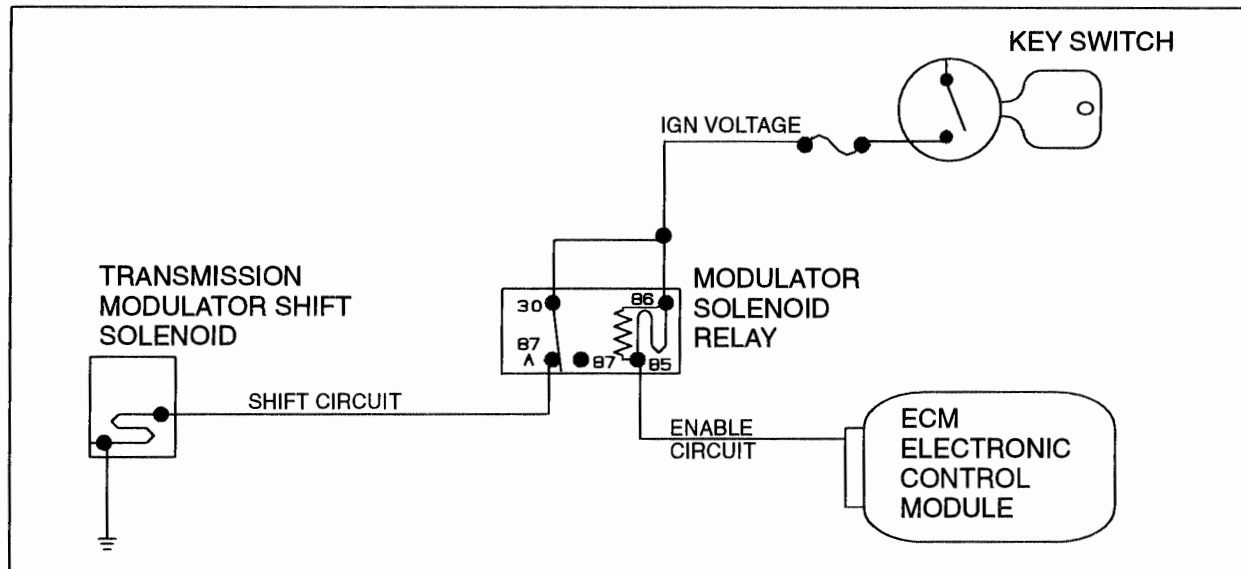


ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

(EDL) ENGINE DATA LINE WITH ALLISON AT/MT TRANSMISSION



CIRCUIT FUNCTIONS

The Electronic Control Module is programmed with two shift schedules: The Closed Throttle Mode and the Wide Open Throttle Mode.

1. The Closed Throttle Mode is for situations with moderate engine load. ECM terminal 32 will be Low (0 volts). This energizes the relay, turning off power to the solenoid, causing the transmission to shift at approximately 65% of engine load.
2. The Wide Open Throttle Mode is for heavy load situations. ECM terminal 32 will be High (12 volts). This de-energizes the relay causing 12 volts to be applied to the solenoid. In this mode, the ECM has shift schedules that occur at 80% of engine load.

When the engine is operating at less than the load shift point, ignition voltage is not applied to the shift solenoid. When the ECM commands a shift, the relay coil ground is opened by the ECM, which de-energizes the relay, turning ON the power to the shift solenoid, causing it to shift.

FAULT DETECTION

The Prolink EST is used to initiate the KOEO Output Circuit Tests. This will test the enabling circuit between the key switch, through the relay coil and circuit to ECM terminal 32. If an open or short (high or low) is found in this circuit, **Flash Code 244** will be set.

Note that the test does not check relay function or the circuit to the shift solenoid.

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ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

ENGINE DATA LINE WITH ALLISON AT/MT TRANSMISSIONS (EDL)

EXTENDED DESCRIPTION

Engine Data Line (EDL) output from the ECM controls the Transmission Modulator Shift Solenoid Control Relay (403), which in turn controls the Transmission Modulator Shift Solenoid (404).

