

F - BASIC TESTING

Article Text

1993 Honda Prelude

For Cadi Centre Nsk CA 95051

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ARTICLE BEGINNING

1993 ENGINE PERFORMANCE

Honda Basic Diagnostic Procedures

Accord, Civic, Civic Del Sol, Prelude

INTRODUCTION

The following diagnostic steps will help prevent overlooking a simple problem. This is also where to begin diagnosis for a no-start condition.

The first step in diagnosing any driveability problem is verifying the customer complaint with a test drive vehicle under the conditions that the problem reportedly occurred.

Before entering self-diagnostics, perform a careful and complete visual inspection. Most engine control problems result from mechanical breakdowns, poor electrical connections or damaged/misrouted vacuum hoses. Before condemning computerized system, perform each test listed in this article.

NOTE: Perform all voltage tests with a Digital Volt-Ohmmeter (DVOM) with a minimum 10-megohm input impedance, unless stated otherwise in test procedure.

PRELIMINARY INSPECTION & ADJUSTMENTS

VISUAL INSPECTION

Visually inspect all electrical wiring for chafed, stretched, cut or pinched wiring. Ensure electrical connectors fit tightly and are not corroded. Ensure vacuum hoses are properly routed and not pinched or cut. See M - VACUUM DIAGRAMS article in the ENGINE PERFORMANCE Section to verify routing and connections. Inspect air induction system for possible vacuum leaks.

MECHANICAL INSPECTION

Compression

Check engine mechanical condition with a compression gauge, vacuum gauge, or an engine analyzer. See engine analyzer manual for specific instructions.

WARNING: DO NOT use ignition switch during compression tests on fuel injected vehicles. Use a remote starter to crank engine. Fuel injectors on many models are triggered by ignition switch during cranking mode, which can create a

fire hazard or contaminate the engine's oiling system.

Check compression pressure with engine at normal operating temperature, all spark plugs removed, throttle valves wide open and at specified cranking speed. Crank engine at least 6 revolutions to determine engine compression. See ENGINE COMPRESSION table.

ENGINE COMPRESSION TABLE (1)

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Model	Standard psi (kg/cm ²)	Minimum psi (kg/cm ²)	Minimum RPM		
Accord & Prelude	178 (12.5)	135 (9.5)	250		
Civic & Civic Del Sol	185 (13.0)	135 (9.5)	250		

(1) - Maximum variation between cylinders is 28 psi (2.0 kg/cm²).

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Exhaust System Backpressure

Exhaust system can be checked using a vacuum or pressure gauge. Remove O2 sensor or LAF sensor. Connect a 1-5 psi pressure gauge, and run engine at 2500 RPM. If exhaust system backpressure exceeds 1 3/4 - 2 psi (.12-.14 kg/cm²), exhaust system or catalytic converter is plugged.

If using a vacuum gauge, connect vacuum gauge hose to intake manifold vacuum port and start engine. Observe vacuum gauge. Open throttle part way and hold steady. If vacuum slowly drops after stabilizing, check exhaust system for restrictions.

FUEL SYSTEM

WARNING: Always relieve fuel pressure before disconnecting any fuel injection-related component. DO NOT allow fuel to contact engine or electrical components.

FUEL PRESSURE

Relieving Fuel Pressure

Remove negative battery cable. Loosen fuel tank filler cap. Place clean shop rag around fuel filter. Slowly loosen 6-mm bolt on top of fuel filter (one complete turn) to relieve system pressure. Always replace washer under 6-mm bolt after loosening.

