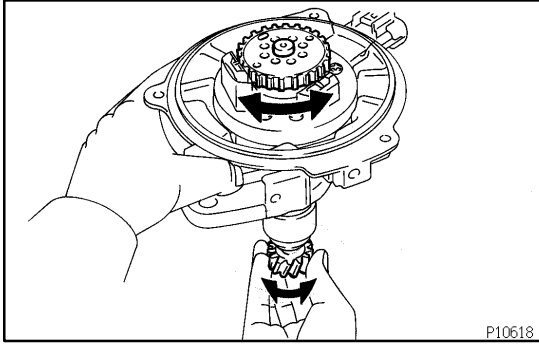
Remove the 2 screws and rotor.



HINT:

At the time of reassemble, please refer to the following item.

Align the hollow of the signal rotor with the protrusion of the rotor.



INSPECTION

INSPECT SHAFT

Turn the shaft and check that it is not rough or worn.

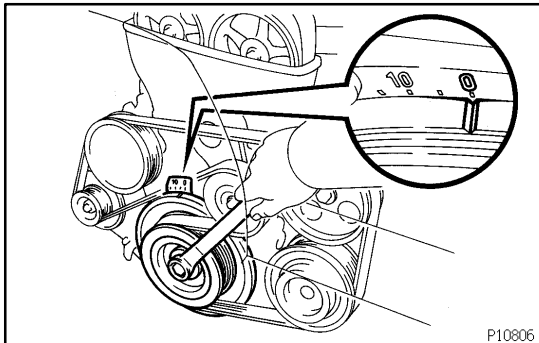
If it feels rough or worn, replace the distributor housing assembly.

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page [IG-15](#)).

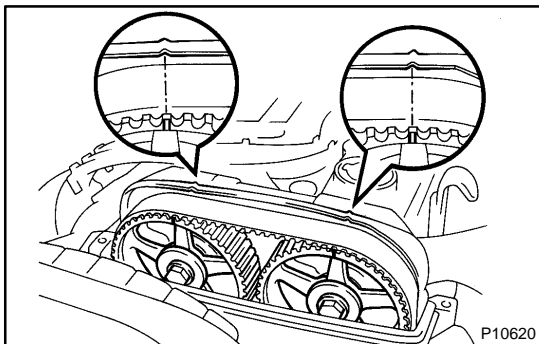
INSTALLATION

1. REMOVE NO. 3 TIMING BELT COVER

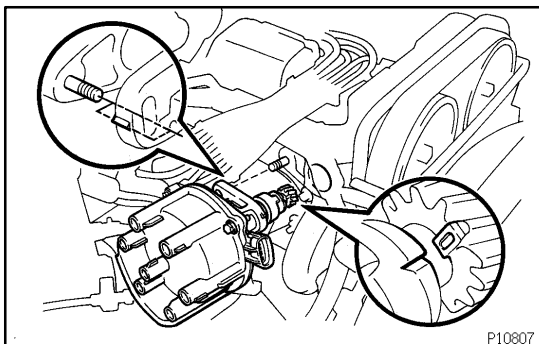


2. SET NO. 1 CYLINDER TO TDC/COMPRESSION

- (a) Turn the crankshaft pulley, and align its groove with timing mark 0 of the No. 1 timing belt cover.



- (b) Check that the timing marks of the camshaft timing pulleys and No. 4 timing belt cover are aligned. If not, turn the crankshaft 1 revolution (360°) and align the mark as above.



3. INSTALL DISTRIBUTOR

- (a) Install a new O-ring to the distributor housing.
 (b) Apply a light coat of engine oil on the O-ring.
 (c) Align the marks of the drive gear and distributor housing.
 (d) Insert the distributor, aligning the protrusion of the flange with that of the stud bolt on the cylinder head.
 (e) Install the distributor with the nut. Lightly tighten the nut.

