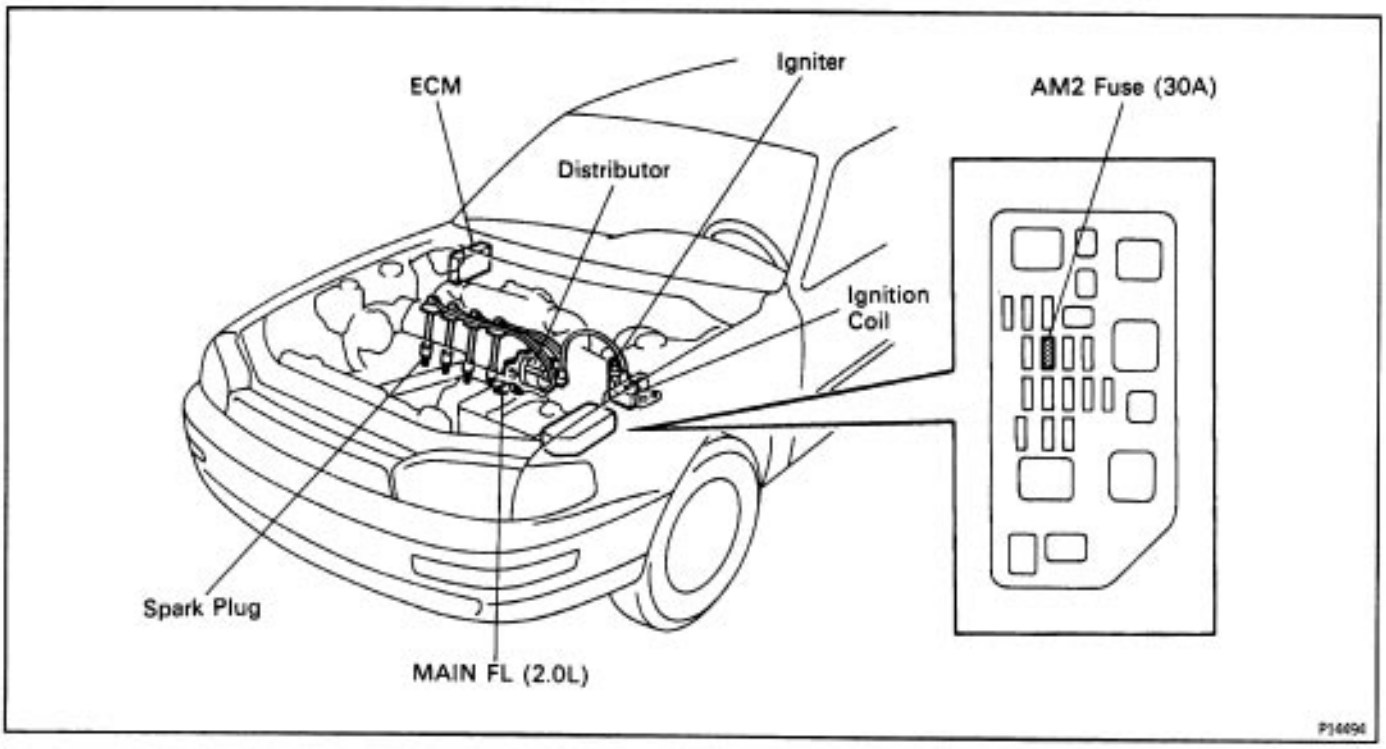
IGNITION SYSTEM

(5S–FE California)

DESCRIPTION

The engine control module (ECM) is programmed with data for optimum ignition timing unndr all operating conditions. Using data provided by sensors which monitor various engine functions (rpm, intake air volume, engine temperature, etc.), the ECM triggers the spark at precisely the right instant.



The ECM monitors the engine condition by signals from each sensor, calculates the ignition timing and sends an ignition signal to the igniter. High voltage from the ignition is distributed to each spark plug in the appropriate order to generate a spark between the electrodes, which ignites the air–fuel mixture.

IGNITER

The igniter temporarily interrupts the primary current with the ignition signal (IGT signal) from the ECM and generates sparks at the spark plug. Also, as a fail–safe measure, when ignition occurs an ignition confirmation signal (IGF signal) is sent to the ECM.

IGNITION COIL

The ignition coil uses a closed core coil with the primary coil wrapped around the core and the secondary coil wrapped around the primary coil. This allows the generation of a high voltage sufficient to cause a spark to jump across the spark plug gap.

DISTRIBUTOR

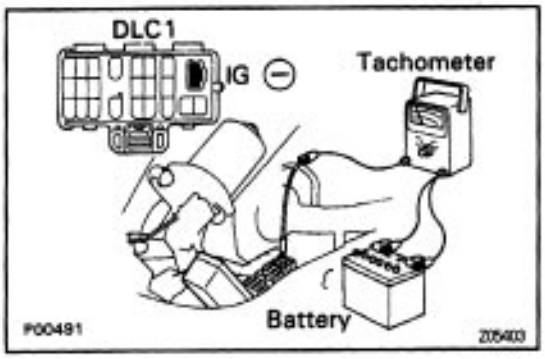
This correctly distributes high voltage to the spark plug of each cylinder in the specified ignition order.

PICKUP COILS

The NE coil detects the crankshaft angle, and the G 1 and G2 coils detect the camshaft position.

PRECAUTION

1. Do not leave the ignition switch on for more than 10 minutes if the engine does not start.



2. With a tachometer connected to the system, connect the tester probe of the tachometer to terminal IG(–) of the data link connector 1.

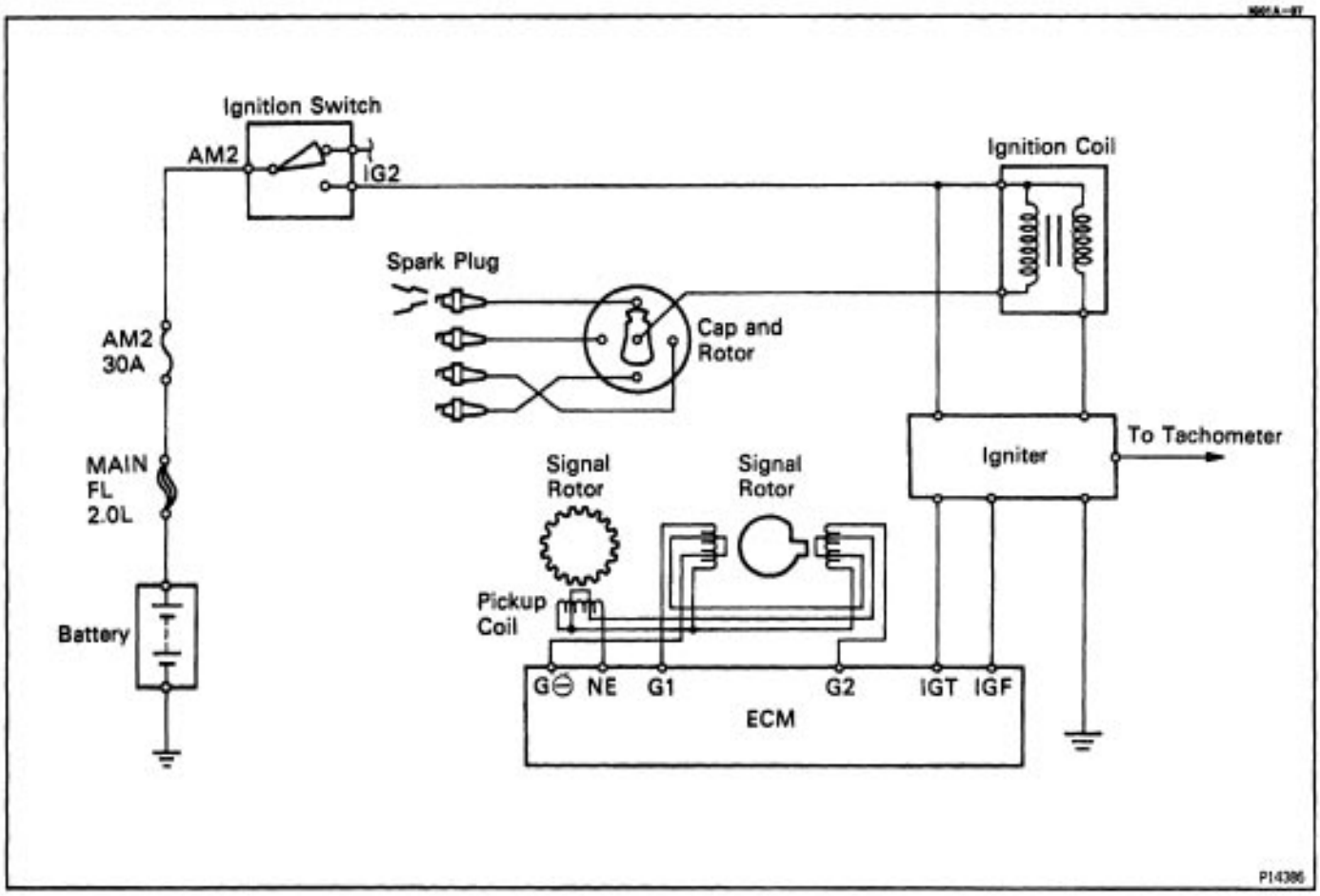
3. As some tachometers are not compatible with this ignition system, we recommend that you confirm the compatibility of yours before use.

4. Never allow the tachometer terminals to touch ground as it could result in damage to the igniter and/or ignition coil.

Do not disconnect the battery while the engine is running.

6. Check that the igniter is properly grounded to the body.

SYSTEM CIRCUIT



OPERATION

To maintain the most appropriate ignition timing, the ECM sends a control signal so that the igniter sends current to the ignition coil and the spark plugs produce a spark.

PREPARATION

SST (SPECIAL SERVICE TOOLS)

	09240–00020 Wire Gauge Set	Air gap
	09843–18020 Diagnosis Check Wire	

RECOMMENDED TOOLS

	09082–00050 TOYOTA Electrical Tester Set	
	09200–00010 Engine Adjust Kit	

EQUIPMENT

Spark plug cleaner	
Tachometer	
Timing light	Ignition timing

ON–VEHICLE INSPECTION

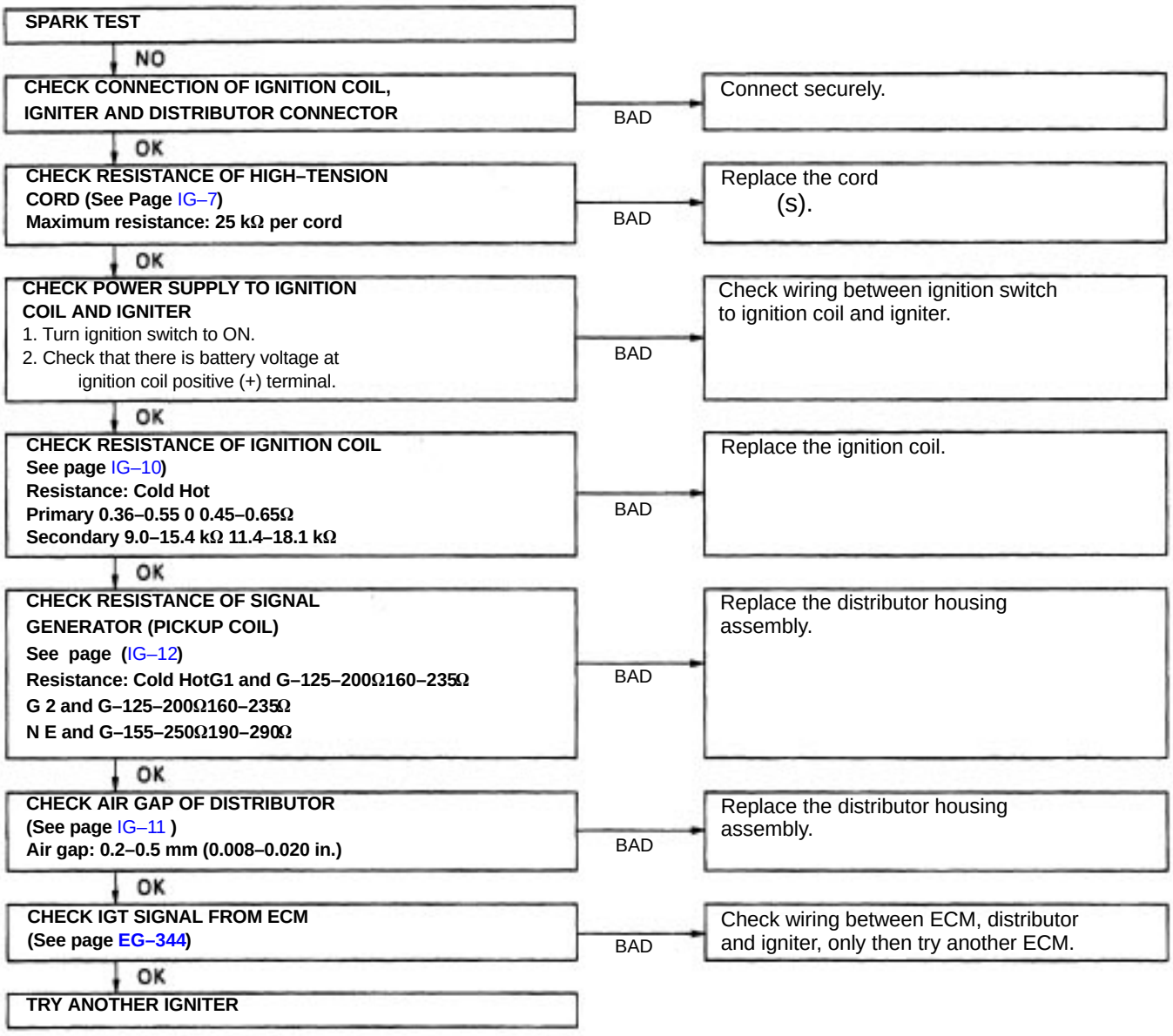
SPARK TEST

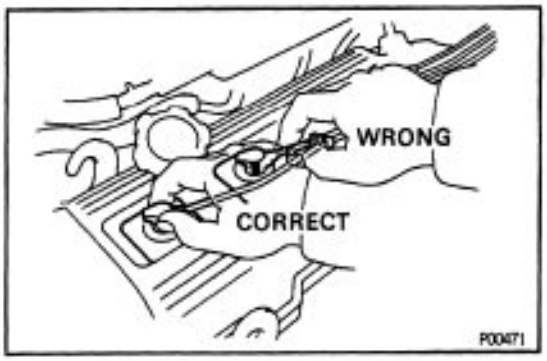
CHECK THAT SPARK OCCURS

(a) Disconnect the high–tension cord (from the ignition coil) from the distributor cap.
(b) Hold the end approx. 12.5 mm (0.50 in.) from the body ground.
(c) See if spark occurs while engine is being cranked.

HINT: To prevent gasoline from being injected from injectors during this test, crank the engine for no more than 1–2 seconds at time.

If the spark does not occur, perform the test as fol–lows:





HIGH–TENSION CORDS INSPECTION

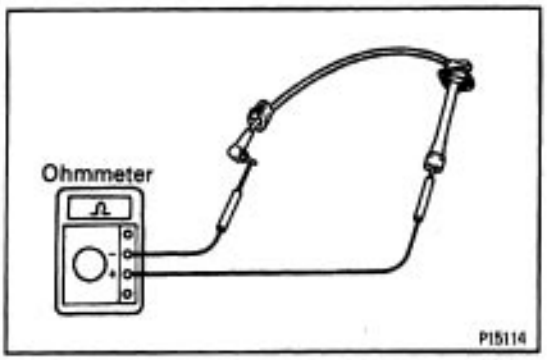
1. DISCONNECT HIGH–TENSION CORDS FROM SPARK PLUGS

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.

2. DISCONNECT HIGH–TENSION CORD FROM IGNITION COIL

3. DISCONNECT HIGH–TENSION CORDS FROM DISTRIBUTOR CAP



4. INSPECT HIGH–TENSION CORD RESISTANCE

Using an ohmmeter, measure the resistance.

Maximum resistance:

25 kΩ per cord .

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

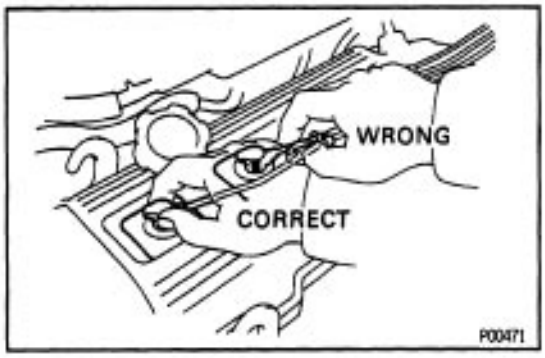
6. RECONNECT HIGH–TENSION CORDS TO DISTRIBUTOR CAP

6. RECONNECT HIGH–TENSION CORD TO IGNITION COIL

7. RECONNECT HIGH–TENSION CORDS TO SPARK PLUGS

SPARK PLUGS INSPECTION

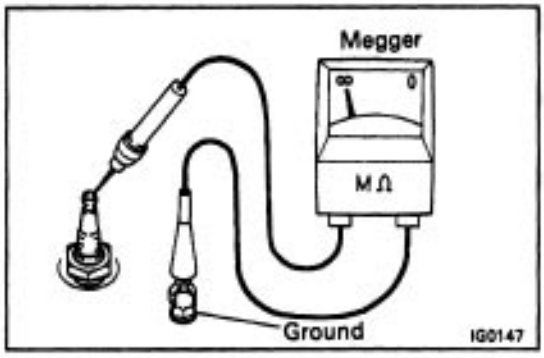
NOTICE:
- **Never use a wire brush for cleaning.**
- **Never attempt to adjust the electrode gap on a used spark plug.**
- **Spark plugs should be replaced every 100.000 km (60.000 miles).**



1. DISCONNECT HIGH–TENSION CORDS FROM 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.



2. INSPECT ELECTRODE

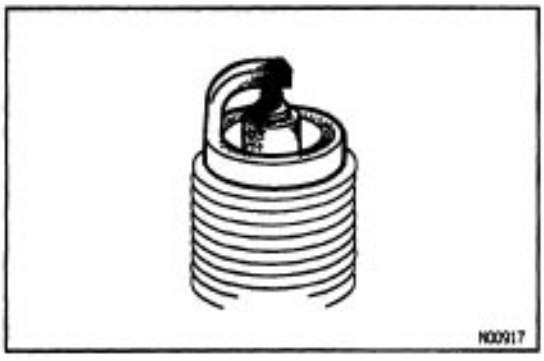
Using a megger (insulation resistance meter), measure the insulation resistance.

Standard correct insulation resistance:

10 MΩ or more

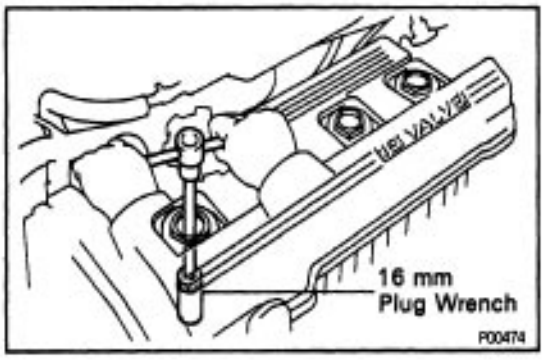
If the resistance is less than specified, proceed to step 4.

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



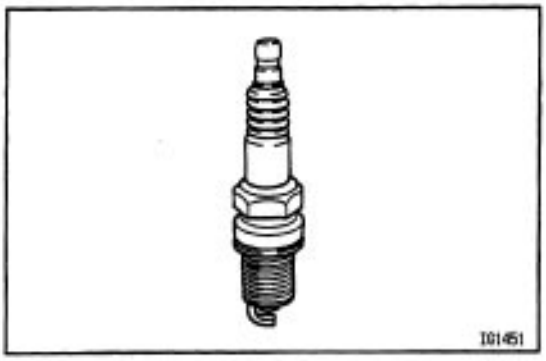
Simple Method:

(a) Quickly race the engine to 4,000 rpm 5 times.
(b) Remove the spark plug. (See step 4)
(c) Visually check the spark plug.
If the electrode is dry ... OK
If the electrode is wet ... Proceed to step 5
(d) Reinstall the spark plug. (See step 8)



3. REMOVE SPARK PLUGS

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



4. VISUALLY INSPECT SPARK PLUGS

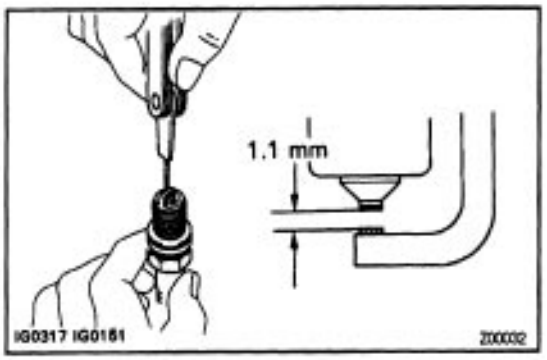
Check the spark plug for thread damage and insulator damage.