The ECM is programmed with two shift schedules: Closed Throttle Mode and Wide Open Throttle Mode. The Closed Throttle Mode schedule for a transmission is for situations with a moderate engine load. The transmission will shift at approximately 65 percent of engine load. The Wide Open Throttle Mode shift schedule has shift points that occur at 80 percent of engine load. This provides increased power in heavy load situations for passing or faster acceleration.

The ECM analyzes engine operating data and determines which mode is most appropriate for current operation. The physical Allison transmission uses EDL output from ECM connector (379) terminal 32 to select the most appropriate shift schedule depending upon engine loads.

Refer to the circuit diagram on page 111 for the following discussion.

When ECM terminal 32 is LOW (0 volts), the transmission operates in the Closed Throttle Mode (normal shift schedule). When ECM terminal 32 is HIGH (12 volts), the transmission operates in the Wide Open Throttle Mode.

WIDE OPEN THROTTLE MODE OPERATION

In the Wide Open Throttle Mode, ECM terminal 32 is HIGH (12 volts) and the XMSN Shift Modulator (404) is energized. The Transmission Modulator Shift Solenoid Control Relay (403) receives ignition power at common terminal 30 and control coil terminal 86. When ECM terminal 32 is HIGH (12 volts), circuits 97F and 92E have 12V so the relay (403) does not energize. The ignition power on circuit 92B goes through the normally closed (N.C.) contacts

(30 to 87A) to the Transmission Modulator Shift Solenoid (404), causing the shift solenoid to energize.

CLOSED THROTTLE MODE OPERATION

In the Closed Throttle Mode, ECM terminal 32 is LOW (0 volts) and Transmission Shift Modulator (404) is not energized. When ECM terminal 32 is LOW (0 volts), circuit 97F grounds the Modulator Shift Control Relay control coil causing the relay to energize, opening the normally closed (N.C.) contacts (30 to 87A) in relay (403), TURNING OFF the power to the Transmission Modulator Shift Solenoid (404), which is de-energized.

ECM DIAGNOSTICS

The ECM does not continuously monitor the EDL circuits. To check these circuits use the ProLink EST to perform the KOEO - Output Circuit Checks (OCC).

FLASH CODE 244
ATA CODE SID 248 FMI 11
ECM: EDL OCC FAULT

The OCC Test checks the Relay Control Coil circuits 97F, 92D, 92E and the relay control coil for opens or shorts (high or low). If a defect is noted, Flash Code 244 will be set. The Engine Warning light does not turn ON.

Note that the ECM diagnostics DO NOT check the actual operation of the Modulator Shift Solenoid Control relay (403) or the Modulator Shift Solenoid (404). The ECM diagnostics also do not check circuits 92B, 92C, 92-G or 11-GJ. For these reasons, it is possible for the Allison AT/MT transmission Modulator Shift Solenoid not to function, without a fault code. Testing Modulator Shift Control Circuits located in TROUBLESHOOTING on page 112 include tests for these circuits.

If Flash code 244 is active or the transmission shift modulator does not operate properly perform Testing Modulator Shift Solenoid (404) Circuits on page 112.

