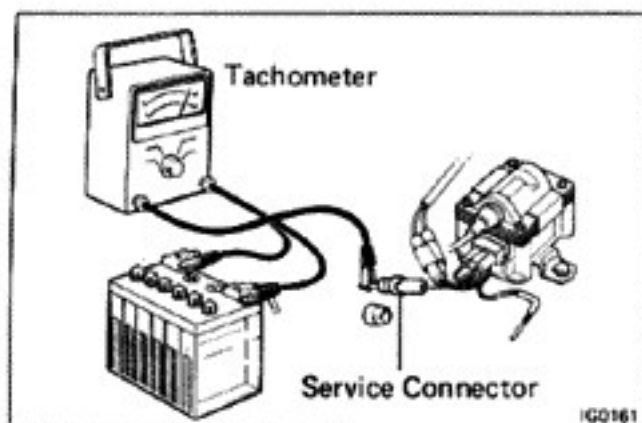


# IGNITION SYSTEM

|   | Page        |
|---|-------------|
| <b>PRECAUTIONS .....</b>                    | <b>IG-2</b> |
| <b>TROUBLESHOOTING .....</b>                | <b>IG-2</b> |
| <b>ELECTRONIC SPARK ADVANCE (ESA) .....</b> | <b>IG-3</b> |
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## PRECAUTIONS

1. Do not keep the ignition switch ON for more than 30 minutes if the engine will not start.
2. As some tachometers are not compatible with this ignition system, we recommended that you confirm the compatibility of your unit before using.
3. **NEVER** allow the ignition coil terminals to touch ground. 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 engine frame.
6. When a tachometer is connected to the system, connect the tachometer positive terminal to the service connector.

