

IGNITION SYSTEM

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IGNITION SYSTEM CIRCUIT

Fig. 8-1

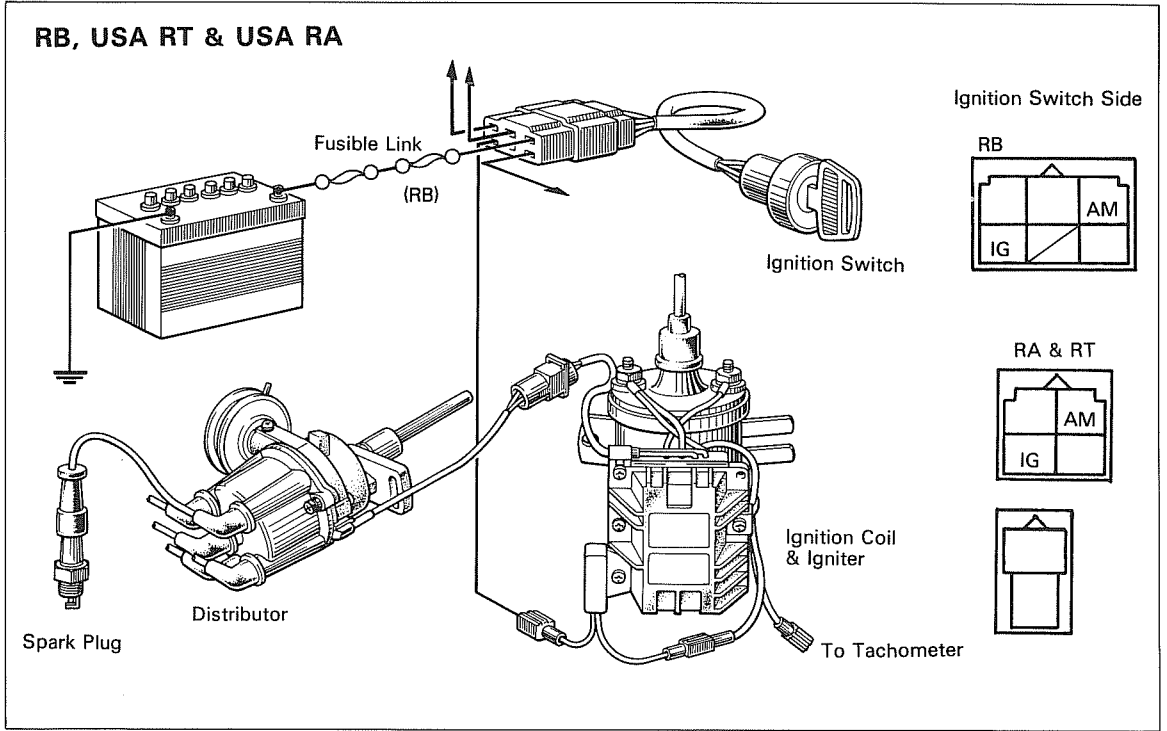


Fig. 8-2

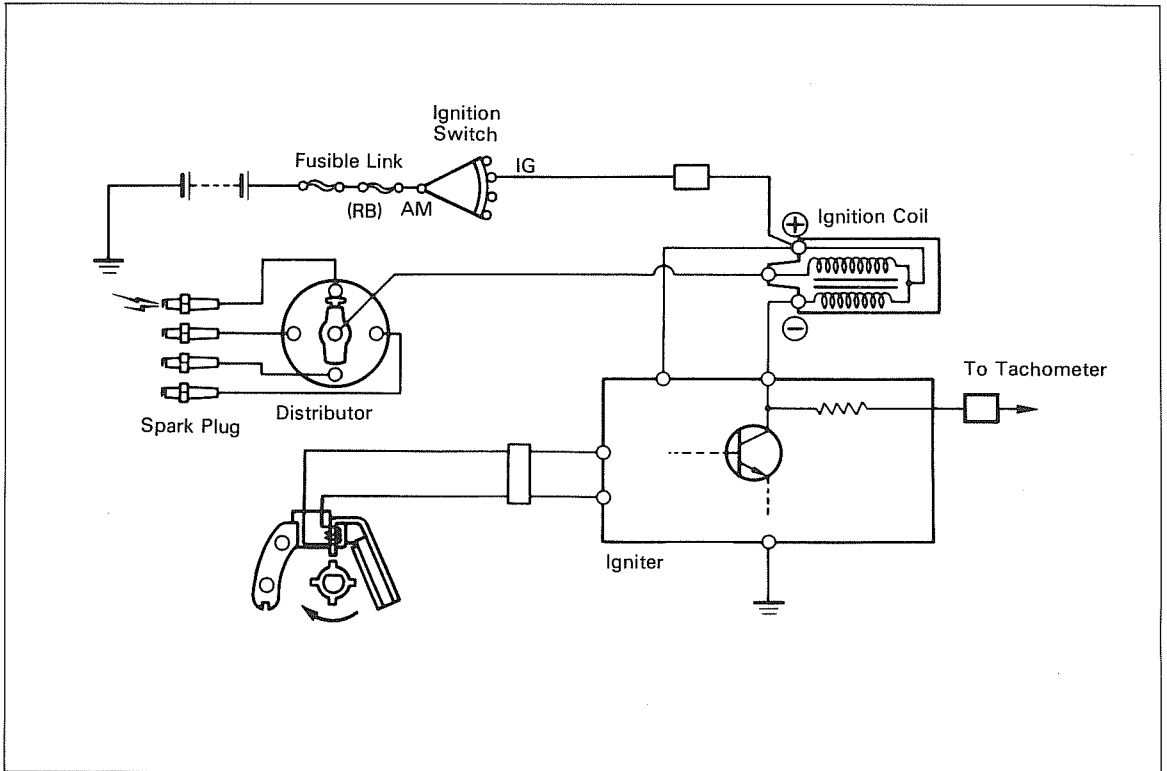


Fig. 8-3

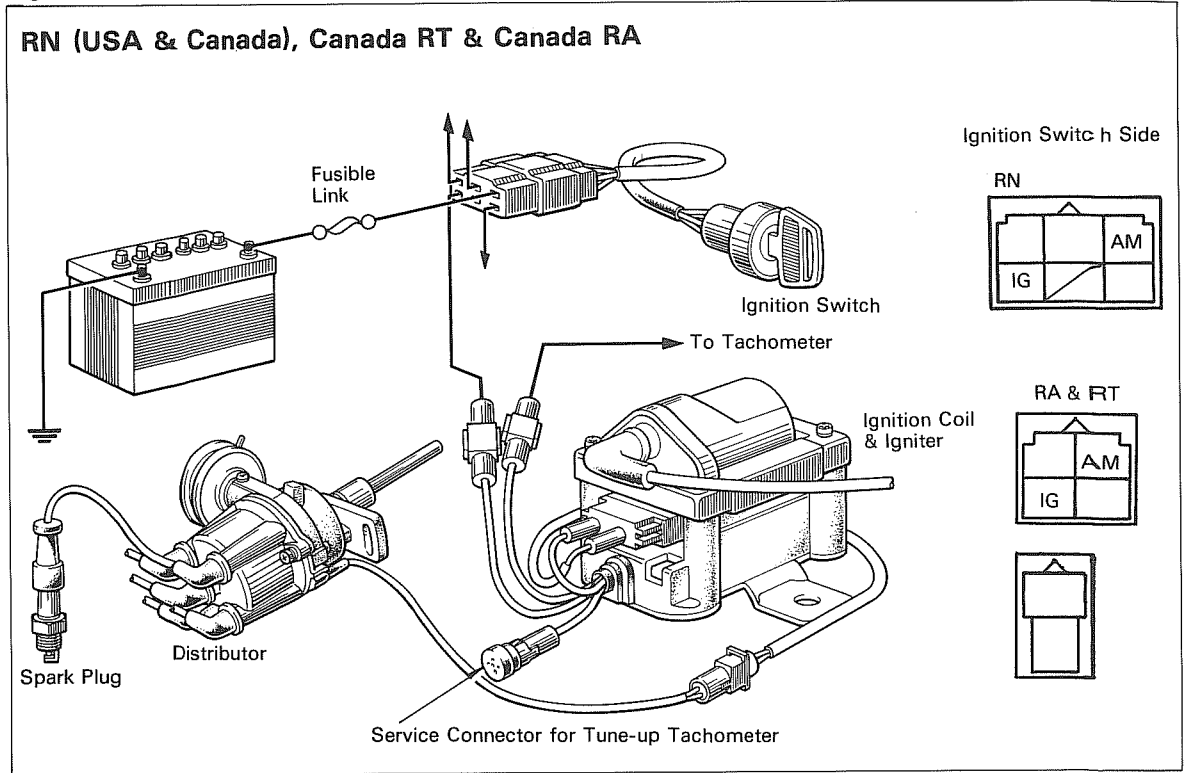


Fig. 8-4

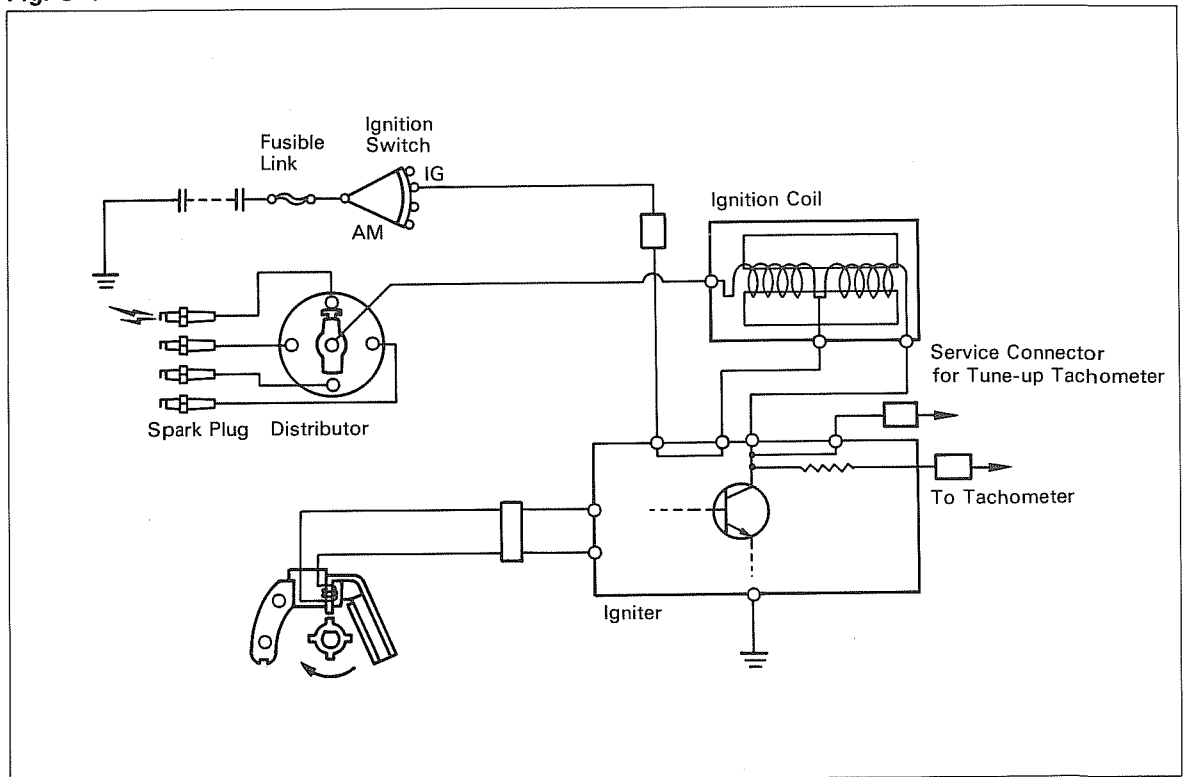


Fig. 8-5

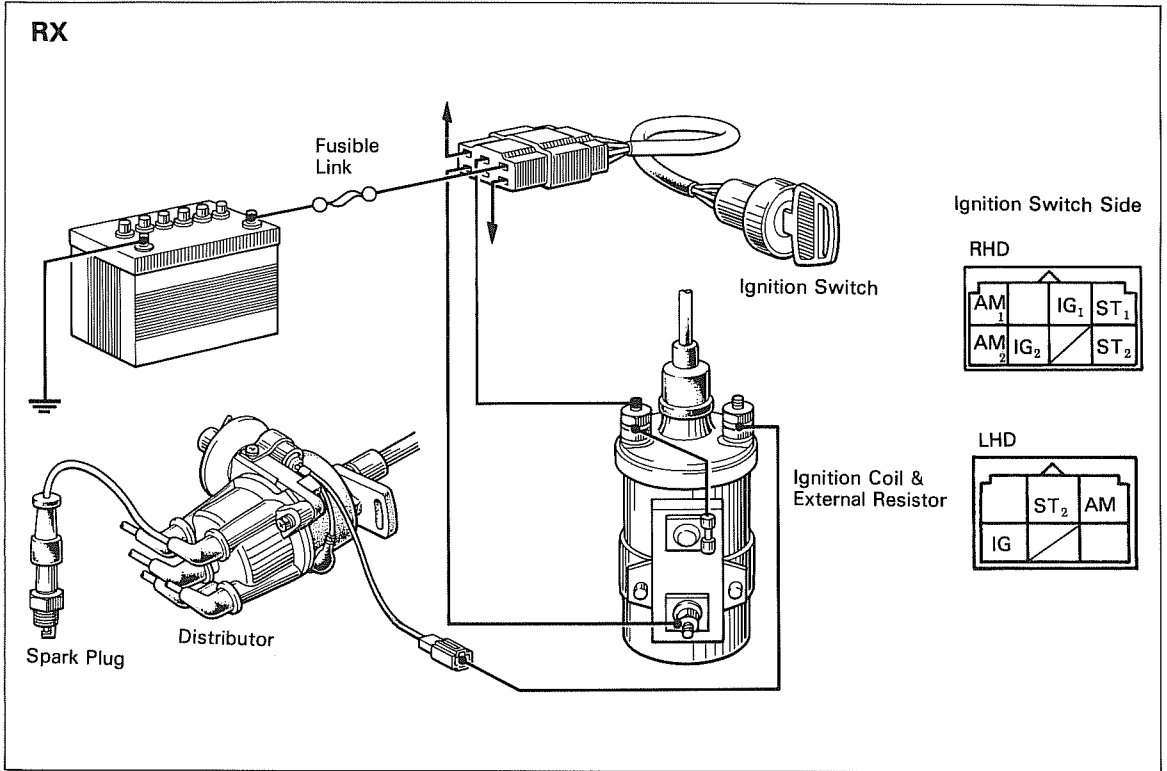


Fig. 8-6

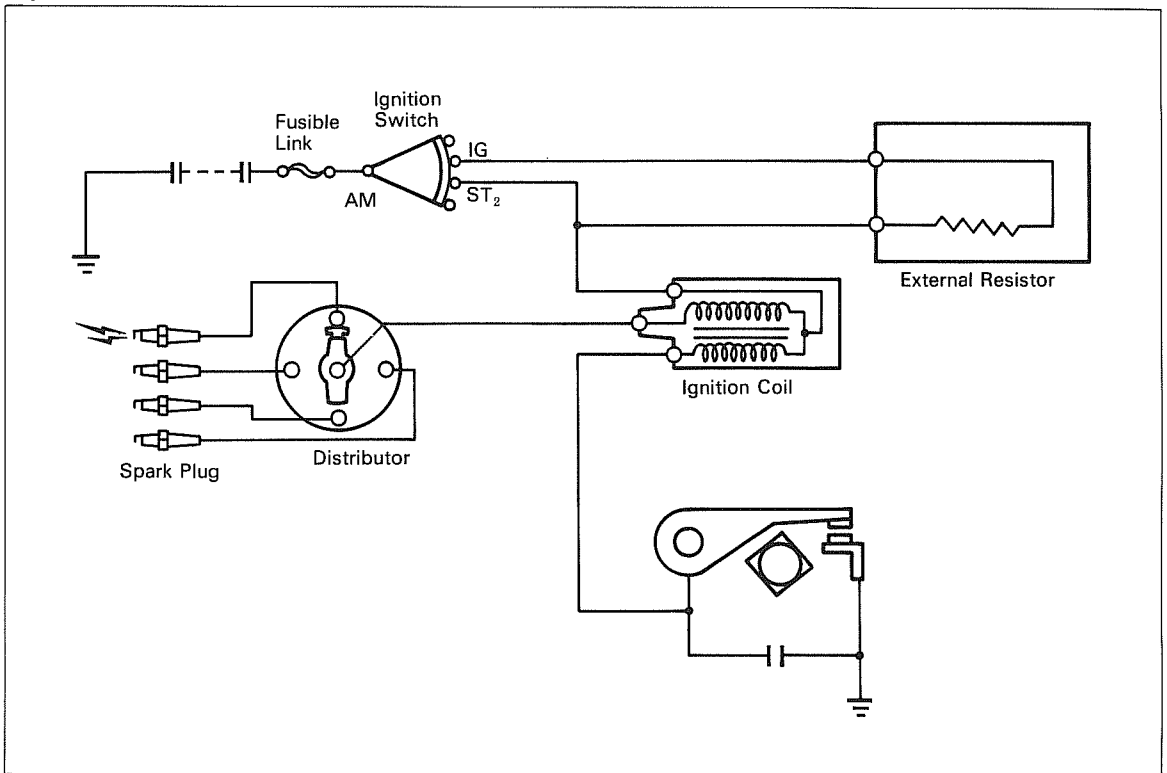


Fig. 8-7

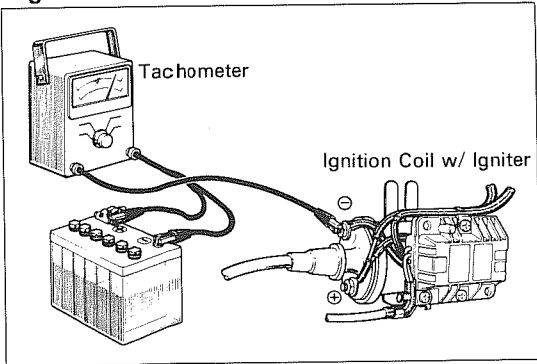