If abnormal, replace the spark plug.

Recommended spark plug:

PK20R11 for ND

BKR6EP11 for NGK



5. INSPECT ELECTRODE GAP

Maximum electrode gap for used spark plug:

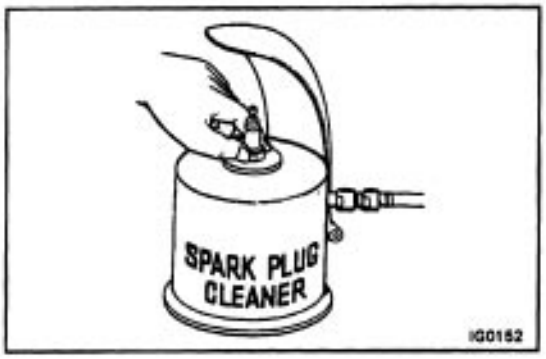
1.3 mm (0.051 In.)

If the gap is greater than maximum, replace the spark plug.

Correct electrode gap for new spark plug:

1.1 m m (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.



6. CLEAN SPARK PLUGS

If the electrode has traces of wet carbon, allow it to dry and then clean with a spark plug cleaner.

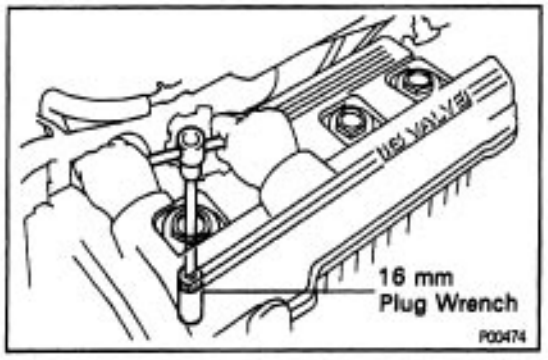
Air pressure:

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.



7. REINSTALL SPARK PLUGS

Using a 16 mm plug wrench, install the 4 spark plugs.

Torque: 18 N–m (180 k9f–cm. 13 ft–lbf)

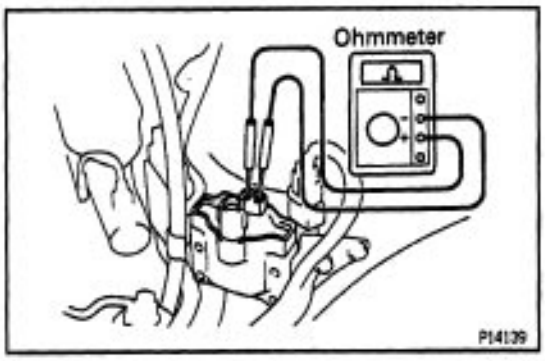
8. RECONNECT HIGH–TENSION CORDS T4 SPARK PLUGS

IGNITION COIL INSPECTION

NOTICE: 'Cold' and 'Hot' in the following sentences express the temperature of the coils themselves. 'Cold' is from–10°C (14°F) to 50°C (122°F) and 'Hot' is from 60°C (122" F) to 100°C (212°F).

1. DISCONNECT IGNITION COIL CONNECTOR

2. DISCONNECT HIGH–TENSION CORD FROM IGNITION COIL



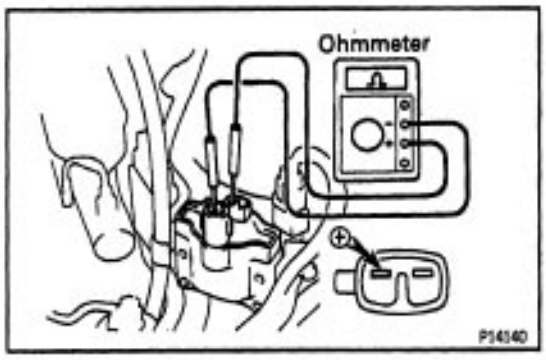
3. INSPECT PRIMARY COIL RESISTANCE

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

Primary coil resistance (Cold):
0.36–0.55Ω

Primary coil resistance (Hot):
0.45–O.65Ω

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



4. INSPECT SECONDARY COIL RESISTANCE

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

Secondary coil resistance (Cold):
9.0–15.4 kΩ

Secondary coil resistance (Hot):
11.4–18.1 kΩ

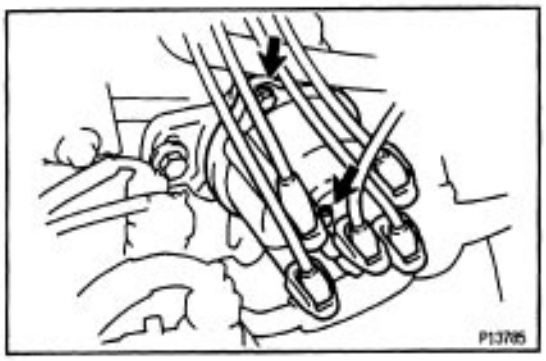
If the resistance is not as specified, replace the ignition coil.

6. RECONNECT HIGH–TENSION CORD TO IGNITION COIL

6. RECONNECT IGNITION COIL CONNECTOR

DISTRIBUTOR INSPECTION

NOTICE: 'Cold' and "Hot' in the following 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).

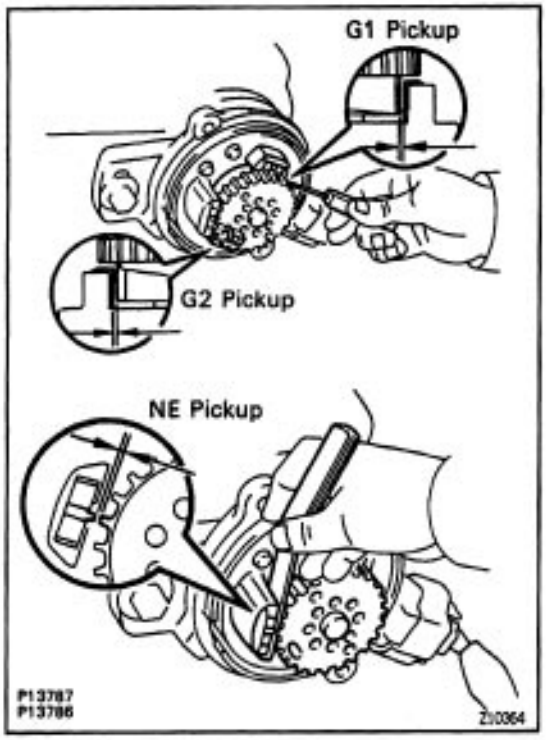


1. REMOVE DISTRIBUTOR CAP

Remove the 2 bolts, and disconnect the distributor cap from the distributor housing.

2. REMOVE ROTOR

3. REMOVE DUSTPROOF COVER



4. INSPECT AIR GAP

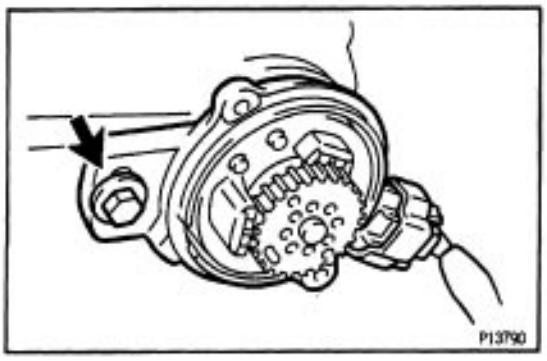
Using SST (G1 and G2 pickups) and a feeler gauge (NE pickup), measure the air gap between the signal rotor and pickup coil projection.

SST 09240–00020 for G 1 and G2 pickups

Air gap:

0.2–0.5 mm (0.008–0.020 in.)

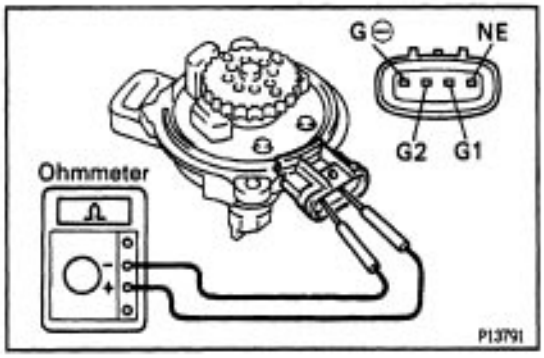
If the air gap is not as specified, replace the distributor housing assembly.



6. DISCONNECT DISTRIBUTOR CONNECTOR

6. REMOVE DISTRIBUTOR HOUSING ASSEMBLY

Remove the bolt, pull out the distributor housing.



7. INSPECT SIGNAL GENERATOR (PICKUP COIL) RESISTANCE

Using an ohmmeter, measure the resistance between terminals.

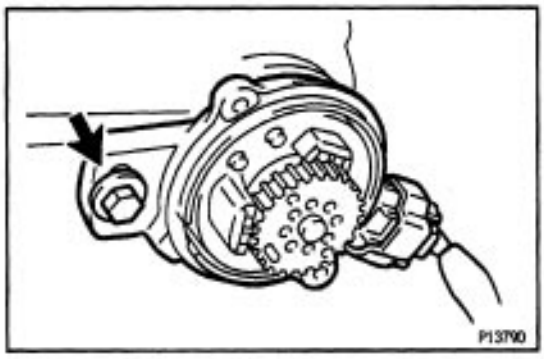
Pickup coil resistance (Cold):

G1 and GE)
125–200Ω
G2 and G(–)
125–200Ω
NE and G(–)
155–2500

Pickup coil resistance (Hot):

G 1 and G(–)
160–235Ω
G2 and G(–)
160–235Ω
NE and G(–)
190–290Ω

If the resistance is not as specified, replace the distributor housing assembly.

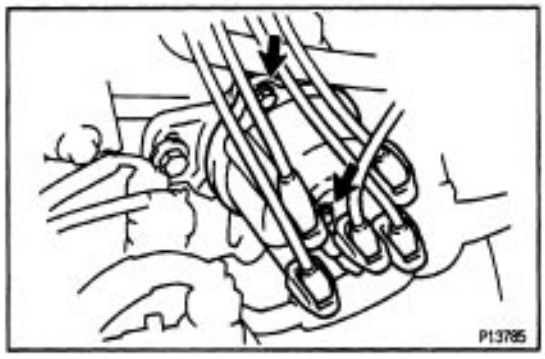


8. REINSTALL DISTRIBUTOR HOUSING ASSEMBLY
(See steps 1 and 2 on pages IG–17 and 18)

9. RECONNECT DISTRIBUTOR CONNECTOR

10. REINSTALL DUSTPROOF COVER

11. REINSTALL ROTOR



12. REINSTALL DISTRIBUTOR CAP

Install a new packing and distributor cap with the 2 bolts.

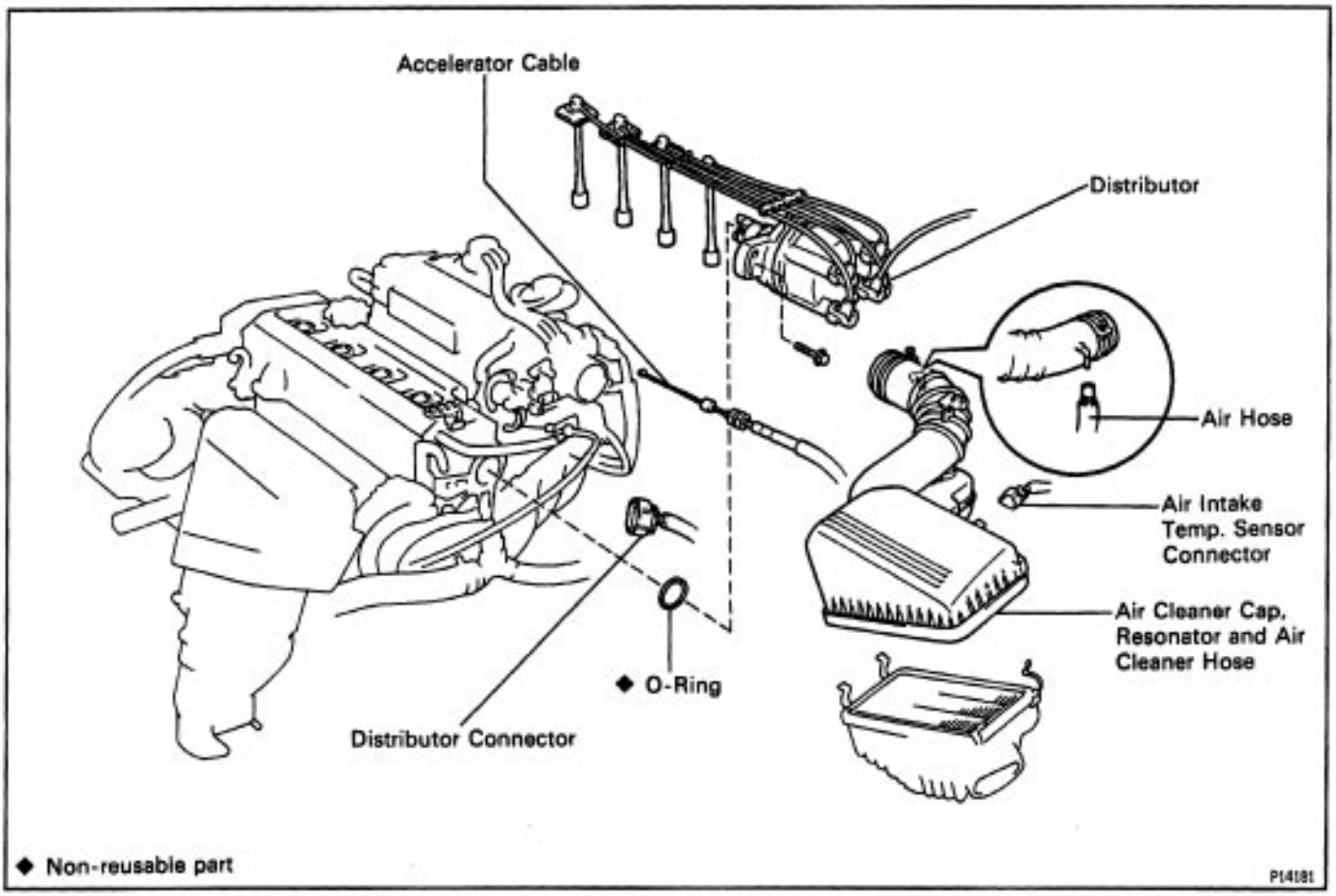
13. ADJUST IGNITION TIMING
(See page IG–19)

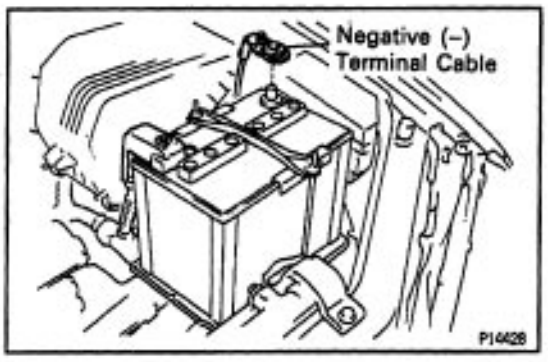
IGNITER INSPECTION

(See Spark Test procedure on page IG–6)

DISTRIBUTOR

COMPONENTS FOR REMOVAL AND INSTALLATION





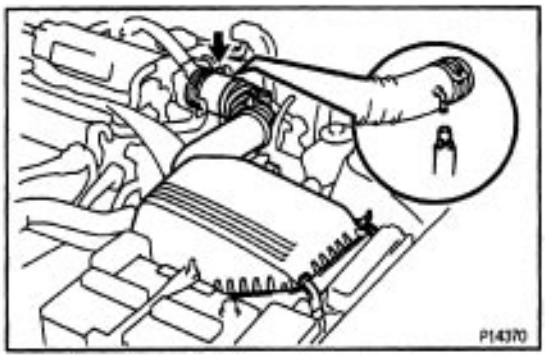
DISTRIBUTOR REMOVAL

(See Components for Removal and Installation)

1. DISCONNECT NEGATIVE (–) TERMINAL CABLE FROM BATTERY

CAUTION: Work must be started after 90 seconds from the time the Ignition switch Is turned to the 'LOCK' position and the negative (–) terminal cable is discon–nacted from the battery.

2. DISCONNECT ACCELERATOR CABLE FROM THROTTLE BODY

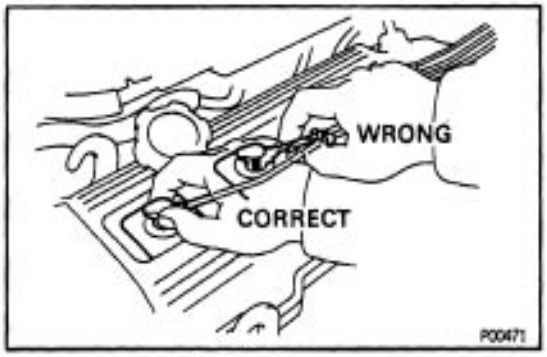


3. REMOVE AIR CLEANER CAP, RESONATOR AND AIR CLEANER HOSE

(a) Disconnect the intake air temperature sensor connector.
(b) Disconnect the air hose from the air cleaner hose.
(c) Loosen the air cleaner hose clamp bolt.
(d) Disconnect the 4 air cleaner cap clips.
(e) Disconnect the air cleaner hose from the throttle body, and remove the air cleaner cap together with the resonator and air cleaner hose.

4. DISCONNECT DISTRIBUTOR CONNECTOR

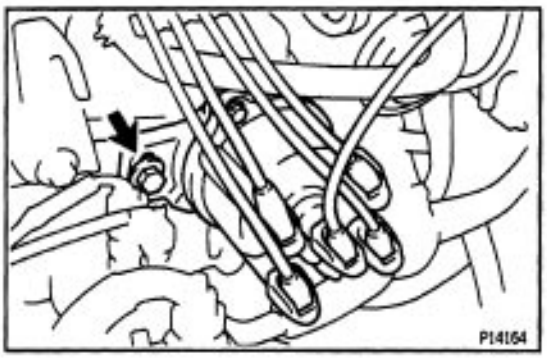
5. DISCONNECT NIGH–TENSION CORD FROM IGNITION COIL



6. DISCONNECT HIGH–TENSION CORDS FROM SPARK PLUGS

(a) Disconnect the high–tension cords from the cord clamps.
(b) Disconnect the 4 high–tension cords from the spark plugs.
Disconnect the high–tension cords at the rubber boot. Do not pull on the high–tension cords.