Basic Diagnosis

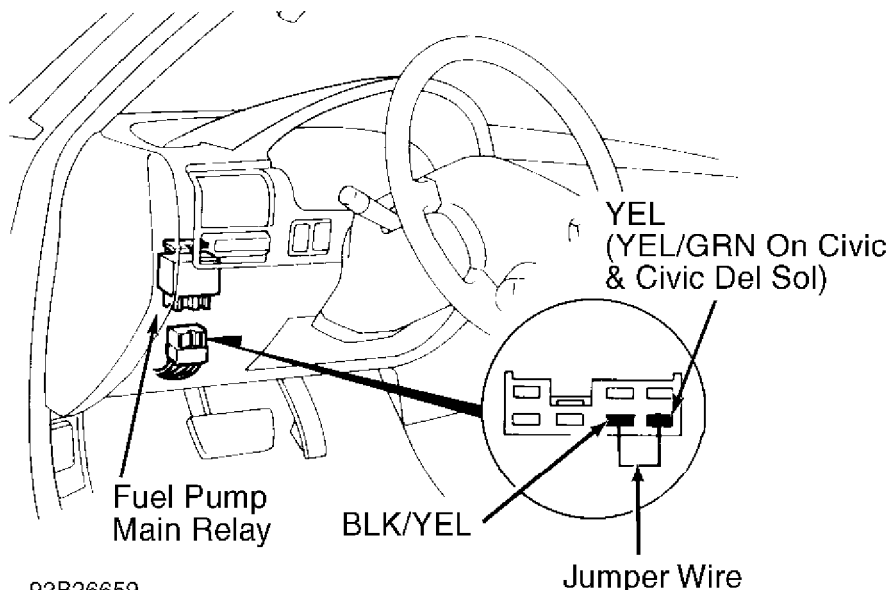
Begin basic diagnosis of fuel system by determining fuel system pressure. If fuel pump fails to run, inspect power supply to

main relay. If all power supplies are present (i.e., battery, ignition and starter switch during cranking), perform functional test of main relay. See M - WIRING DIAGRAMS and I - SYS/COMP TESTS articles in the ENGINE PERFORMANCE Section.

Pressure Testing

1) Disconnect negative battery cable. Relieve fuel pressure. See RELIEVING FUEL PRESSURE. Connect Fuel Pressure Gauge (07406-0040001) at 6-mm bolt. Reconnect negative battery cable. Start engine, and note fuel pressure. If vehicle will not start, check for spark. If spark is present and no fuel pressure is evident, inspect fuel pump main relay.

2) Remove connector from fuel pump main relay. See Fig. 1. Using a test light, check for power on Black/Yellow wire at fuel pump relay connector. If power is present, connect a jumper wire between Black/Yellow wire (B+) and Yellow wire (Yellow/Green wire on Civic & Civic Del Sol).



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Fig. 1: Locating Fuel Injection Main Relay
Courtesy of American Honda Motor Co., Inc.

3) If fuel pump runs, go to step 4). If fuel pump fails to run, see I - SYS/COMP TESTS article in the ENGINE PERFORMANCE Section. If no voltage is present on Black/Yellow wire, check for open in wire between fuel pump main relay connector and fuse No. 2 on fuse box. Go to step 4) after repairing circuit.

4) Start engine. Disconnect vacuum hose from pressure regulator, and check for manifold vacuum. If vacuum is not present, check for restriction in vacuum port or hose. Plug vacuum hose and inspect fuel pressure gauge reading. Gauge reading should be within specification. See FUEL PRESSURE table. Pressure should drop slightly

when vacuum hose is reconnected.

REGULATED FUEL PRESSURE TABLE (1)

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Application At Idle - psi (kg/cm)

Accord, Civic & Civic Del Sol

Vacuum Hose Disconnected	40-47 (2.8-3.3)
Vacuum Hose Connected	.....	30-38 (2.1-2.7)

Prelude

2.2L Engine (F22A1)

Vacuum Hose Disconnected	.....	36-43 (2.5-3.0)
Vacuum Hose Connected	.....	28-35 (2.0-2.5)

2.2L Engine (H22A1)

Vacuum Hose Disconnected	.....	33-40 (2.3-2.8)
Vacuum Hose Connected	.....	25-32 (1.8-2.3)

2.3L Engine(H23A1)

Vacuum Hose Disconnected	.....	36-43 (2.5-3.0)
Vacuum Hose Connected	.....	28-35 (2.0-2.5)

(1) - Measure regulated fuel pressure with vacuum hose connected and disconnected from pressure regulator.

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5) If pressure is higher than specified, inspect for pinched or clogged fuel return line between fuel rail and fuel tank. If no problem is found in fuel line, replace pressure regulator.

6) If pressure is less than specified, inspect for plugged fuel filter. If filter is not plugged, lightly pinch fuel return line. If pressure does not increase, replace fuel pump. If pressure increases, replace pressure regulator.

NOTE: If vehicle starts and runs, fuel pump main relay is okay.

IGNITION CHECKS

ELECTRONIC IGNITION SYSTEM

Spark

Check for spark at secondary coil wire and each spark plug wire using a spark tester. If spark is not present, continue with following tests. Check spark plug wire resistance on suspect wires. Resistance should be less than 25,000 ohms.