Fig. 8-8

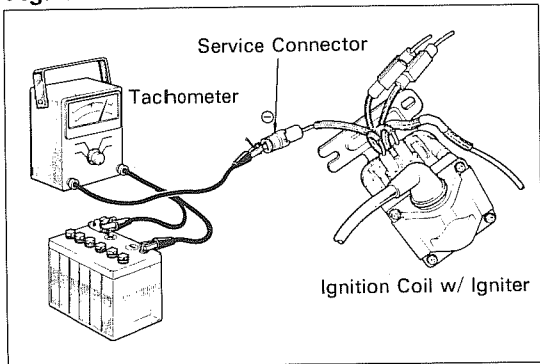


Fig. 8-9

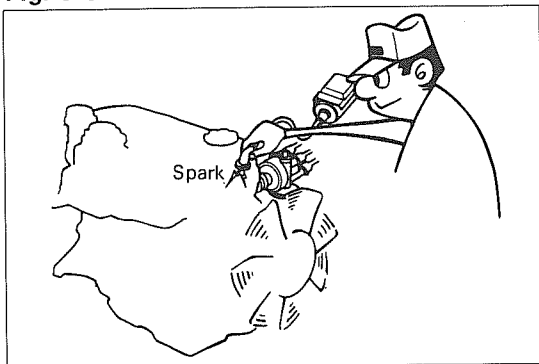
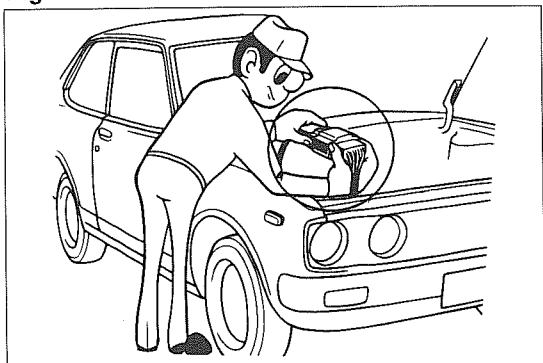


Fig. 8-10



ON-VEHICLE INSPECTION

Precautions

1. For the vehicles equipped with an igniter, pay attention to the following items:
 - (1) Do not keep the ignition switch 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:

For RB, USA RT and USA RA, connect the tachometer (+) terminal to the ignition coil (-) terminal.