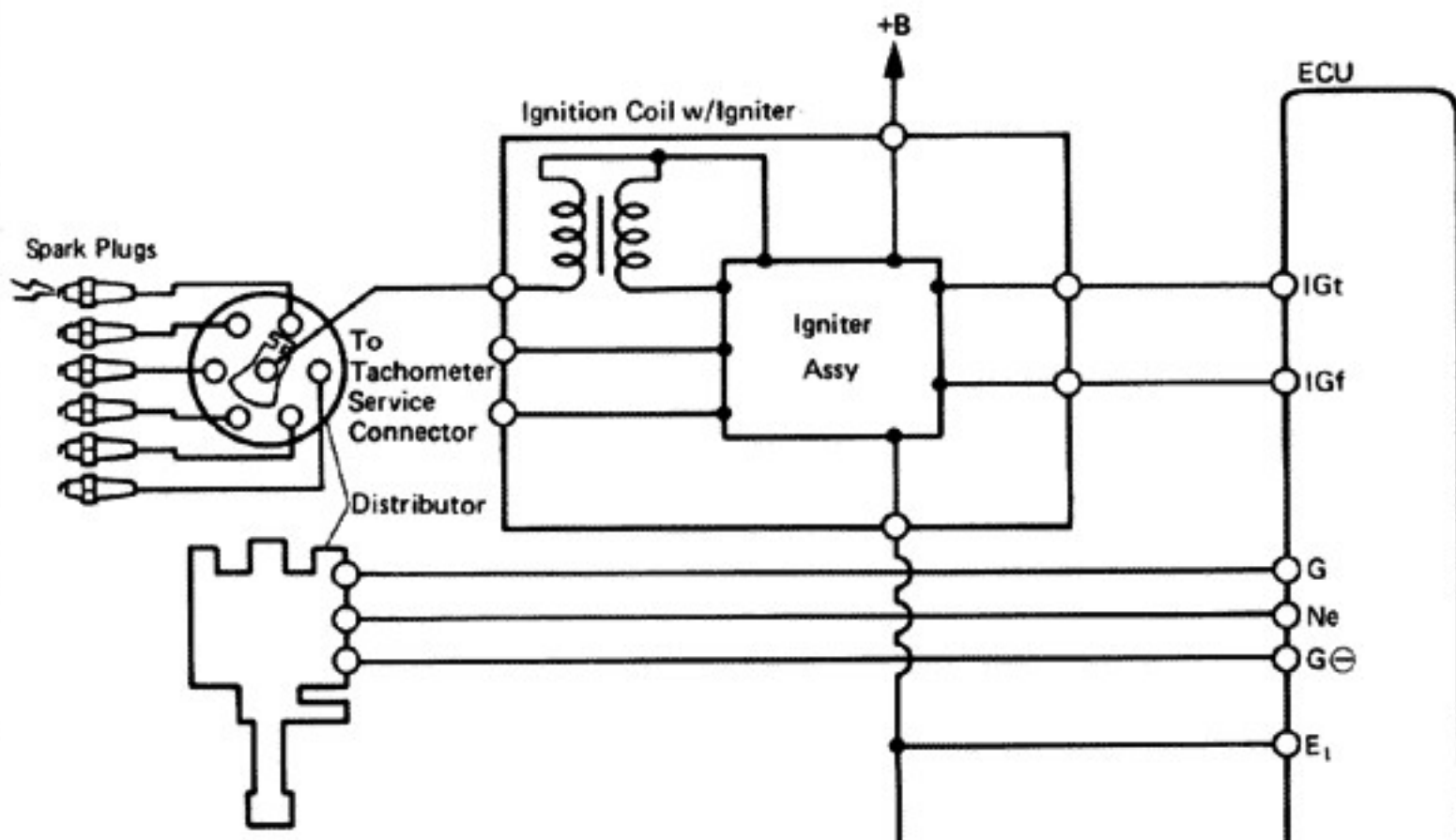
## TROUBLESHOOTING

| 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                                 | Perform spark test<br>Inspect coil<br><br>Inspect distributor<br>Inspect plugs                 | IG-4<br>IG-7<br><br>IG-7<br>IG-5         |
| Rough idle or stalls                                   | Spark plugs 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>Reset timing<br>Perform spark test<br>Inspect coil<br><br>Inspect distributor | IG-5<br>IG-1<br>IG-4<br>IG-7<br><br>IG-7 |
| Engine hesitates/<br>Poor acceleration                 | Spark plugs faulty<br>Incorrect ignition timing  | Inspect plugs<br>Reset timing  | IG-4<br>IG-1                             |
| Muffler explosion<br>(after fire) all the time         | Incorrect ignition timing  | Reset timing   | IG-1                                     |
| Engine backfires                                       | Incorrect ignition timing  | Reset timing   | IG-1                                     |
| Poor gasoline mileage                                  | Spark plugs faulty   | Inspect plugs  | IG-5                                     |

### ELECTRONIC SPARK ADVANCE (ESA)

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 volume, eng. temperature, etc.) the microcomputer (ECU) triggers the spark at precisely the right instant.