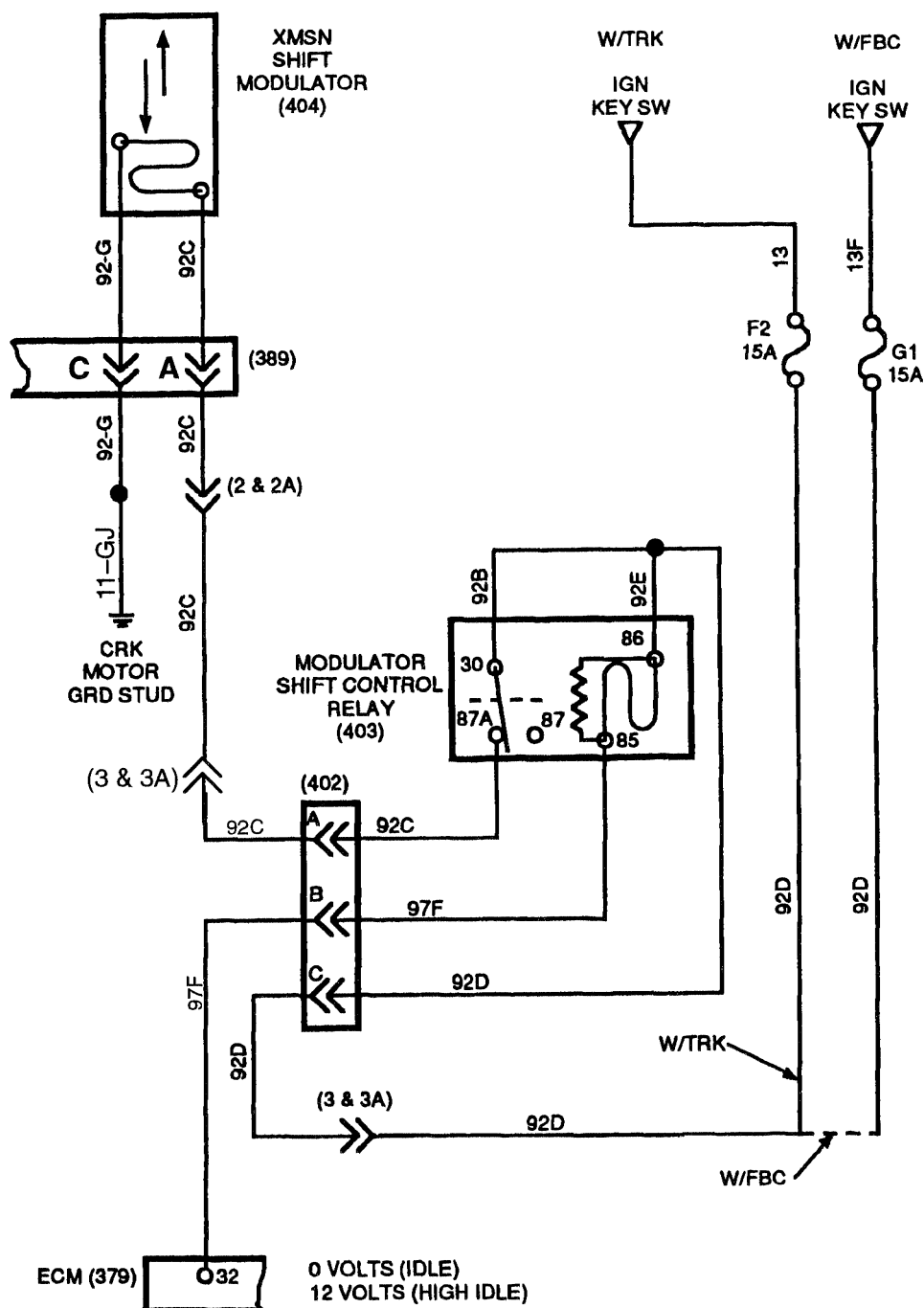
ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

ENGINE DATA LINE WITH ALLISON AT/MT TRANSMISSIONS (EDL)

