



Installation Instructions

MC-11 TRACTOR ANTILOCK SYSTEMS

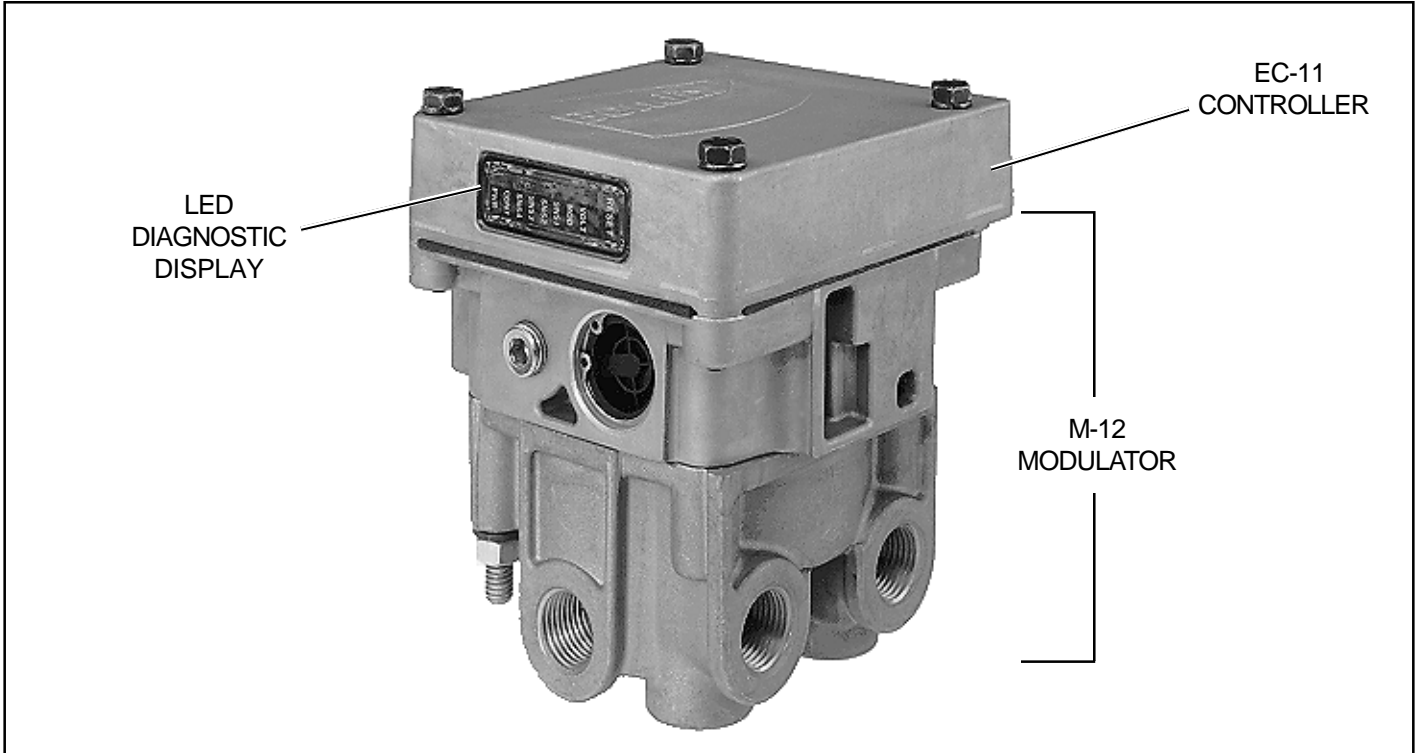


FIGURE 1 MC-11 TRACTOR ANTILOCK ASSEMBLY

IMPORTANT! PLEASE READ AND FOLLOW THESE INSTRUCTIONS TO AVOID PERSONAL INJURY OR DEATH:

When working on or around a vehicle, the following general precautions should be observed at all times.