## ESA SYSTEM CIRCUIT



# ON-VEHICLE INSPECTION

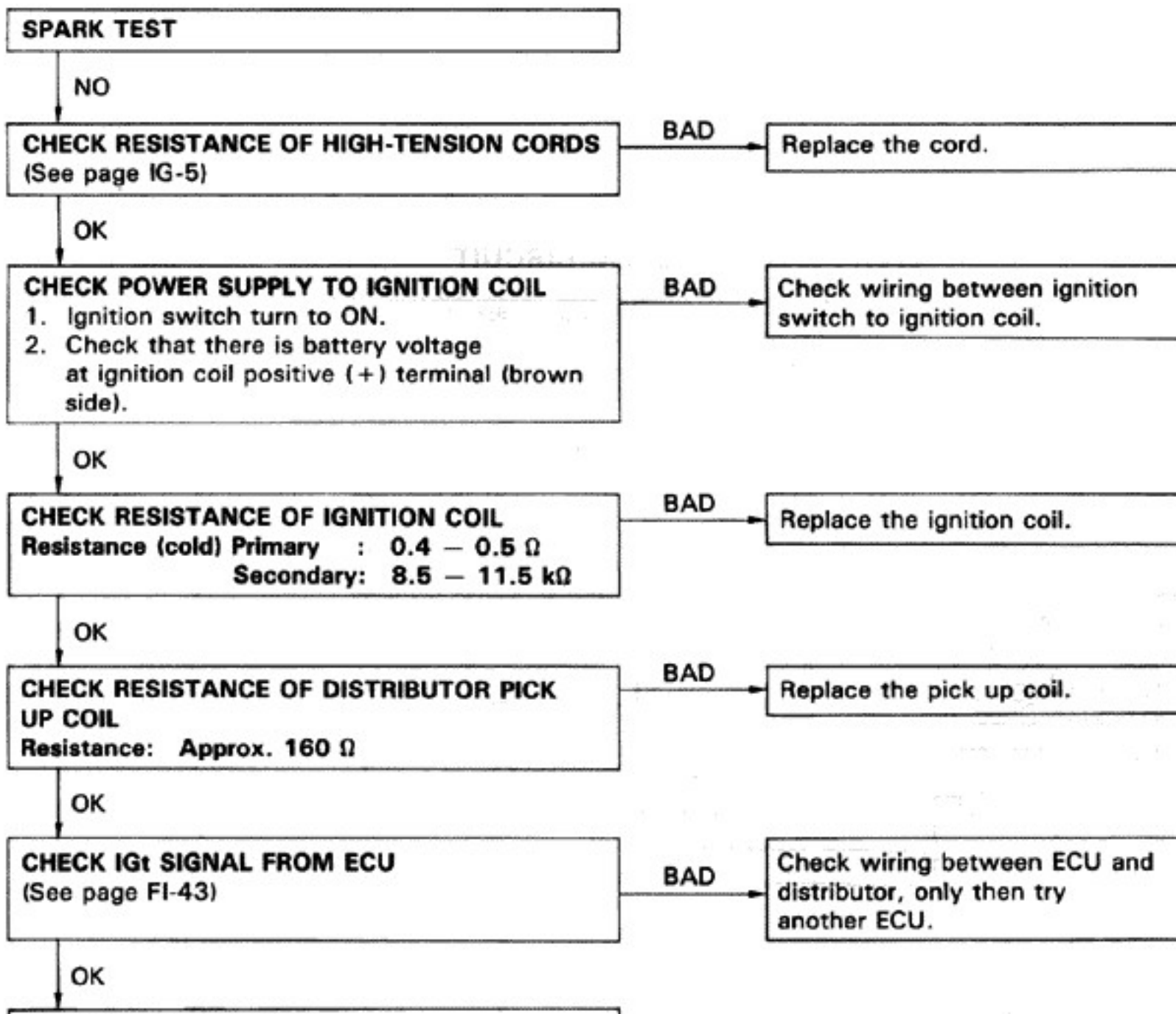
## SPARK TEST

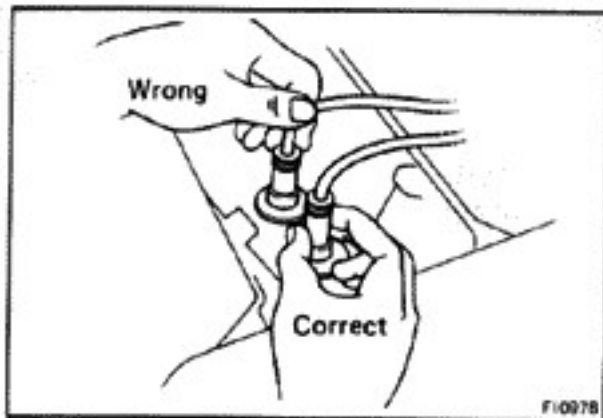
### CHECK THAT SPARK OCCURS

- Disconnect high-tension cord from the distributor.
- Hold the end approx. 12.7 mm (0.50 in.) from the body of car.
- See if spark occurs while engine is being cranked.

