Distributors & Ignition Systems

HITACHI ELECTRONIC IGNITION — HONDA

Accord, Civic, Prelude

NOTE: Some Honda models use Toyo Denso distributors. See appropriate article in this section.

DESCRIPTION

Honda's Hitachi electronic distributors consist of a distributor housing, rotor and the distributor cap. The reluctor, stator, magnets, pulse generator/ignitor and breaker plate assemblies are all located inside the distributor housing.

All models use a centrifugal advance system. All Civic models and Accord/Prelude models, with manual transmissions, use a vacuum advance system. Hitachi-equipped Accord/Prelude models, with automatic transmissions, use a vacuum advance/retard system.

OPERATION

The reluctor, secured to the distributor rotor shaft by a roll pin, turns with the distributor shaft. As the reluctor turns, its 4 external teeth come in line with the 2 stator upright teeth.

As the reluctor approaches and passes the stator teeth, variations occur in the magnetic field around them. This causes the pulse generator to signal the ignitor.

Each time the reluctor teeth come in line with and then pass the stator teeth, transistors inside the ignitor are turned off and on. This results in a magnetic field building and collapsing in the primary circuit of the ignition coil. When this field collapses, a voltage surge occurs in the secondary circuit of the ignition coil.

When this occurs, a high voltage spark is fed from the coil, through the distributor rotor and cap to the secondary wiring and spark plugs.

Fig. 1: Disassembled View of Hitachi Distributor

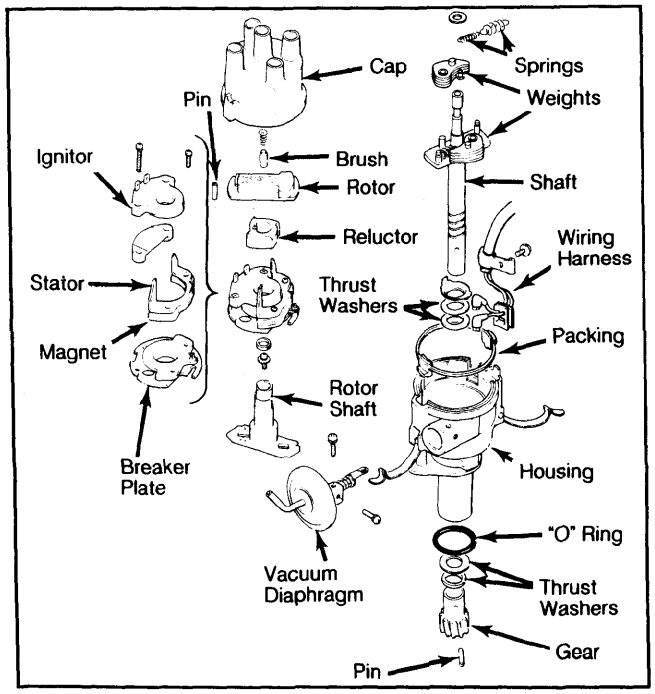
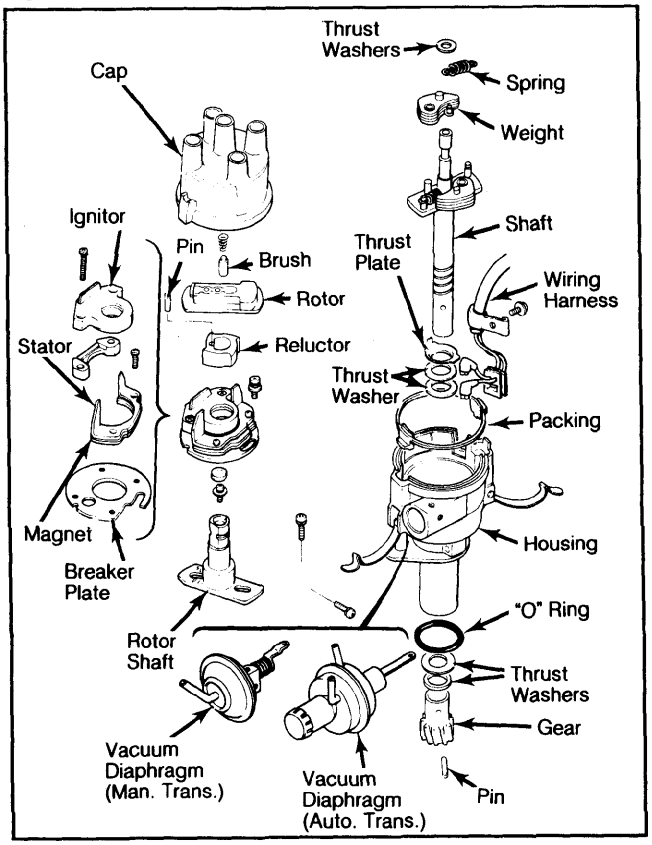