For RN (USA and Canada), Canada RT and Canada RA, the service wiring connector covered with a rubber cap should be used only for the engine tune-up tachometer.

2. Check the spark.

Pull the distributor resistive cord, connected to the ignition coil, from the distributor and hold its end close to a ground. Then start the engine and check for spark.

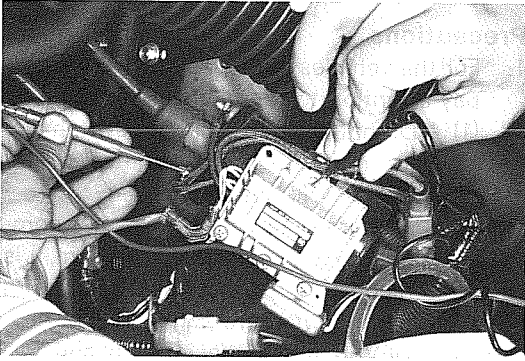
— Caution —

The check must be made within as short a time as possible.

3. Connector

Check the connector and wiring.

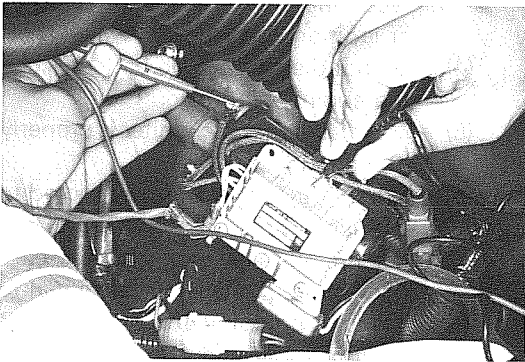
Fig. 8-11

**Igniter (RB, USA RT & USA RA)**

1. Turn the ignition switch to ON.
2. Check the power SOURCE line voltage. Connect a voltmeter (+) lead to the ignition coil (+) terminal, and the (-) lead to the igniter body.

Voltage: Approx. 12V

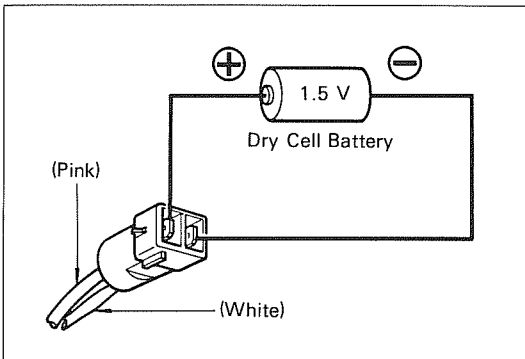
Fig. 8-12



3. Check the power transistor OFF condition. Connect a voltmeter (+) lead to the ignition coil (-) terminal, and the (-) lead to the igniter body.

Voltage: Approx. 12V

Fig. 8-13

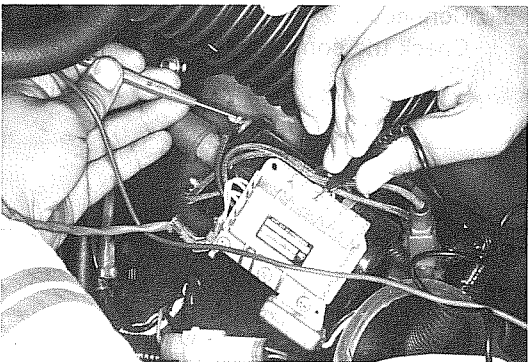


4. Check the power transistor ON condition.
 - (1) Disconnect the wiring connector from the distributor.
 - (2) Using a dry cell battery (1.5 V), connect the positive pole to the pink wire terminal and the negative pole to the white wire terminal.

— Note —

The check must be made within 5 seconds.

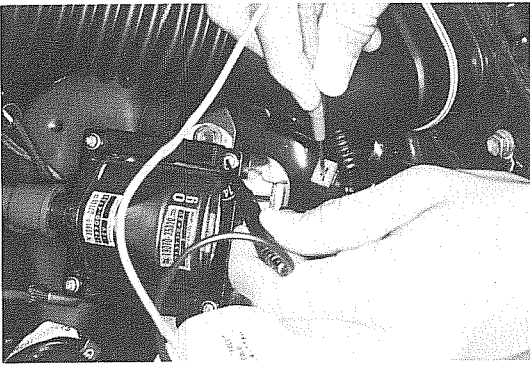
Fig. 8-14



- (3) Connect a voltmeter (+) lead to the ignition coil (-) terminal, and the (-) lead to the igniter body.

Voltage: 5V-less than battery voltage

Fig. 8-15

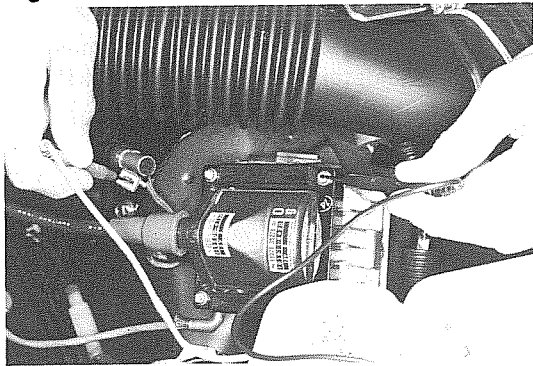


Igniter (RN, Canada RT & Canada RA)

1. Turn the ignition switch to ON.
2. Check the power SOURCE line voltage.
 - (1) Disconnect the wiring connector brown and yellow.
 - (2) Connect a voltmeter (+) lead to the brown connector for the wire harness side, and the (-) lead to the igniter body.

Voltage: Approx. 12V

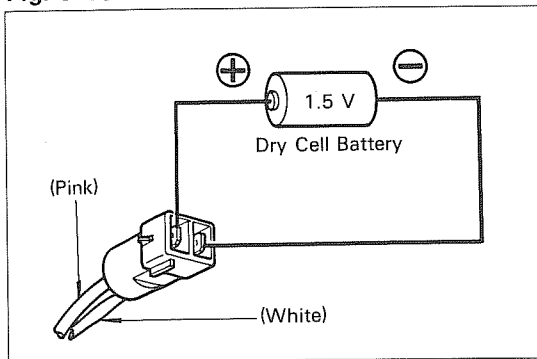
Fig. 8-16



3. Check the power transistor OFF condition.
 - (1) Connect the wiring connector for brown.
 - (2) Connect a voltmeter (+) lead to the yellow connector for igniter side, and the (-) lead to the igniter body.

Voltage: Approx. 12V

Fig. 8-17

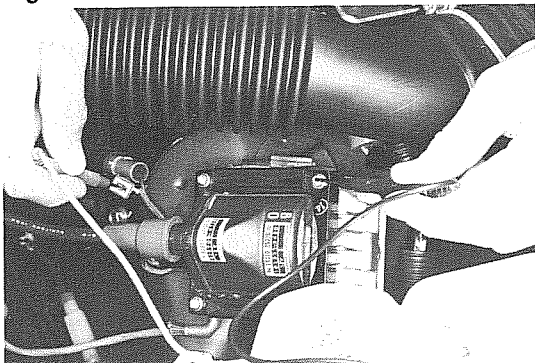


4. Check the power transistor ON condition.
 - (1) Disconnect the wiring connector from the distributor.
 - (2) Using a dry cell battery (1.5 V), connect the positive pole to the pink wire terminal and the negative pole to the white wire terminal.

— Note —

The check must be made within 5 seconds.

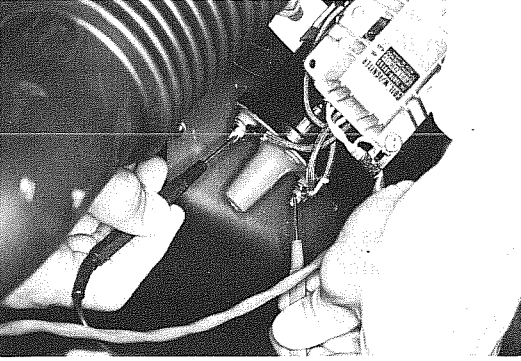
Fig. 8-18



3. Connect a voltmeter (+) lead to the yellow connector for igniter side, and the (-) lead to the igniter body.

Voltage: 5V-less than battery voltage

Fig. 8-19

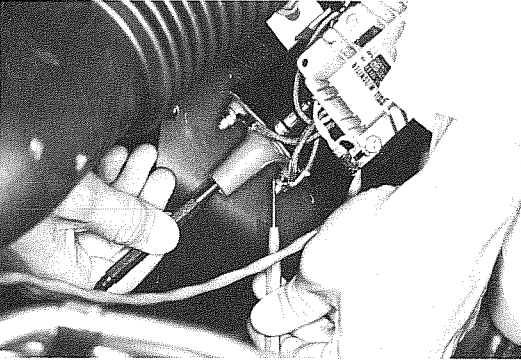
**Ignition Coil (RB, USA RT & USA RA)**

Check the ignition coil resistance with an ohmmeter.