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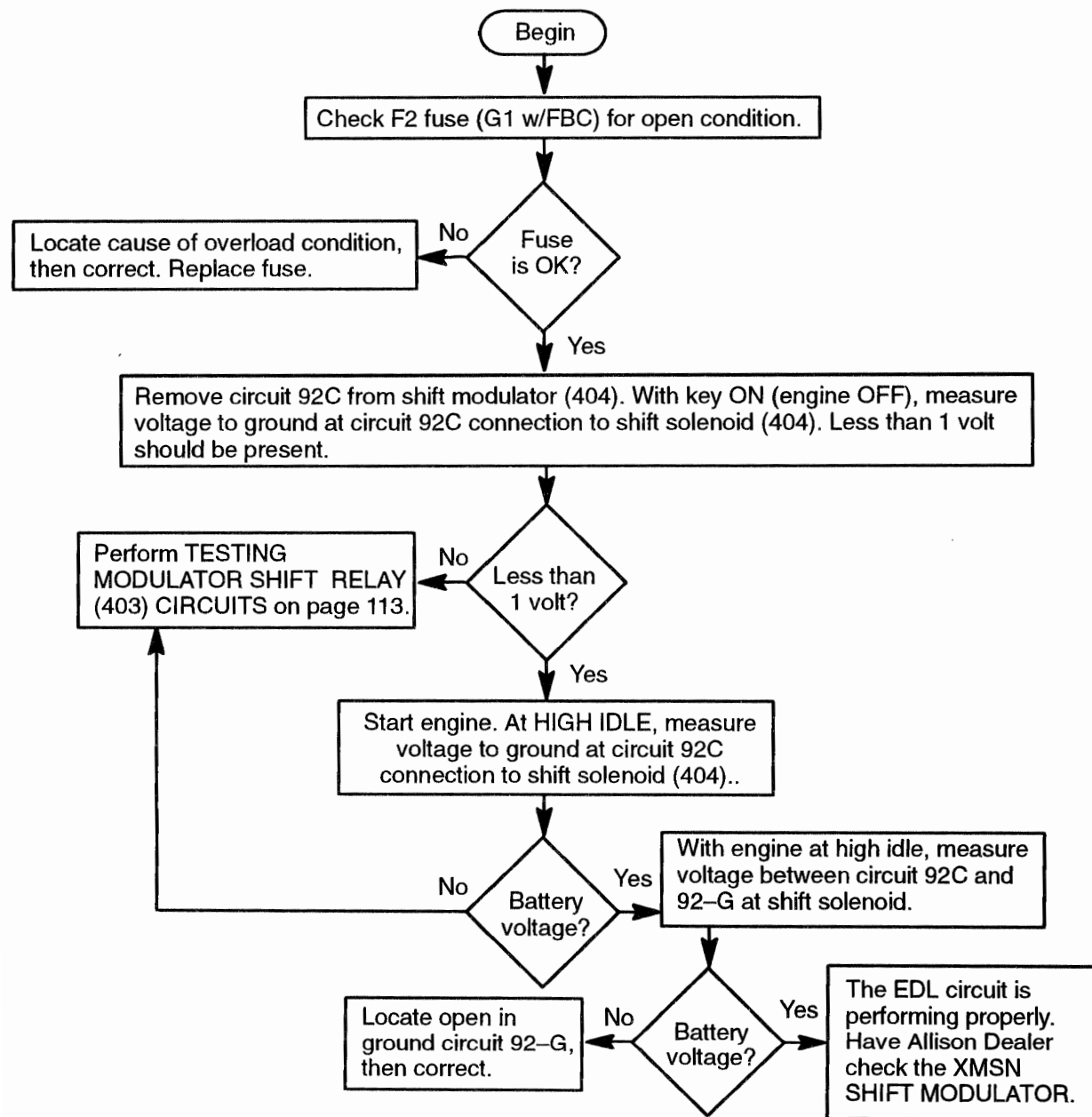
CIRCUIT DIAGRAM

