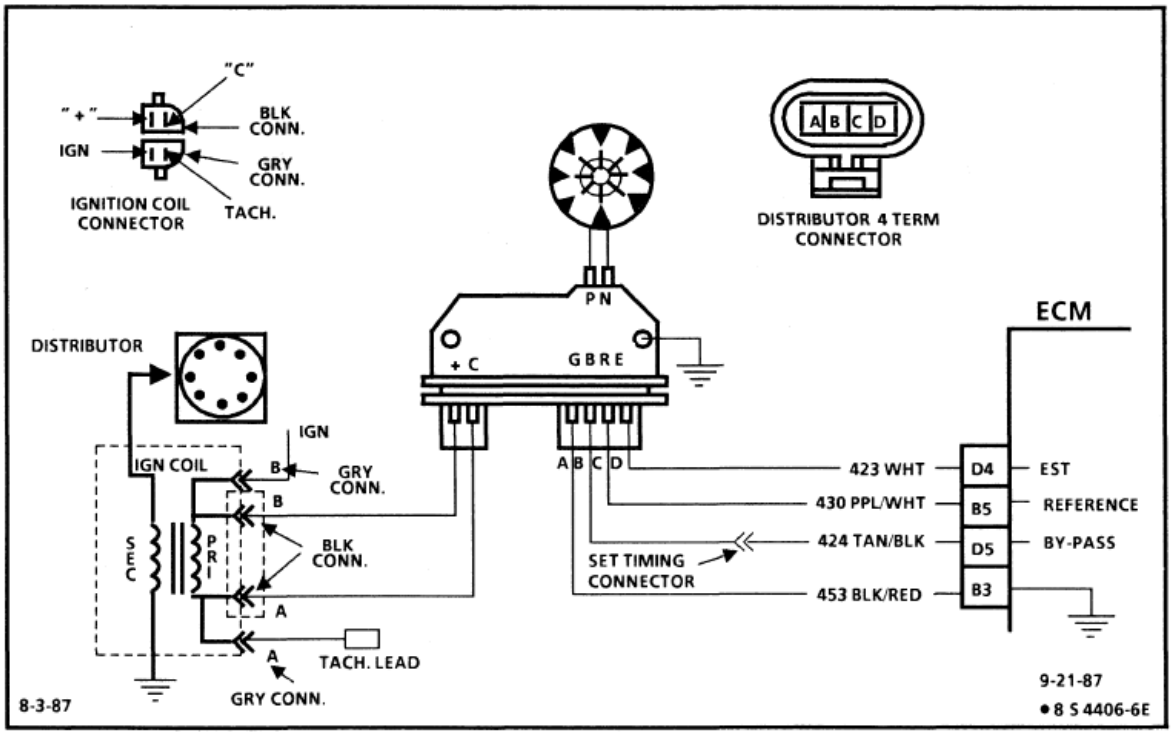

CHART C-4

IGNITION SYSTEM CHECK
(REMOTE COIL/SEALED MODULE CONNECTOR DISTRIBUTOR)
5.0L (VIN F) & 5.7L (VIN 8) "F" CARLINE (PORT)

Test Description: Numbers below refer to circled numbers on the diagnostic chart.

1. Two wires are checked, to ensure that an open is not present in a spark plug wire.

1A. If spark occurs with EST connector disconnected, pick-up coil output is too low for EST operation.

2. A spark indicates the problem must be the distributor cap or rotor.

3. Normally, there should be battery voltage at the "C" and "+" terminals. Low voltage would indicate an open or a high resistance circuit from the distributor to the coil or ignition switch. If "C" terminal voltage was low, but "+" terminal voltage is 10 volts or more, circuit from "C" terminal to ignition coil or ignition coil primary winding is open.

4. Checks for a shorted module or grounded circuit from the ignition coil to the module. The distributor module should be turned "OFF", so normal voltage should be about 12 volts.
   If the module is turned "ON", the voltage would be low, but above 1 volt. This could cause the ignition coil to fail from excessive heat.
   With an open ignition coil primary winding, a small amount of voltage will leak through the module from the Batt+" to the tach terminal.