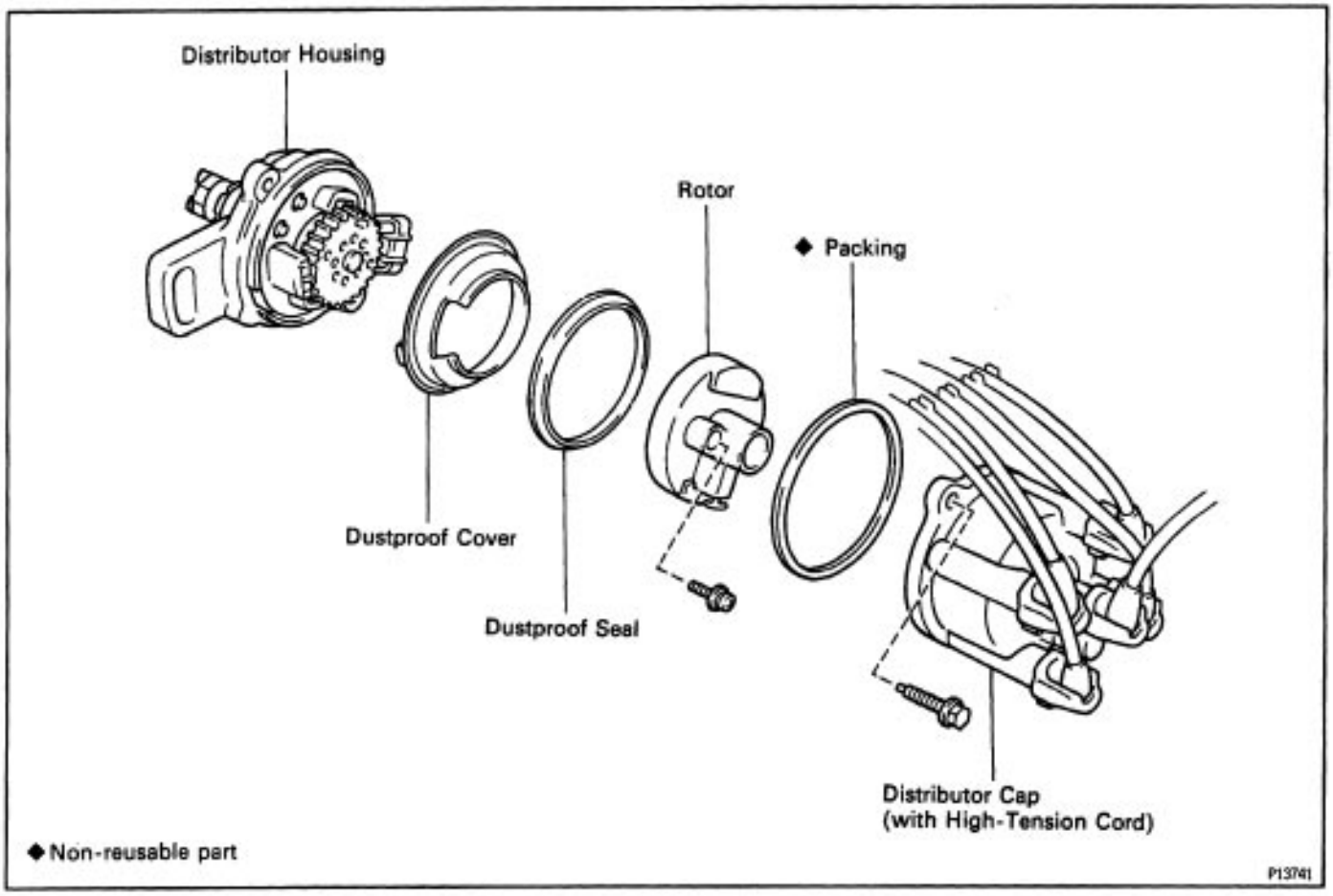
NOTICE: Pulling on or bending the cords may damage the conductor Inside.

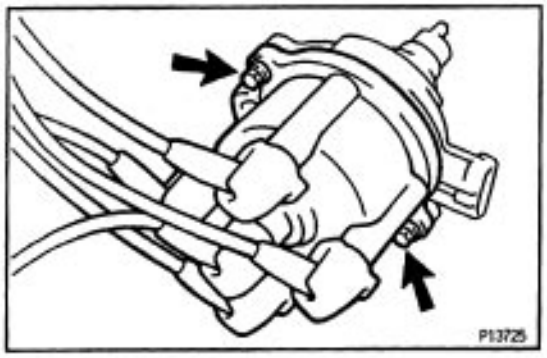


7. REMOVE DISTRIBUTOR

(a) Remove the hold–down bolt, and pull out the distributor.
(b) Remove the 0–ring from the distributor housing.

COMPONENTS FOR DISASSEMBLY AND ASSEMBLY



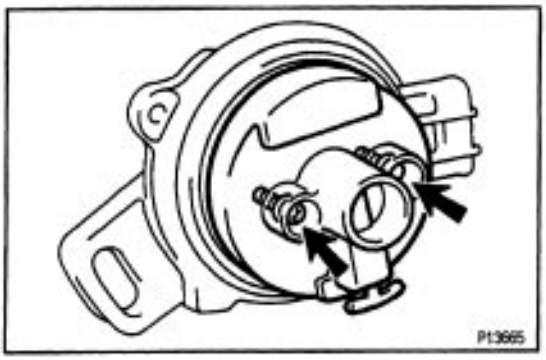


DISTRIBUTOR DISASSEMBLY

(See Components for Disassembly and Assembly)

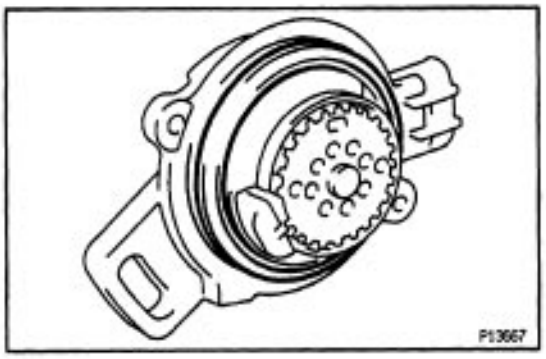
1. REMOVE DISTRIBUTOR CAP

Remove the 2 bolts, distributor cap and packing.



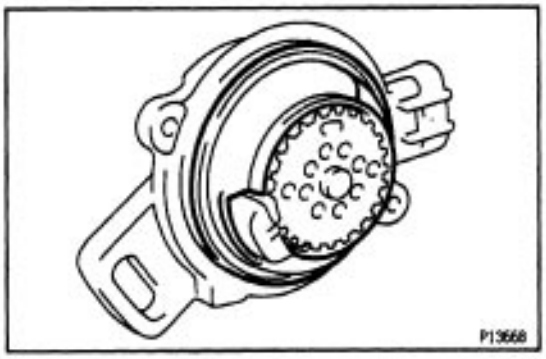
2.REMOVE ROTOR

Remove the 2 screws and rotor.

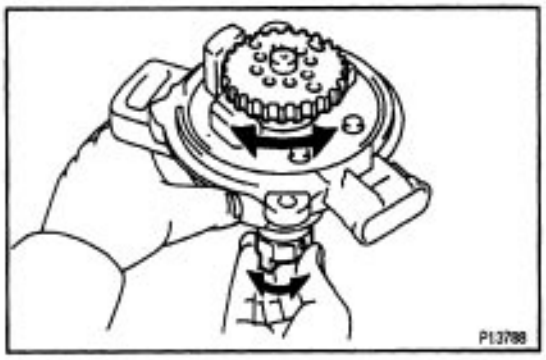


3. REMOVE DUST PROOF COVER

(a) Remove the dust proof seal.



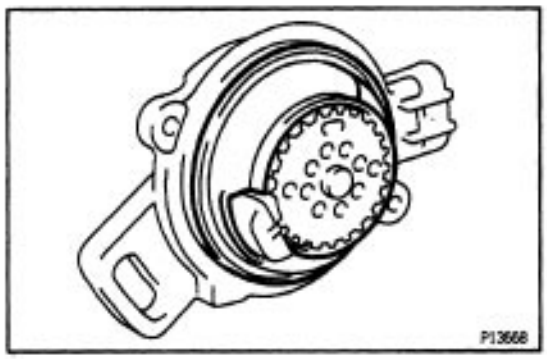
(b) Remove the dust proof cover.



DISTRIBUTOR 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.

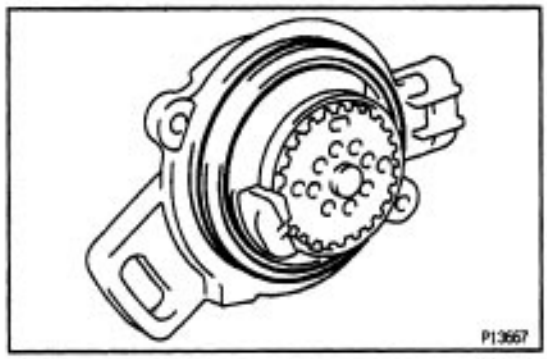


DISTRIBUTOR ASSEMBLY

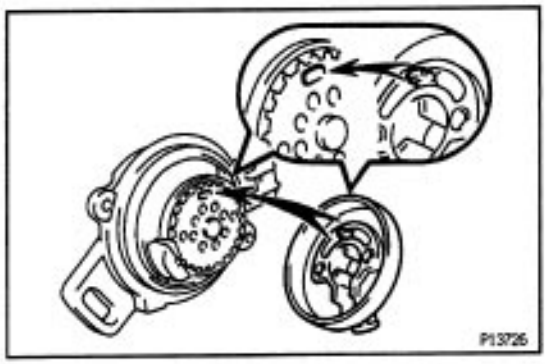
(See Components for Disassembly and Assembly)

1. INSTALL DUST PROOF COVER

(a) Install the dust proof cover.

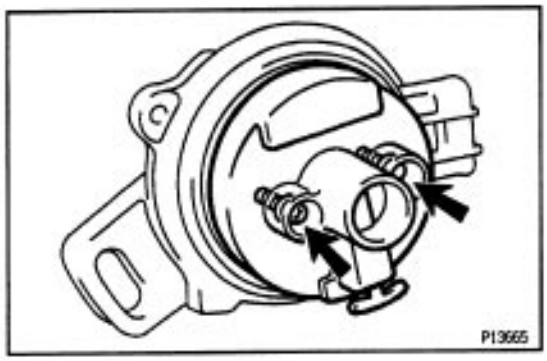


(b) Install the dust proof.seal.

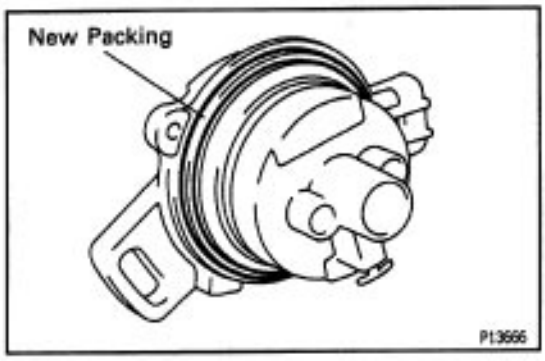


2. INSTALL ROTOR

(a) Align the hollow of the signal rotor with the protrusion of the rotor.

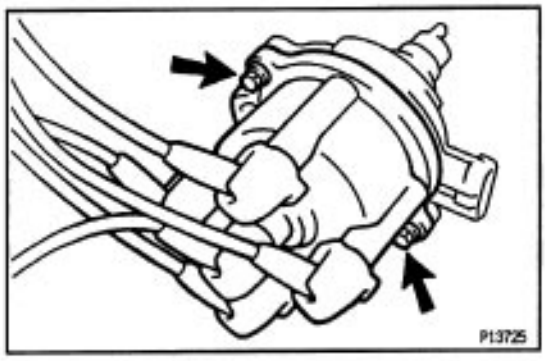


(b) Install the rotor with the 2 screws.



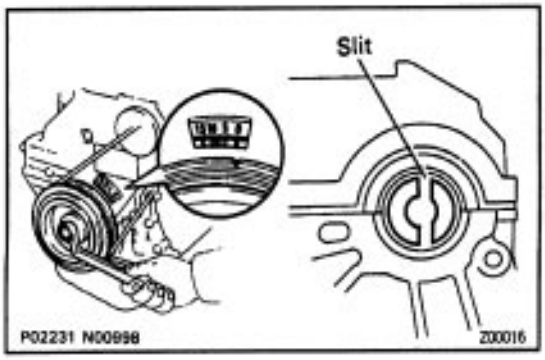
3. INSTALL DISTRIBUTOR CAP

(a) Install a new packing to the distributor housing.



(b) Install the distributor cap with the 2 bolts.

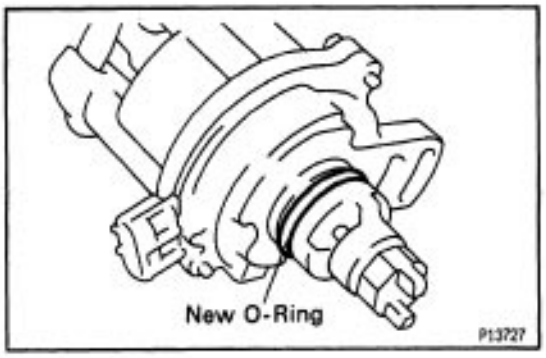
DISTRIBUTOR INSTALLATION



(See Components for Removal and Installation)

1. SET NO. 1 CYLINDER TO TDC/COMPRESSION

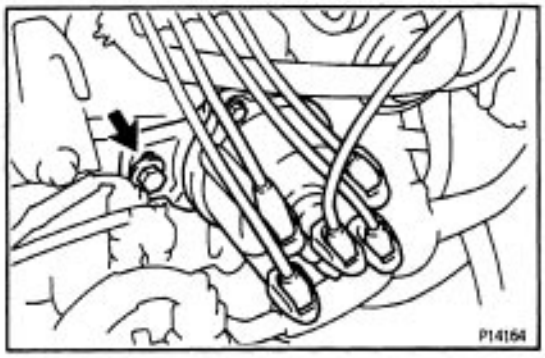
Turn the crankshaft clockwise, and position the slit of the intake camshaft as shown in the illustration.



2. INSTALL DISTRIBUTOR

(a) Install a new O–ring to the housing.
(b) Apply a light coat of engine oil on the 0–ring.

(c) Align the cutout of the coupling with the line of the housing.
(d) Insert the distributor, aligning the center of the flange with that of bolt hole on the cylinder head.



(e) Lightly tighten the hold–down bolt.
(f) Connect the high–tension cords to the clamp on the cylinder head cover.

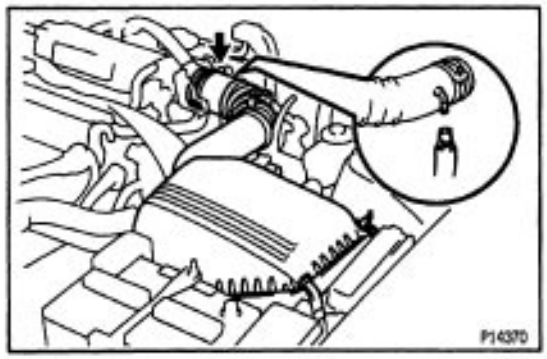
3. CONNECT HIGH–TENSION CORDS TO SPARK PLUGS

Firing order:

1–3–4–2

4. CONNECT HIGH–TENSION CORD TO IGNITION COIL

5. CONNECT DISTRIBUTOR CONNECTOR



6. INSTALL AIR CLEANER CAP, RESONATOR AND AIR CLEANER HOSE

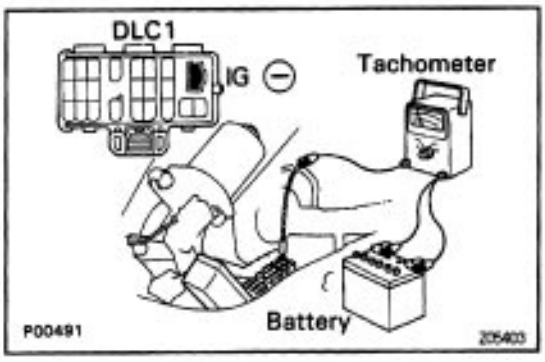
(a) Connect the air cleaner hose to the throttle body.
(b) Install the air cleaner cap together with the resonator and air cleaner hose.
(c) Connect the air hose to the air cleaner hose.
(d) Connect the intake air temperature sensor connector.

7. CONNECT AND ADJUST ACCELERATOR CABLE

8. CONNECT NEGATIVE (–) TERMINAL CABLE TO BATTERY

9. WARM UP ENGINE

Allow the engine to warm up to normal operating temperature.

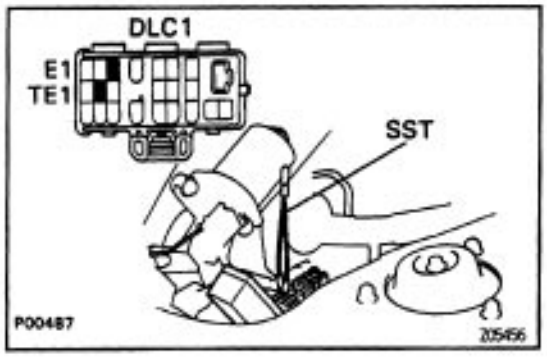


10. CONNECT TACHOMETER AND TIMING LIGHT TO ENGINE

Connect the test probe of a tachometer to terminal IGE) of the data link connector 1.

NOTICE:

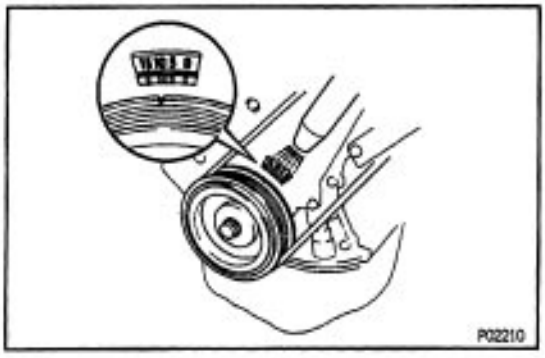
- **NEVER allow the tachometer terminal to touch ground as It could result In damage to the igniter and/or ignition coil.**
- **As some tachometers are not compatible with this ignition system, we recommend that you confirm the compatibility of yours before use. .**



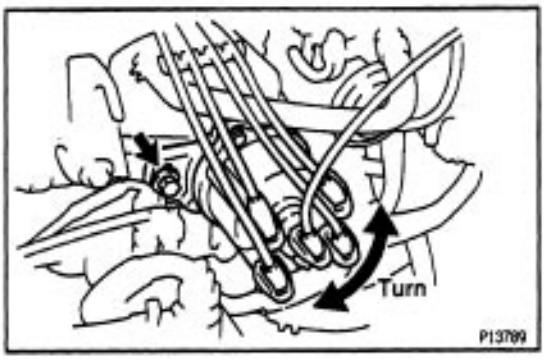
11. ADJUST IGNITION TIMING

(a) Using SST, connect terminals TE1 and E1 of the data link connector 1.
SST 09843–18020

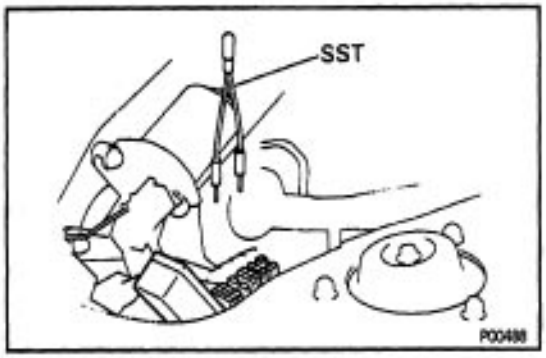
HINT: After engine speed is kept at 1,000–1,300 rpm for 5 seconds, check that it returns to idle speed.



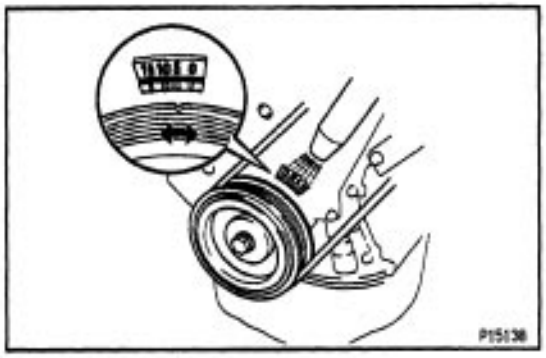
(b) Using a timing light, check the ignition timing.
Ignition timing:
10° BTDC 0 idle
(Transmission in neutral position)



(c) Loosen the hold–down bolt, and adjust by turning the distributor.
(d) Tighten the hold–down bolt, and recheck the ignition timing.
Torque: 19 N–m (195 kgf–cm, 14 ft–lbf)



(e) Remove the SST.
SST 09843–18020



12. FURTHER CHECK IGNITION TIMING
Ignition timing:
0–10° BTDC 0 idle
(Transmission in neutral position)
HINT: The timing mark moves in a range between 0° and 10°.