MODULATOR SHIFT SOLENOID W/ALLISON AT XMSN

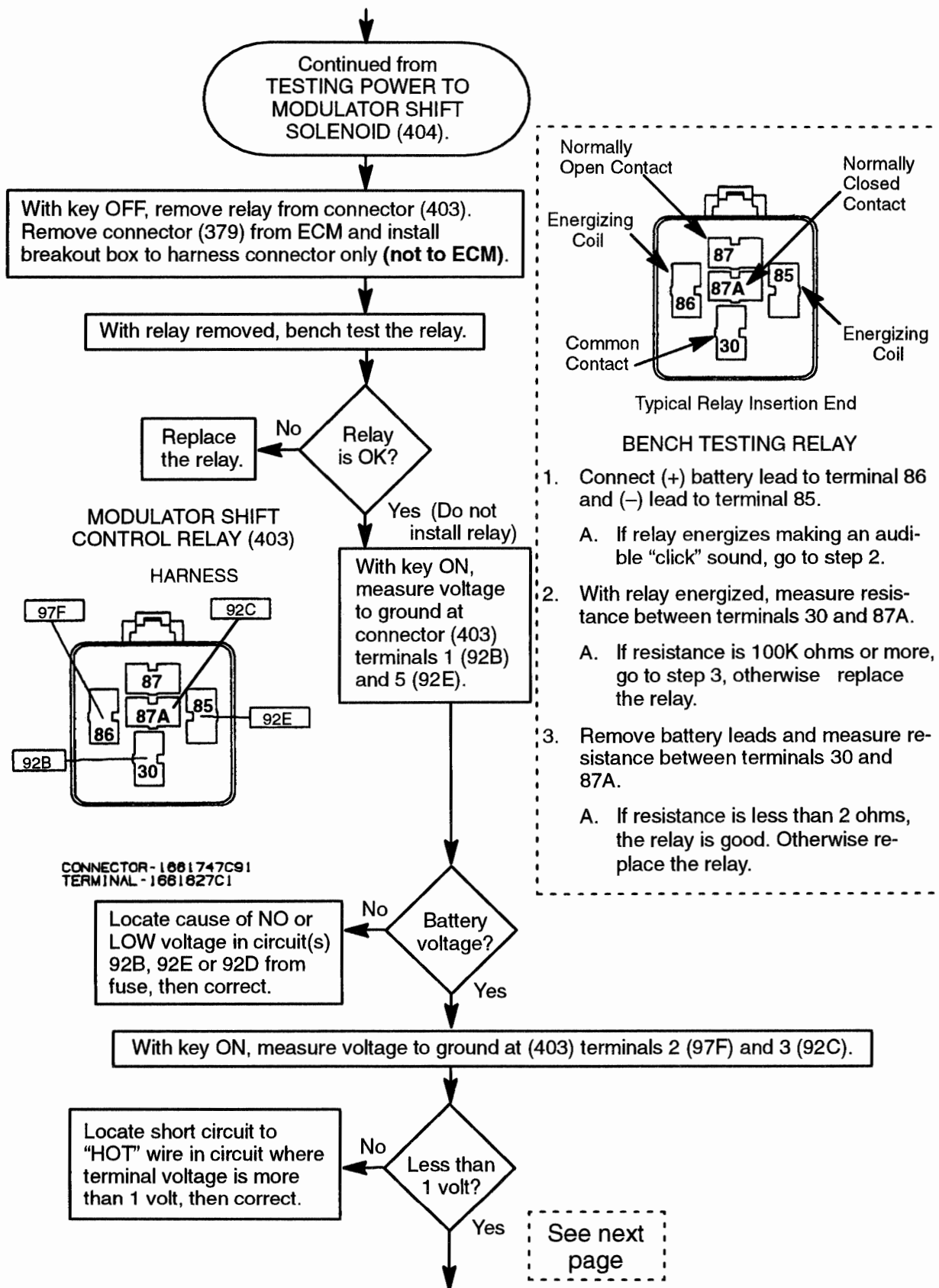


ELECTRONIC CONTROL SYSTEM DIAGNOSTICS**TROUBLESHOOTING****BEFORE TROUBLESHOOTING**

- A. Before troubleshooting, make sure that the batteries are fully charged! Check battery cables and grounds for clean, tight connections free from damage. The voltage tests will give misleading readings if the batteries are not fully charged.
- B. Before troubleshooting, inspect connectors for pushed back, loose or damaged (spread or bent) terminals, or wires with cut strands etc. Wires and connections must be free of damage or corrosion. When some connectors corrode, a light white residue will be present that must be removed.
- C. Before troubleshooting, inspect the suspect circuit grounds for clean, tight connections free of any damage.