**NOTE:** To prevent gasoline from being injected from the 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:

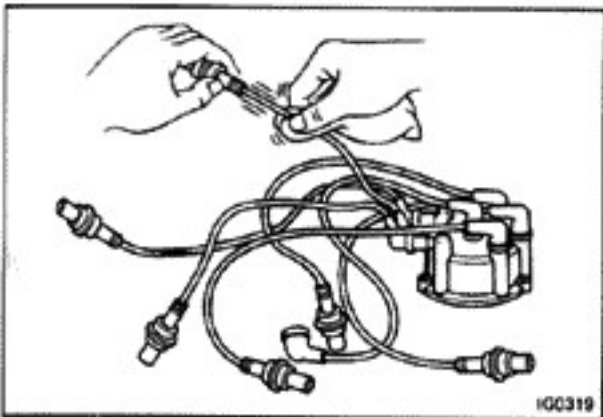




## INSPECTION OF HIGH-TENSION CORD

1. **CAREFULLY REMOVE HIGH TENSION CORDS BY RUBBER THEIR BOOTS**

**CAUTION:** DO NOT pull on the cords or bend the wires. The conductor inside may be damaged.



2. **INSPECT CORD TERMINALS**

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

3. **CHECK WIRE RESISTANCE**

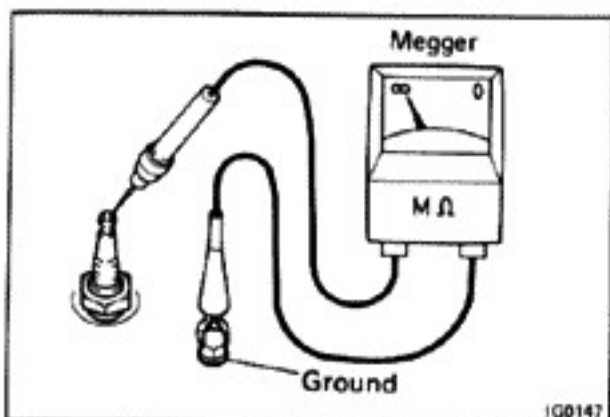
Using an ohmmeter, check that the resistance does not exceed the maximum. Replace the cord as required.

**Maximum resistance: 25 k $\Omega$  per cord**

## INSPECTION OF SPARK PLUG (Platinum Tipped Spark Plug)

### CAUTION:

- NEVER USE WIRE BRUSH FOR CLEANING
- NEVER ATTEMPT TO ADJUST GAP ON USED PLUG
- SPARK PLUGS SHOULD BE REPLACED EVERY 60,000 miles (100,000 km)

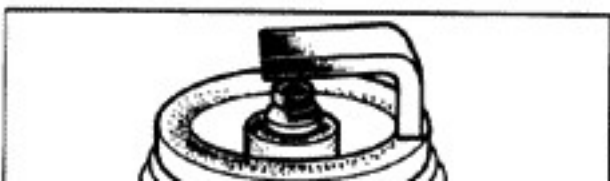


1. **INSPECT ELECTRODE**

- (a) If using a megger (insulation resistance meter): Measure the insulation resistance.

**Correct insulation resistance: More than 10 M $\Omega$**

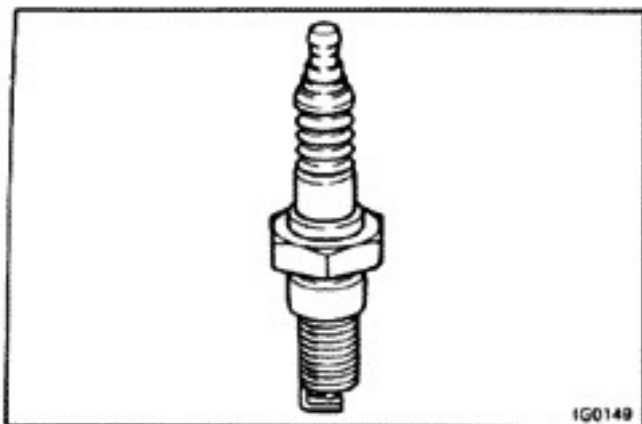
If less than 10 M $\Omega$ , clean the plug. (See page IG-6)



- (b) If not using a megger:

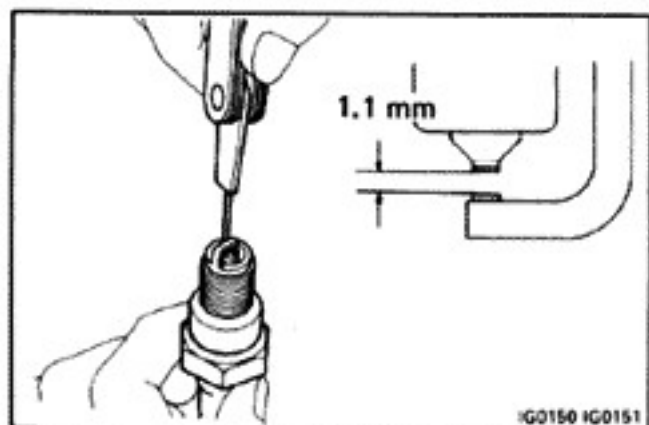
Quickly race the engine to 4,000 rpm five times. Visually inspect the spark plugs.