5. Applying a voltage (1.5 to 8 volts) to module terminal "P" should turn the module ON" and the tach terminal voltage should drop to about 7-9 volts. This test will determine whether the module or coil is faulty or if the pick-up coil is not generating the proper signal to turn the module "ON". This test can be performed by using a DC battery with a rating of 1.5 to 8 volts. The use of the test light is mainly to allow the "P" terminal to be probed more easily. Some digital multi-meters can also be used to trigger the module by selecting ohms, usually the diode position. In this position the meter may have a voltage across it's terminals which can be used to trigger the module. The voltage in the ohm's position can be checked by using a second meter or by checking the manufacturer's specification of the tool being used.

6. This should turn "OFF" the module and cause a spark. If no spark occurs, the fault is most likely in the ignition coil, because most module problems would have been found before this point in the procedure. A module tester could determine which is at fault.

CHART C-4
IGNITION SYSTEM CHECK
(REMOTE COIL/SEALED MODULE CONNECTOR DISTRIBUTOR)
5.0L (VIN F) & 5.7L (VIN 8) "F" CARLINE (PORT)

1 • Perform Diagnostic Circuit Check before proceeding with this test. (If a tachometer is connected to the Tach term., disconnect it before proceeding with the test).
• Check spark at plug with spark tester J-26792 or equivalent (ST-125) while cranking (if no spark on one wire, check a second wire) A few sparks and then nothing is considered no spark.

- No Spark → **1A** • Disconnect 4 term. distributor connector and check for spark.
  - No spark → **2** • Check for spark at coil wire with tester while cranking. (Leave spark tester connected to coil wire for Steps 3-6).
    - No Spark → **3** • Disconnect distributor 2 term. "C / + " connector. • Ignition switch "on", Engine stopped. • Check volts at " + " and "C" term's. of dist. harn. conn.
      - Both term's. 10 volts or more → **4** • Reconnect dist. 2 term. conn. • With ign. "ON", check voltage from tach. term. to gnd. (term. may be taped back in harness).
        - Over10 volts → • Connect test light from tach. term. to ground. • Crank engine and observe light.
          - Light on steady → **5** • Disconnect distributor 4 term. connector. • Remove dist. cap. • Disconnect pick-up coil connector from module. • Connect voltmeter from tach. term. to ground. • Ignition on. • Insulate a test light probe to 1/4" from tip and note voltage, as test light is momentarily connected from a voltage source (1.5 to 8V) to module term. "P". (Fig. 1).
            - Voltage drops → **6** • Check for spark from coil wire with spark tester as test light is removed from module term.
              - No Spark → • If no module tester (J24642) is available; Replace ign. coil and repeat Step 5.
                - No Spark → Ign. coil removed is OK, reinstall coil and check coil wire from dist. cap. if OK, replace dist. module.
                - Spark → System OK
              - Spark → • If module tester (J24642) is available: test module
                - OK → Check coil wire from cap to coil. If OK, replace coil.
                - Not OK → Replace module
            - No drop in voltage → Check module ground. If OK, replace module.
          - Light blinks → Replace ignition coil and recheck for spark with spark tester. If still no spark, re-install original coil and replace dist. module..
        - Under 1 volt → Repair open tach. lead or conn and repeat test #4.
        - 1 to 10 volts → Replace module and check for spark from coil as in Step 6.
          - Spark → System OK
          - No Spark → Replace ign. coil, it too is faulty
      - Both term's. under 10 volts → Repair wire from module " + " term. to "B" term. of black Ign. coil connector or primary ckt. to ign. sw.
      - Under 10 volts "C" term. only → Check for open or gnd. in ckt. from "C" term. to ign. coil. If Ckt. is OK, fault is. ign. coil or conn..
    - Spark → Inspect cap for water, cracks, etc. If OK, replace rotor.
  - Spark → Replace pick-up coil
- Spark → Check fuel,spark plugs, etc. See section "B" symptoms.

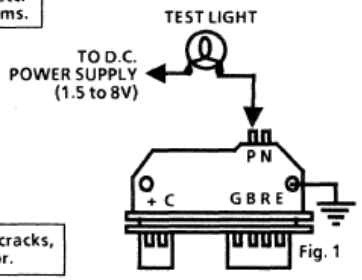

Fig. 1

- Yes → Check pick-up coil or conns. (Coil resistance should be 500-1500 ohms and not grounded).
- No → Replace pole piece and shaft assy.

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SECTION C5

ELECTRONIC SPARK CONTROL (ESC) SYSTEM

CONTENTS

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DIAGNOSIS C5-1
ON-CAR SERVICE C5-1
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GENERAL DESCRIPTION

PURPOSE

Varying octane levels in today's gasoline can cause detonation in high performance engines. Detonation is sometimes called spark knock.