Ignition Coil Power Source

1) On Civic, remove distributor cap to check power source directly at coil. On all models, disconnect ignition coil primary

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leads. Turn ignition on. Using voltmeter, check voltage between ground and Black/Yellow wire terminal of ignition coil harness.

2) Battery voltage should be present. If battery voltage is not present, check for open in Black/Yellow wire between coil and ignition switch.

Ignitor Power Source

Turn ignition off. Disconnect harness connector at distributor. Turn ignition on. Using voltmeter, check for battery voltage between ground and Black/Yellow wire of harness. If voltage is not present, check for open in Black/Yellow wire between ignition coil and harness connector. If wire is okay, check ignition coil resistance (for internal short to ground).

Ignitor Check

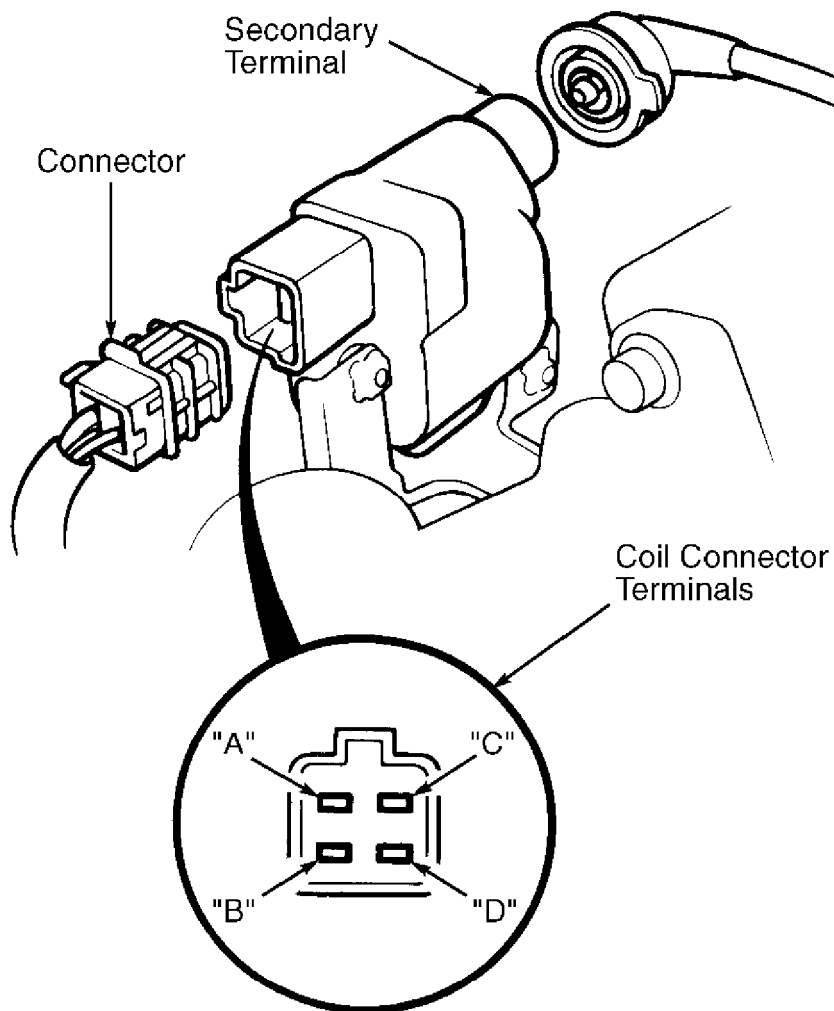
Check TDC/CRANK/CYL sensor resistance values. See TACH PULSE SIGNAL. Check power sources. If no problems are found and spark is not present, replace ignitor.

Ignition Coil Resistance (Accord & Prelude)

1) Remove primary and secondary leads from ignition coil. Using an ohmmeter, check resistance between primary terminals "A" and "C" ("A" and "B" for Prelude) of ignition coil. See Fig. 2. Resistance should be .6-.8 ohm at room temperature.

2) On Accord, check resistance between terminals "B" and "D" of ignition coil (tachometer circuit). Resistance should be about 2090-2310 ohms at room temperature.

3) On all models, check secondary resistance between terminal "A" and secondary output terminal (coil tower). See IGNITION COIL RESISTANCE table. Check for continuity between terminals "A" and "B" ("A" and "C" for Prelude). Continuity should exist. If readings are not within specification, replace coil.