13. DISCONNECT TACHOMETER AND TIMING LIGHT FROM ENGINE

SERVICE SPECIFICATIONS

SERVICE DATA

Ignition timing	w/ Terminals TE1 and E1 connected of DLC1		10° BTDC @ idle
Firing order	–		1 – 3 – 4 – 2
High–tension cord	Resistance	Limit	25 kΩ per cord
Spark plug	Recommended spark plug	ND	PK20R11
		NGK	BKR6EP11
	Correct electrode gap		1.1 mm (0.043 in.)
Ignition coil	Primary coil resistance	at cold	0.36 – 0.55 Ω
		at hot	0.45 – 0.65 Ω
	Secondary coil resistance	at cold	9.0 – 15.4 kΩ
		at hot	11.4 – 18.1 kΩ
Distributor	Air gap		0.2 – 0.5 mm (0.008 – 0.020 in.)
	Pickup coil resistance	at cold G1 – G⊖	125 – 200 Ω
		G2 – G⊖	125 – 200 Ω
		NE – G⊖	155 – 250 Ω
		at hot G1 – G⊖	160 – 235 Ω
		G2 – G⊖	160 – 235 Ω
		NE – G⊖	190 – 290 Ω

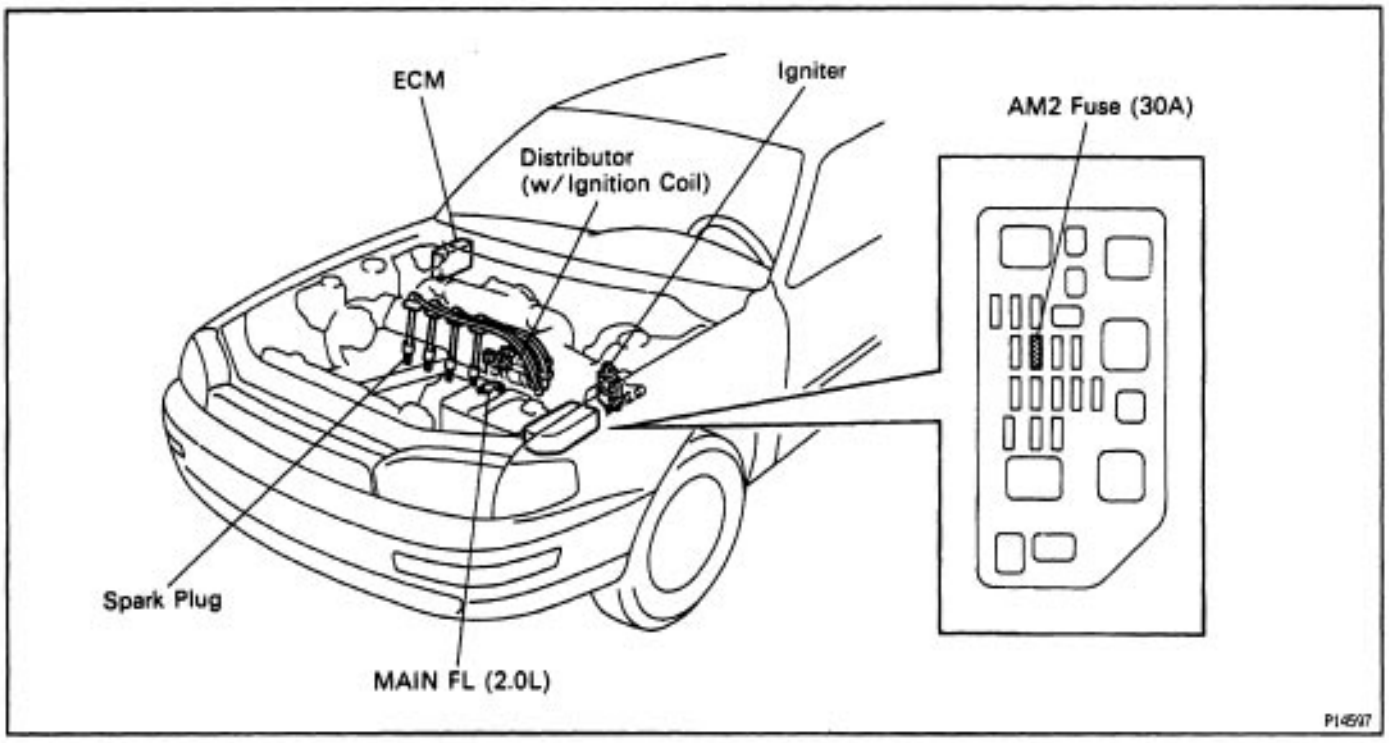
TORQUE SPECIFICATIONS

Part tightened	N·m	kgf·cm	ft·lbf
Spark plug x Cylinder head	18	180	13
Distributor x Cylinder head	19	195	14

(5S–FE Except California)

DESCRIPTION

The engine control module (ECM) is programmed with data for optimum ignition timing under all operating conditions. Using data provided by sensors which monitor various engine functions (rpm, intake air volume, engine temperature, etc.), the ECM triggers the spark at precisely the right instant.



The ECM monitors the engine condition by signals from each sensor, calculates the ignition timing and sends an ignition signal to the igniter. High voltage from the ignition is distributed to each spark plug in the appropriate order to generate a spark between the electrodes, which ignites the air–fuel mixture.

IGNITER

The igniter temporarily interrupts the primary current with the ignition signal (IGT signal) from the ECM and generates sparks at the spark plug. Also, as a fail–safe measure, when ignition occurs an ignition confirmation signal (IGF signal) is sent to the ECM.

IGNITION COIL

The ignition coil uses a closed core coil with the primary coil wrapped around the core and the secondary coil wrapped around the primary coil. This allows the generation of a high voltage sufficient to cause a spark to jump across the spark plug gap.

DISTRIBUTOR

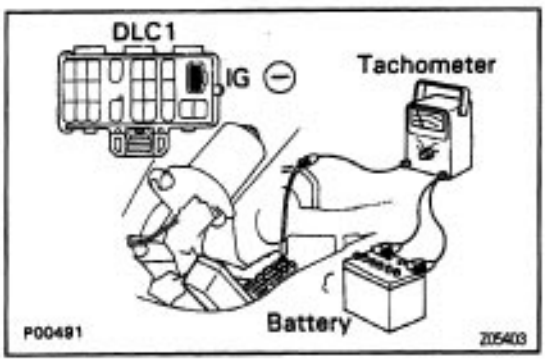
This correctly distributes high voltage to the spark plug of each cylinder in the specified ignition order.

The NE coil detects the crankshaft position, and the G coil detects the camshaft position.

The NE coil detects the crankshaft position, and the G coil detects the camshaft position.

PRECAUTION

1. Do not leave the ignition switch on for more then 10 minutes if the engine does not start.



2. With a tachometer connected to the system, connect the test probe of the tachometer to terminal IG ⊕ of the data link connector 1.

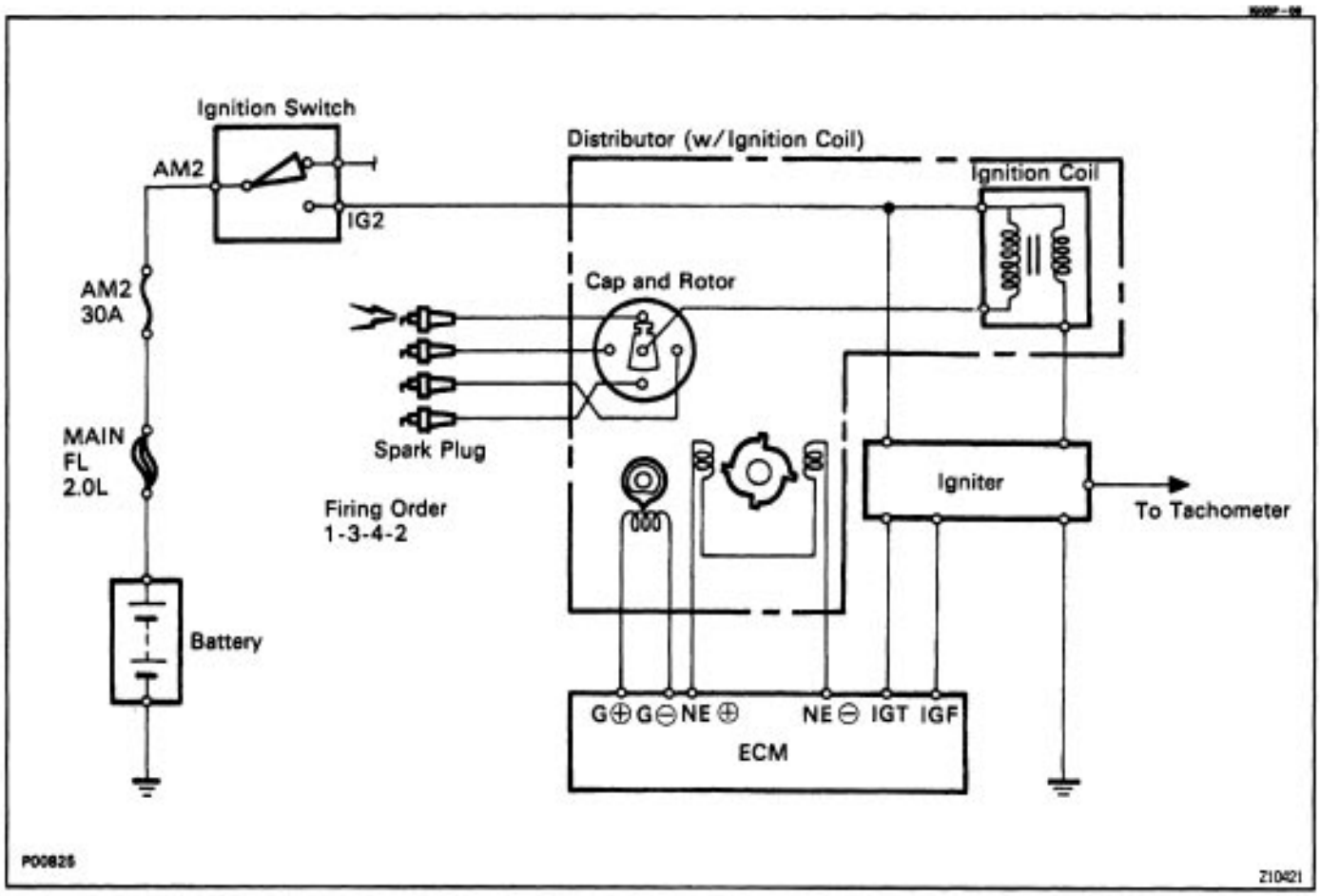
3. As some tachometers are not compatible with this ignition system, we recommend that you confirm the compatibility of yours before use.

4. NEVER allow the tachometer terminals to touch ground as it could result in damage to the igniter and/or ignition coil.

6. Do not disconnect the battery while the engine is running.

6. Check that the igniter is properly grounded to the body.

SYSTEM CIRCUIT



OPERATION

To maintain the most appropriate ignition timing, the ECM sends a control signal so that the igniter sends current to the ignition coil and the spark plugs produce a spark.

PREPARATION

SST (SPECIAL SERVICE TOOLS)

	09843–18020 Diagnosis Check Wire	

RECOMMENDED TOOLS

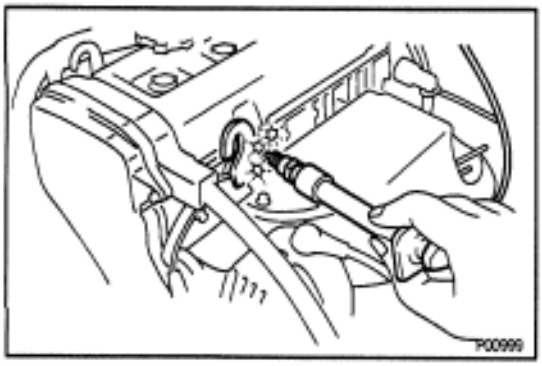
	09082–00050 TOYOTA Electrical Tester Set	
	09200–00010 Engine Adjust Kit	

EQUIPMENT

Megger insulation resistance meter	Insulation resistance meter
Spark plug cleaner	
Tachometer	
Timing light	Ignition timing

SSM (SPECIAL SERVICE MATERIALS)

08826–00080 Seal packing or equivalent	Ignition coil



ON–VEHICLE INSPECTION

SPARK TEST

CHECK THAT SPARK OCCURS

(a) Disconnect the high–tension cords from the spark plugs. (See page IG–28)
(b) Remove the spark plugs. (See page IG–28)
(c) Install the spark plugs to the each high–tension cord.
(d) Ground the spark plug.
(e) Check if spark occurs while engine is being cranked.

HINT: To prevent gasoline from being injected from injectors during this test, crank the engine for no more than 1–2 seconds at a time. If the spark does not occur, perform the test as follows:

SPARK TEST

NO

CHECK CONNECTION OF DISTRIBUTOR CONNECTORS → BAD → Connect securely.

OK

CHECK RESISTANCE OF HIGH–TENSION CORD (See page IG–27)
Maximum resistance: 25 kΩ per cord → BAD → Replace the cord (s) .

OK

CHECK POWER SUPPLY TO IGNITION COIL
1. Turn ignition switch ON.
2. Check that there is battery voltage at ignition coil positive (+) terminal. → BAD → Check wiring between ignition switch and ignition coil.

OK

CHECK RESISTANCE OF IGNITION COIL (See page IG–30)
Resistance: Cold Hot
Primary 0.36–0.55 Ω 0.45–0.65 Ω
Secondary 9.0–15.4 kΩ 11.4–18.1 kΩ → BAD → Replace the ignition coil.

OK

CHECK RESISTANCE OF SIGNAL GENERATOR (PICKUP COIL) (See page IG–31)
Resistance: Cold Hot
G (+) and IG (–) 185–275 Ω 240–325Ω
N E (+) and NE (–) 370–550Ω 475–650 Ω → BAD → Replace distributor housing assembly.

OK

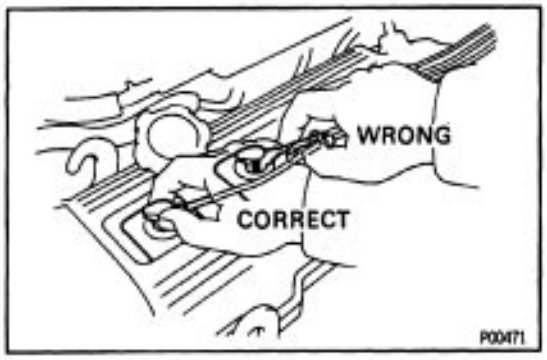
CHECK AIR GAP OF DISTRIBUTOR (See page IG–30)
Air gap: 0.2–0.4 mm (0.008–0.016 in.) → BAD → Replace the distributor housing assembly.

OK

CHECK IGT SIGNAL FROM ECM (See page EG–344) → BAD → Check wiring between ECM, distributor and igniter, and then try another ECM.

OK

TRY ANOTHER IGNITER



HIGH–TENSION CORDS INSPECTION

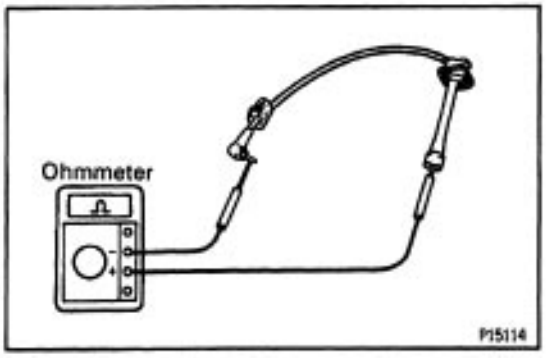
1. DISCONNECT HIGH–TENSION CORDS FROM SPARK PLUGS

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.

2. DISCONNECT HIGH–TENSION CORDS FROM DISTRIBUTOR CAP



3. INSPECT HIGH–TENSION CORD RESISTANCE

Using an ohmmeter, measure the resistance.

Maximum resistance:

25 kΩ per cord

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

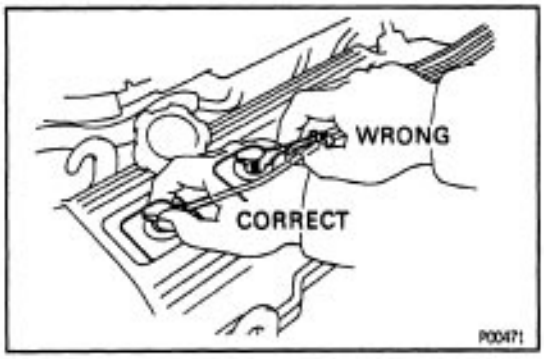
4. RECONNECT HIGH–TENSION CORDS TO DISTRIBUTOR CAP

5. RECONNECT HIGH–TENSION CORDS TO SPARK PLUGS .

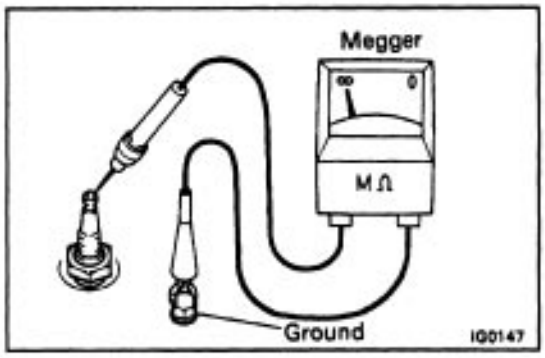
SPARK PLUGS INSPECTION

NOTICE:

- **Never use e 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).**



1. DISCONNECT HIGH–TENSION CORDS FROM SPARK PLUGS



2. INSPECT ELECTRODE

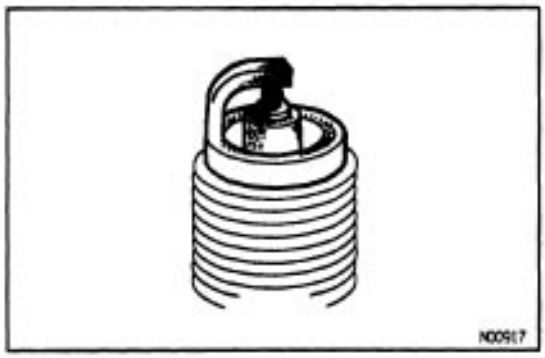
Using a megger (insulation resistance meter), measure the insulation resistance.

Standard correct insulation resistance:

10 MΩ or more

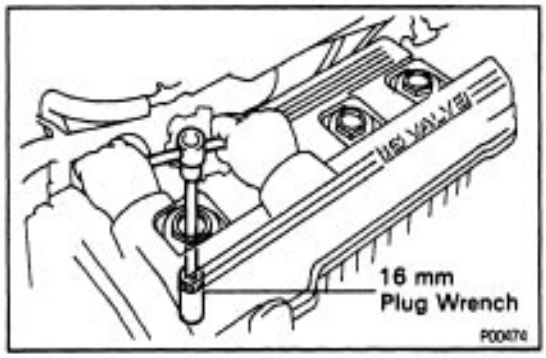
If the resistance is less than specified, proceed to step 3.

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



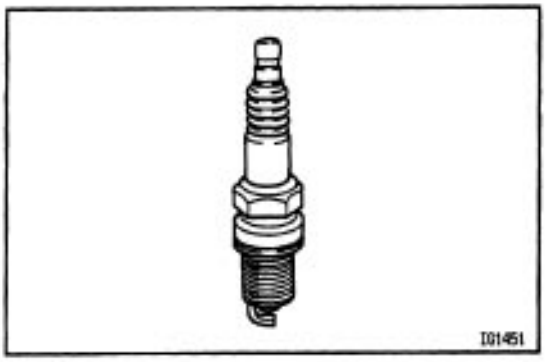
Simple Method:

(a) Quickly race the engine to 4,000 rpm 5 times.
(b) Remove the spark plug. (See step 3)
(c) Visually check the spark plug.
If the electrode is dry ... OK
If the electrode is wet ... Proceed to step 4
(d) Reinstall the spark plug.
(See step 7 on page IG–29)



3. REMOVE SPARK PLUGS

Using a 16 mm plug wrench, remove the spark plug.



4. VISUALLY INSPECT SPARK PLUGS

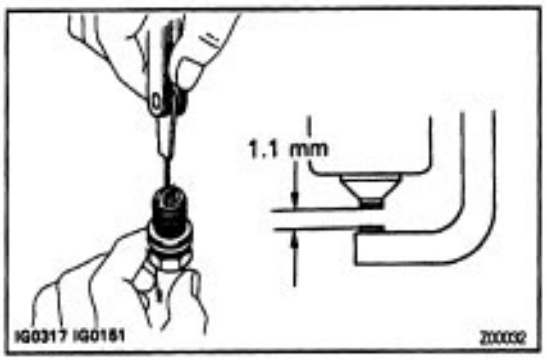
Check the spark plug for thread damage and insulator damage.

If abnormal, replace the spark plug.

Recommended spark plug:

PK20R 11 for N D

BKR6EP11 for NGK



5. INSPECT ELECTRODE GAP

Maximum electrode gap:

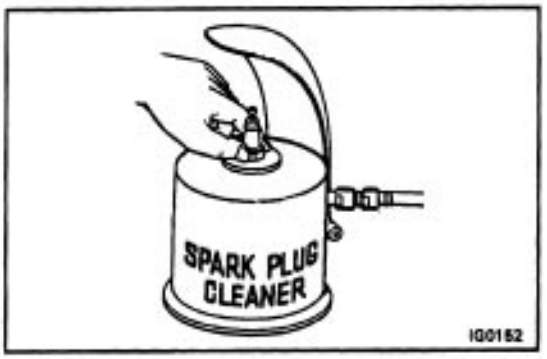
1.3 mm (0.051 in.)