TESTING MODULATOR SHIFT SOLENOID (404) CIRCUITS

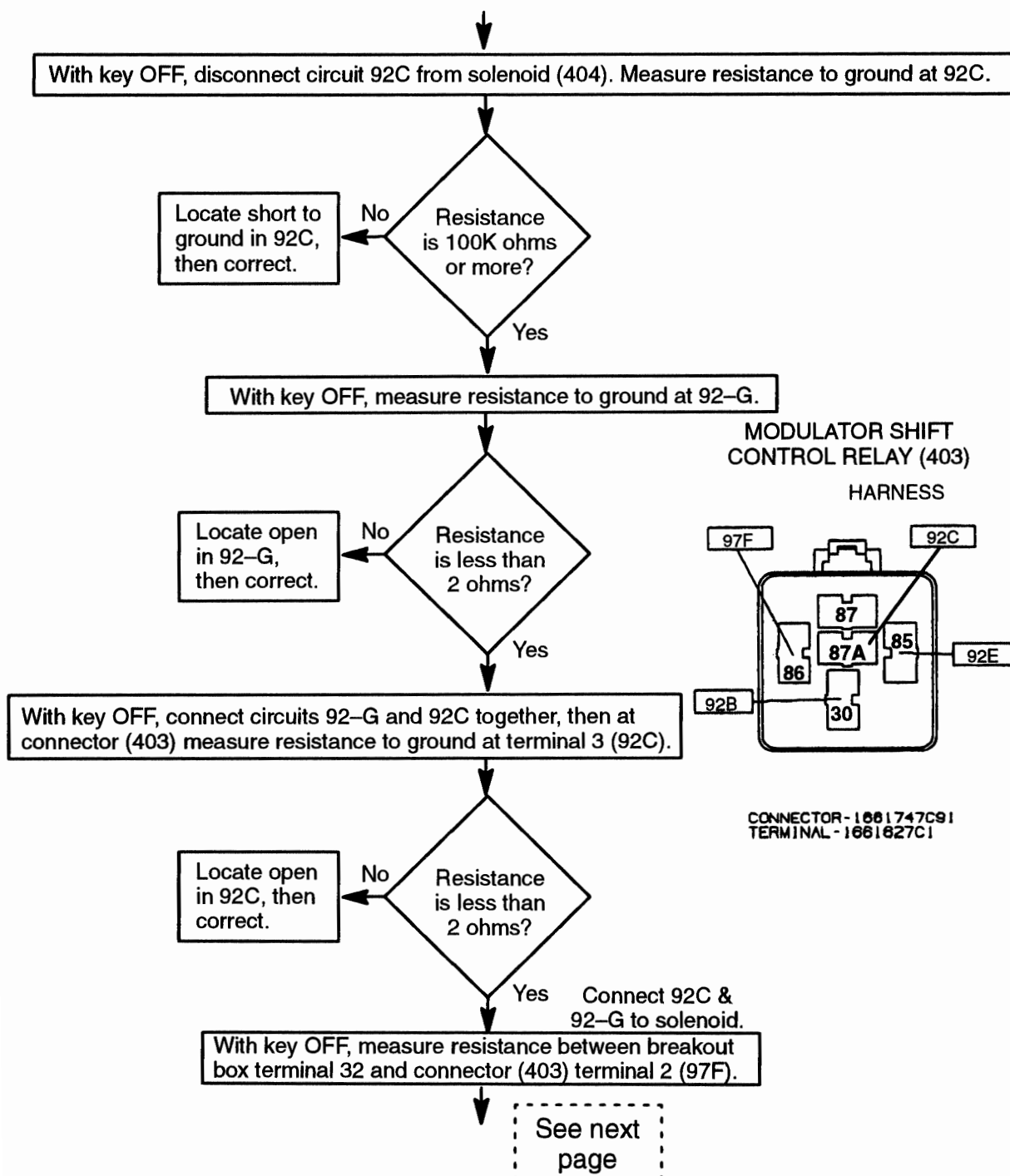
TESTING MODULATOR SHIFT CONTROL RELAY (403) CIRCUITS



ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

ENGINE DATA LINE WITH ALLISON AT/MT TRANSMISSIONS (EDL)

TESTING MODULATOR SHIFT CONTROL RELAY (403) CIRCUITS (Continued)



ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

ENGINE DATA LINE WITH ALLISON AT/MT TRANSMISSIONS (EDL)

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TESTING MODULATOR SHIFT CONTROL RELAY (403) CIRCUITS (Continued)

