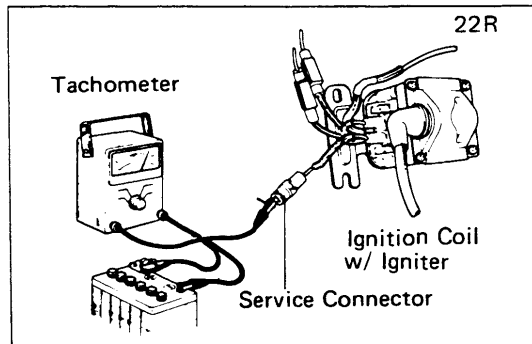
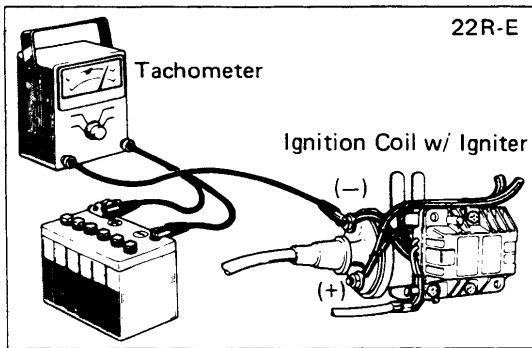


# IGNITION SYSTEM

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| TROUBLESHOOTING .....          | IG-2  |
| ELECTRONIC SPARK ADVANCE ..... | IG-3  |
| ON-VEHICLE INSPECTION .....    | IG-4  |
| DISTRIBUTOR .....              | IG-10 |

**IG**



## PRECAUTIONS

1. Do not allow the ignition switch to be ON for more than 10 minutes if the engine will not start.
2. As some tachometers are not compatible with this ignition system, it is recommended that you consult with the manufacturer.
3. NEVER allow the ignition coil terminals to touch ground as it could result in damage to the igniter and/or ignition coil.
4. Do not disconnect the battery when the engine is running.
5. Make sure that the igniter is properly grounded to the body.
6. When a tachometer is connected to the system, connect the tachometer test probe to the ignition coil negative terminal.