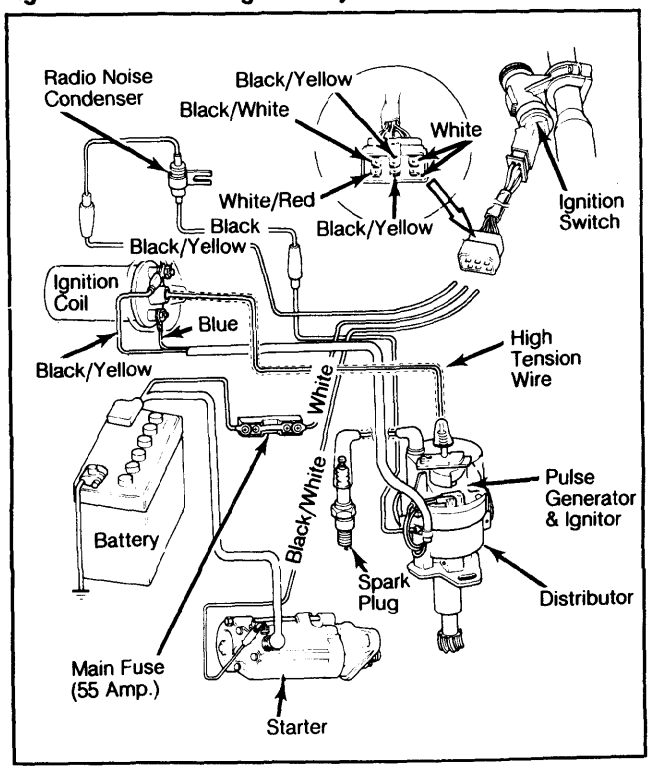
Illustration applies to Civic and Accord models.

Fig. 2: Disassembled View of Hitachi Distributor



This distributor is used in Prelude models.

Fig. 3: Schematic of Ignition System



This diagram applies to Accord and Prelude models.