1. Primary coil resistance: between the (+) and (-) terminals.

Resistance: 0.8 – 1.1 Ω

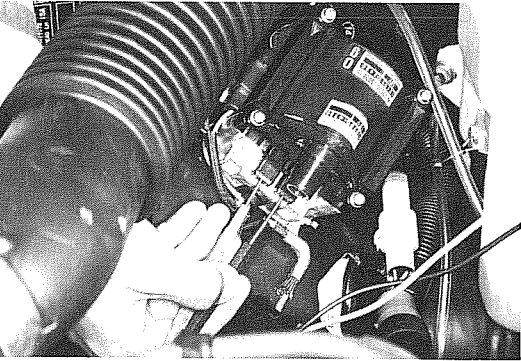
Fig. 8-20



2. Secondary coil resistance: between the (+) terminal and high tension terminal.

Resistance: 10.7 – 14.5 k Ω

Fig. 8-21

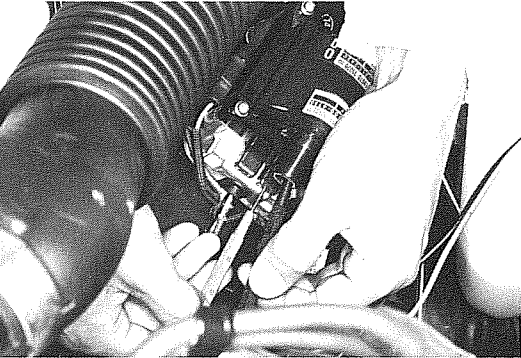
**Ignition Coil (RN, Canada RT & Canada RA)**

Check the ignition coil resistance with an ohmmeter.

1. Primary coil resistance: between the (+) (Brown side) and (-) (Black side) terminal.

Resistance: 0.4 – 0.5 Ω

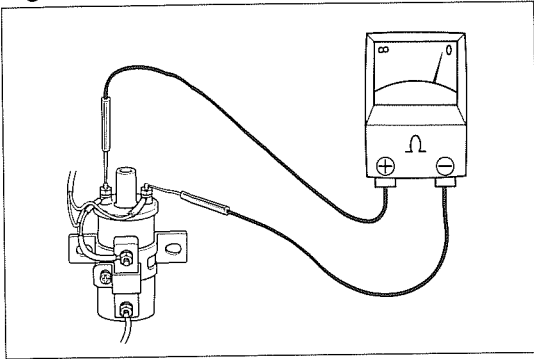
Fig. 8-22



2. Secondary coil resistance: between the (+) terminal (Brown side) and high tension terminal.

Resistance: 8.5 – 11.5 k Ω

Fig. 8-23

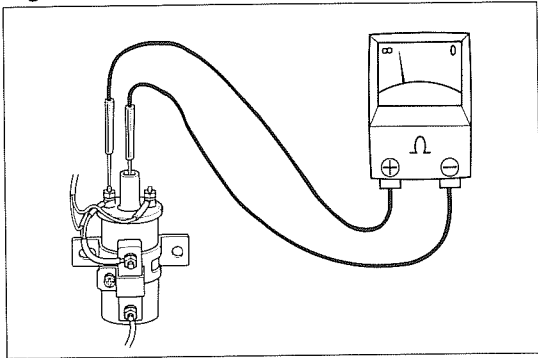
**Ignition Coil (RX)**

Check the ignition coil resistance with an ohmmeter.

1. Primary coil resistance: between the (+) and (-) terminals.

Resistance: 1.2 – 1.5 Ω

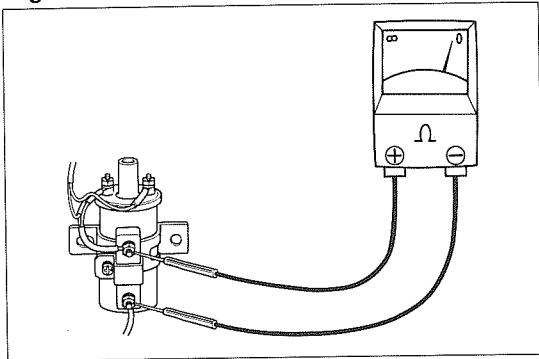
Fig. 8-24



2. Secondary coil resistance: between the (+) terminal and high tension terminal.

Resistance: 8.5 – 11.5 kΩ

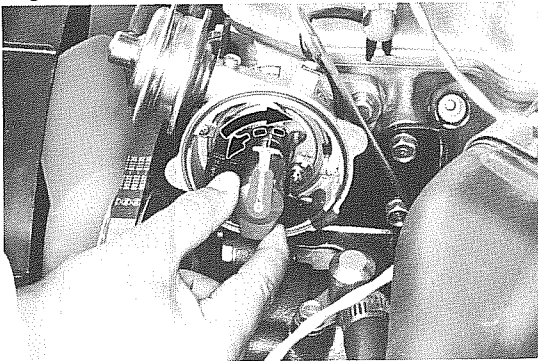
Fig. 8-25

**Resistor (RX)**

Check the resistor resistance with an ohmmeter.

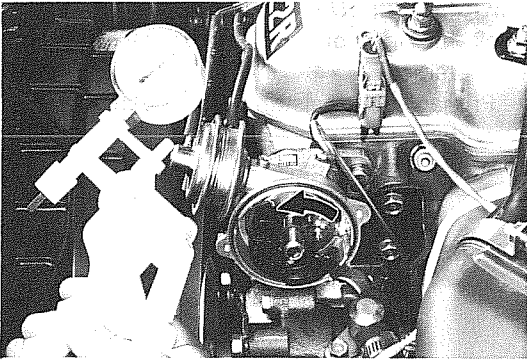
Resistance: 1.3 – 1.5 Ω

Fig. 8-26

**Distributor**

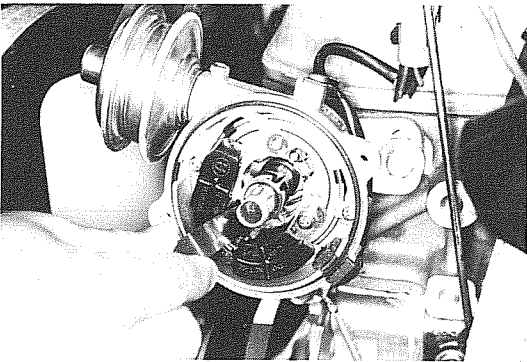
1. Check the governor.
Turn the rotor clockwise and release it. The rotor should return smoothly to its original position.

Fig. 8-27



2. Check the vacuum advancer operation. Disconnect the vacuum hose and connect a vacuum pump to the diaphragm. Apply vacuum and check that the advance moves.

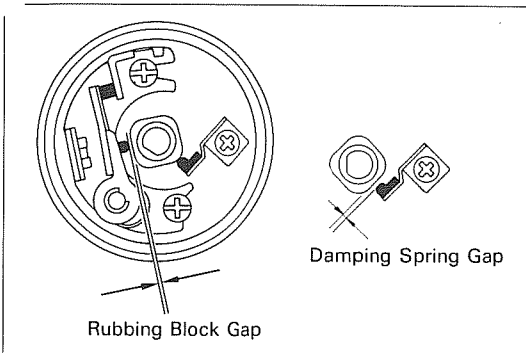
Fig. 8-28



3. Check the air gap. (Breaker points less type)
Check the air gap between the signal rotor and signal generator projection with a thickness gauge.

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

J. 8-29

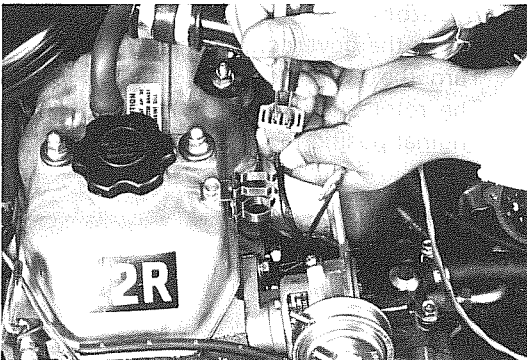


4. Check the rubbing block gap and damping spring gap. (Breaker points type)

**Rubbing block gap:
0.45 mm
(0.0177 in.)**

**Damping spring gap:
0.1 – 0.4 mm
(0.004 – 0.016 in.)**

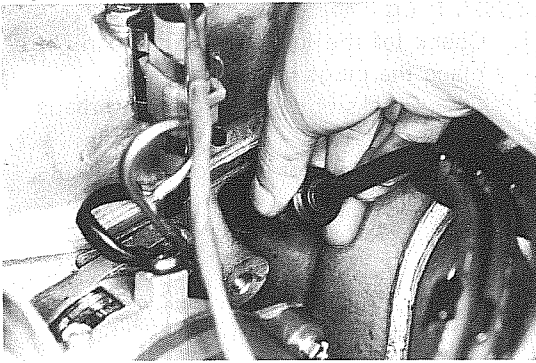
Fig. 8-30



5. Check the signal generator. (22R)
Check the resistance of the signal generator with an ohmmeter.

Resistance: 130 – 190 Ω

Fig. 8-31

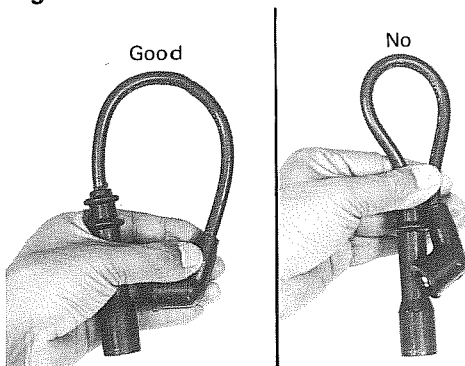


High Tension Cord

– Note –

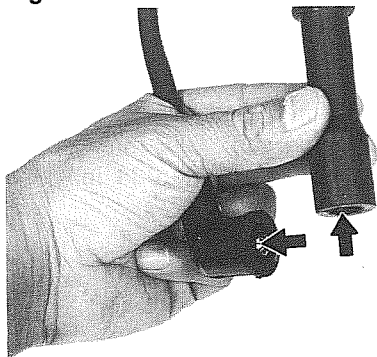
1. Carefully remove the high tension cords by pulling on the rubber boots.