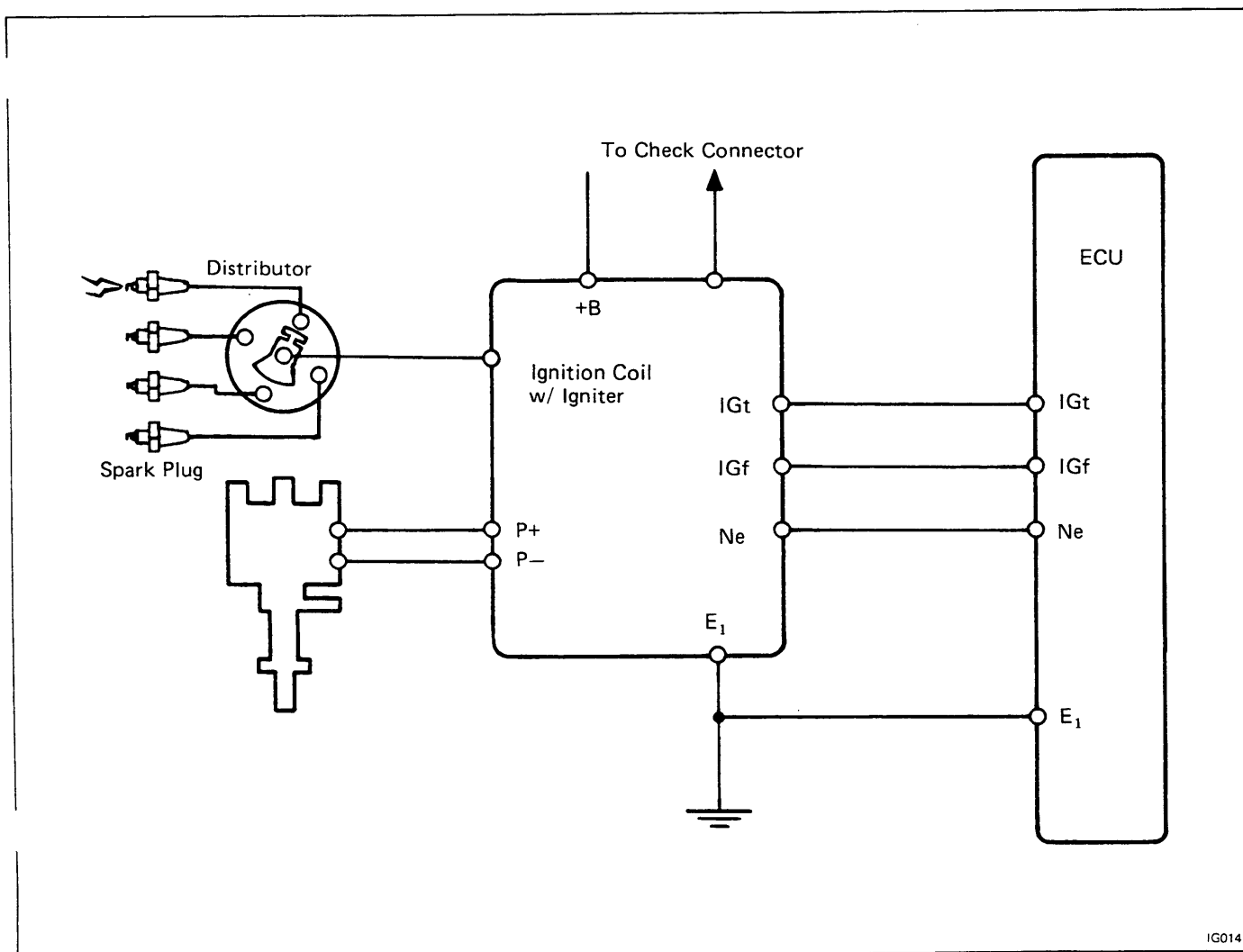
## TROUBLESHOOTING

| Problem  | Possible cause   | Remedy  | Page   |
|--|--|---|--|
| Engine will not start/<br>Hard to start<br>(cranks ok)                         | Ignition problems <ul style="list-style-type: none"> <li>• Ignition coil</li> <li>• Igniter</li> <li>• Distributor</li> </ul> Spark plugs faulty<br>Ignition wiring disconnected or broken                 | Perform spark test<br>Inspect coil<br>Inspect igniter<br>Inspect distributor<br>Inspect plugs<br>Inspect wiring                 | IG-4<br>IG-5,7<br>IG-6,8<br>IG-9,10<br>IG-4<br>IG-4          |
| Rough idle or stalls   | Spark plugs faulty<br>Ignition wiring faulty<br>Incorrect ignition timing<br>Ignition problems <ul style="list-style-type: none"> <li>• Ignition coil</li> <li>• Igniter</li> <li>• Distributor</li> </ul> | Inspect plugs<br>Inspect wiring<br>Reset timing<br>Perform spark test<br>Inspect coil<br>Inspect igniter<br>Inspect distributor | IG-4<br>IG-4<br>IG-10<br>IG-4<br>IG-5,7<br>IG-6,8<br>IG-9,10 |
| Engine hesitates/<br>Poor acceleration   | Spark plugs faulty<br>Ignition wiring faulty<br>Incorrect ignition timing  | Inspect plugs<br>Inspect wiring<br>Reset timing   | IG-4<br>IG-4<br>IG-10  |
| Engine dieseling (for. carb.)<br>(runs after ignition<br>switch is turned off) | Fuel cut system faulty   | Repair fuel cut system  |  |
| Muffler explosion<br>(after fire) all the time                                 | Incorrect ignition timing  | Reset timing  | IG-10  |
| Engine backfires   | Incorrect ignition timing  | Reset timing  | IG-10  |
| Poor gasoline mileage  | Spark plugs faulty<br>Incorrect ignition timing  | Inspect plugs<br>Reset timing   | IG-4<br>IG-10  |
| Engine overheats   | Incorrect ignition timing  | Reset timing  | IG-10  |