If the electrode is dry, .... Okay

**3. VISUALLY INSPECT SPARK PLUGS**

Inspect the spark plugs for thread or insulator damage.  
If defective, replace the plug.

**Spark plug:** ND P16R  
NGK BPR5EP11

**4. INSPECT ELECTRODE GAP**

**Maximum limit:** 1.4 mm (0.055 in.)

If limit is exceeded, replace the plug.

**Correct electrode gap of new plug:**  
1.1 mm (0.043 in.)

If adjusting the gap of a new plug, bend only the base of the ground electrode, do not touch the tip.

**5. CLEAN SPARK PLUGS**

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

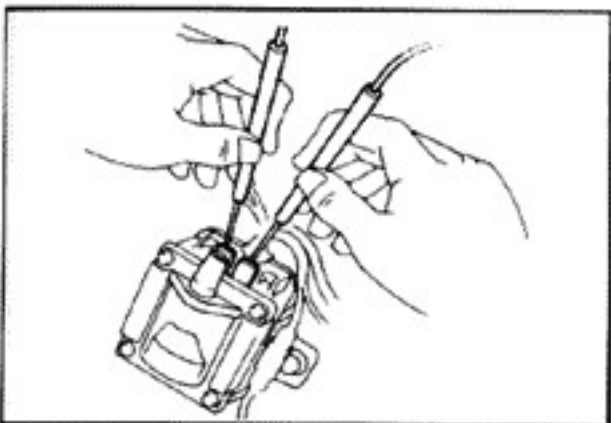
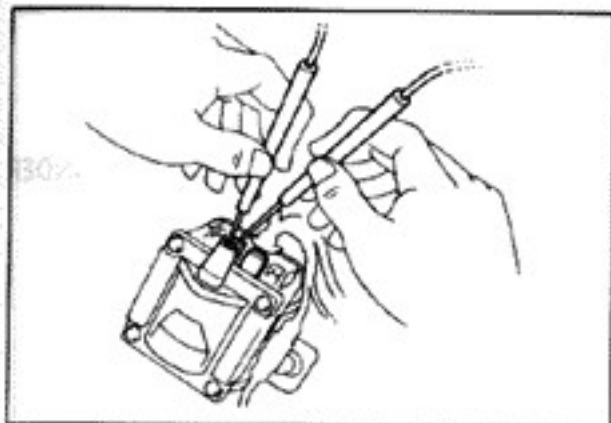
**Air pressure:** Below 6 kg/cm<sup>2</sup> (85 psi, 588 kPa)

**Duration:** 20 seconds or less

**NOTE:** If there are traces of oil, clean it off with gas before using the spark plug cleaner.

**6. INSTALL SPARK PLUGS**

**Torque:** 170 kg-cm (12 ft-lb, 17 N·m)



## INSPECTION OF IGNITION COIL

### 1. DISCONNECT HIGH-TENSION CORD

### 2. MEASURE COIL RESISTANCE

- Disconnect ignition coil connectors.
- 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  $\Omega$

- Measure secondary coil resistance.

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

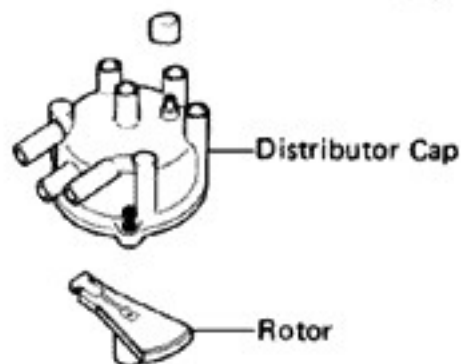
**Secondary coil resistance (cold):** 8.5 — 11.5 k $\Omega$

### 3. CONNECT HIGH-TENSION CORD

## ON-VEHICLE INSPECTION OF DISTRIBUTOR

### 1. INSPECT DISTRIBUTOR CAP AND ROTOR

- Check for cracks, carbon tracks, burnt or corroded terminals.
  - Check the distributor center contact for wear.
- If a problem is found, replace the component.



IG0141

### 2. CHECK PICKUP COIL

Using an ohmmeter, check each resistance of the two pickup coils.