To control spark knock, an Electronic Spark Control (ESC) system has been added. This system is designed to retard spark timing up to 20°, if necessary, to reduce spark knock in the engine. This allows the engine to use maximum spark advance to improve driveability and fuel economy.

OPERATION

The ESC system has two major components:

- ESC module
- ESC knock sensor

The ESC knock sensor detects abnormal vibration (spark knocking) in the engine. The knock sensor is mounted in the engine block near the cylinders. The ESC module receives the knock sensor information and sends a signal to the ECM. The ECM then adjusts the Electronic Spark Timing (EST) to reduce spark knocking.

The ESC module sends a voltage signal (8 to 10 volts) to the ECM when no spark knock is detected by the knock sensor, and the ECM provides normal spark advance.

When the knock sensor detects spark knock, the module turns "OFF" CKT 485 to the ECM. The ECM then retards EST to reduce spark knock.

Loss of the ESC knock sensor signal or loss of ground at ESC module terminal "D" would cause the signal on CKT 485 to the ECM to remain high. This condition would cause the ECM to control EST as if no spark knock was occuring. No retard would occur, and spark knock could become severe under heavy engine load conditions. This condition should, however, cause a Code 43 to set.

Loss of the ESC signal to the ECM would cause the ECM to constantly retard EST. This will result in sluggish performance and set a Code 43.

DIAGNOSIS

Code 43 indicates that the ECM terminal "B7" is receiving less than 6 volts for a 4 second period with the engine running. This is CKT 485, which normally provides a 8 to 10 volt signal from the ESC module to the ECM. See Code 43 CHART for diagnosis if the code is present.

When no Code 43 is present but the ESC system is a potential cause of excessive spark knock, see CHART C-5 which follows.

ON-CAR SERVICE

ESC SENSOR

Remove or Disconnect

1. Negative battery cable.
2. Raise car.
3. ESC wiring harness connector from ESC sensor.
4. ESC sensor from engine block.

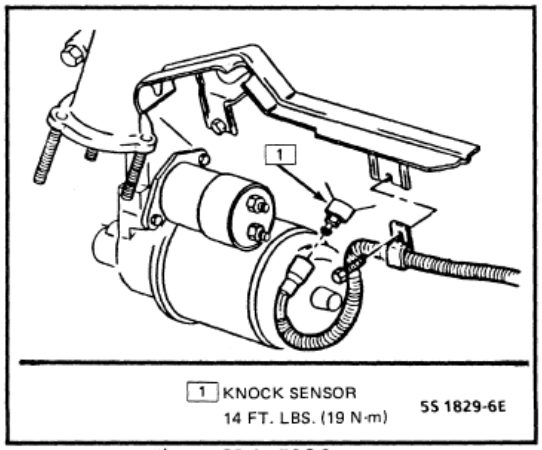

Figure C5-1 - ESC Sensor

Install or Connect

1. ESC sensor into engine block.
   - Tighten to 19 N·m (14 ft. lb.).
2. ESC wiring harness connector to the ESC sensor.
3. Lower car.
4. Negative battery cable.

ESC MODULE AND BRACKET

Refer to Figure C5-2 for ESC module replacement.

PARTS INFORMATION

PART NAME	GROUP
Bracket, Elek Spark Cont Mdl	2.383
Module, Elek Spark Cont	2.383
Sensor, ESC Knock	2.383
Shield, Elek Spark Cont Knock	2.383

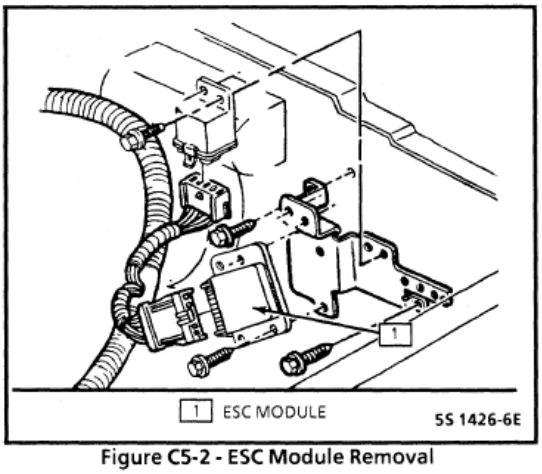

Figure C5-2 - ESC Module Removal