Fig. 8-32



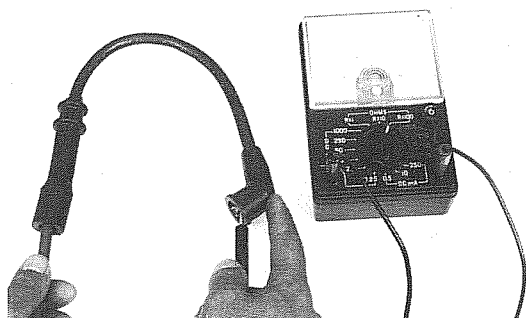
2. Be careful not to break the conductors.

Fig. 8-33



1. Check the condition of the cord terminal. If any terminal is corroded, clean it. If it is broken or distorted, replace the cord.
2. Clean the cord terminal.

Fig. 8-34

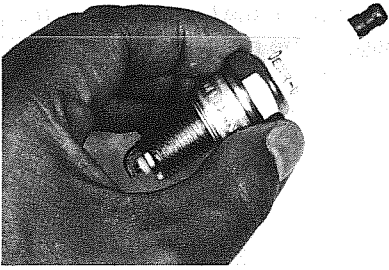


3. Measure the resistance of each cord as shown in the figure. If the reading exceeds the limit, replace the cord.

Resistance:

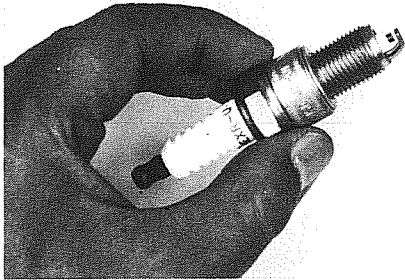
Less than 25 kΩ per cord

Fig. 8-35

**Spark Plug**

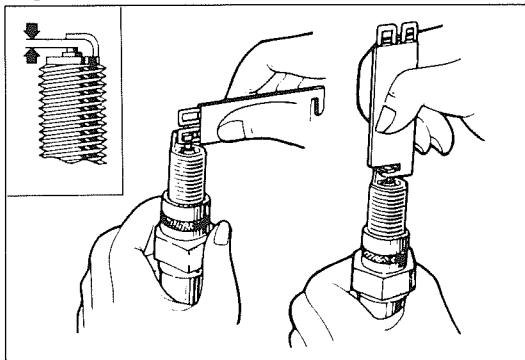
1. Check for the following and clean or replace the plugs if necessary.
 - (1) Cracks or damages in the threads or insulator.
 - (2) Damaged or deteriorated gaskets.

Fig. 8-36



- (3) Wear on the electrodes.
- (4) Burnt condition of electrodes and the amount of carbon deposit.

Fig. 8-37



2. Measure the plug gap with plug gap gauge.
If not at specified value, adjust by bending the ground (outer) electrode.

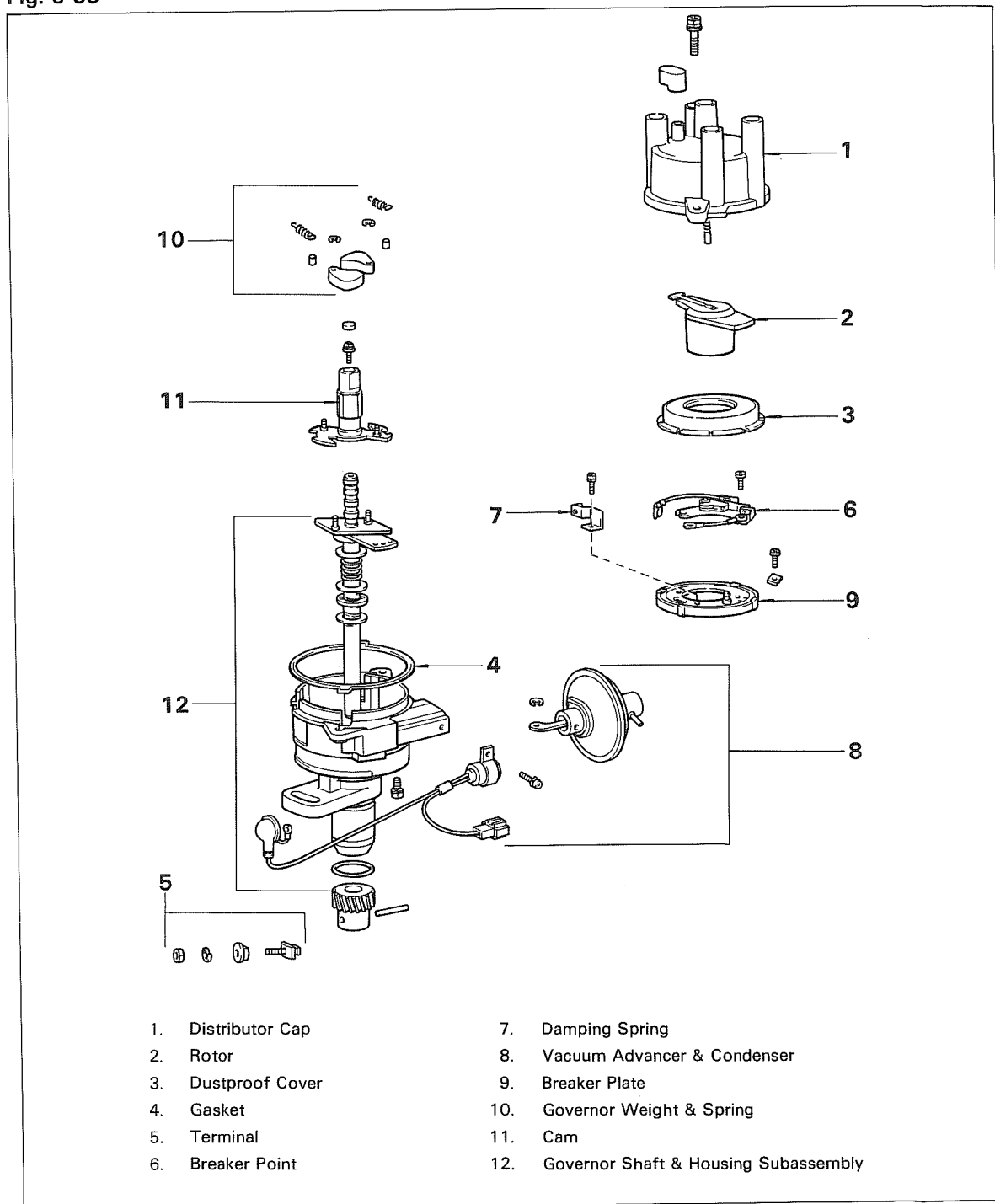
**Spark plug gap: 0.8 mm
(0.031 in.)**

DISTRIBUTOR

DISASSEMBLY

1. Disassemble the parts in the numerical order shown in the figure.

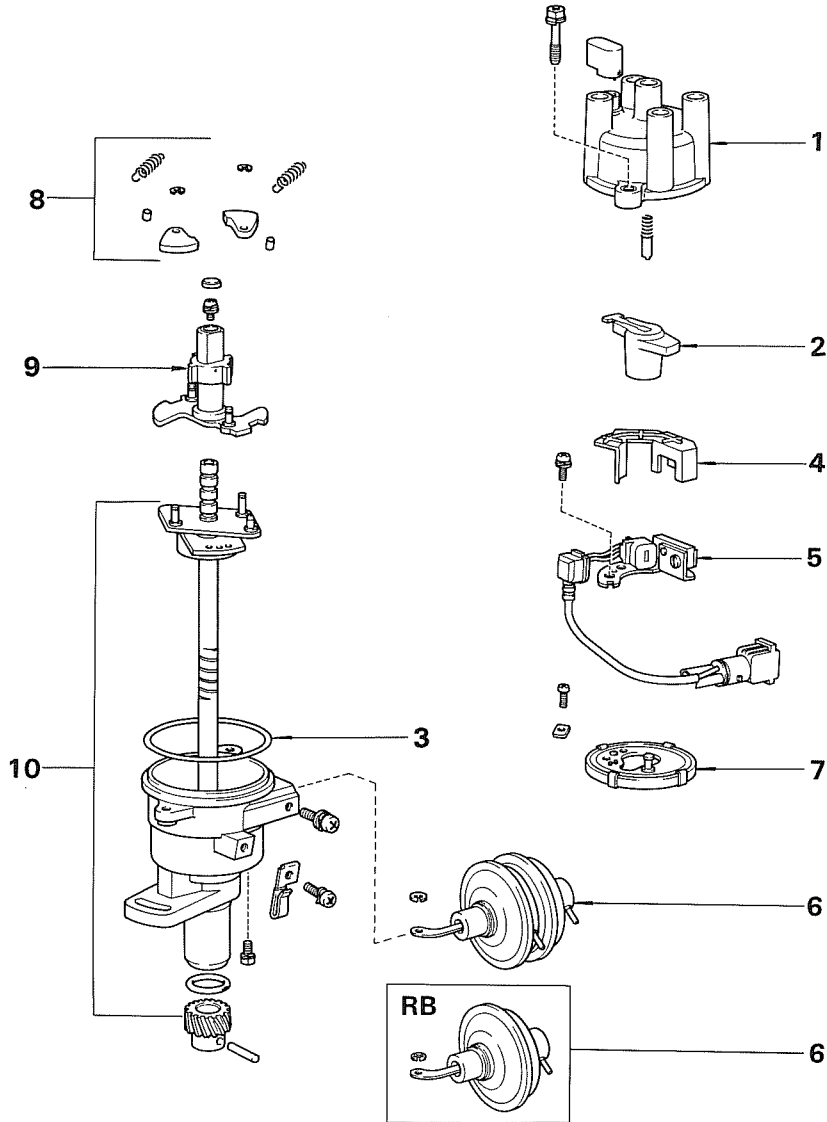
Fig. 8-38



- | | |
|--------------------|--|
| 1. Distributor Cap | 7. Damping Spring |
| 2. Rotor | 8. Vacuum Advancer & Condenser |
| 3. Dustproof Cover | 9. Breaker Plate |
| 4. Gasket | 10. Governor Weight & Spring |
| 5. Terminal | 11. Cam |
| 6. Breaker Point | 12. Governor Shaft & Housing Subassembly |

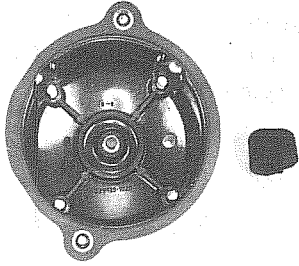
2. Disassemble the parts in the numerical order shown in the figure.