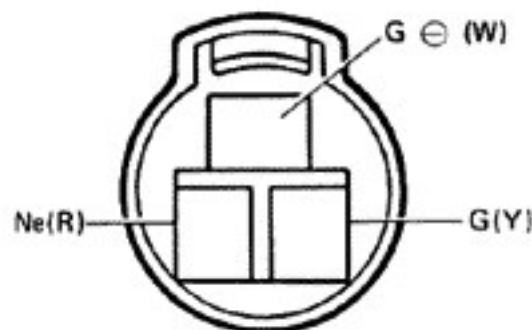
**G pickup coil resistance:**

**G — G ⊖** 140 — 180  $\Omega$

**Ne pickup coil resistance:**

**Ne — G ⊖** 140 — 180  $\Omega$

If the resistance is not correct, replace the distributor.



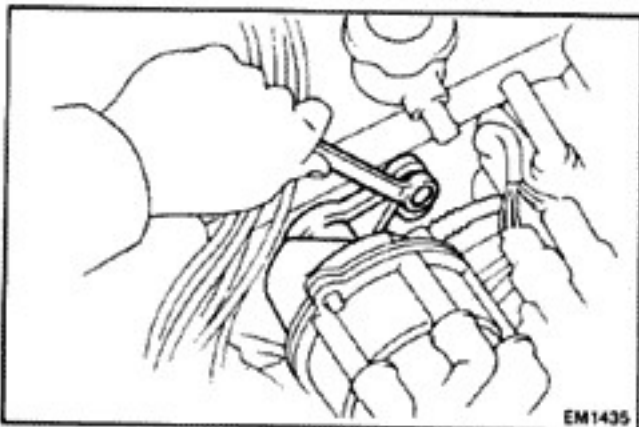
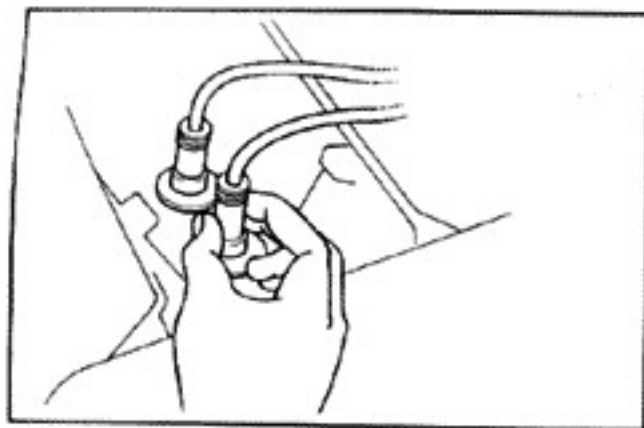
IC32



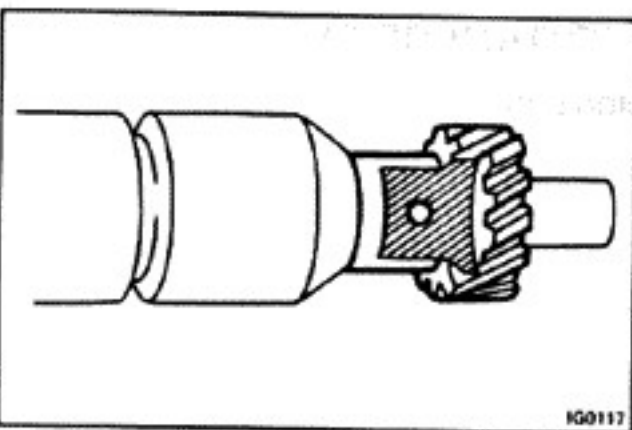
## DISTRIBUTOR

### REMOVAL OF DISTRIBUTOR

1. DISCONNECT HIGH TENSION CORDS FROM CYLINDER HEAD AND IGNITION COIL
2. DISCONNECT DISTRIBUTOR CONNECTOR
3. REMOVE DISTRIBUTOR SET BOLT
4. PULL OUT DISTRIBUTOR FROM CYLINDER HEAD
5. REMOVE O-RING