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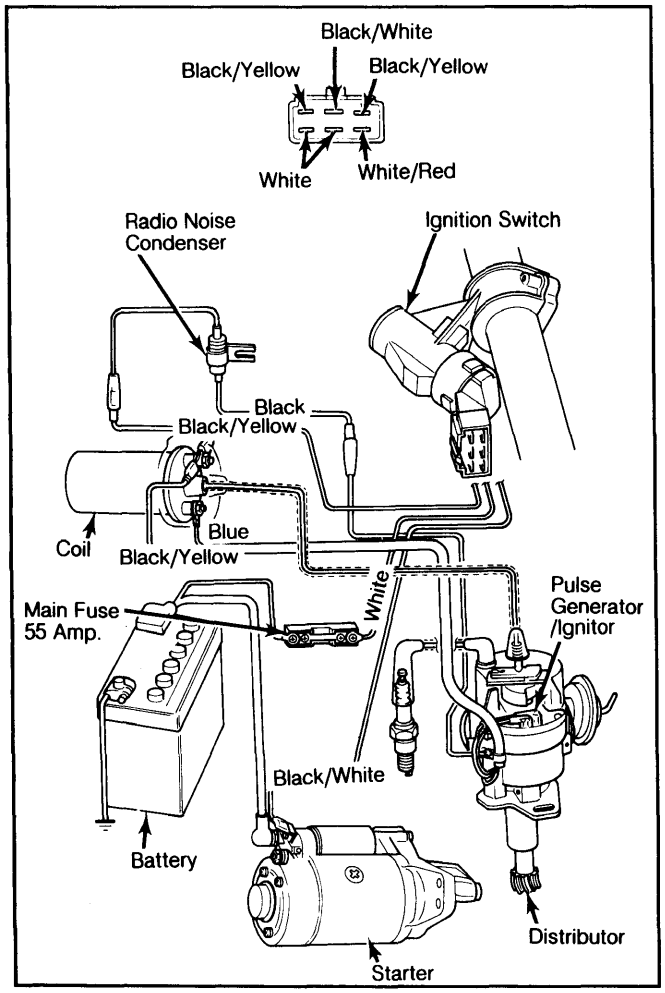
Fig. 4: Schematic of Ignition System



This diagram applies to Civic models.

SPECIFICATIONS

CENTRIFUGAL & VACUUM ADVANCE/RETARD

See the appropriate Distributor Specifications Table in this section.

ADJUSTMENT

CAUTION: To avoid damaging the ignition system, never reverse battery polarity. Do not let pulse generator wires touch ignition wires. Do not do anything that would produce abnormal pulses. Always connect pulse type tachometers to negative terminal of ignition coil. Make sure all wires and cables are connected properly.

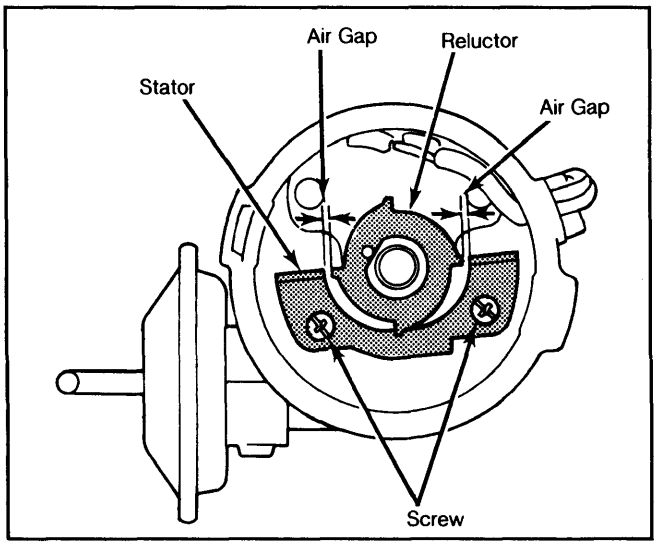
CAM ANGLE

Cam angle (dwell) is automatically set and manual adjustment is not required.

RELUCTOR-TO-STATOR AIR GAP

Align 2 teeth of reluctor with 2 teeth of stator and check air gap. Check air gap at all teeth as reluctor is rotated. *See Fig. 5.* There should be equal air gap at all 4 teeth. If necessary to adjust, loosen 2 screws securing stator and reposition stator to provide equal air gaps. Tighten 2 screws.

Fig. 5: Adjusting Reluctor-To-Stator Air Gap



Air gap should be equal at all teeth.

ROTOR-TO-DISTRIBUTOR CAP TERMINAL

Check occasionally for rough or pitted rotor or cap terminals. Scrape or file off carbon deposits. Smooth rotor terminal with an oil stone or No. 600 sandpaper if roughness exists.

CENTRIFUGAL ADVANCE

Disconnect vacuum advance hoses from distributor. Connect timing light and start engine. Increase engine speed. Timing mark (T) should appear to move past pointer toward firewall, indicating an increase in ignition advance. If not, check centrifugal advance mechanism for sticking or binding.