Fig. 8-39



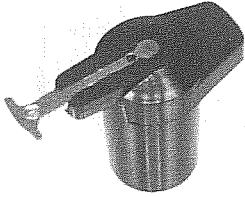
- | | |
|---------------------|--|
| 1. Distributor Cap | 6. Vacuum Advancer Diaphragm |
| 2. Rotor | 7. Breaker Plate |
| 3. Dustproof O Ring | 8. Governor Weight & Spring |
| 4. Dust Cover | 9. Signal Rotor |
| 5. Signal Generator | 10. Governor Shaft & Housing Subassembly |

Fig. 8-40

**INSPECTION & REPAIR****Cap**

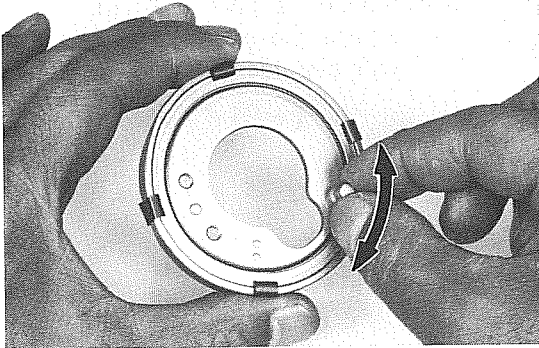
Check for cracks, carbon tracks, burnt or corroded terminals and check the center contact for wear.

Fig. 8-41

**Rotor**

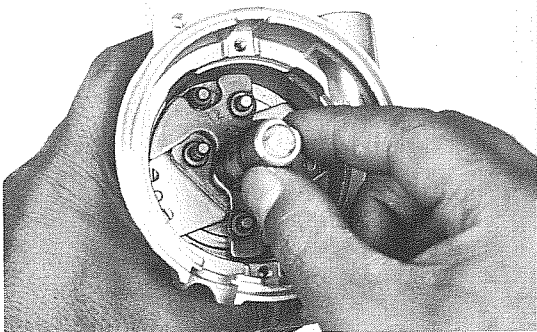
Check for cracks, carbon tracks, burnt or corroded terminals.

Fig. 8-42

**Breaker Plate**

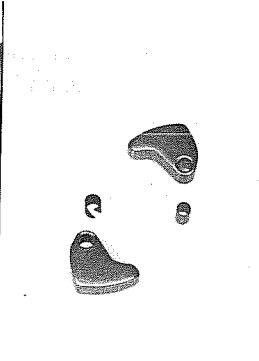
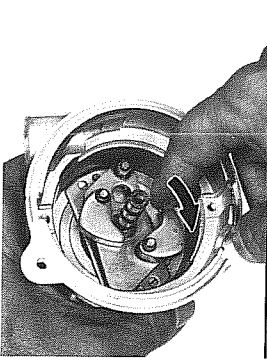
Check for smooth rotation.

Fig. 8-43

**Cam & Shaft**

1. Check the cam for wear or damage.
2. Check the fit between the cam and shaft.

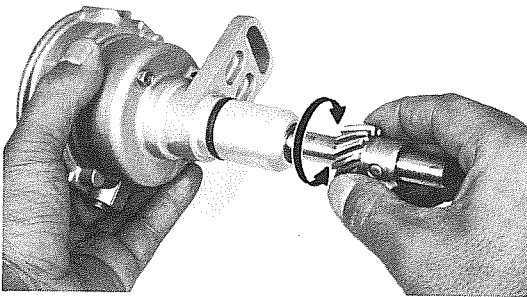
Fig. 8-44



Governor Weight & Pin

1. Rotate the governor weight to check for binding.
2. Check the governor weights and bearings for wear or damage.

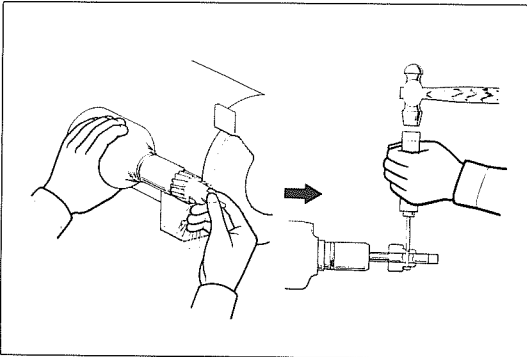
Fig. 8-45



Governor Shaft & Housing

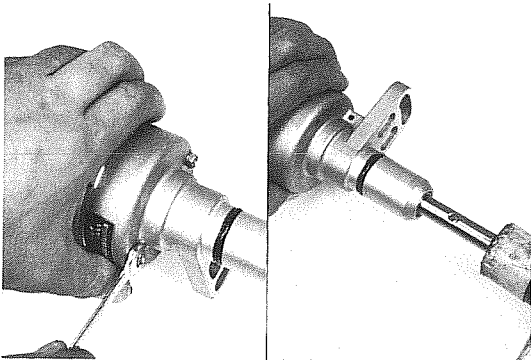
1. Confirm that the governor shaft rotates smoothly.
If necessary, disassemble.

Fig. 8-46



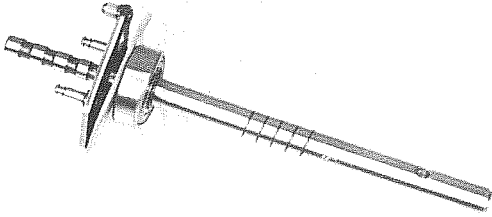
2. Disassemble the governor shaft.
(1) Scrape the peened end of the pin with a grinder and drive out the pin.

Fig. 8-47



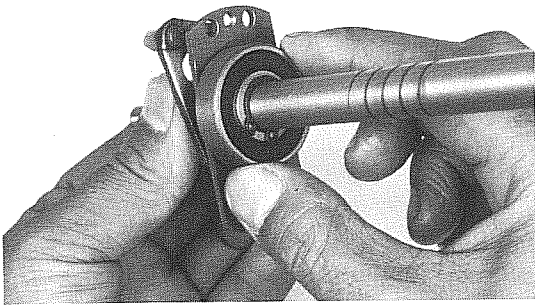
- (2) Remove two screws and drive out the governor shaft.

Fig. 8-48



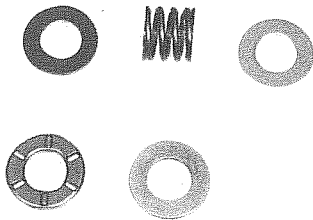
- (3) Check the governor shaft for wear or damage.

Fig. 8-49



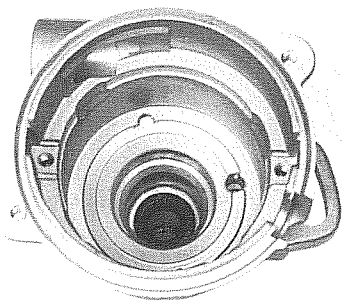
- (4) Check the bearing for wear, sticking or damage.

Fig. 8-50



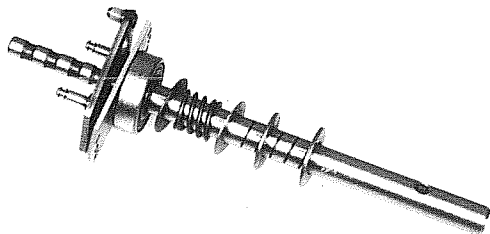
- (5) Check the needle roller bearing, washers and spring for sticking, scoring or damage. (21R, 21R-C)

Fig. 8-51



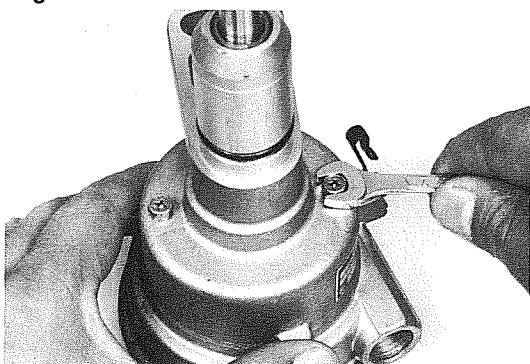
- (6) Check the housing, bushing and O ring for wear, deformation or damage.

