



Figure A-31 DFI HEI Circuit

### CODE 23, EST BYPASS SIGNAL CIRCUIT

**IMPORTANT:** If "CHECK ENGINE" light IS NOT on with engine running (other than diagnostic display), this is an intermittent failure and **CANNOT BE DIAGNOSED USING THIS PROCEDURE.**

The ECM pulls the HEI bypass line, see Figure A-31, down to 0 volts when the engine is cranking. When the engine starts, the ECM pulls the HEI bypass line up to around 5 volts and the 5 volt signal commands the HEI module to use the spark timing which is supplied by the ECM. The ECM monitors the HEI bypass feedback line to determine if the bypass circuit is operating properly.

Code 23 (Figures A-31 and A-32) indicates that the ECM is not receiving the proper bypass signal voltage through the HEI bypass feedback circuit. Possible causes of this condition are:

- A defective HEI module.
  - Defective wires, terminals, etc.
  - An ECM not processing the bypass feedback signal properly or not switching the bypass line on and off.
  - An open set timing jumper.
- To begin diagnosis measure the voltage on circuit #462 while in the "bypass" mode (ignition off for 10 seconds and then back on). If the voltage is less than 2.5, the ECM has pulled the bypass line down properly. If the voltage goes above 2.5 volts after the engine is started, the ECM has pulled the bypass line up properly. At this point the problem must be an open in circuit #424 or #462 between the "set timing" connector and the ECM or a faulty ECM.
  - If the voltage on circuit #462 is below 2.5 volts with the engine running, the system has not come out of the "bypass" mode. To isolate the malfunction, measure the voltage on circuit #462 on the ECM side of the "set-timing" connector. If the voltage on circuit #462 is less than 2.5 volts, measure the circuit voltage at the ECM. If voltage is greater than 2.5 volts at the ECM, circuit #462 must be open to the "set-timing" connector. If the voltage is still less than 2.5 volts, circuit #462 may be shorted to ground. If the wire is OK, the fault must be in the ECM connector or ECM itself.
  - If the voltage is now greater than 2.5 the voltage is being grounded by the wiring harness, the HEI module or the ECM through the feedback input terminal. To determine the source of the ground reconnect the "set timing" connector and disconnect the 4-way weatherpack connector. After the engine stalls, the "set-timing" connector should be at 5 volts. If it is, the short to ground is in the distributor harness or the HEI module. If the voltage is 0 volt, the short to ground is either in circuit #424 or the ECM.
  - If circuit #462 is at more than 2.5 volts, the source of this voltage must be determined. If the voltage is no longer present with the distributor disconnected, then the distributor harness, HEI module connector or HEI module is shorting circuit #462 to voltage.
  - If the voltage is still present, disconnect the ECM. If the voltage is now less than 2.5 volts at the "set-timing" connector, the voltage was coming from the ECM itself. If the voltage is still greater than 2.5, circuit #462 is shorted to voltage.