VACUUM ADVANCE

1) Remove distributor cap. Disconnect vacuum hoses from distributor vacuum advance or advance/retard diaphragm. Connect vacuum pump to diaphragm. Gradually draw a vacuum while watching breaker plate movement.

2) Check for smooth operation without binding. If pump indicates a loss of vacuum, replace diaphragm unit. Turn breaker plate right and left to check for free movement.

TESTING

BASIC SYSTEM TEST

1) If engine will not start and starter will not crank engine, check battery, main fuse and electrical wiring. Check starter circuit wiring and ignition switch. If

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engine will not start, but starter cranks engine, hold coil wire 1/4" from coil tower while cranking engine.

2) If there is spark from coil, then hold spark plug wire terminal 1/4" from spark plug while cranking engine.

3) If there is no spark at the plug, check spark plug wire condition, inspect distributor cap and rotor, and as a last resort, replace ignitor in distributor. If spark exists at the plug, check fuel system, spark plugs, ignition timing or valve timing.

4) If there was no spark at the coil in step **1)**, check voltage between coil primary winding positive terminal and ground with ignition switch in "ON" position. Battery voltage should be found. If not, check wiring from ignition switch to ignition coil.

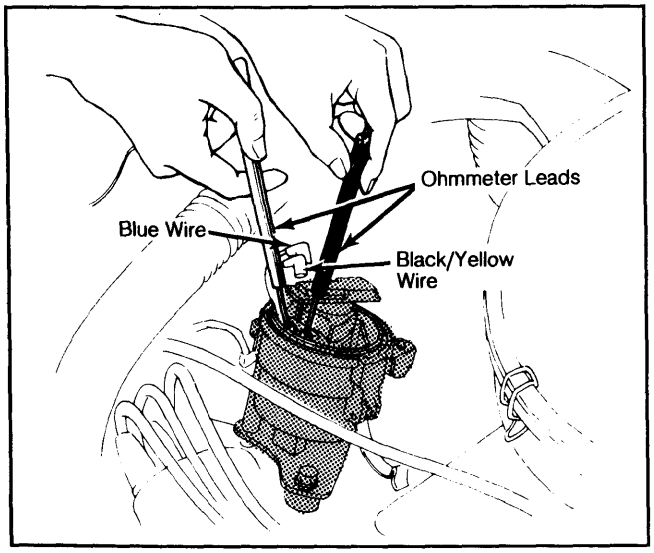
5) If battery voltage exists, check voltage between coil primary winding negative terminal and ground with ignition switch in "ON" position. Again, battery voltage should exist. If not, check wiring from coil primary negative terminal to ignitor. Also check coil primary resistance.

6) If battery voltage was present at negative terminal, check voltage between coil positive and negative terminals with engine cranking. Reading should be 1-3 volts. If within specifications, check primary and secondary coil resistance. Also check spark plug wire resistance.

7) If voltage in step **6)** was not 1-3 volts, disconnect lead wires from ignitor in distributor. Check voltage on coil side of connector, first between blue wire and black (ground) wire and then between black/yellow wire and black (ground) wire. Battery voltage should exist with ignition switch "ON".

8) If not, check wiring from ignition coil to ignitor. Check continuity between ignitor terminals. *See Fig. 6.* Set ohmmeter to x100 range. Attach positive lead to terminal for black/yellow wire and negative lead to terminal for blue wire. There should be continuity.

Fig. 6: Checking Continuity at Ignitor Terminals



Test as shown and then reverse probe connections.

9) Then, reverse ohmmeter leads (positive lead to terminal for blue wire, negative lead to terminal for black/yellow wire). There should be no continuity. If incorrect results are obtained, replace ignitor and repeat test.