4. REINSTALL NO. 3 TIMING BELT COVER

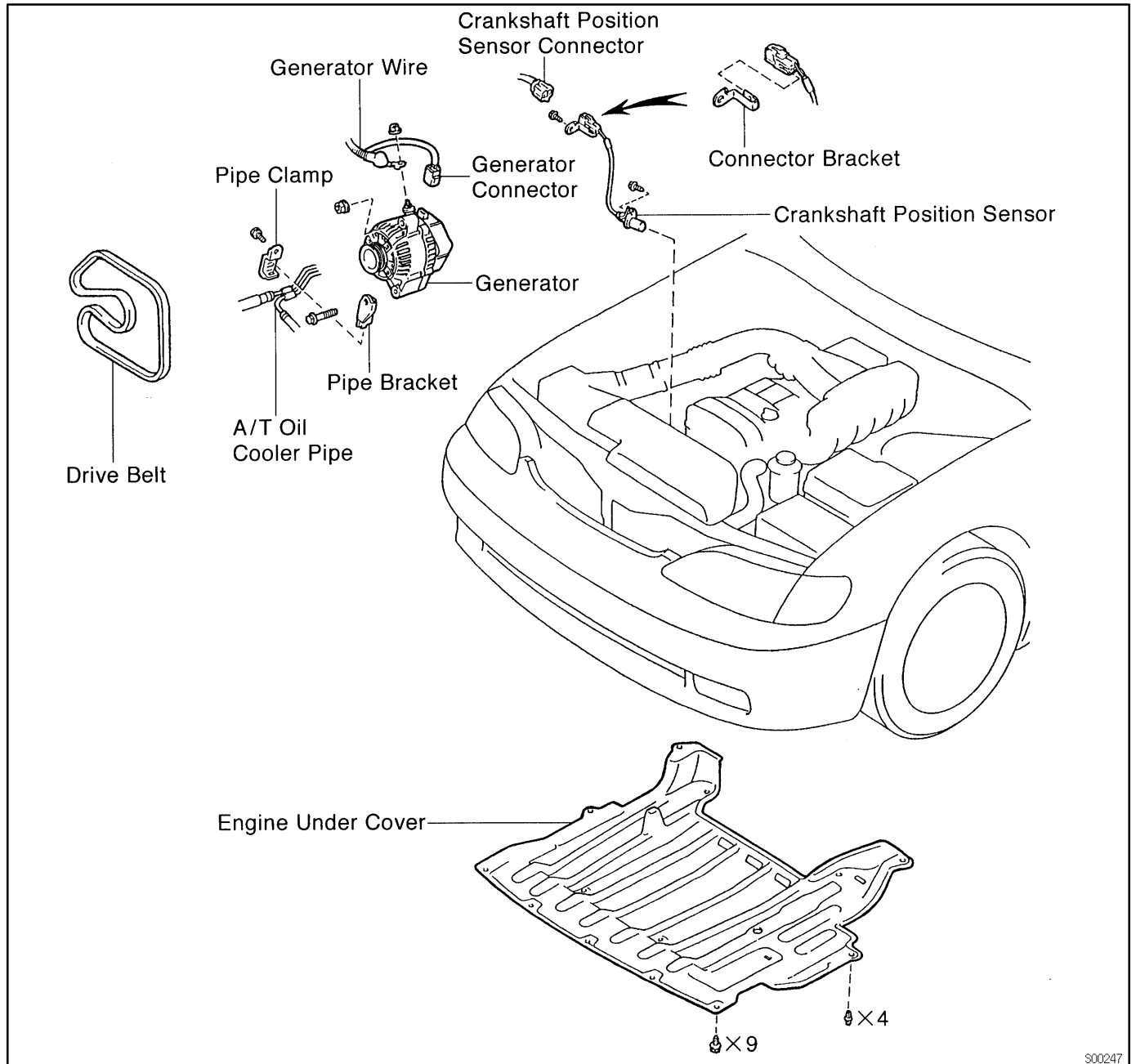
5. CONNECT HIGH-TENSION CORDS TO DISTRIBUTOR

6. CONNECT DISTRIBUTOR CONNECTOR

7. ADJUST IGNITION TIMING (See page [EM-11](#))

CRANKSHAFT POSITION SENSOR COMPONENTS

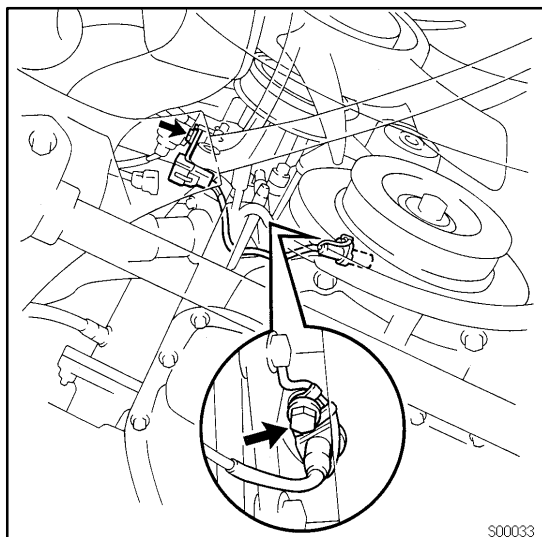
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REMOVAL

1. REMOVE GENERATOR (See page CH-7)
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 sensor.
Torque: 8.8 N·m (90 kgf·cm, 78 in.-lbf)
 - (b) Remove the connector bracket from the connector.

INSTALLATION

Installation is in the reverse order of removal (See page [IG-20](#)).