1. Park the vehicle on a level surface, apply the parking brakes, and always block the wheels.
2. Stop the engine when working around the vehicle.
3. If the vehicle is equipped with air brakes, make certain to drain the air pressure from all reservoirs before beginning ANY work on the vehicle.
4. Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in manner that removes all electrical power from the vehicle.
5. When working in the engine compartment the engine should be shut off. Where circumstances require that the engine be in operation, **EXTREME CAUTION** should be used to prevent personal injury resulting from contact with moving, rotating, leaking, heated, or electrically charged components.
6. Never connect or disconnect a hose or line containing pressure; it may whip. Never remove a component or plug unless you are certain all system pressure has been depleted.
7. Never exceed recommended pressures and always wear safety glasses.
8. Do not attempt to install, remove, disassemble or assemble a component until you have read and thoroughly understand the recommended procedures. Use only the proper tools and observe all precautions pertaining to use of those tools.
9. Use only genuine Bendix replacement parts, components, and kits. Replacement hardware, tubing, hose, fittings, etc. should be of equivalent size, type, and strength as original equipment and be designed specifically for such applications and systems.
10. Components with stripped threads or damaged parts should be replaced rather than repaired. Repairs requiring machining or welding should not be attempted unless specifically approved and stated by the vehicle or component manufacturer.
11. Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.

GENERAL

The EC-11 contains self-test and diagnostic circuitry that continuously checks for proper operation of the entire antilock system, including wiring continuity. A dash light, controlled by the EC-11, advises the driver of the antilock system condition. Specific component condition is provided by a series of Light Emitting Diodes (LEDs) displayed through a "window" in the EC-11 housing.

The dash light's separation from the diagnostic window allows the driver to be aware of any problems that occur but not to be confused by diagnostic information.

A special feature of the MC-11 antilock system is failure latching. When the controller senses an error, it stores the condition in memory, disables antilock, and illuminates the dash light and the appropriate LEDs on the EC-11. The condition is truly stored-it is not cleared by loss of power to the EC-11. The LEDs will re-light when power is restored and will remain illuminated until the problem is corrected. After the actual problem is discovered and corrected, maintenance personnel can clear the EC-11 diagnostics by passing a small magnet over the RESET area in the "window."

DIAGNOSTIC LEDs

There are six LEDs and a magnetic reset switch on the EC-11 diagnostic window.

"VOLT" LED

This red LED illuminates when power to the EC-11 falls outside the acceptable range of 9-18 volts. If the voltage returns to within the acceptable range, the VOLT LED will go off. This is the only LED that will reset itself when the failure condition no longer exists.

"MOD" LED

This red LED illuminates AND LATCHES ON when solenoid resistance is not within the acceptable range of 9.5-11.5 ohms. It can also illuminate if excessive electrical spikes are present in the power line.

"SNS 1" AND "SNS 2"

The red SNS LEDs illuminate AND LATCH ON to indicate any one of a number of permanent or intermittent failures. (For example, open or shorted wheel speed sensor, open or shorted sensor wiring, no wheel speed signal.)

"CONT" LED

This red LED illuminates AND LATCHES ON if the EC-11 is malfunctioning, or if excessive electrical spikes are present in the power line.

"PWR" LED

This green LED illuminates and remains on during vehicle operation to indicate that vehicle power is reaching the EC-11.

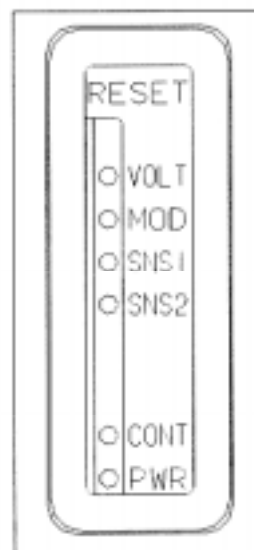
TROUBLESHOOTING

GENERAL

While the EC-11 diagnostic display locates a specific problem area, it is still necessary to determine whether the problem resides in the component itself or the wiring. Basically, the troubleshooting procedure that follows is devoted to narrowing down the problem to either the wiring or a specific antilock component.

