

Starter Test

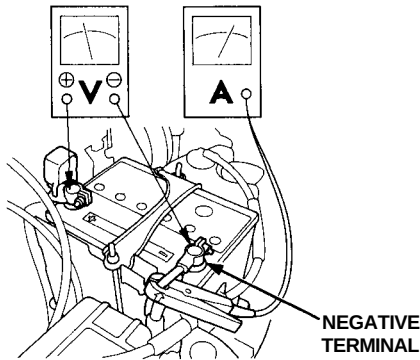
NOTE: The air temperature must be between 59 and 100°F (15 and 38°C) before testing.

Recommended Procedure:

- Use a starter system tester.
- Connect and operate the equipment in accordance with the manufacturer's instructions.
- Test and troubleshoot as described.

Alternate Procedure:

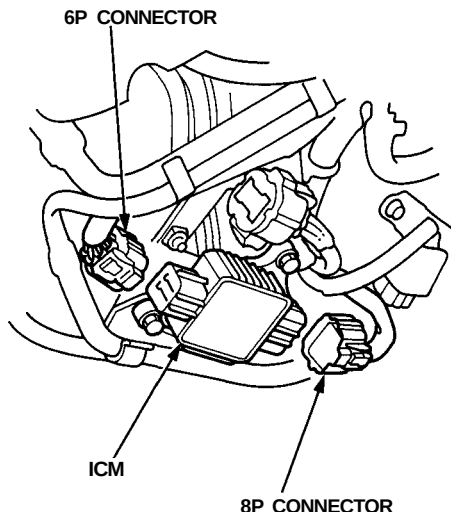
- Use following equipment:
 - Ammeter, 0 - 400 A
 - Voltmeter, 0 - 20 V (accurate within 0.1 volt)
 - Tachometer, 0 - 1,200 rpm
- Hook up a voltmeter and ammeter as shown.



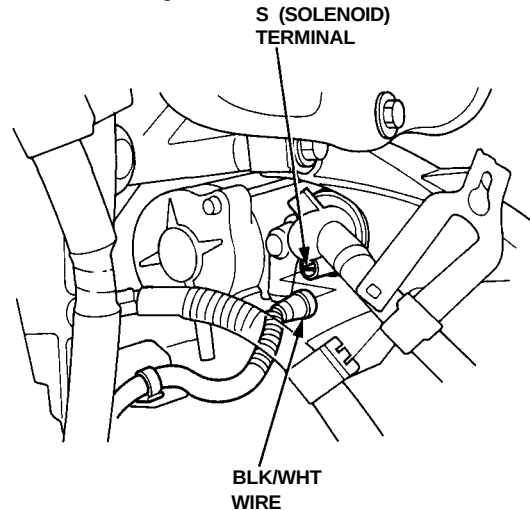
NOTE: After this test, or any subsequent repair, reset the PCM to clear any codes (see [section 11](#)).

Check the Starter Engagement

1. Disconnect the 8P and 6P connector from the ICM.



2. With the shift lever in **P** or **N**, turn the ignition switch to START (III).
 - The starter should crank the engine. If the starter does not crank the engine, go to step 3.
 - If it cranks the engine erratically or too slowly, go to "Check for Wear and Damage" on the next page.
3. Check the battery, battery positive cable, ground, starter cut relay, and the wire connections for looseness and corrosion. Test again. If the starter still does not crank the engine, go to step 4.
4. Unplug the connector (BLK/WHT wire) from the starter. Make sure the shift lever is in **P** or **N**, then connect a jumper wire from the battery positive (+) terminal to the solenoid terminal. The starter should crank the engine.



- If the starter still does not crank the engine, remove it, and diagnose its internal problem.
 - If the starter cranks the engine, go to step 5 and continue the test.
5. Check the ignition switch.
 6. Check the starter cut relay.
 7. Check for an open in the wire between the ignition switch and starter.
 8. Check the immobilizer system (see [section 23](#)).

(cont'd)

Starting System

Starter Test (cont'd)

Check for Wear and Damage

The starter should crank the engine smoothly and steadily. If the starter engages, but cranks the engine erratically, remove it, and inspect the starter drive gear and drive plate ring gear for damage.

Check the drive gear overrunning clutch for binding or slipping when the armature is rotated with the drive gear held. If the clutch is damaged, replace the clutch assembly.

Check Cranking Voltage and Current Draw

Cranking voltage should be no less than 8.0 volts.
Current draw should be no more than 400 amperes.

If cranking voltage is too low, or current draw too high, check for:

- Dead or low battery
- Open circuit in starter armature commutator segments
- Starter armature dragging
- Shorted armature winding
- Excessive drag in engine

Check Cranking rpm

Engine speed during cranking should be above 100 rpm.

If speed is too low, check for:

- Loose battery or starter terminals
- Excessively worn starter brushes
- Open circuit in commutator segments
- Dirty or damaged helical spline or drive gear
- Defective drive gear overrunning clutch

Check Starter Disengagement

With the shift lever in **P** or **N**, turn the ignition switch to "START (III)", and release to "ON (II)". The starter drive gear should disengage from the drive plate ring gear when you release the key.

If the drive gear hangs up on the drive plate ring gear, check for:

- Solenoid plunger and switch malfunction
- Dirty drive gear assembly or damaged overrunning clutch