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Fig. 2: Identifying Ignition Coil Terminals (Accord & Prelude)
 Courtesy of American Honda Motor Co., Inc.

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Application			
	Primary		Secondary

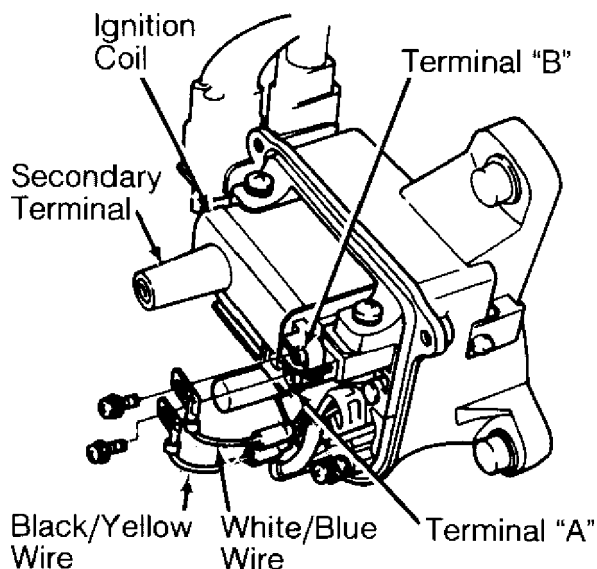
Accord & Prelude	.6-.8	14,400-21,600
Civic & Civic Del Sol	.6-.8	12,800-19,200

Ignition Coil Resistance (Civic & Civic Del Sol)

1) Turn ignition off. Remove distributor cap. Remove 2 Phillips screws retaining primary ignition leads to ignition coil. Remove primary leads from ignition coil. Using an ohmmeter, check resistance between primary terminals "A" and "B" on ignition coil. See Fig. 3. Resistance should be .6-.8 ohm at room temperature.

2) Check secondary resistance between terminal "A" and secondary output terminal (coil tower) at room temperature. See

IGNITION COIL RESISTANCE table. If readings are not within specification, replace coil.

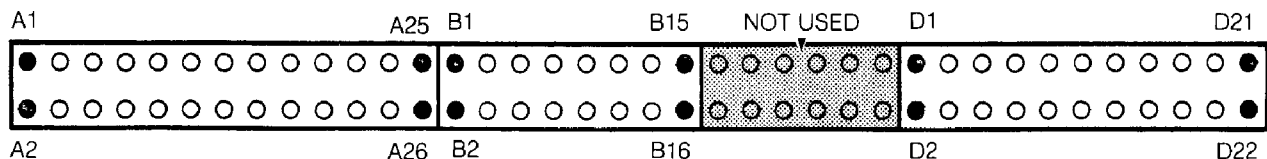


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Fig. 3: Identifying Ignition Coil Terminals (Civic & Civic Del Sol)
 Courtesy of American Honda Motor Co., Inc.

Tach Pulse Signal

1) Timing control and triggering of fuel injectors are based upon input signals from TDC/CRANK/CYL sensors. These sensors are simple Permanent Magnet (PM) generator pick-up coils.

2) Using a DVOM on low voltage scale (preferably with a bar-graph function), check for a pulsed low-voltage signal at proper Engine Control Module (ECM) harness terminals with engine cranking. See Fig. 4. See WIRING HARNESS & SENSOR RESISTANCE TEST table. If a pulsed signal is present, no fault is present. If pulsed signal is not present, check sensor and wiring integrity.



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Fig. 4: Identifying ECM Wire Harness Connector Terminals
 Courtesy of American Honda Motor Co., Inc.

3) To test sensor and wiring integrity, turn ignition off. Disconnect connectors from ECM. Lightly probe appropriate ECM harness terminals to check for proper winding resistance of each sensor. See WIRING HARNESS & SENSOR RESISTANCE TEST table. If resistance is within specification, go to step 5). If resistance is not within specification, check resistance of TDC/CRANK/CYL sensor directly. **BASIC TESTII**

sensor connector. See Fig. 5. See TDC/CRANK/CYL SENSOR RESISTANCE TEST table.

4) If sensor resistance is now within specification, repair opens, shorts or corrosion in wire harness between sensor(s) and ECM. If resistance is not within specification, replace sensor.