## ELECTRONIC SPARK ADVANCE (ESA) FOR 22R-E

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

### ESA SYSTEM CIRCUIT



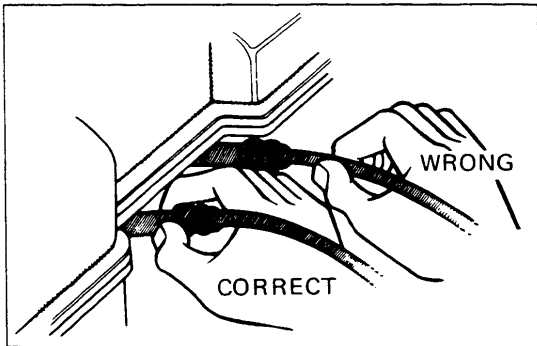
## ON-VEHICLE INSPECTION

### SPARK TEST

NOTE: Perform this test to check that current is coming from the distributor.

1. **CONNECT TIMING LIGHT TO EACH SPARK PLUG**
2. **CRANK ENGINE AND CHECK THAT LIGHT FLASHES**

If the timing light does not flash, check the wiring connections, ignition coil, igniter, distributor or ignition switch.



### INSPECTION OF HIGH TENSION CORD

1. **CAREFULLY REMOVE HIGH TENSION CORDS BY RUBBER BOOT**

CAUTION: DO NOT pull on or bend the cords to avoid damaging the conductor inside.

2. **INSPECT CORD TERMINALS**

Check the terminals for corrosion, breaks or distortion. Replace cords as required.

3. **CHECK CORD RESISTANCE**

Using an ohmmeter, check that the resistance does not exceed the maximum. Replace cords as required.

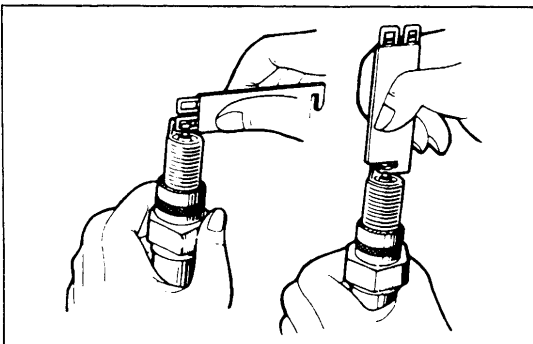
Maximum resistance: 25 k $\Omega$  per cord

### INSPECTION OF SPARK PLUGS

1. **REMOVE SPARK PLUGS**
2. **CLEAN AND INSPECT SPARK PLUGS**
  - (a) Clean the spark plugs with a spark plug cleaner or wire brush.
  - (b) Inspect the spark plugs for electrode wear, thread damage and insulator damage.

If a problem is found, replace the plugs.

Spark plug: ND W16EXR-U  
NGK BPR5EY



3. **ADJUST ELECTRODE GAP**

Carefully bend the outer electrode to obtain the correct electrode gap.

Correct electrode gap: 0.8 mm (0.031 in.)