If the gap is greater than maximum, replace the spark plug.

Correct electrode gap of 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.



6. CLEAN SPARK PLUGS

If the electrode has traces of wet carbon, allow it to dry and then clean with a spark plug cleaner.

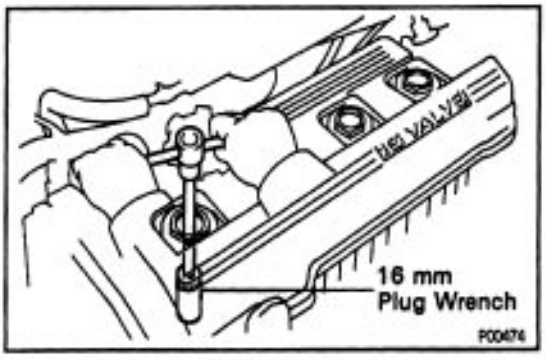
Air pressure:

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.



7. INSTALL SPARK PLUGS

Using a 16 mm plug wrench, install the spark plug.

Torque: 18 N–m (180 kgf–cm, 13 ft–lbf)

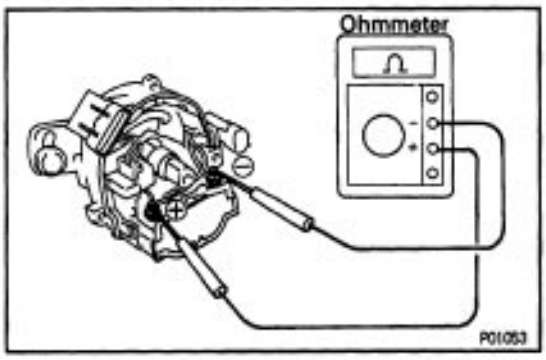
8. RECONNECT HIGH–TENSION CORDS TO SPARK PLUGS

DISTRIBUTOR INSPECTION

NOTICE: 'Cold' and 'Hot' in the following 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. DISCONNECT DISTRIBUTOR CONNECTORS
2. REMOVE DISTRIBUTOR CAP
3. REMOVE ROTOR
4. REMOVE IGNITION COIL DUST COVER

Ignition Coil

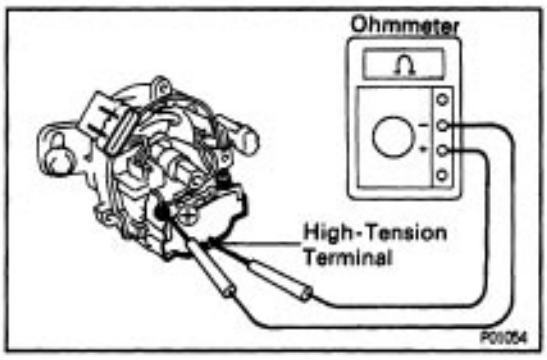


5. INSPECT PRIMARY COIL RESISTANCE

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

Primary coil resistance (Cold):
0.38–0.550
Primary coil resistance (Hot):
0.45–0.650

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



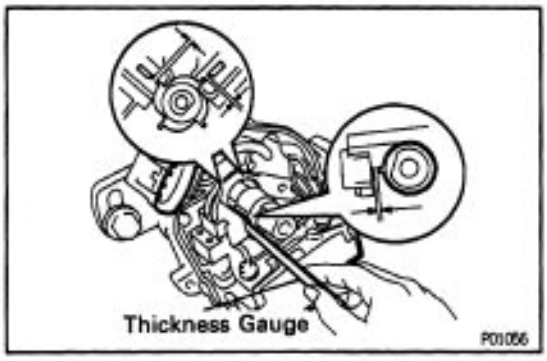
6. INSPECT SECONDARY COIL RESISTANCE

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

Secondary coil resistance (Cold):
9.0–15.4 kΩ
Secondary coil resistance (Hot):
11.4–18.1 kΩ

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

Distributor

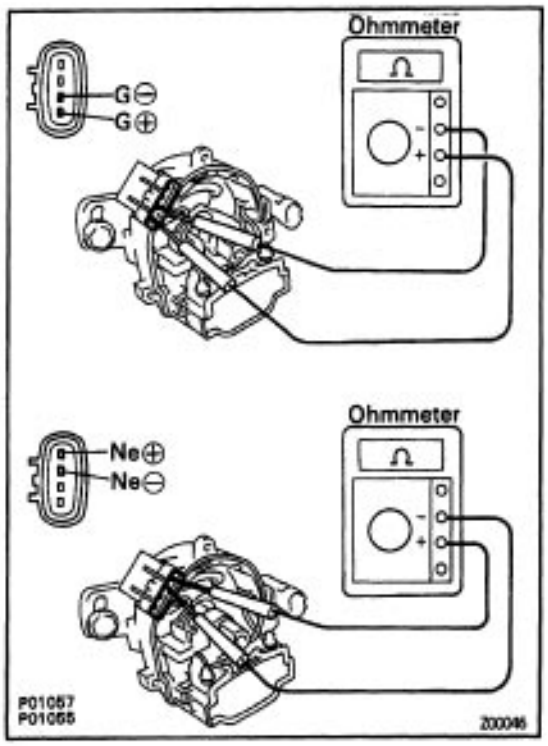


7. INSPECT AIR GAP

Using a thickness gauge, measure the air gap between the signal rotor and pickup coil projection.

Air gap:
0.2–0.4 mm (0.008–0.018 in.)

If the air gap is not as specified, replace the distributor housing assembly.



8. INSPECT SIGNAL GENERATOR (PICKUP COIL) RESISTANCE

Using an ohmmeter, measure the resistance between the terminals (G⊕ and G , NE⊕ and NE).

Pickup coil resistance (Cold):

G⊕ and G
185–2750
NE⊕ and NE
370–5500

Pickup coil resistance (Hot):

G⊕ and G
240–3250
NE⊕ and NE
475–6500

If the resestance is not as specified, replace the dis–tributor housing assmebly.

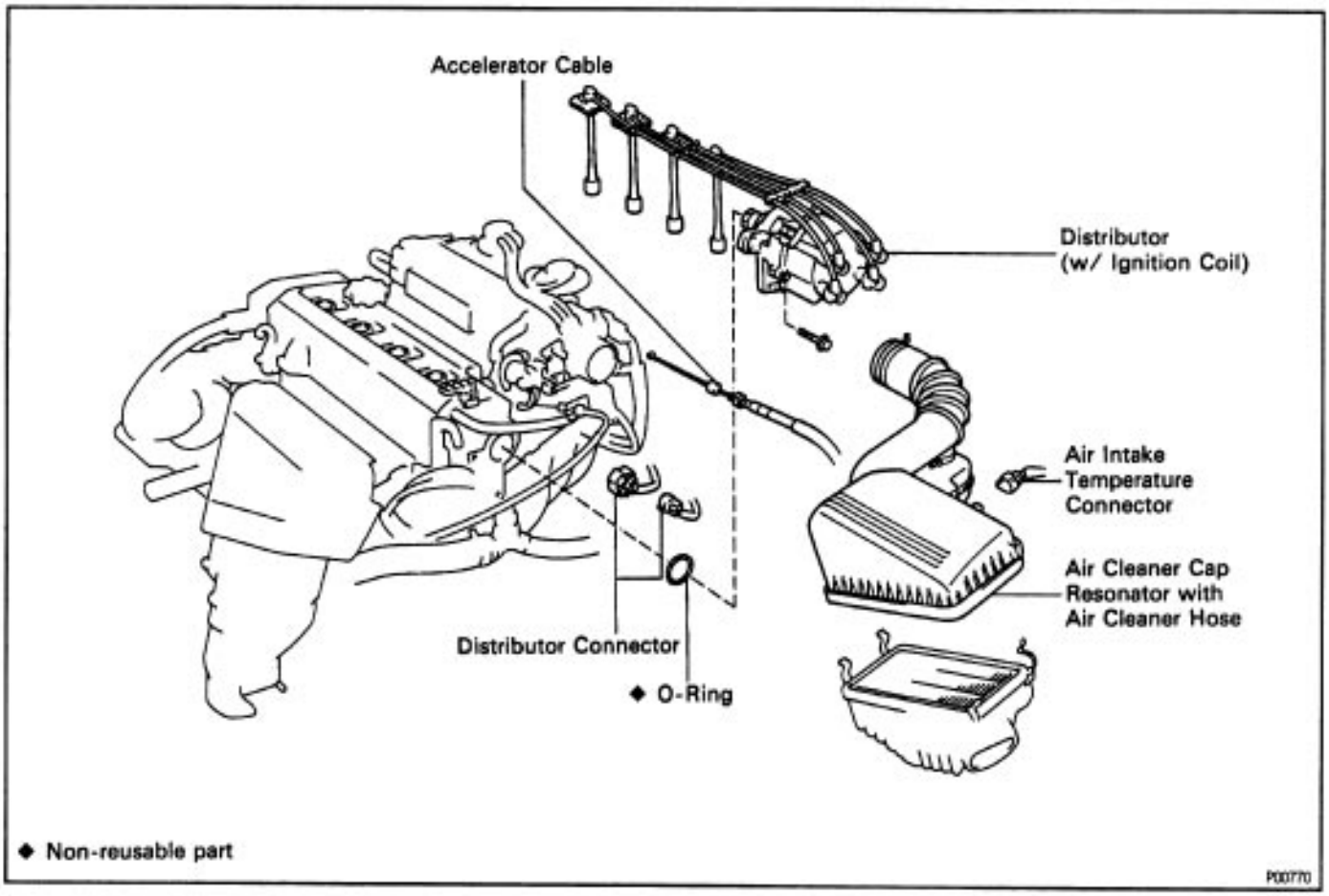
9. REINSTALL IGNITION COIL DUST COVER
10. REINSTALL ROTOR
11. REINSTALL DISTRIBUTOR CAP
12. RECONNECT DISTRIBUTOR CONNECTORS

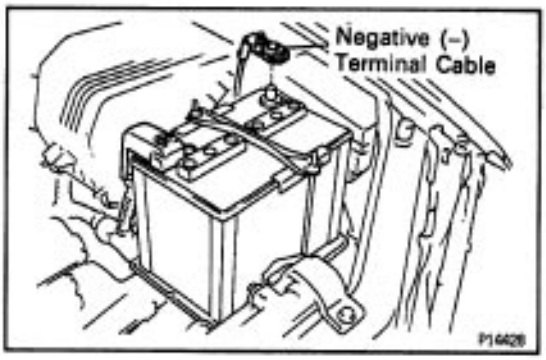
IGNITER INSPECTION

(See Spark Test procedure on page IG–26)

DISTRIBUTOR

COMPONENTS FOR REMOVAL AND INSTALLATION



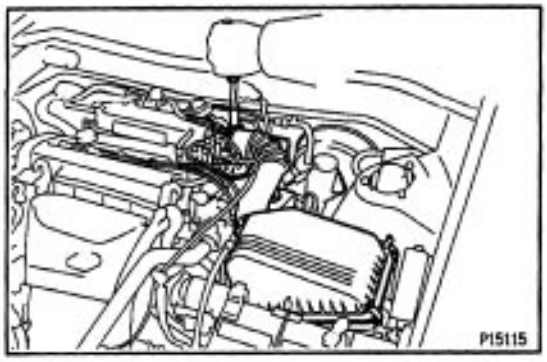


DISTRIBUTOR REMOVAL

1. DISCONNECT NEGATIVE (–) TERMINAL CABLE FROM BATTERY

CAUTION: Work must be started after 90 seconds from the time the ignition switch (: turned to the 'LOCK' position and the negative (–) terminal cable is discon–nected from the battery.

2. DISCONNECT ACCELERATOR CABLE FROM THROTTLE LINKAGE



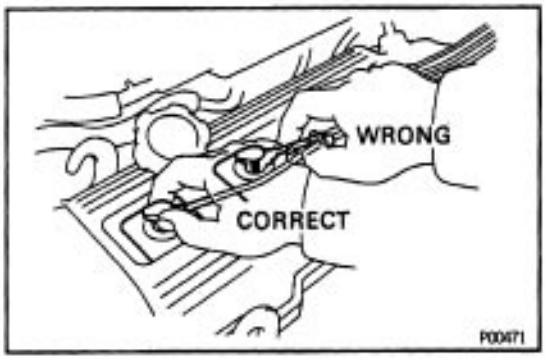
3. REMOVE AIR CLEANER CAP, RESONATOR AND AIR CLEANER HOSE

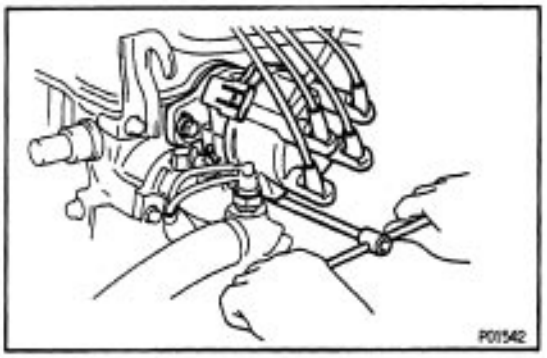
(a) Disconnect the intake air temperature sensor connector.
(b) Loosen the air cleaner hose clamp bolt.
(c) Disconnect the 4 air cleaner cap clips.
(d) Disconnect the air cleaner hose from the throttle body, and remove the air cleaner cap together with the resonator and air cleaner hose.

4. DISCONNECT DISTRIBUTOR CONNECTORS

5. DISCONNECT HIGH–TENSION CORDS FROM SPARK PLUGS

(a) Disconnect the 4 high–tension cords from the spark plugs.
(b) Disconnect the high–tension cords from the clamp on the cylinder head cover.

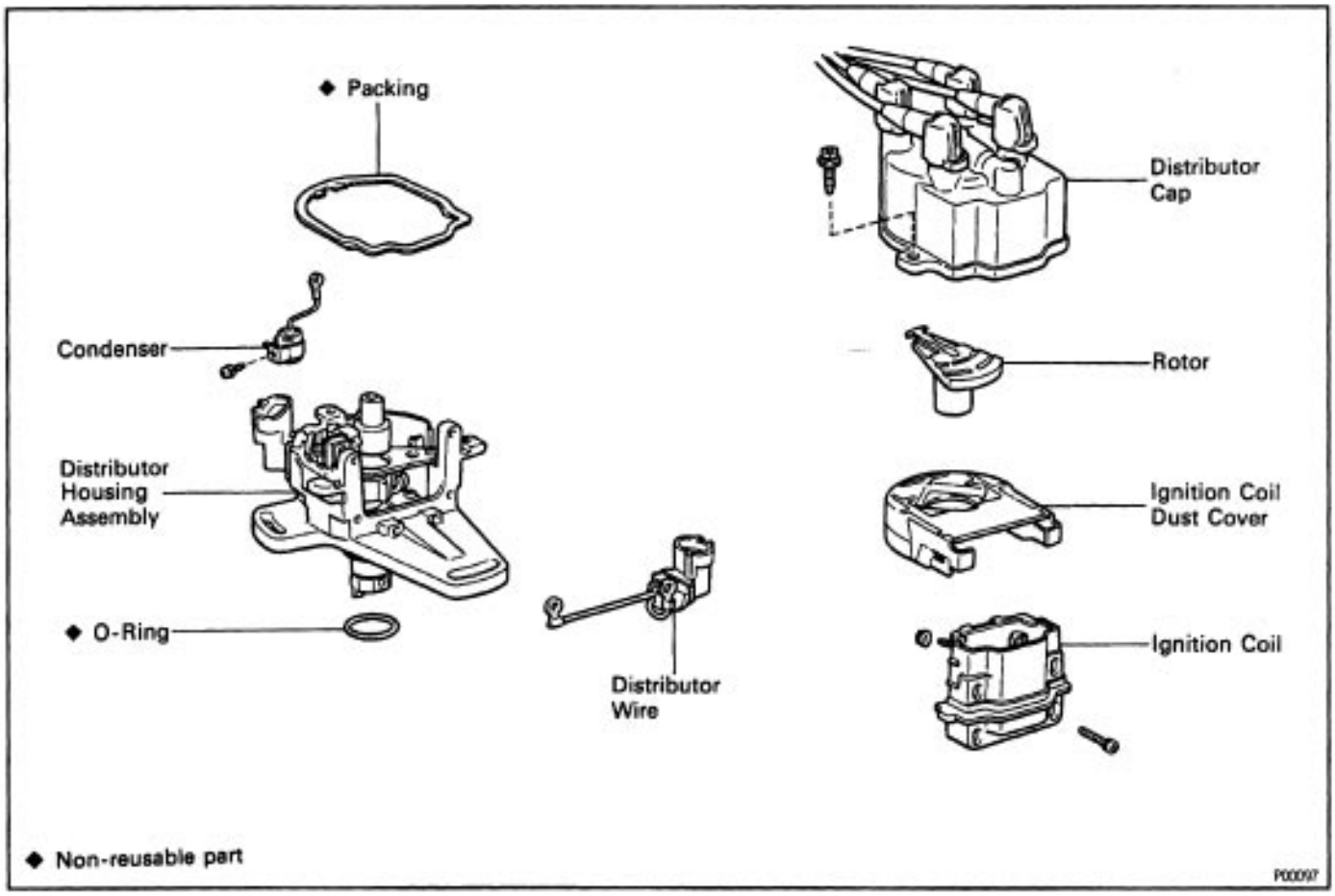




6. REMOVE DISTRIBUTOR

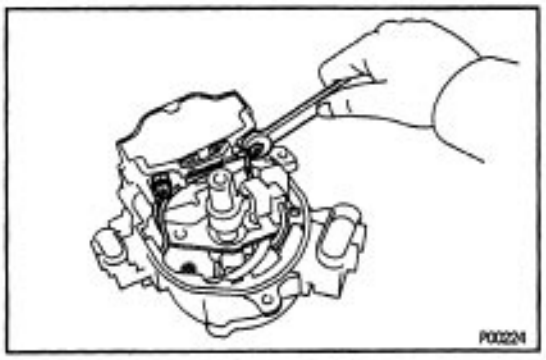
(a) Remove the 2 hold–down bolts, and pull out the distributor.
(b) Remove the 0–ring from the distributor housing.

COMPONENTS FOR DISASSEMBLY AND ASSEMBLY



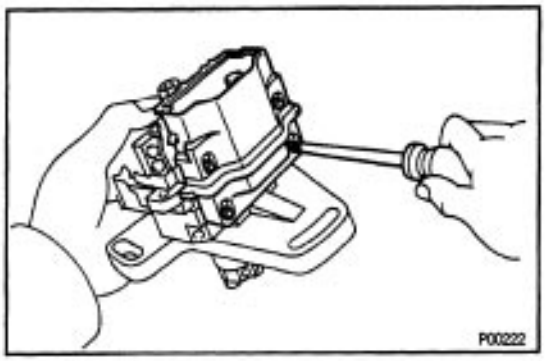
DISTRIBUTOR DISASSEMBLY

1. REMOVE DISTRIBUTOR CAP WITHOUT DISCONNECTING HIGH–TENSION CORDS
2. REMOVE ROTOR
3. REMOVE IGNITION COIL DUST COVER

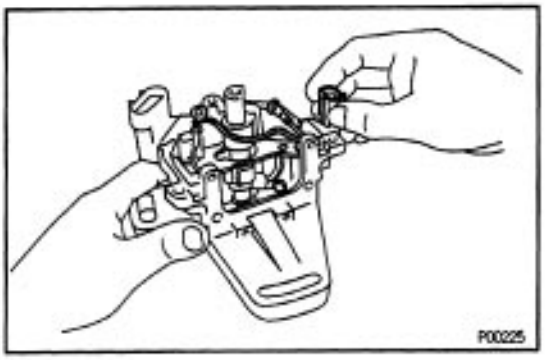


4. REMOVE IGNITION COIL

(a) Remove the 2 nuts, and disconnect the 3 wires from the ignition coil terminals.

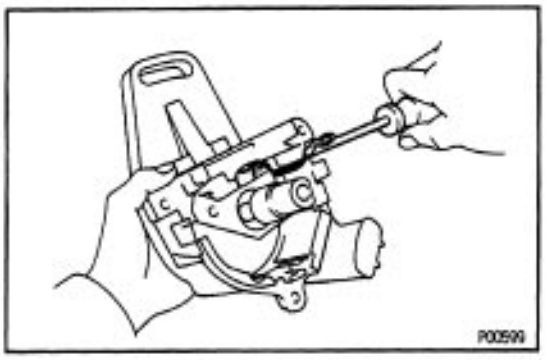


(b) Remove the 4 screws and ignition coil.