5) If resistance values in step 3) were within specification, check for continuity to ground at each ECM sensor terminal. If continuity is present, disconnect sensor(s) and recheck for continuity to ground at ECM harness sensor terminals. If continuity no longer exists, go to next step. If continuity to ground is still present, repair short to ground in ECM harness between ECM and sensor(s).

6) If continuity did not exist with sensor disconnected, check for continuity to ground on each sensor connector terminal. See Fig. 5. See TDC/CRANK/CYL SENSOR RESISTANCE TEST table. If continuity to ground exists, replace sensor.

WIRING HARNESS & SENSOR RESISTANCE TEST TABLE

Application		Terminals	Ohms
Accord			
CRANK	.....	B15 & B16	260-500
CYL	.....	B11 & B12	260-500
TDC	.....	B13 & B14	260-500
Civic, Civic Del Sol & Prelude			
CRANK	.....	B15 & B16	350-700
CYL	.....	B11 & B12	350-700
TDC	.....	B13 & B14	350-700

TDC/CRANK/CYL SENSOR RESISTANCE TEST TABLE

Application		Terminals	Wire Color
CRANK Sensor Wire			
1 Of 2	.....	"B"	Blue/Green
2 Of 2	.....	"F"	Blue/Yellow
CYL Sensor Wire			
1 Of 2	.....	"D"	Orange
2 Of 2	.....	"H"	White
TDC Sensor Wire			
1 Of 2	.....	"C"	Orange/Blue
2 Of 2	.....	"G"	White/Blue

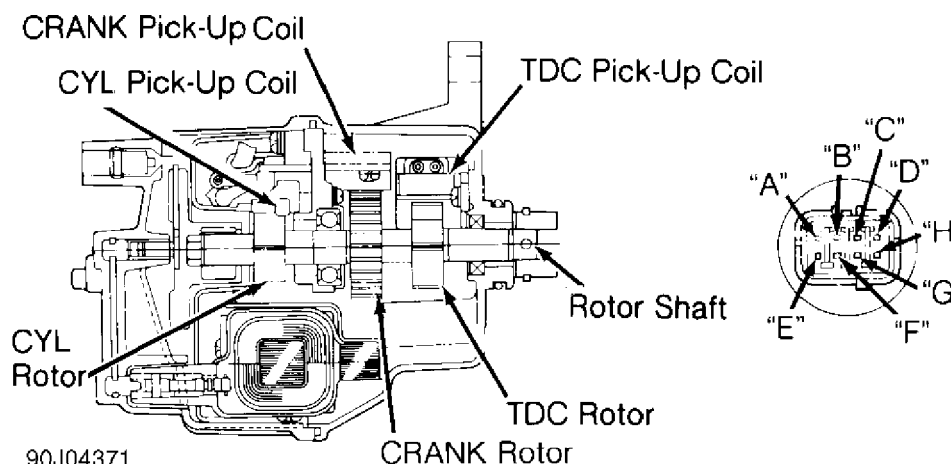


Fig. 5: Identifying TDC/CRANK/CYL Sensor Connector Terminals
 Courtesy of American Honda Motor Co., Inc.

IDLE SPEED & IGNITION TIMING

Ensure idle speed and ignition timing are set to specification. See IDLE SPEED SPECIFICATIONS and IGNITION TIMING tables. For adjustment procedures, see D - ADJUSTMENTS article in the ENGINE PERFORMANCE Section.

IDLE SPEED SPECIFICATIONS TABLE

Application	(1) RPM
Accord & Prelude	500-600
Civic & Civic Del Sol	370-470

(1) - With Intake Air Control (IAC) valve disconnected, headlights and cooling fan off and transmission in Neutral or Park.

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IGNITION TIMING TABLE (Degrees BTDC @ RPM)

Application	Specification
Accord & Prelude	13-17 @ 700-800
Civic & Civic Del Sol	
1.5L	
D15B7	
A/T	16 @ 700
M/T	16 @ 650

1.6L (D16Z6)
A/T 16 @ 700
M/T 16 @ 650
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SUMMARY

 If no faults were found while performing BASIC TESTING, proceed to G - TESTS W/ CODES article in the ENGINE PERFORMANCE Section. If no hard codes are found in self-diagnostics, proceed to H - TESTS W/O CODES article in the ENGINE PERFORMANCE Section for diagnosis by symptom (i.e., ROUGH IDLE, NO-START, etc.), or intermittent diagnosis procedures.

END OF ARTICLE