COMPONENT TESTS

Ignition Coil Primary Resistance

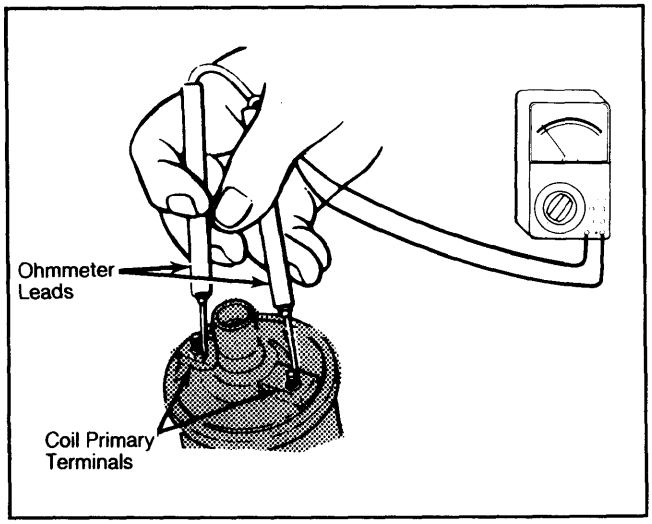
1) Turn ignition switch "OFF" and remove positive and negative wires from ignition coil terminals. Connect an ohmmeter set in the x1 range with one probe touching each primary terminal. *See Fig. 7.*

2) On Accord and Prelude models, reading should be 1.06-1.24 ohms. On Civic models, reading should be 1.0-1.3 ohms. If reading is not to specifications, replace ignition coil.

Ignition Coil Secondary Resistance

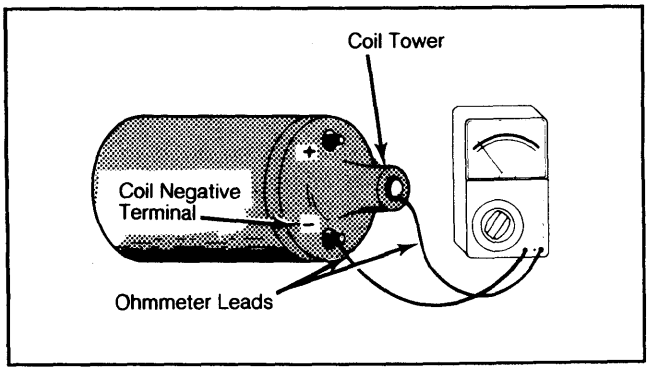
Turn ignition switch "OFF". Set ohmmeter in x1000 range. Connect ohmmeter leads to ignition coil negative terminal (wire removed) and coil tower terminal. *See Fig. 8.* On all models, secondary resistance should be 7,400-11,000 ohms. If not replace ignition coil.

Fig. 7: Checking Ignition Coil Primary Resistance



Attach probes to positive and negative terminals.

Fig. 8: Checking Ignition Coil Secondary Resistance



Attach leads to negative terminal and coil tower.

Condenser Capacity

Using a condenser tester, check for 0.38-0.56 microfarads.

Ignition Wire Resistance

Carefully remove wires by pulling on their rubber boots. Do not bend wire or conductor may be broken. Check for corroded condition, cleaning if necessary. Connect ohmmeter probes (set in x1000 scale) to each end of ignition wires. Resistance reading should be less than 25,000 ohms. If not, replace wires.

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OVERHAUL

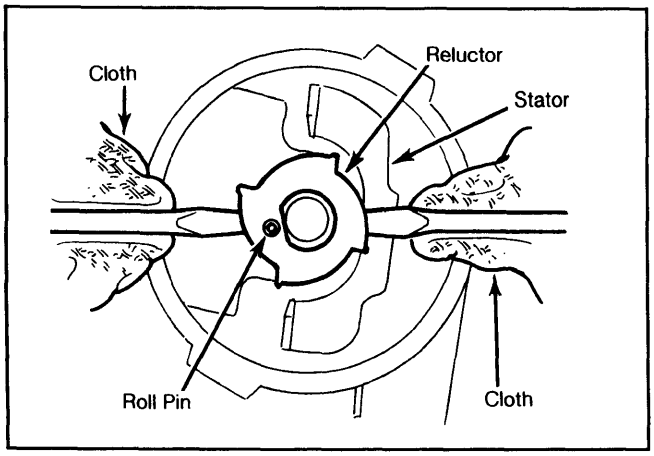
DISASSEMBLY

1) Remove all spark plug wires and vacuum hoses from the distributor. Remove distributor cap. Remove the condenser ground wire, and disconnect pulse generator/ignitor wire connector from distributor. Remove hold-down bolt, and lift distributor from cylinder head.