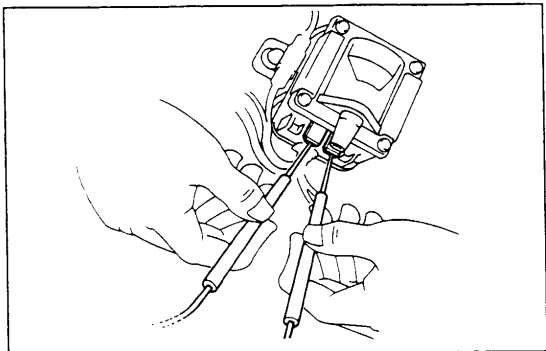
4. **INSTALL SPARK PLUGS**

**[FOR 22R]****INSPECTION OF IGNITION COIL**

1. **DISCONNECT HIGH TENSION WIRE AND IGNITION COIL CONNECTOR**

2. **CLEAN COIL AND CHECK FOLLOWING:**

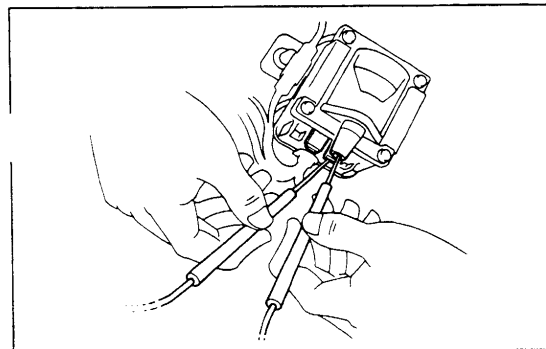
- (a) Check for cracks or damage.
- (b) Check the terminals for carbon tracks.
- (c) Check the high-tension wire hole for carbon deposits and corrosion.



3. **MEASURE PRIMARY COIL RESISTANCE**

Using an ohmmeter, measure the resistance between the positive (+) (brown side) and negative (—) (black side) terminals.

**Primary coil resistance (cold): 0.4 — 0.5  $\Omega$**



4. **MEASURE SECONDARY COIL RESISTANCE**

Using an ohmmeter, measure the resistance between the positive (+) terminal (brown side) and the high tension terminal.

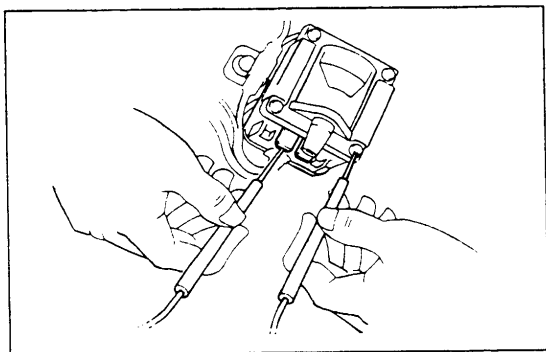
**Secondary coil resistance (cold): 8.5 — 11.5 k $\Omega$**

5. **MEASURE INSULATION RESISTANCE**

Using an ohmmeter, measure the resistance between the positive (+) terminal and the igniter body.

**Insulation resistance: Infinity**

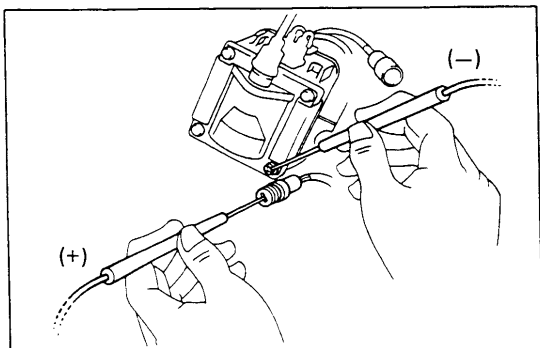
If a problem with the coil is found, replace it.



6. **CONNECT HIGH TENSION WIRE AND IGNITION COIL CONNECTOR**

## INSPECTION OF IGNITER

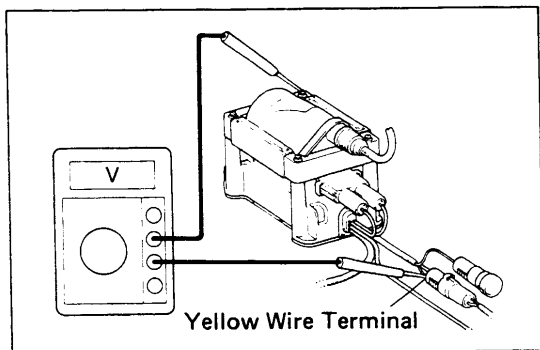
## 1. TURN IGNITION SWITCH ON



## 2. CHECK POWER SOURCE LINE VOLTAGE

- (a) Disconnect the wiring connector for brown wire and yellow wire.
- (b) Using a voltmeter, connect the positive (+) probe to the brown wire for the wire harness side and the negative (-) probe to body ground.