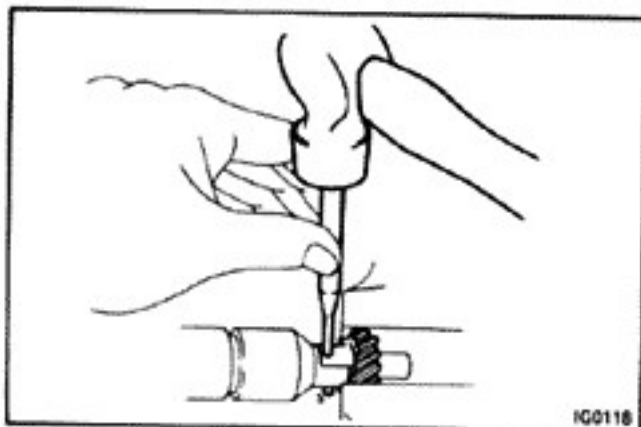
EM1435



IG0117

### REPLACEMENT DISTRIBUTOR DRIVE GEAR

1. GRIND DRIVE GEAR AND PIN  
Using a grinding wheel, grind the gear and pin.  
**CAUTION:** Be careful not to damage the shaft.
2. REMOVE PIN AND DRIVE GEAR
  - (a) Using a punch and hammer, drive out the pin.
  - (b) Remove the drive gear and discard it.



IG0118

3. INSTALL NEW DRIVE GEAR AND PIN
  - (a) Align the marks on the housing and new gear.
  - (b) Using a hammer, install a new pin.

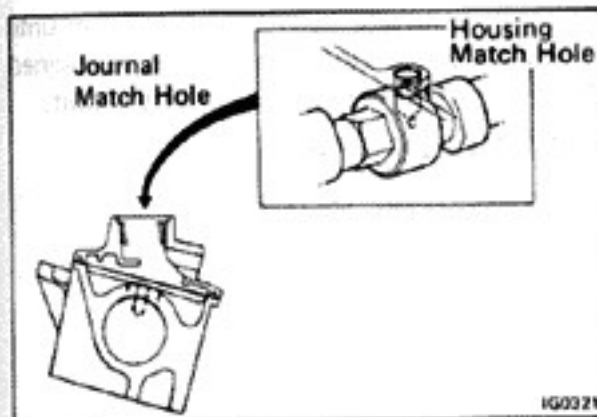
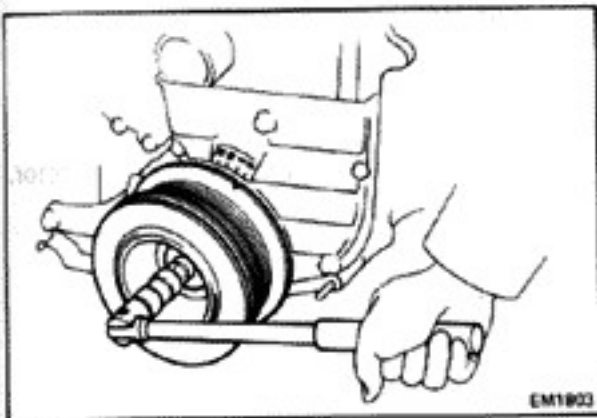




## INSTALLATION OF DISTRIBUTOR

### 1. INSTALL DISTRIBUTOR AND SET TIMING

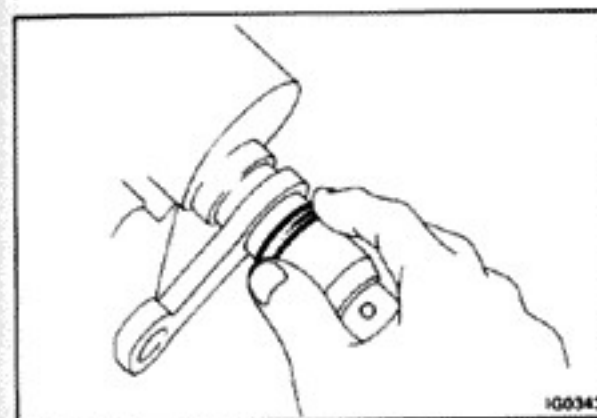
- (a) Turn the crankshaft pulley until the timing mark is aligned with the TDC mark.



- (b) Remove the oil filler cap.