Fig. 8-52



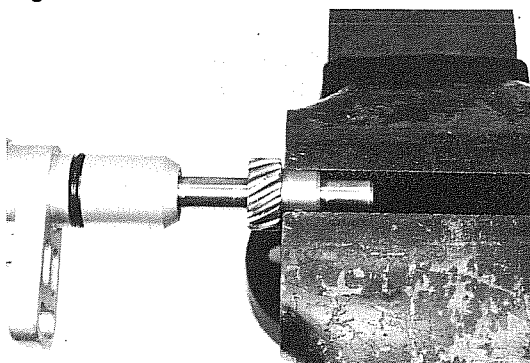
- (7) Assemble the spring, bearing and washers as shown in the figure. (21R, 21R-C)

Fig. 8-53



- (8) Align the holes in the bearing retainer and housing. Install two screws.

Fig. 8-54

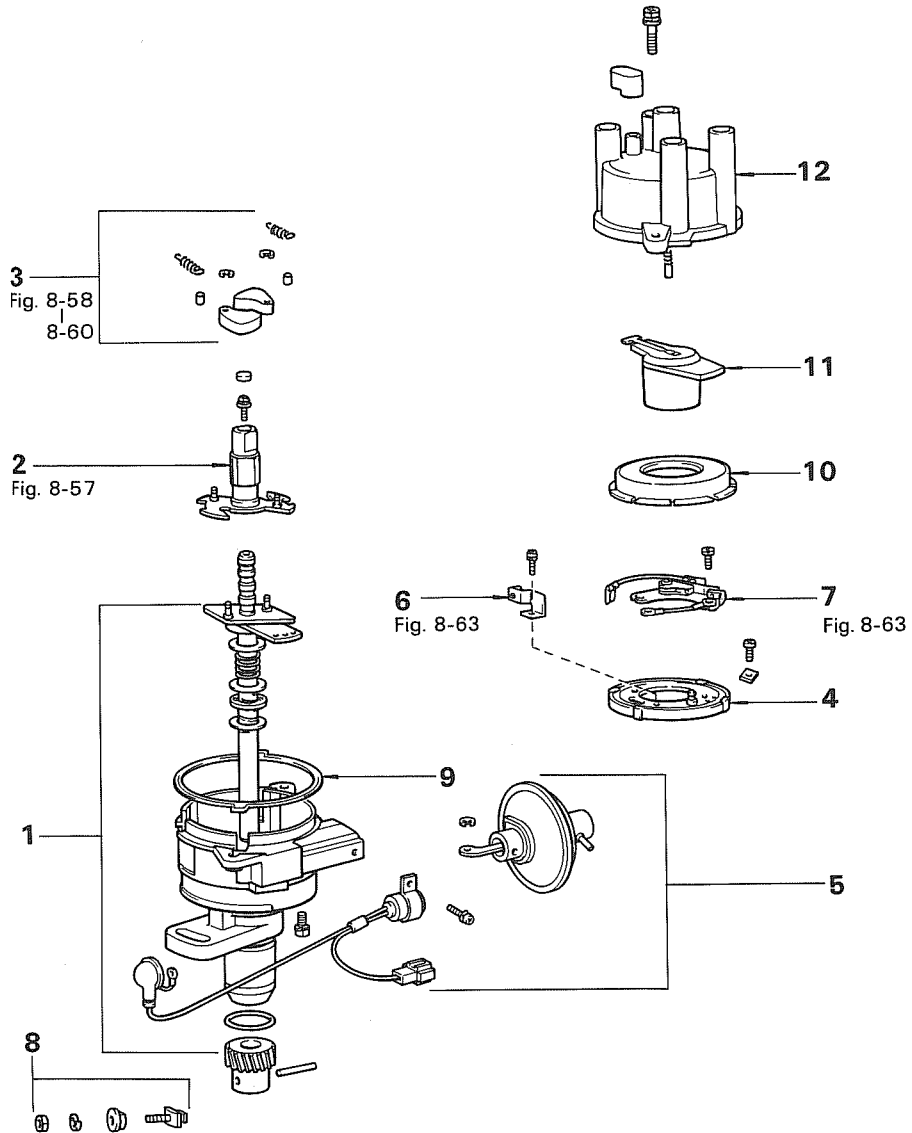


- (9) Peen both ends with a vise.

ASSEMBLY

1. Assemble the parts in the numerical order shown in the figure.

Fig. 8-55



- | | |
|---|---------------------|
| 1. Governor Shaft & Housing Subassembly | 7. Breaker Point |
| 2. Cam | 8. Terminal |
| 3. Governor Weight & Spring | 9. Gasket |
| 4. Breaker Plate | 10. Dustproof Cover |
| 5. Vacuum Advancer & Condenser | 11. Rotor |
| 6. Damping Spring | 12. Distributor Cap |

2. Assemble the parts in the numerical order shown in the figure.

Fig. 8-56

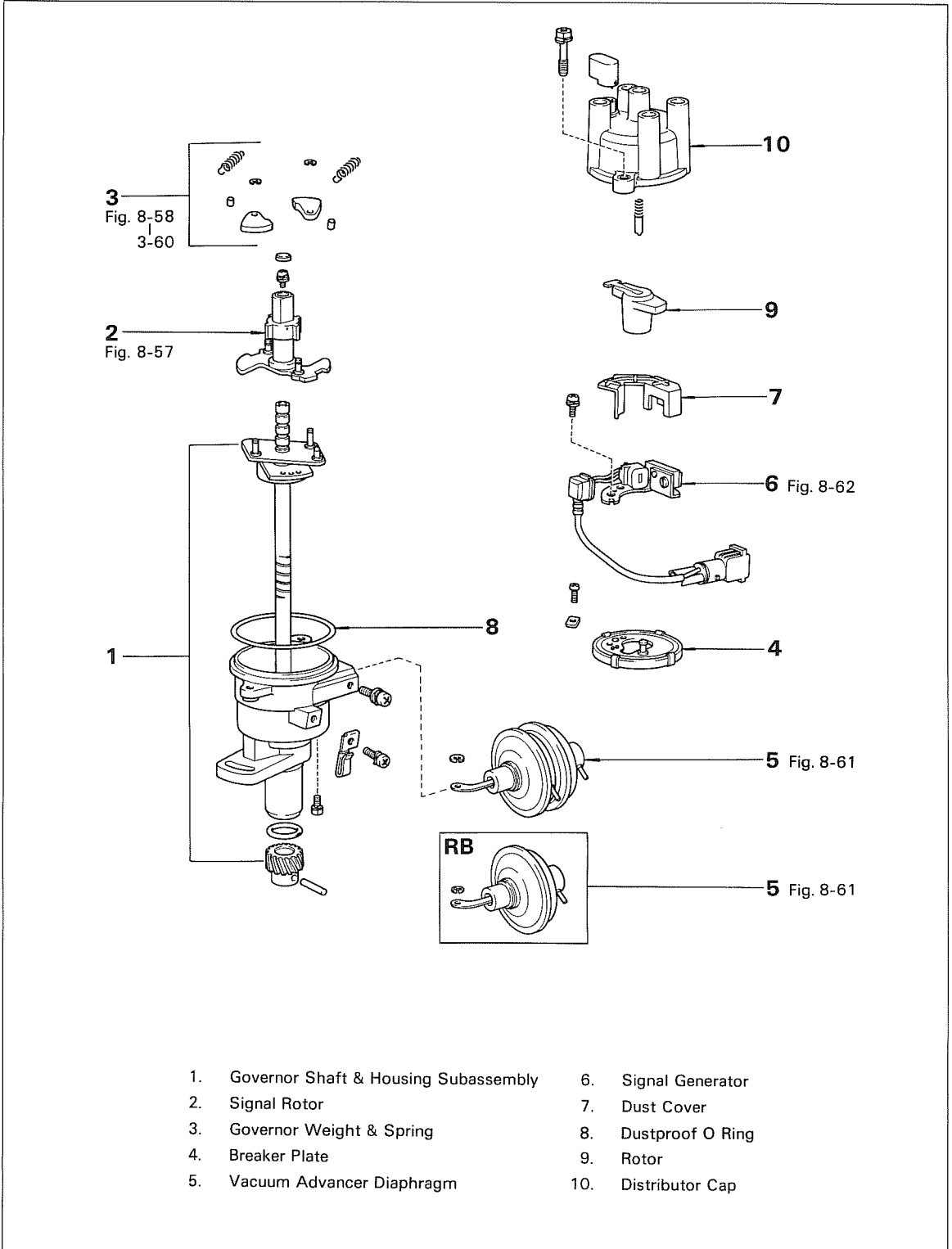
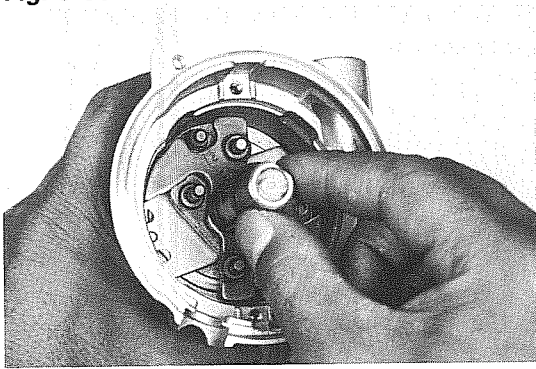
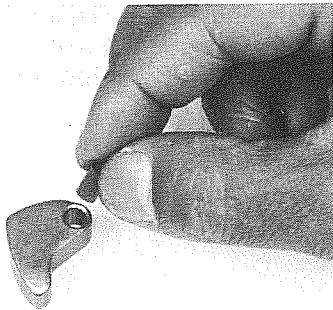


Fig. 8-57



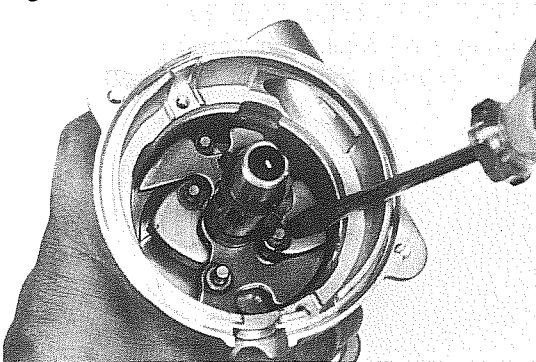
Match the mark (12 for 22R/14.5 for 21R and 21R-C) with the stopper and fit on the cam.