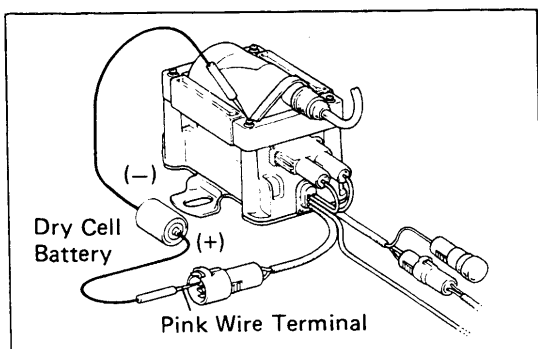
**Voltage: Approx. 12 V**



## 3. CHECK POWER TRANSISTOR IN IGNITER

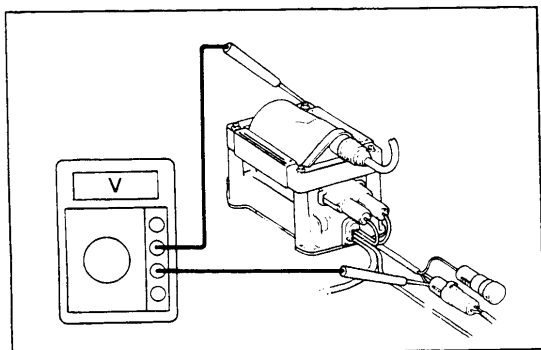
- (a) Connect the wiring connector for brown wire and yellow wire.
- (b) Using a voltmeter, connect the positive (+) probe to the yellow wire for the igniter side and the negative (-) probe to body ground.

**Voltage: Approx. 12 V**



- (c) Unplug the wiring connector from the distributor.
- (d) Using a dry cell battery (1.5 V), connect the positive (+) pole of the battery to the pink wire terminal and the negative (-) pole to the white wire terminal.

**CAUTION: Do not apply voltage more than 5 seconds to avoid destroying the power transistor in the igniter.**



- (e) Using a voltmeter, connect the positive (+) probe to the yellow connector for the igniter side and the negative (-) probe to body ground.

**Voltage: 8 — 10 V**

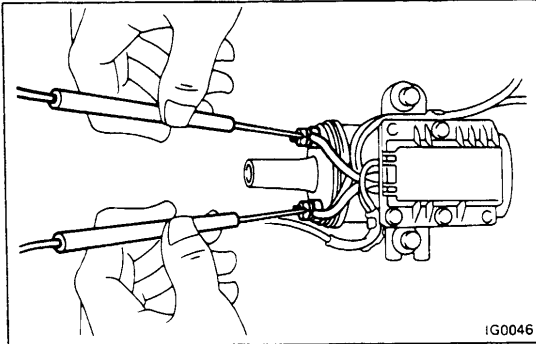
If a problem is found, replace the igniter.

## 4. TURN IGNITION SWITCH OFF

## 5. REMOVE TEST EQUIPMENT AND RECONNECT WIRING

**[FOR 22R-E]**  
**INSPECTION OF IGNITION COIL**

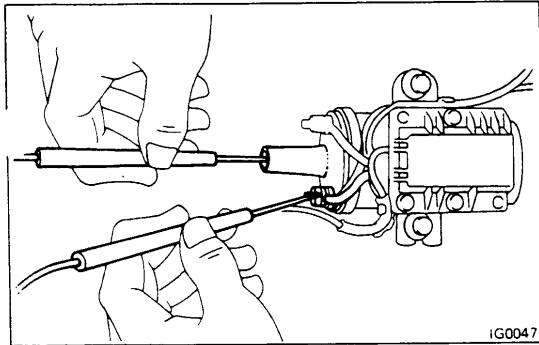
**1. DISCONNECT HIGH TENSION WIRE**



**2. MEASURE PRIMARY COIL RESISTANCE**

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

**Primary coil resistance (cold): 0.5 – 0.7  $\Omega$**



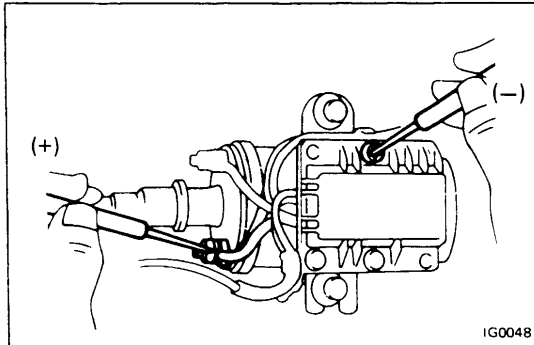
**3. MEASURE SECONDARY COIL RESISTANCE**