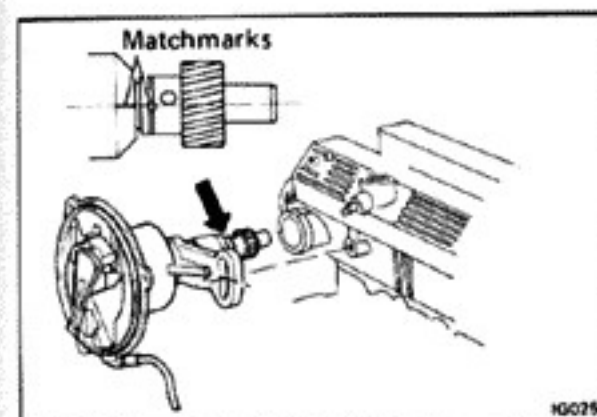
- (c) Make sure that the match hole on the No. 2 journal of the camshaft housing is aligned with that of the camshaft.

**NOTE:** If not, turn the crankshaft one full turn.



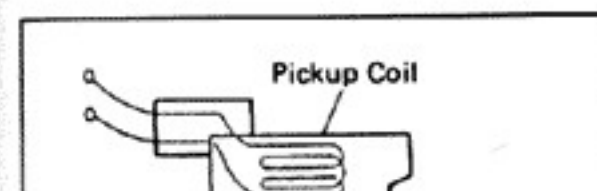
- (d) Install the new O-ring to the distributor.

**NOTE:** Always use a new O-ring when installing the distributor.



- (e) Align the matchmark of the distributor (the drillmark on spiral gear) with that of distributor housing.

- (f) Insert the distributor, aligning the center of flange with that of the bolt hole of cylinder head.

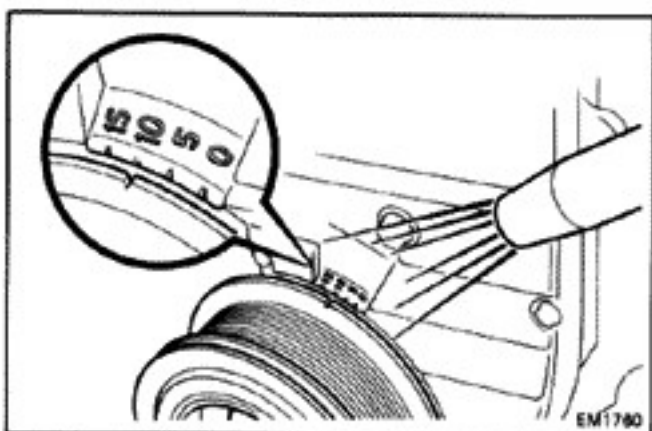
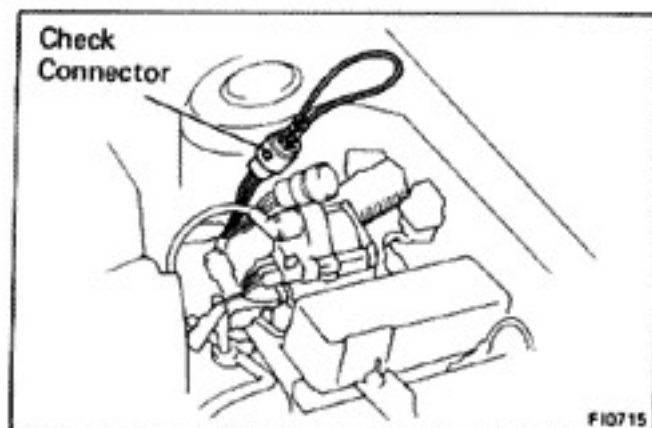


- (g) Align the rotor tooth with the pickup coil.

- (h) Temporarily install the distributor set bolt.

- (i) Install the distributor cap with wires.

- (j) Connect the distributor connector.



## 2. ADJUST IGNITION TIMING

- (a) Connect a timing light to the engine.
- (b) Start the engine and run it at idle.
- (c) Short circuit the terminals of the check connector T and E1.

- (d) Using a timing light, slowly turn the distributor until the timing mark on the crankshaft pulley is aligned with the 10° mark. Tighten the distributor bolt.

**Ignition timing: 10° BTDC @ (T and E1)**

**Torque: 140 kg-cm (10 ft-lb, 14 N·m)**

- (e) Unshort the check connector.