Fig. 8-58



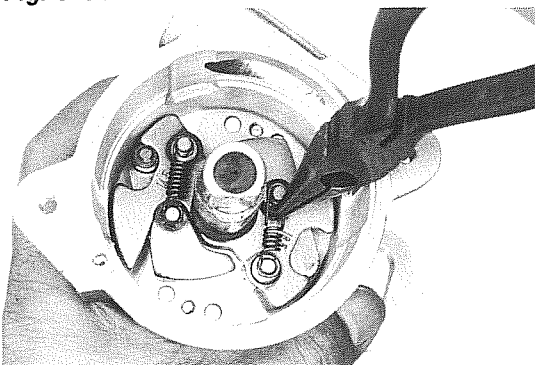
Install the bearing into the pin hole.

Fig. 8-59



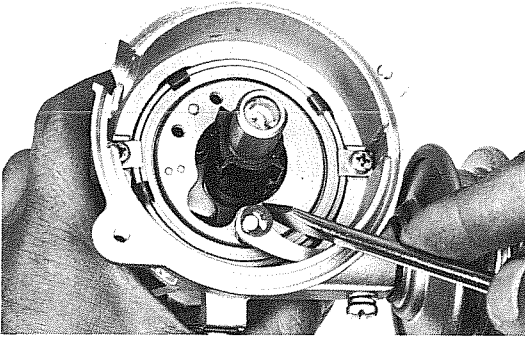
Be sure the E ring is installed in the groove correctly.

Fig. 8-60



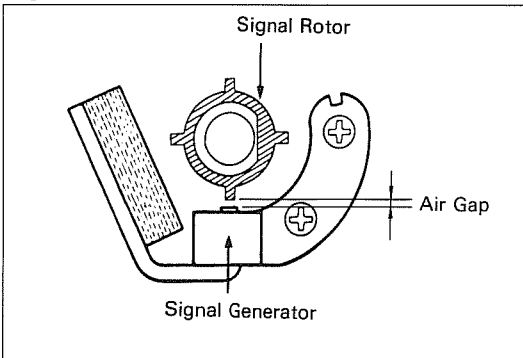
Be sure the governor spring is installed correctly.

Fig. 8-61



Be sure the E ring is installed in the breaker plate correctly.

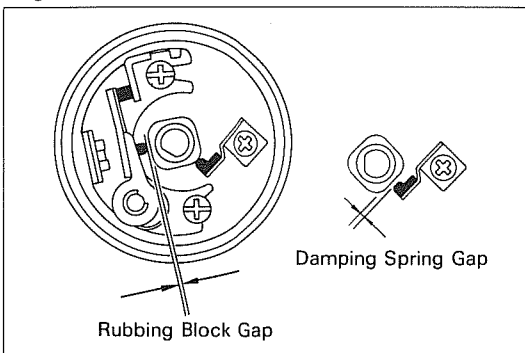
Fig. 8-62



Adjust the air gap. (Breaker points less type)

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

Fig. 8-63

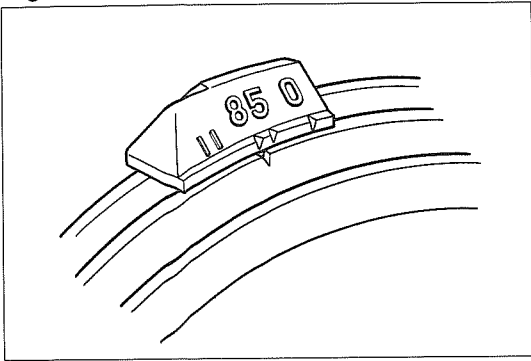


Adjust the rubbing block gap and damping spring gap. (Breaker points type)

Rubbing block gap:
0.45 mm
(0.018 in.)

Damping spring gap:
0.1 – 0.4 mm
(0.004 – 0.016 in.)

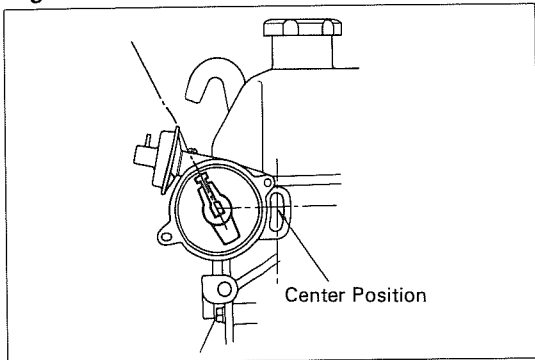
Fig. 8-64



INSTALLATION

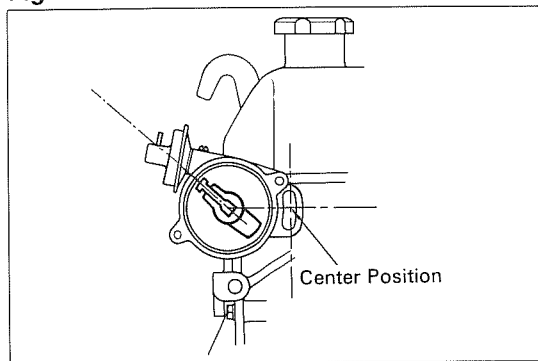
1. Set the No. 1 cylinder to the ignition timing position.

Fig. 8-65



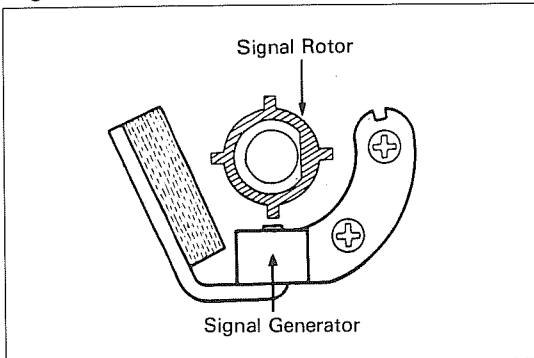
2. Begin insertion of the distributor with the rotor pointing to the vacuum advancer setting screw and the distributor mounting hole approximately at center position of the bolt hole.

Fig. 8-66



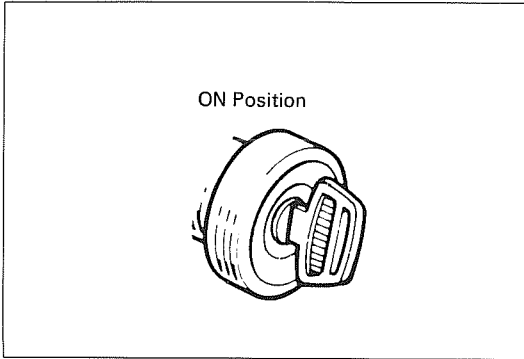
3. When fully installed, the rotor will rotate to the position shown in the figure.

Fig. 8-67



4. Align the rotor tooth with the signal generator, and tighten the clamp bolt in that position.

Fig. 8-68

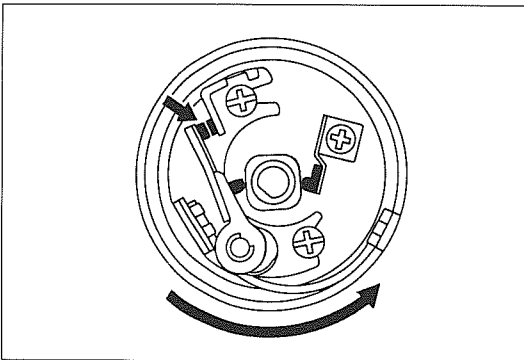


5. Turn the ignition switch ON. (Breaker points type)

— Note —

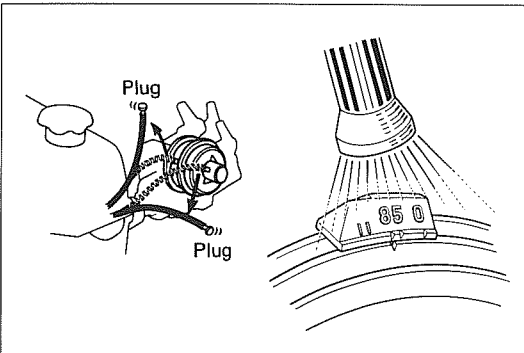
Do not turn the starter motor.

Fig. 8-69



6. Rotate the distributor body counterclockwise until a spark jumps between the points, and tighten the clamp bolt in that position.

Fig. 8-70



7. Check the ignition timing at idle speed.

Ignition timing:

21R & 21R-C (Sweden):

8° BTDC/Max. 750 rpm

21R-C (Australia):

5° BTDC/Max. 600 rpm (M/T)

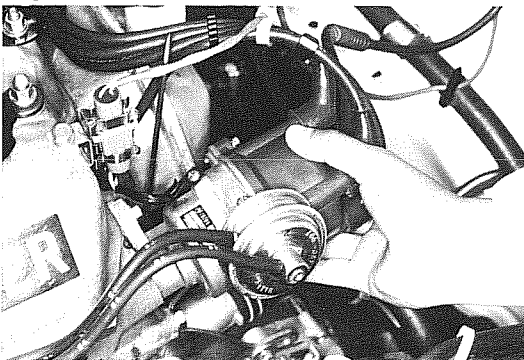
5° BTDC/Max. 650 rpm (A/T)

22R

8° BTDC/Max. 950 rpm

(w/ Vacuum advancer OFF)

Fig. 8-71



8. If necessary, align the timing marks by turning the distributor body.