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

**Secondary coil resistance (cold): 11.4 – 15.6 k $\Omega$**

## INSPECTION OF IGNITER

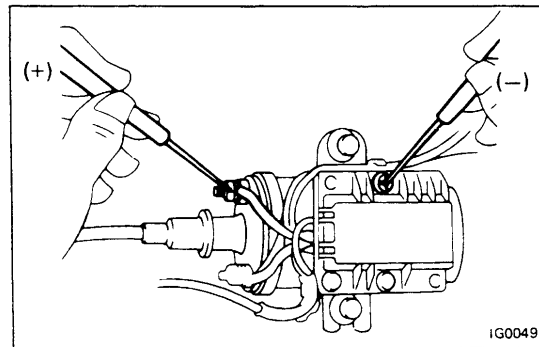
### 1. TURN IGNITION SWITCH ON



### 2. CHECK POWER SOURCE LINE VOLTAGE

Using a voltmeter, connect the positive (+) probe to the ignition coil positive (+) terminal and the negative (-) probe to body ground.

**Voltage: Approx. 12V**



### 3. CHECK POWER TRANSISTOR IN IGNITER

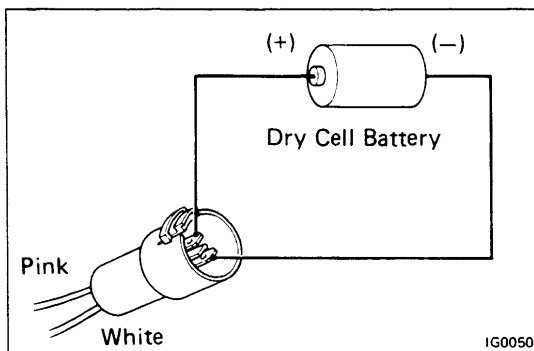
- (a) Using a voltmeter, connect the positive (+) probe to the ignition coil negative (-) terminal and the negative (-) probe to body ground.

**Voltage: Approx. 12V**

- (b) Unplug the wiring connector from the distributor.

- (c) Using a dry cell battery (1.5V), connect the positive (+) pole of the battery to the pink wire terminal and the negative (-) pole to the white wire terminal.

**CAUTION: Do not apply voltage more than 5 seconds to avoid destroying the power transistor in the igniter.**



- (d) Using a voltmeter, connect the positive (+) probe to the ignition coil negative (-) terminal and the negative (-) probe to the body ground.

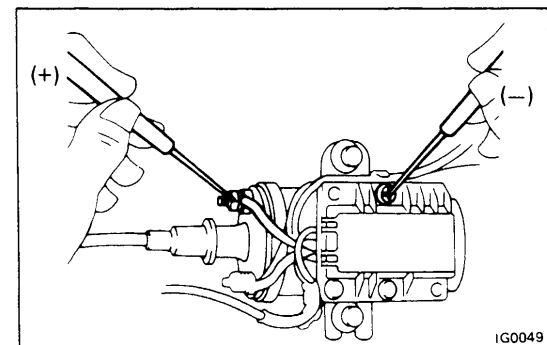
- (e) Check the voltage reading.

**Voltage: 5 — 8V**

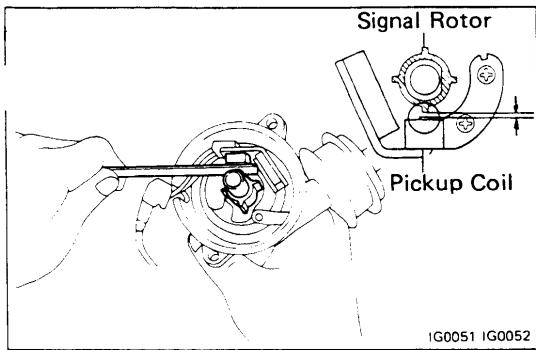
If a problem is found, replace the igniter.