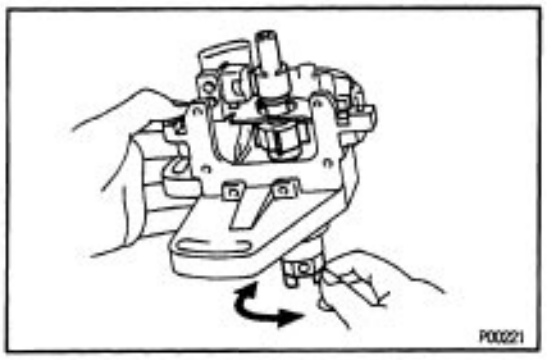
B. REMOVE DISTRIBUTOR WIRE

Remove the distributor wire from the distributor housing.



6. REMOVE CONDENSER

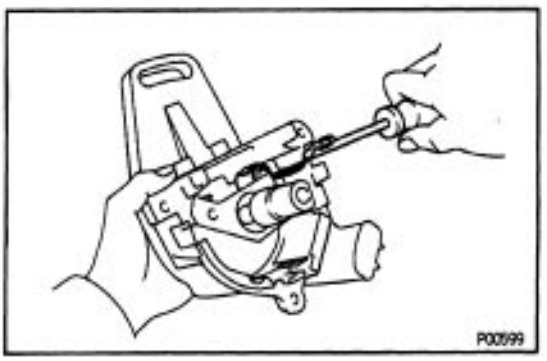
Remove the screw and condenser.



DISTRIBUTOR 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.

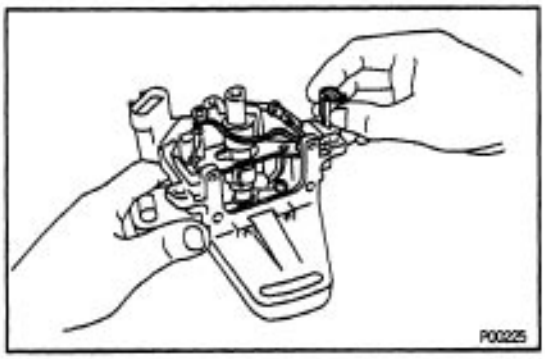


DISTRIBUTOR ASSEMBLY

(See Components for Disassembly and Assembly)

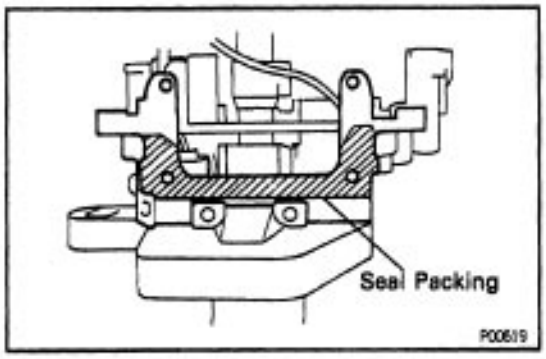
1. INSTALL CONDENSER

Install the condenser with the screw.



2. INSTALL DISTRIBUTOR WIRE

Install the grommet of the wire to the distributor housing.

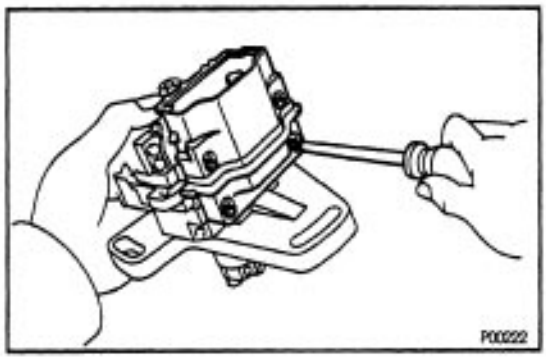


3. INSTALL IGNITION COIL

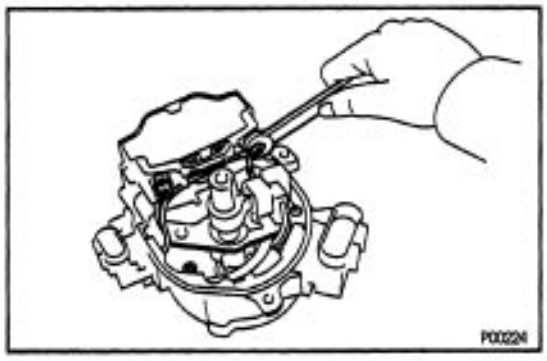
(a) Remove any old packing (FIPG) material.

(b) Apply seal packing to the ignition coil installing sur–face of the housing as shown in the illustration.

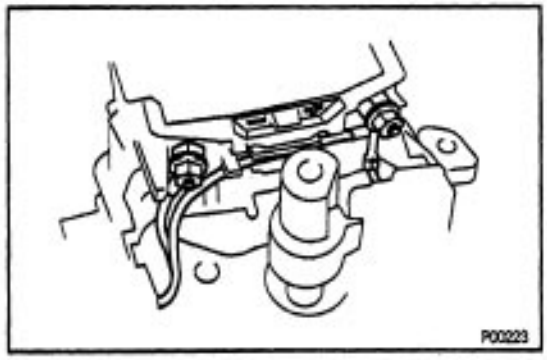
Seal packing:
Part No. 08826–00080 or equivalent



(c) Install the ignition coil with the 4 screws.



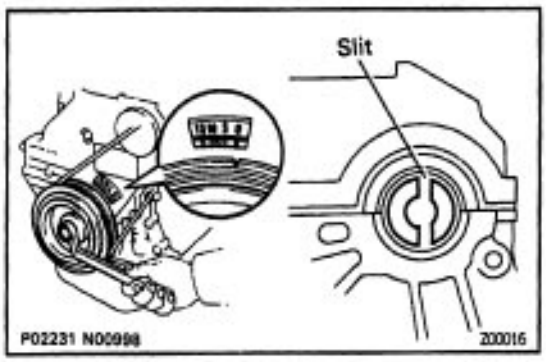
(d) Connect the 3 wires to the ignition coil terminals with the 2 nuts.



NOTICE:

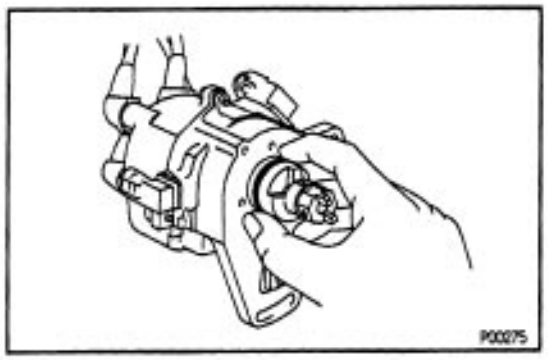
- **When connecting the wires to the ignition coil. insert both properly into their grooves found on the side of the Ignition coil.**
- **Be sure the wires do not contact with signal rotor or distributor housing.**

4. INSTALL IGNITION COIL DUST COVER
5. INSTALL ROTOR
6. INSTALL DISTRIBUTOR CAP AND HIGH–TENSION CORDS

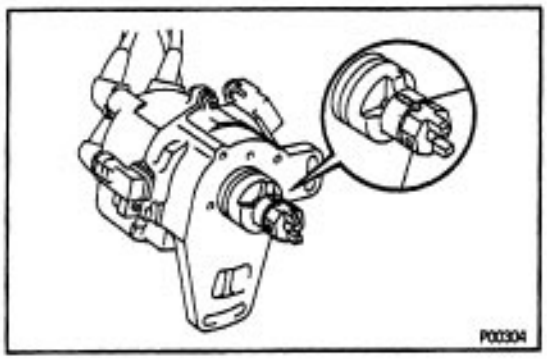


DISTRIBUTOR INSTALLATION

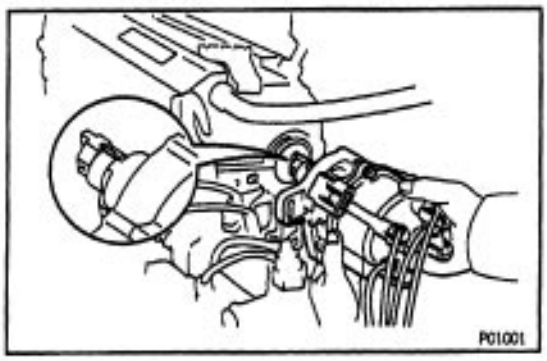
(See Components for Disassembly and Assembly)
1. SET NO. 1 CYLINDER TO TDC/COMPRESSION
Turn the crankshaft clockwise, and position the slit of the intake camshaft as shown in the illustration.



2. INSTALL DISTRIBUTOR
(a) Install a new O–ring to the housing.
(b) Apply a light coat of engine oil on the 0–ring.

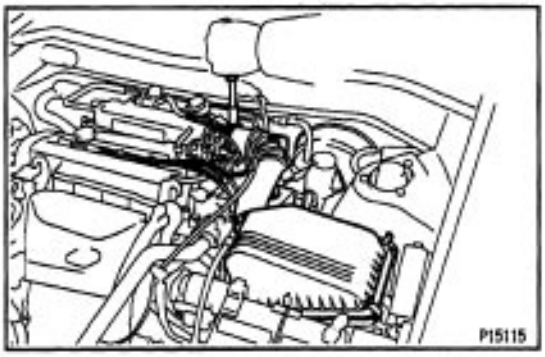


(c) Align the cutout of the coupling with the line of the housing.



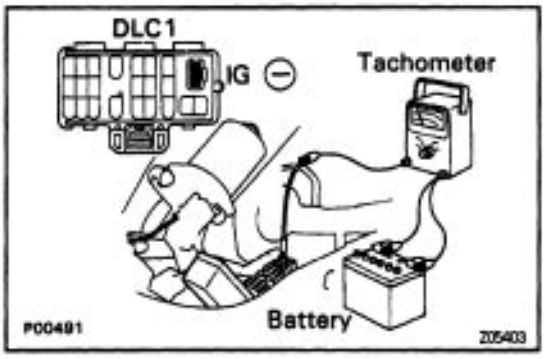
(d) Insert the distributor, aligning the center of the flange with that of bolt hole on the cylinder head.
(e) Lightly tighten the 2 hold–down bolts.
(f) Connect the high–tension cords to the clamp on the cylinder head cover. .

3. CONNECT HIGH–TENSION CORDS TO SPARK PLUGS
Firing order:
1–3–4–2
4. CONNECT DISTRIBUTOR CONNECTORS

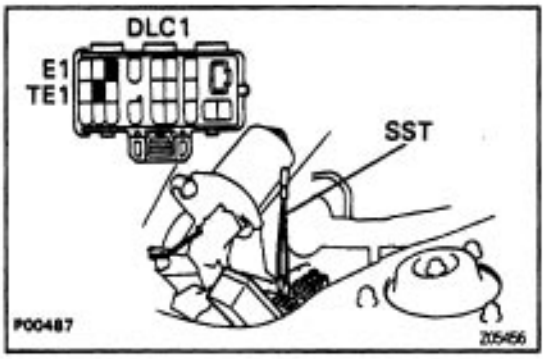


5. INSTALL AIR CLEANER CAP, RESONATOR AND AIR CLEANER HOSE
(a) Connect the air cleaner hose to the throttle body.
(b) Install the air cleaner cap together with the resonator and air cleaner hose.
(c) Connect the intake air temperature sensor connector.

6. CONNECT AND ADJUST ACCELERATOR CABLE
7. CONNECT NEGATIVE (–) TERMINAL CABLE TO BATTERY
8. WARM UP ENGINE
Allow the engine to warm up to normal operating temperature.

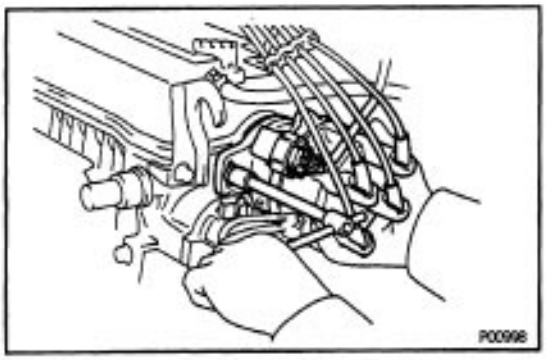


9. CONNECT TACHOMETER
Connect the test probe of a tachometer to terminal IG
E) of the data link connector 1.
NOTICE:
- **NEVER allow the tachometer terminal to touch ground as it could result in damage to the igniter and/or ignition coil.**
- **As some tachometers are not compatible with this ignition system, we recommend that you confirm the compatibility of yours before use.**

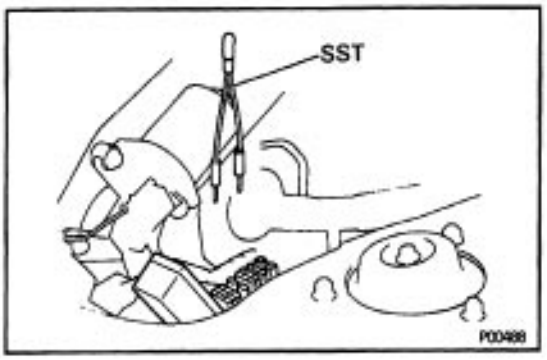


10. ADJUST IGNITION TIMING
(a) Using SST, connect terminals TE 1 and E 1 of the data link connector 1.
SST 09843–18020
HINT: After engine speed is kept at 1,000–1,300 rpm for 5 seconds, check that it returns to idle speed.

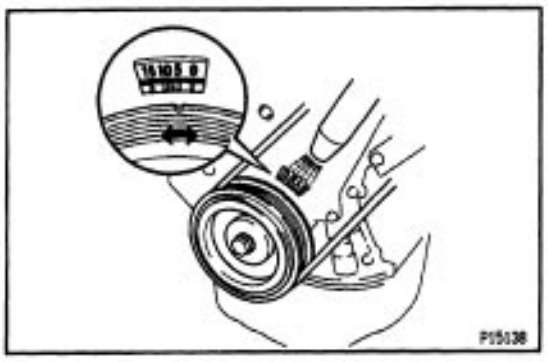
(b) Using a timing light, check the ignition timing.
Ignition timing:
10° BTDC 0 Idle
(Transmission In neutral position)



(c) Loosen the 2 hold–down bolts, and adjust by turning the distributor.
(d) Tighten the hold–down bolts, and recheck the ignition timing.
Torque: 19 N–m (195 kgf–cm, 14 ft–lbf)



(e) Remove the SST.
SST 09843–18020



11. FURTHER CHECK IGNITION TIMING
Ignition timing:
0–10° BTDC 0 idle
(Transmission In neutral position)
HINT: The timing mark moves in a range between 0° and 10°.

12. DISCONNECT TACHOMETER AND TIMING LIGHT FROM ENGINE

SERVICE SPECIFICATIONS

SERVICE DATA

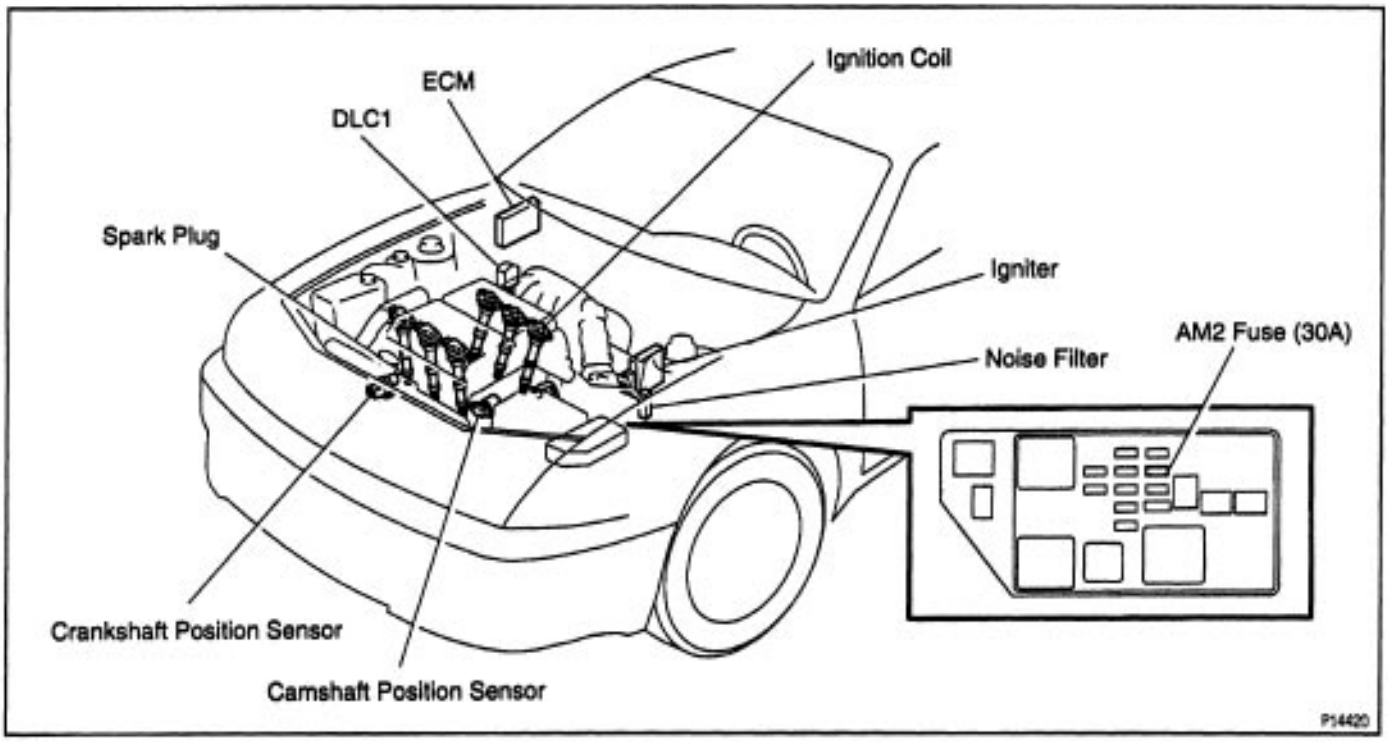
Ignition timing	w/ Terminals TE1 end E1 connected of DLC1		10°BTDC @ idle
Firing order	–		1 – 3 – 4 – 2
High–tension cord	Resistance	Limit	25 kΩ per cord
Spark plug	Recommended spark plug	ND	PK20R11
		NGK	BKR6EP11
	Correct electrode gap		1.1 mm (0.043 in.)
Ignition coil	Primary coil resistance	at cold	0.36 – 0.55 Ω
		at hot	0.45 – 0.65 Ω
	Secondary coil resistance	at cold	9.0 – 15.4 kΩ
		at hot	11.4 – 18.1 kΩ
Distributor	Air gap		0.2 – 0.4 mm (0.008 – 0.016 in.)
	Pickup coil resistance	at cold G⊕ – G⊖	185 – 275 Ω
		NE⊕ – NE⊖	370 – 550 Ω
		at hot G⊕ – G⊖	240 – 325 Ω
		NE⊕ – NE⊖	475 – 650 Ω

TORQUE SPECIFICATIONS

Part tightened	N·m	kgf·cm	ft·lbf
Spark plug x Cylinder heed	18	180	13
Distributor x Cylinder head	19	195	14

(1 MZ–FE)
DESCRIPTION

The engine control module (ECM) is programmed with data for optimum ignition timing under all operating conditions. Using data provided by sensors which monitor various engine functions (RPM, intake air volume, engine temperature, etc.), the ECM triggers the spark at precisely the right instant.



The ECM monitors the engine condition by signals from each sensor, calculates the ignition timing and sends an ignition signal to the igniter. High voltage from the ignition is distributed to each spark plug in the appropriate order to generate a spark between the electrodes, which ignites the air–fuel mixture.

IGNITER

The igniter interrupts the primary current with the ignition signal (IGT signal) from the ECM and generates sparks at the spark plug. Also, as a fail–safe measure, when ignition occurs an ignition confirmation signal (IGF signal) is sent to the ECM.

IGNITION COILS

The ignition coil uses a closed core coil with the primary coil wrapped around the core and the secondary coil wrapped around the primary coil. This allows the generation of a high voltage sufficient to cause a spark to jump across the spark plug gap.