2) Carefully pry upward on reluctor with 2 screwdrivers, cushioned with rags to prevent damage to distributor housing. *See Fig. 9.* Use care not to damage reluctor or stator.

3) Remove advance (or retard) diaphragm mounting screw. Pull out on diaphragm unit, while lifting up on end of diaphram arm.

Fig. 9: Removing Reluctor from Shaft



Use cloths and screwdrivers to pry off reluctor.

4) On all models, drive roll pin from distributor shaft. Remove shaft and gear from housing. Inspect and replace parts as necessary.

REASSEMBLY

1) Install centrifugal advance weights and springs. Install thrust plate and 2 washers on shaft. Grease shaft and install in housing. Put 2 washers and gear on lower end of shaft. Line up holes in gear shoulder with hole in shaft. Drive in new roll pin.

2) Rotate gear until mark on gear shoulder lines up with mark on housing. Hold gear in line with mark and install rotor shaft on top of main shaft. Flat surface should face vacuum advance side of housing.

3) Be sure holes in rotor shaft arms fit over pins in centrifugal advance weights. Install screw with lock washer in top of shaft.

4) Align breaker plate in distributor housing. *See Fig. 10.* Check that upper plate moves freely. Be sure diaphragm arm attachment pin does not rotate past end of slot in lower plate.

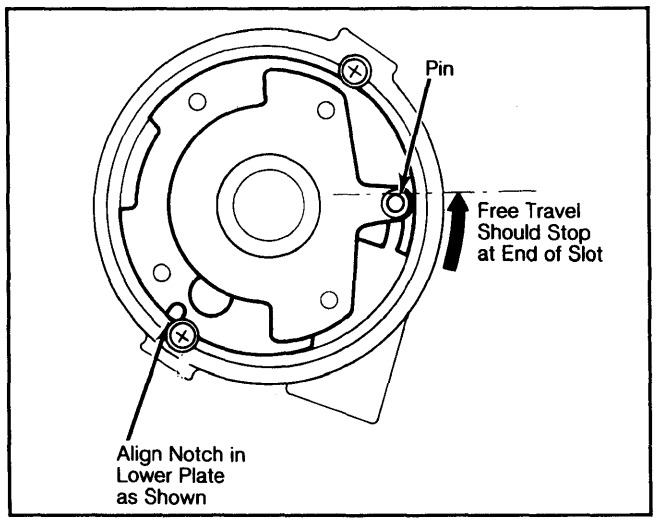
5) If such condition exists, adjust range of free travel by forcibly rotating plate past its limit in opposite direction. Recheck pin position. When installing reluctor, drive roll pin in place with its gap away from distributor shaft.

6) Check reluctor-to-stator air gap and rotor-to-terminal surfaces. Install diaphragm assembly. Crank engine until No. 1 piston is at TDC. Position rotor 1/8 turn past firing position for No. 1 cylinder (mark on distributor).

7) Install new "O" ring on distributor housing. Line up mark on distributor gear shoulder with mark on housing. Insert distributor straight into final position. Rotor will turn itself to No. 1 firing position.

8) Install hold-down bolt, and tighten it temporarily. Set ignition timing, and tighten hold-down bolt securely. Install distributor cap, aligning mark on cap (near clamp lug) with rotor.

Fig. 10: Installation of Breaker Plate to Distributor Housing



Be sure diaphragm arm pin does not rotate past end of slot in lower plate.