### 4. TURN IGNITION SWITCH OFF

### 5. REMOVE TEST EQUIPMENT AND RECONNECT WIRING







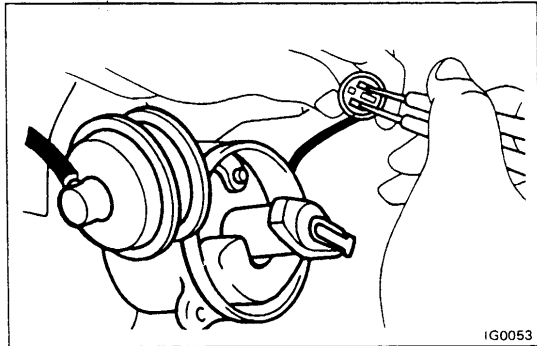
## ON-VEHICLE INSPECTION OF DISTRIBUTOR

### 1. CHECK AIR GAP

- (a) Using a feeler gauge, measure the gap between the signal rotor and the pickup coil projection.

**Air gap:** 0.2 — 0.4 mm (0.008 — 0.016 in.)

- (b) Adjust the gap if necessary.
- Loosen the two screws and move the signal generator until the gap is correct. Tighten the screws and recheck the gap.

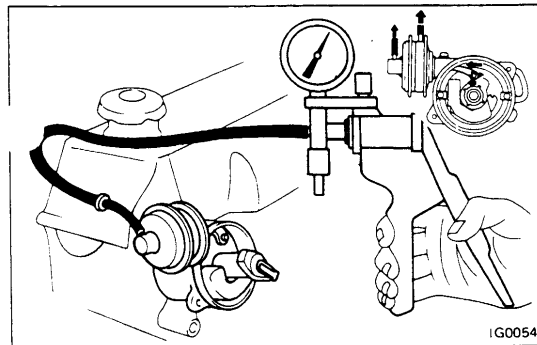


### 2. CHECK SIGNAL GENERATOR

Using an ohmmeter, check the resistance of the signal generator.

**Generator resistance:** 140 — 180Ω

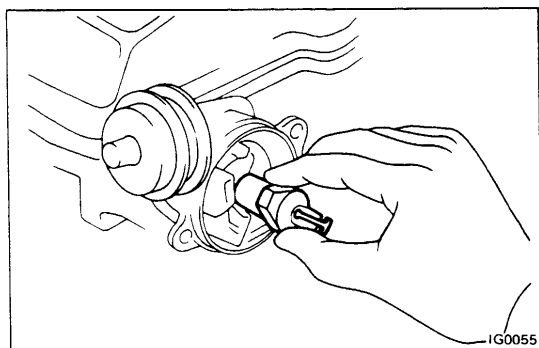
If the resistance is not correct, replace the signal generator.



### 3. CHECK VACUUM ADVANCE (FOR 22R)

- (a) Disconnect the vacuum hose and connect a vacuum pump to the diaphragms.
- (b) Apply vacuum and check that the vacuum advance moves.

If the vacuum advance does not work, repair or replace as necessary.