CAMSHAFT POSITION SENSOR

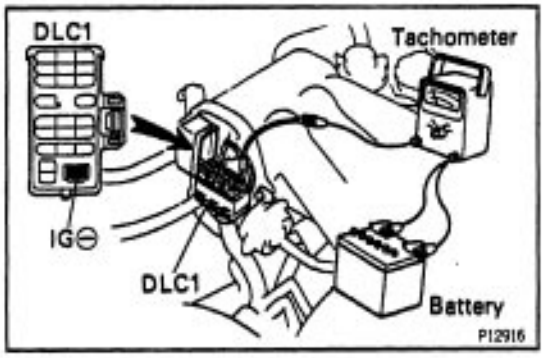
The camshaft position sensor detect the camshaft position.

CRANKSHAFT POSITION SENSOR

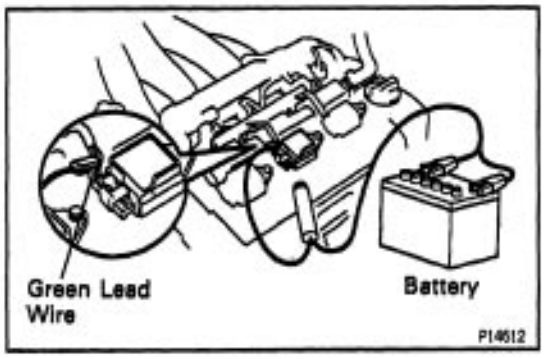
The crankshaft position sensor detect the crankshaft position.

PRECAUTION

1. Do not leave the ignition switch on for more than 10 minutes if the engine does not start.



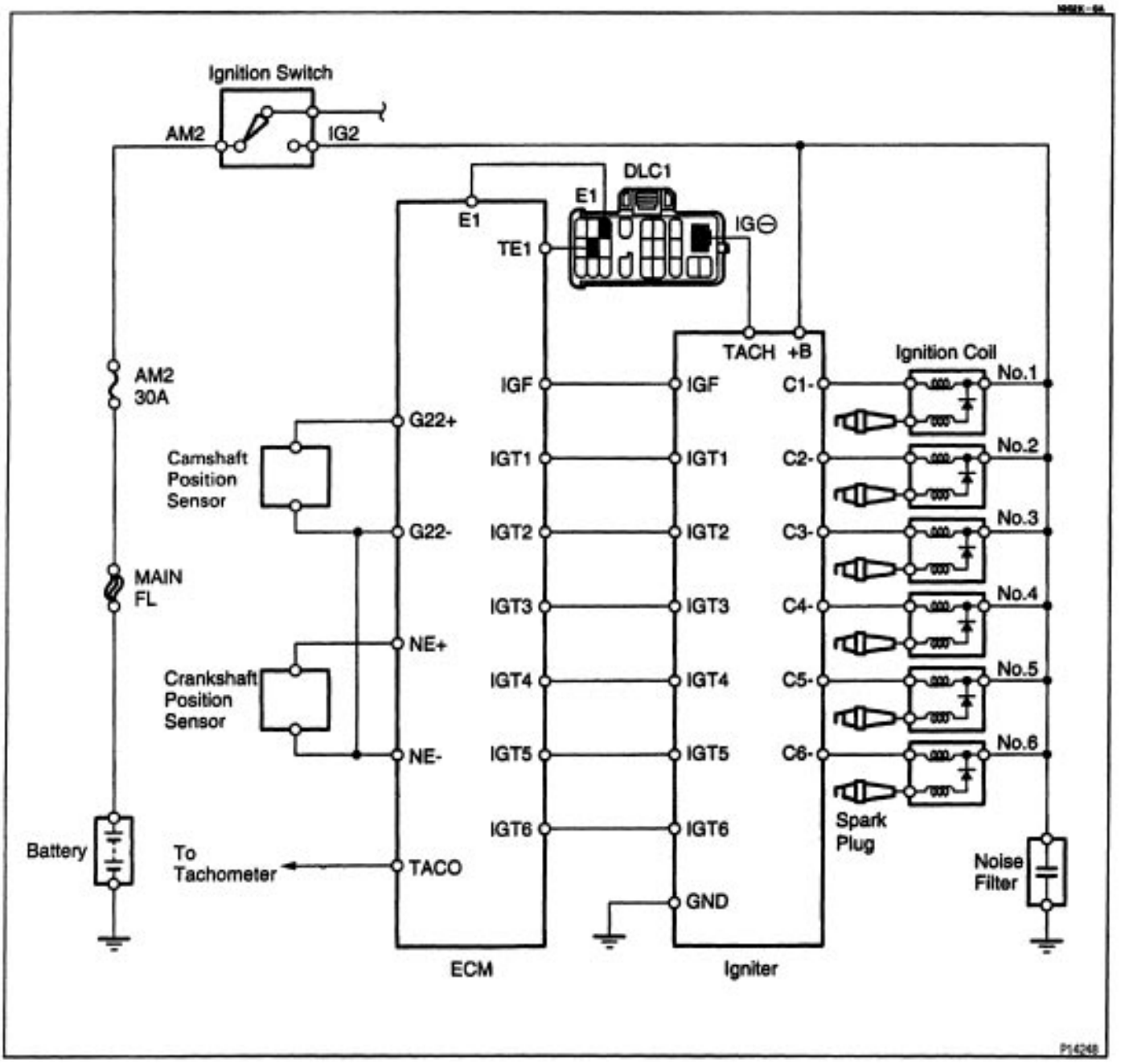
2. With a tachometer connected to the system, connect the tester probe of the tachometer to terminal IG⊕ of the DLC 1.



3. With a timing tight connected to the system, connect the timing light pickup clip to the green lead wire for the No.4 ignition coil.

4. As some tachometers are not compatible with this ignition system, we recommend that you confirm the compatibility of your unit before use.
5. Never allow the tachometer terminals to touch ground as it could result in damage to the igniter and/or ignition coil.
6. Do not disconnect the battery while the engine is running.
7. Check that the igniter is properly grounded to the body.

SYSTEM CIRCUIT



OPERATION

To maintain the most appropriate ignition timing, the ECM sends a control signal so that the igniter is pass the current to the ignition coils and the spark plugs produce a spark.

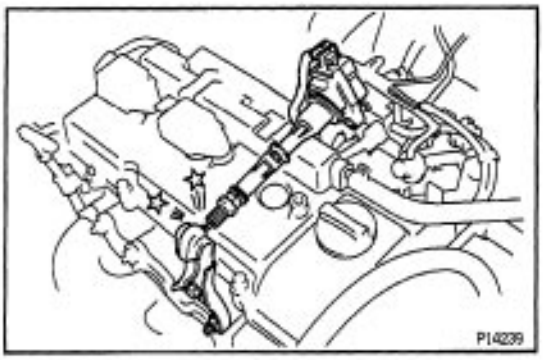
PREPARATION

RECOMMENDED TOOLS

	09082–00050 TOYOTA Electrical Tester Set	
	09200–00010 Engine Adjust Kit	

EQUIPMENT

Megger insulation resistance meter	Spark plug
Spark plug cleaner	
Thermometer	
Timing light	



ON–VEHICLE INSPECTION

SPARK TEST

CHECK THAT SPARK OCCURS

(a) Remove the ignition coil.
(See steps 1 to 3 on page IG–50)
(b) Remove the spark plug.
(See step 3 on page IG–47)
(c) Install the spark plug to the ignition coil, and connect the ignition coil connecter.
(d) Ground the spark plug.
(e) Check if spark occurs while engine is being cranked.
HINT: To prevent gasoline from being injected from injectors during this test, crank the engine for no more than 1–2 seconds at time.
If the spark does not occur, perform the test as fol–lows:

SPARK TEST

NO

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

OK

CHECK POWER SUPPLY TO IGNITION COIL AND IGNITER
1. Turn ignitioin switch ON.
2. Check that there is battery voltage at Ignition coil positive (+) terminal. — BAD → Check wiring between ignition switch to ignition coil and igniter.

OK

CHECK RESISTANCE OF IGNITION COIL
(See page IG–48)
Resistance:
Primary Cold : 0.54–0.84Il, Hot : 0.68–0.98 n — BAD → Replace the ignition coil.

OK

CHECK RESISTANCE OF CAMSHAFT POSITION SENSOR
(See page IG–49)
Resistance:
Cold : 835–1,4000, Hot : 1,060–1,6450 — BAD → Replace the camshaft position sen-sor.

OK

CHECK RESISTANCE OF CRANKSHAFT POSITION SENSOR
(See page IG–54)
Resistance:
Cold : 1,630–2,7400, Hot : 2,065–3,2250 — BAD → Replace the crankshaft position sen-sor.

OK

CHECK IGT SIGNAL FROM ECM
(See page EG–550) — BAD → Check wiring between ECM, and igni-ter, and then try another ECM.

OK

TRY ANOTHER IGNITER

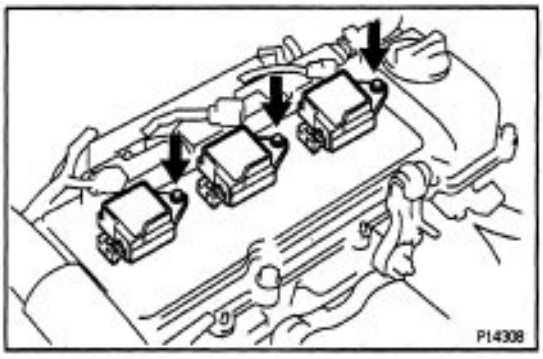
V04169

(f) Reinstall the spark plug.
(See step 7 on page IG–47)
(g) Reinstall the ignition coil.
(See steps 1 to 3 on page IG–51)

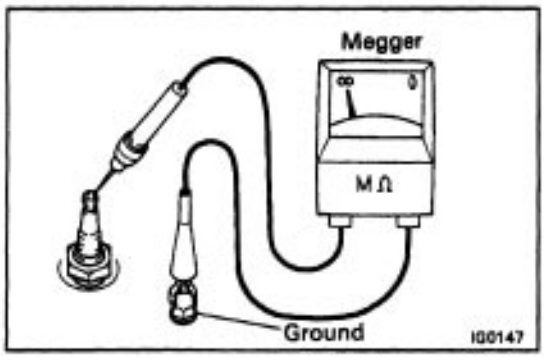
SPARK PLUGS INSPECTION

NOTICE:

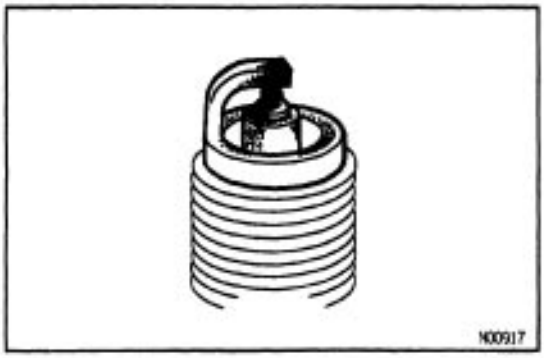
- **Never use a wire brush for cleaning.**
- **Never attempt to adjust the electrode gap on a used spark plug.**
- **Spark plugs should be replaced every 100,000 km (60,000 miles).**



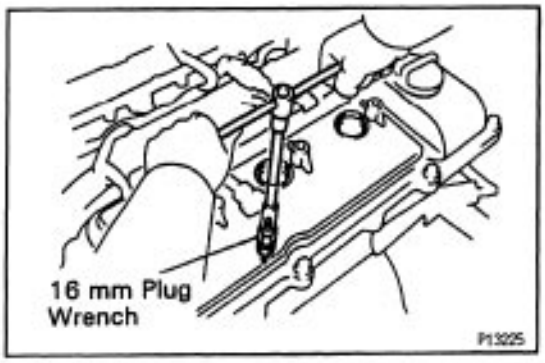
1. REMOVE IGNITION COILS
(See steps 1 to 3 on page IG–b0)



2. INSPECT 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 4.
HINT: If a megger is not available, the following simple method of inspection provides fairly accurate results.

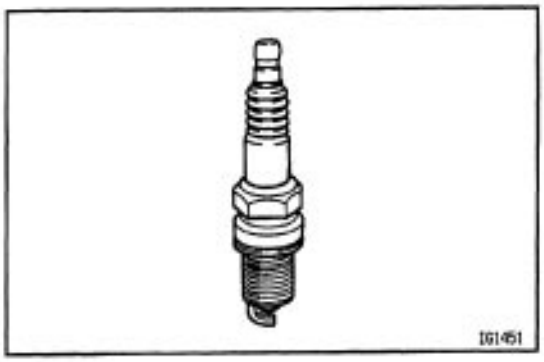


Simple Method:
(a) Quickly race the engine to 4,000 rpm 5 times.
(b) Remove the spark plug. (See step 3)
(c) Visually check the spark plug.
If the electrode is dry ... OK
If the electrode is wet ... Proceed to step 4
(d) Reinstall the spark plug. (See step 7)



3. REMOVE SPARK PLUGS

Using a 16 mm plug wrench, remove the ^ spark plugs from the RH and LH cylinder heads.



4. VISUALLY INSPECT SPARK PLUGS

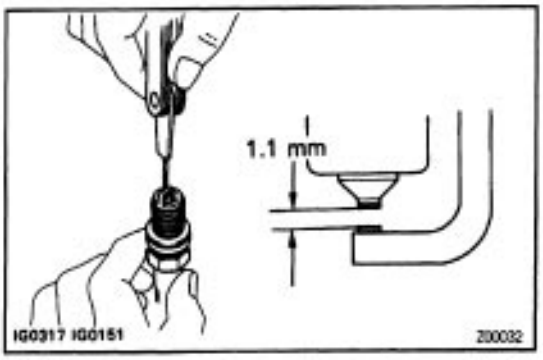
Check the spark plug for thread damage and insulator damage.

If abnormal, replace the spark plug.

Recommended spark plug:

PK20R11 for ND

BKR6EP–11 for NGK



5. INSPECT ELECTRODE GAP

Maximum electrode gap for used spark plug:

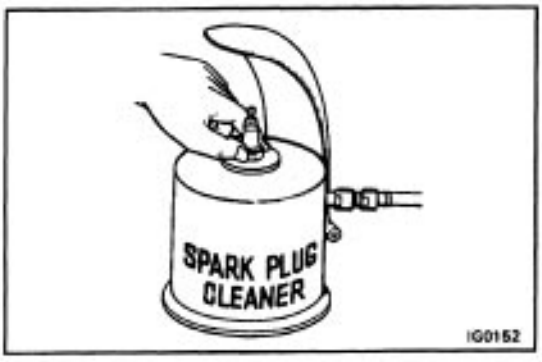
1.3 mm (0.051 in.)

If the gap is greater than maximum, replace the spark plug.

Correct electrode gap for now 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.



6. CLEAN SPARK PLUGS

If the electrode has traces of wet carbon, allow it to dry and then clean with a spark plug cleaner.

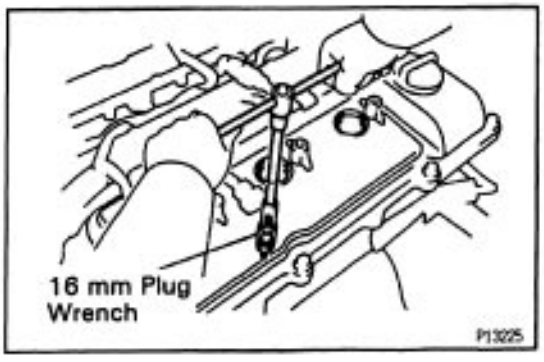
Air pressure:

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.



7. REINSTALL SPARK PLUGS

Using a 16 mm plug wrench, install the6 spark plugs to the RH and LH cylinder heads**.**

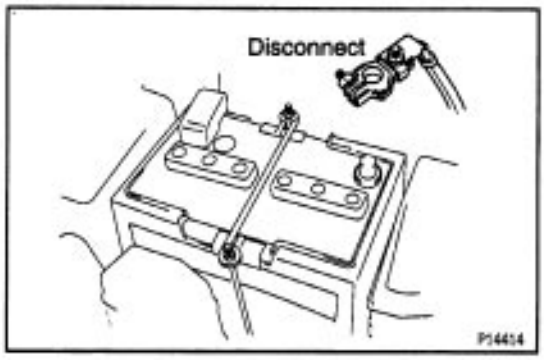
Torque: 18 N–m (180 kgf–cm. 13 ft–lbf)

8. REINSTALL IGNITION COILS

(See steps 1 to 3 on page IG–51**)**

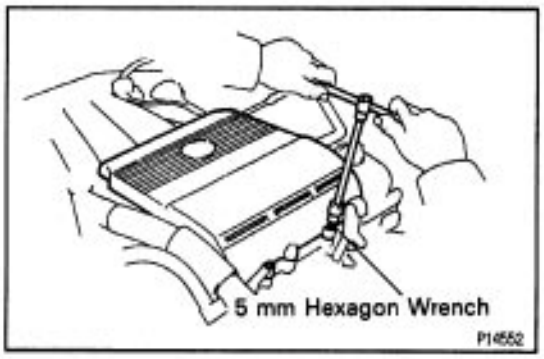
IGNITION COIL INSPECTION

NOTICE: 'Cold' and 'Hot' in the following sentences express the temperature of the coils themselves. "Cold" is from–10°C (14°F) to 50°C (1122* F) and 'Hot' is from 60°C (122°F) to 100°C (212°F).



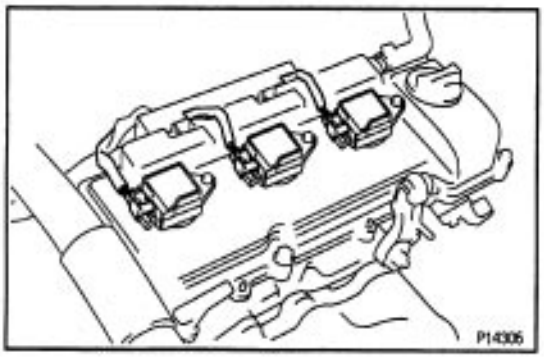
1. DISCONNECT NEGATIVE (–) TERMINAL CABLE FROM BATTERY

CAUTION: Work must be started after 90 seconds from the time the ignition switch is turned to the "LOCK" position and the negative (–) terminal cable is disconnected from the battery.

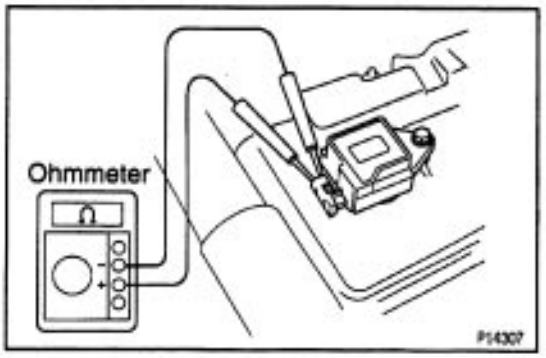


2. REMOVE V–BANK COVER

Using a 5 mm hexagon wrench, remove the 2 cap nuts and V–bank cover.



3. DISCONNECT IGNITION COIL CONNECTORS



4. INSPECT PRIMARY COIL RESISTANCE

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

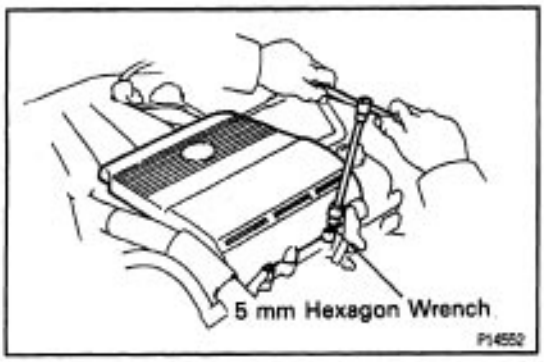
Primary coil resistance (Cold):

0.54–0.84Ω

Primary coil resistance (Hot):

0.68–0.980

If the resistance is not as specified, replace the ignition coil. (See page I G–50)



5. RECONNECT IGNITION COIL CONNECTORS

6. REINSTALL V–BANK COVER

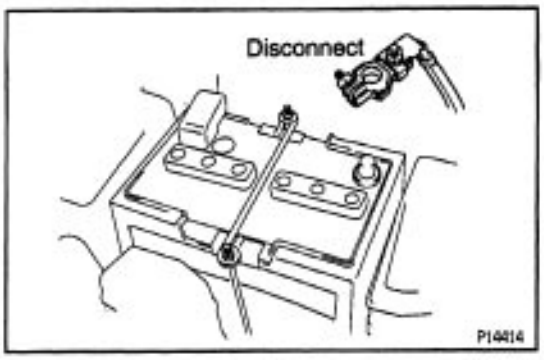
Using a 5 mm hexagon wrench, install the V–bank cover with the 2 cap nuts.

HINT: For fixing the V–bank cover, push on the cover until sense of “click” is felt.

7. RECONNECT NEGATIVE (–) TERMINAL CABLE TO BATTERY

CAMSHAFT POSITION SENSOR INSPECTION

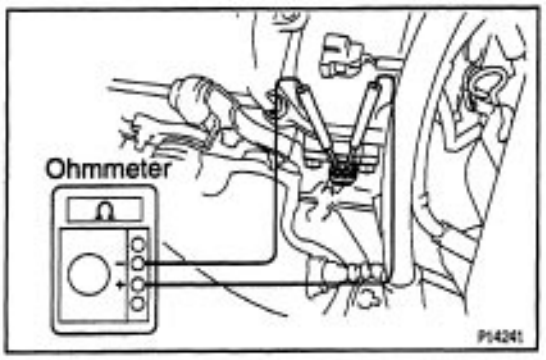
NOTICE: ’Cold’ and ’Hot’ in the following sentences express the temperature of the sensors themselves. ’Cold’ Is from–10°C (14°F) to 50°C (122°F) and “Hot’ is from 50°C 0 22°F) to 100°C (212°P).



1. DISCONNECT NEGATIVE (–) TERMINAL CABLE FROM BATTERY

CAUTION: Work must be started after 90 seconds from the time the Ignition switch Is turned to the ’LOCK’ position and the negative (–) terminal cable is disconnected from the battery.

2. DISCONNECT CAMSHAFT POSITION SENSOR CONNECTOR



3. INSPECT CAMSHAFT POSITION SENSOR RESISTANCE

Using an ohmmeter, measure the resistance between terminals.

Resistance (Cold):

835–1,4000

Resistance (Hot):

1,060–1,645 0

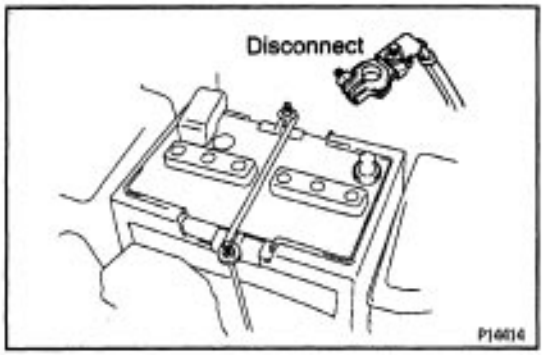
If the resistance is not as specified, replace the camshaft position sensor. (See page IG–52)

4. RECONNECT CAMSHAFT POSITION SENSOR CONNECTOR

5. RECONNECT NEGATIVE (–) TERMINAL CABLE TO BATTERY

IGNITER INSPECTION

(See procedure Spark Test on page IG–46)

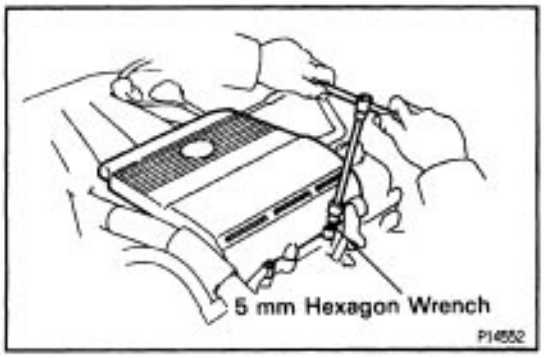


IGNITION COIL

IGNITION COILS REMOVAL

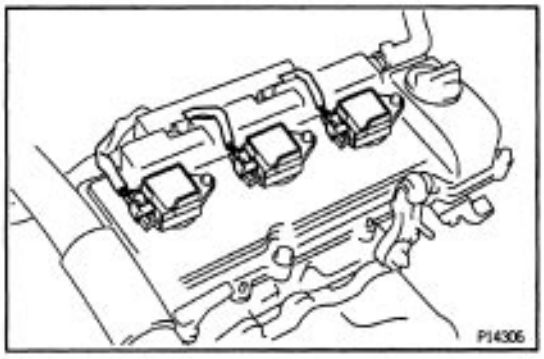
1. DISCONNECT NEGATIVE (–) TERMINAL CABLE FROM BATTERY

CAUTION: Work must be started after 90 seconds from the time the Ignition switch is turned to the 'LOCK' position and the negative (–) terminal cable is disconnected from the battery.



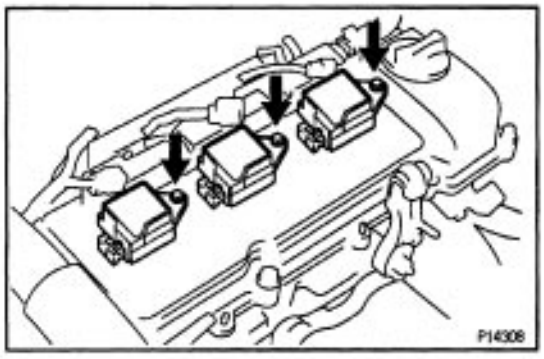
2. REMOVE V–BANK COVER

Using a 5 mm hexagon wrench, remove the 2 cap nuts and V–bank cover.

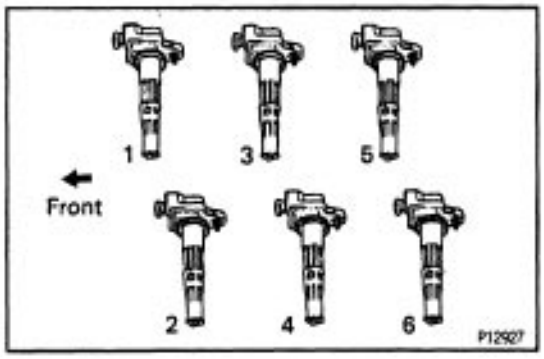


3. REMOVE IGNITION COILS

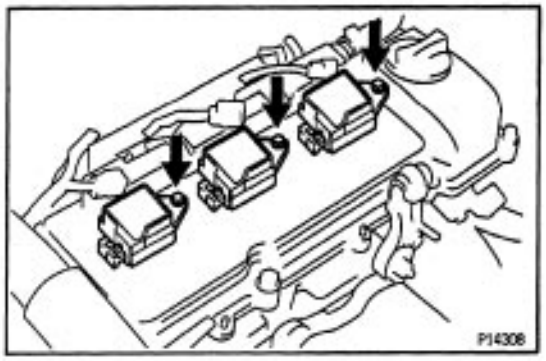
(a) Disconnect the 6 connectors from the RH and LH cylinder heads.



(b) Remove the 8 bolts and6 ignition coils from the RH and LH cylinder heads.



HINT: Arrange the ignition coils in correct order.

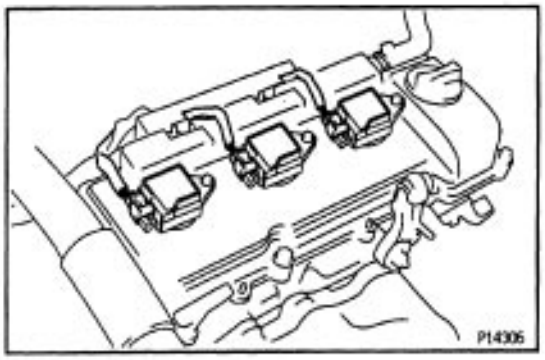


IGNITION COIL INSTALLATION

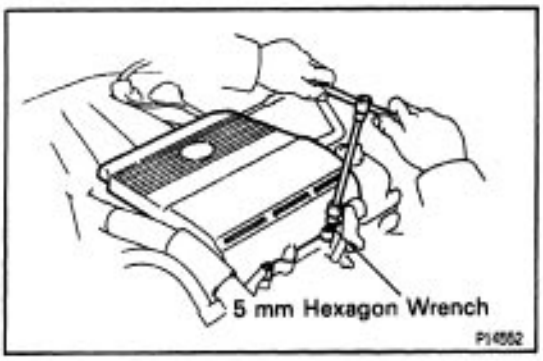
1. INSTALL IGNITION COILS

(a) Install the6 ignition coils to the RH and LH cylinder heads with the ^ bolts.

Torque: 8 N–m (80 kgf–cm. 89 in.lbf)



(b) Connect the 6 ignition coil connectors.

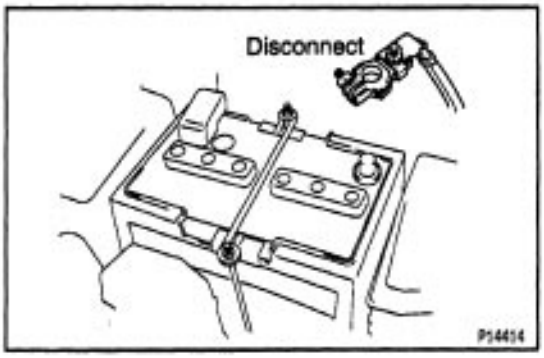


2. INSTALL V–BANK COVER

Using a 5 mm hexagon wrench, install the V–bank cover with the 2 cap nuts.

HINT: For fixing the V–bank cover, push on the cover until sense of “click” is felt.

3. CONNECT NEGATIVE (–) TERMINAL CABLE TO BATTERY

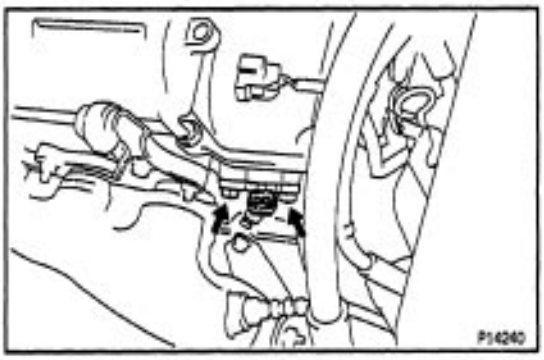


CAMSHAFT POSITION SENSOR

CAMSHAFT POSITION SENSOR REMOVAL

1. DISCONNECT NEGATIVE (–) TERMINAL CABLE FROM BATTERY

CAUTION: Work must be started after 90 seconds from the time the ignition switch is turned to the "LOCK" position and the negative (–) terminal cable is disconnected from the battery.



2. REMOVE CAMSHAFT POSITION SENSOR

(a) Disconnect the camshaft position sensor connector.
(b) Remove the 2 bolts and camshaft position sensor.

CAMSHAFT POSITION SENSOR INSTALLATION

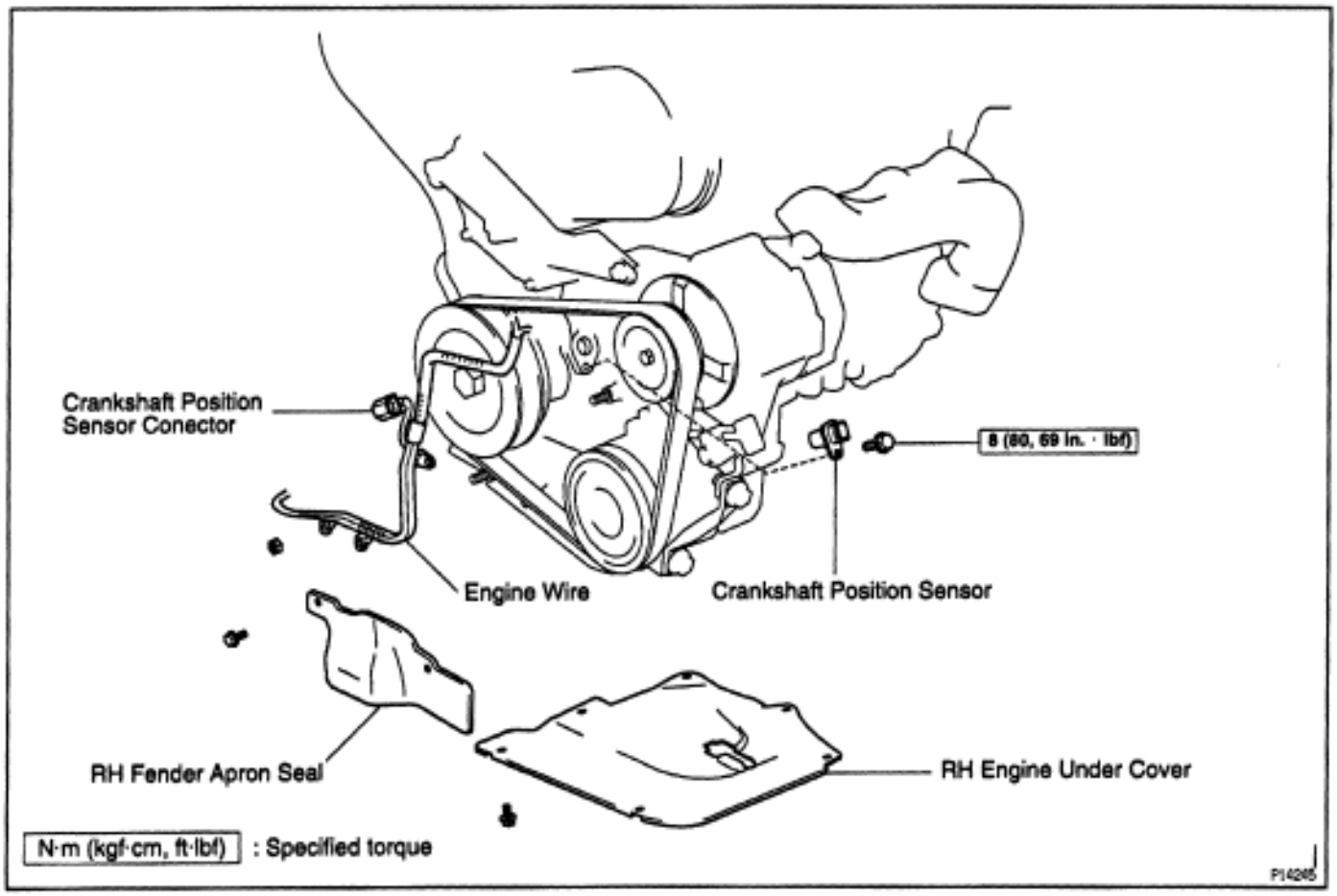
1. INSTALL CRANKSHAFT POSITION SENSOR

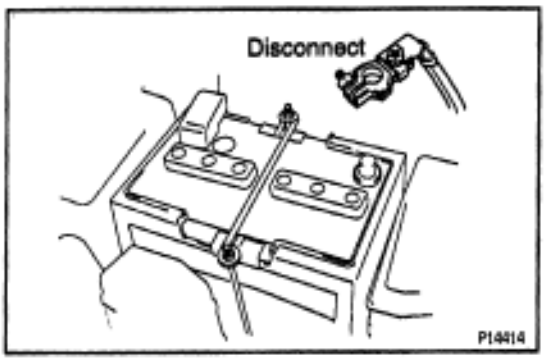
Torque: 8 N–m (80 kgf–cm, 69 in.ibf)

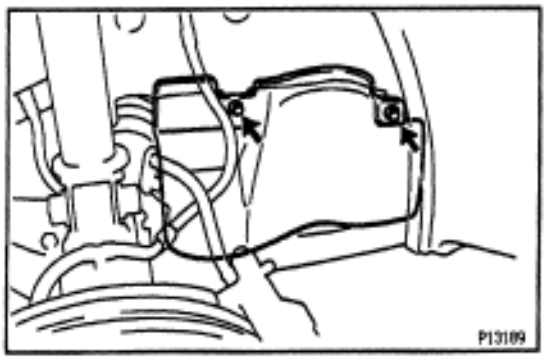
2. CONNECT NEGATIVE (–) TERMINAL CABLE TO BATTERY

CRANKSHAFT POSITION SENSOR

COMPONENTS FOR REMOVAL AND INSTALLATION







CRANKSHAFT POSITION SENSOR REMOVAL

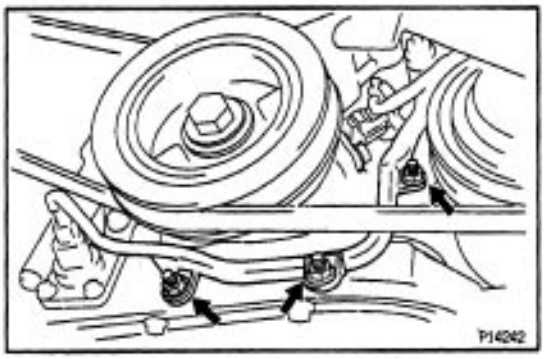
(See Components for Removal and Installation)

1. DISCONNECT NEGATIVE (–) TERMINAL CABLE FROM BATTERY

CAUTION: Work must be started after 90 seconds from the time the Ignition switch is turned to the 'LOCK' position and the negative (–) terminal cable is disconnected from the battery.

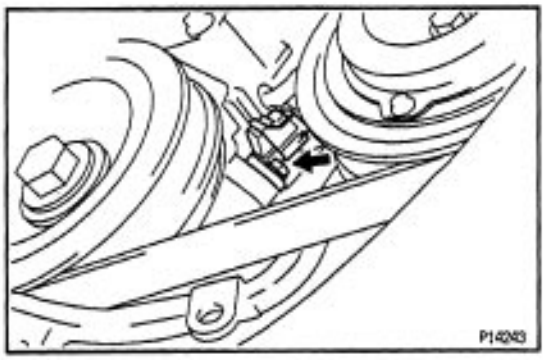
2. REMOVE RH ENGINE UNDER COVER

3. REMOVE RH FENDER APRON SEAL



4. DISCONNECT ENGINE WIRE

Remove the 3 nuts and disconnect the engine wire.



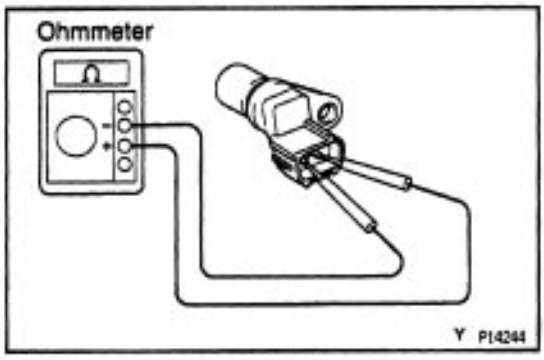
5. REMOVE CRANKSHAFT POSITION SENSOR

(a) Remove the bolt and disconnect the crankshaft posi–tion sensor.

(b) Disconnect the crankshaft position sensor conecter.

CRANKSHAFT POSITION SENSOR INSPECTION

NOTICE: 'Cold' and 'Hot' in the following sentences ex–press the temperature of the sensors 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).



INSPECT CRANKSHAFT POSITION SENSOR RESISTANCE

Using an ohmmeter, measure the resistance between terminals.

Resistance (Cold):

1,630–2,740 0

Resistance (Hot):

2,060–3,225 0

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

CRANKSHAFT POSITION SENSOR INSTALLATION

(See Components for Removal and Installation)

1. INSTALL CRANKSHAFT POSITION SENSOR
Torque: 8 N–m (80 kgf–cm, 69 in.lbf)

2. CONNECT ENGINE WIRE

3. INSTALL RH FENDER APRON SEAL

4. INSTALL RH ENGINE UNDER COVER

6. CONNECT NEGATIVE (–) TERMINAL CABLE TO BATTERY

SERVICE SPECIFICATIONS

SERVICE DATA

Ignition timing	w/ Terminals TE1 and E1 connected of DLC1		10 ± 2° BTDC @ idle
Firing order	–		1 – 2 – 3 – 4 – 5 – 6
Spark plug	Recommended spark plug	ND	PK20R11
		NGK	BKR6EP–11
	Correct electrode gap for new plug		1.1 mm (0.043 in.)
	Maximum electrode gap for used plug		1.3 mm (0.051 in.)
Ignition coil	Primary coil resistance	at cold	0.54 – 0.84 Ω
		at hot	0.68 – 0.98 Ω
Camshaft position sensor	Resistance	at cold	835 – 1,400 Ω
		at hot	1,060 – 1,645 Ω
Crankshaft position sensor	Resistance	at cold	1,630 – 2,740 Ω
		at hot	2,060 – 3,225 Ω

TORQUE SPECIFICATIONS

Part tightened	N·m	kgf·cm	ft·lbf
Spark plug x Cylinder heed	18	180	13
Ignition coil x Cylinder head	8	80	69 in.·lbf
Camshaft position sensor x Cylinder head	8	80	69 in.·lbf
Crankshaft position sensor x Oil pump	8	80	69 in.·lbf