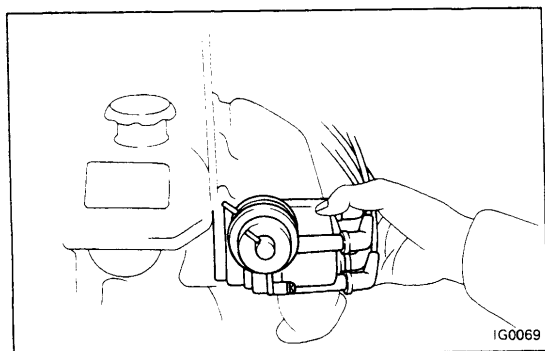
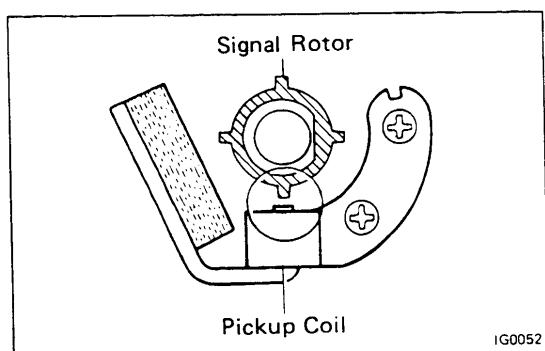
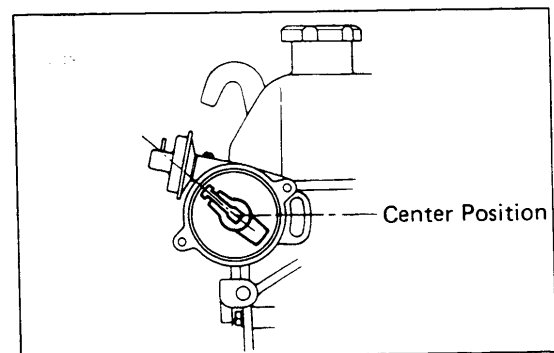
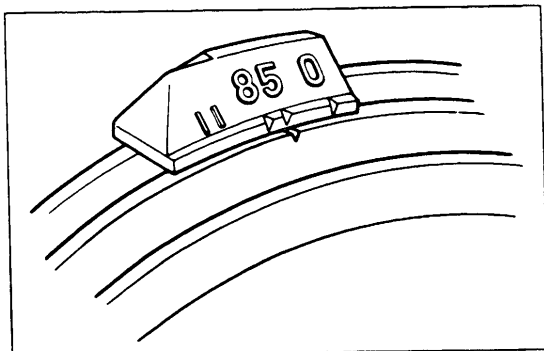
### 4. CHECK GOVERNOR ADVANCE (FOR 22R)

- (a) Turn the rotor shaft clockwise, release it and check that the rotor returns slightly counterclockwise.
- (b) Check that the rotor shaft is not excessively loose.

## DISTRIBUTOR

### REMOVAL OF DISTRIBUTOR

1. DISCONNECT VACUUM HOSES (FOR 22R), HIGH TENSION CORDS AND WIRING CONNECTOR
2. REMOVE TWO SCREWS AND PULL OFF DISTRIBUTOR CAP
3. REMOVE HOLD-DOWN BOLT AND PULL OUT DISTRIBUTOR



### INSTALLATION OF DISTRIBUTOR

#### 1. INSTALL DISTRIBUTOR AND SET TIMING

- (a) Turn the crankshaft pulley until the timing mark is aligned with 0° TDC (22R) and 5° BTDC (22R-E) mark.

NOTE: Check that the rocker arms on the No.1 cylinder are loose. If not, turn the crankshaft one full turn.

- (b) Temporarily install the rotor.
- (c) Begin insertion of the distributor with the rotor pointing upward and the distributor mounting hole approximately at center position of the bolt hole.
- (d) When fully installed, the rotor will rotate to the position shown.

- (e) Align the rotor tooth with the pickup coil projection.
- (f) Coat the distributor set bolt with sealer and install the bolt. Torque the bolt.

**Torque: 220 kg-cm (16 ft-lb, 22 N·m)**

- (g) Install the rotor and distributor cap with wires.

#### 2. INSTALL FOLLOWING PARTS:

- (a) Vacuum hoses (for 22R)
- (b) Wiring connector

#### 3. ADJUST IGNITION TIMING

- (a) Connect a timing light to the engine.
- (b) Start the engine and run it at idle.
- (c) Using a timing light, slowly turn the distributor until the timing mark on the crankshaft pulley is aligned with the 12° mark. Tighten the distributor bolt.
- (d) Recheck the ignition timing.

**Ignition timing: 22R 0° TDC (Max. 950 rpm)**  
 (w/vacuum advance cut)  
**22R-E 5° BTDC at idle**  
 (short terminal "T")