TIPS

1. All troubleshooting should begin by performing the "STARTUP," which focuses on observing the antilock status light on the dash.
2. The troubleshooting technician should record all findings and the action taken during the troubleshooting process.
3. No voltage or resistance tests are performed into the EC-11. All electrical tests begin at the wire-harness end of the connector and move AWAY from the EC-11 toward and antilock system component (Modulator, Wheel Speed Sensor, etc.).



EC-11 DIAGNOSTIC WINDOW

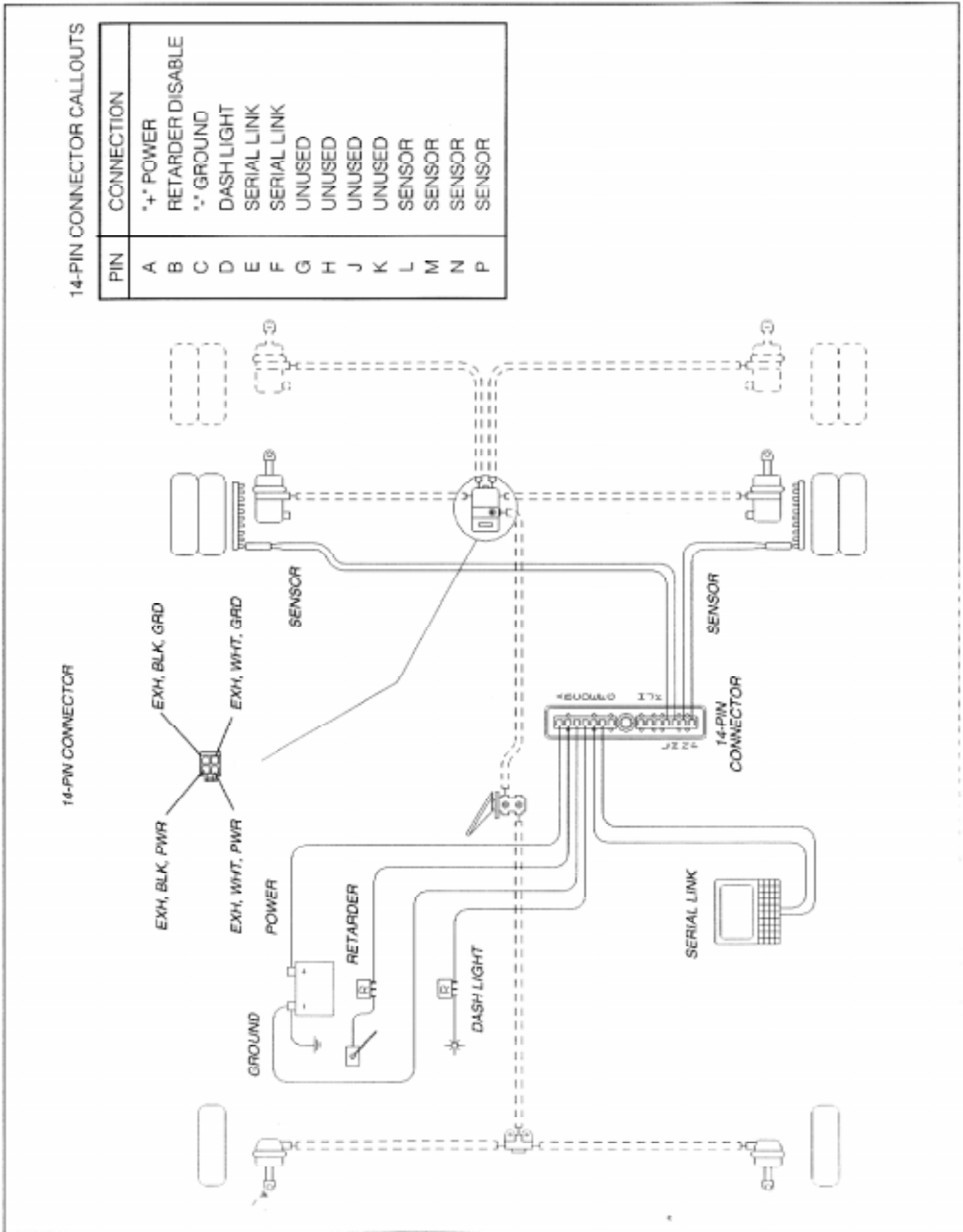
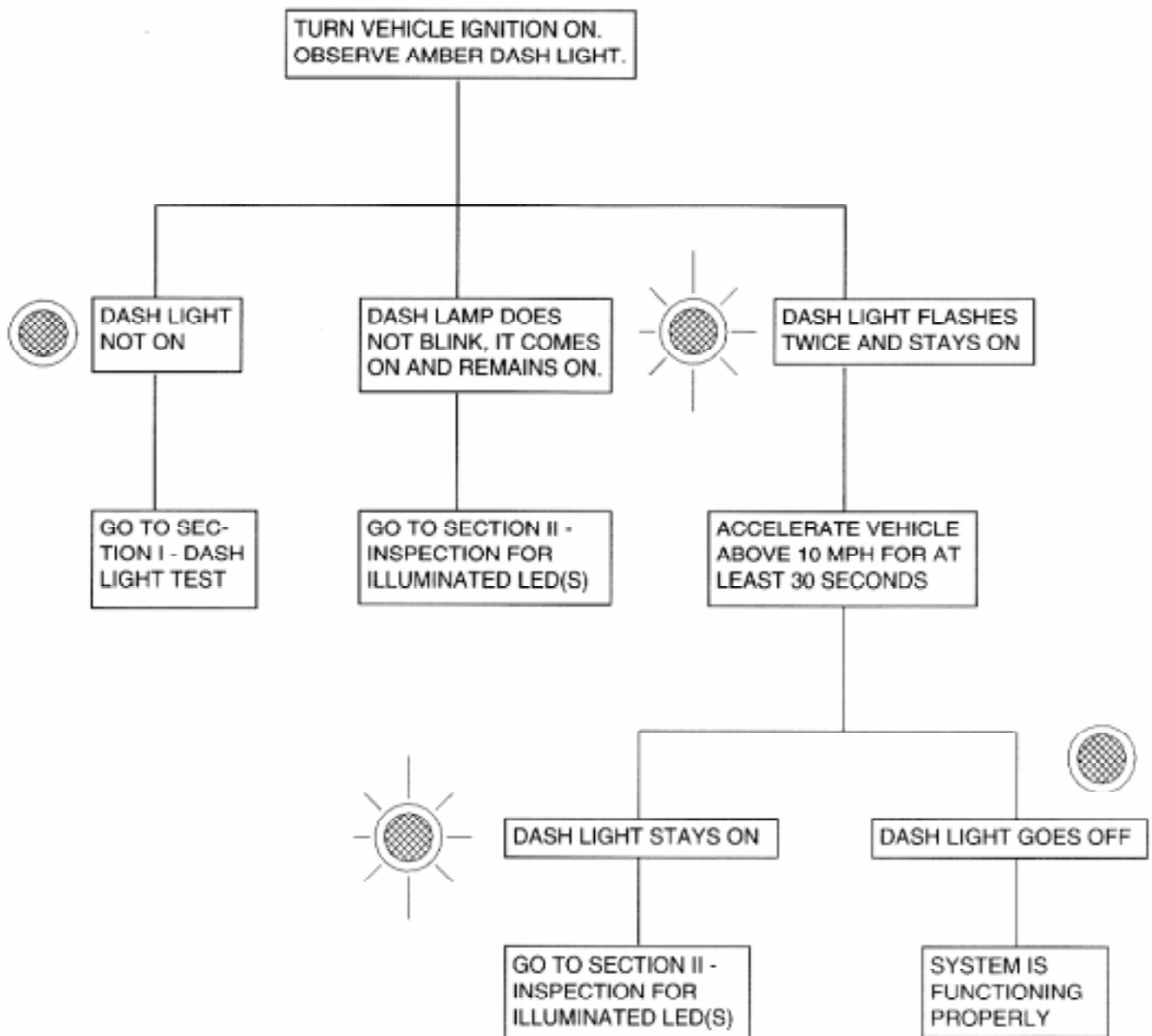


FIGURE 2 MC-11 WIRING SCHEMATIC

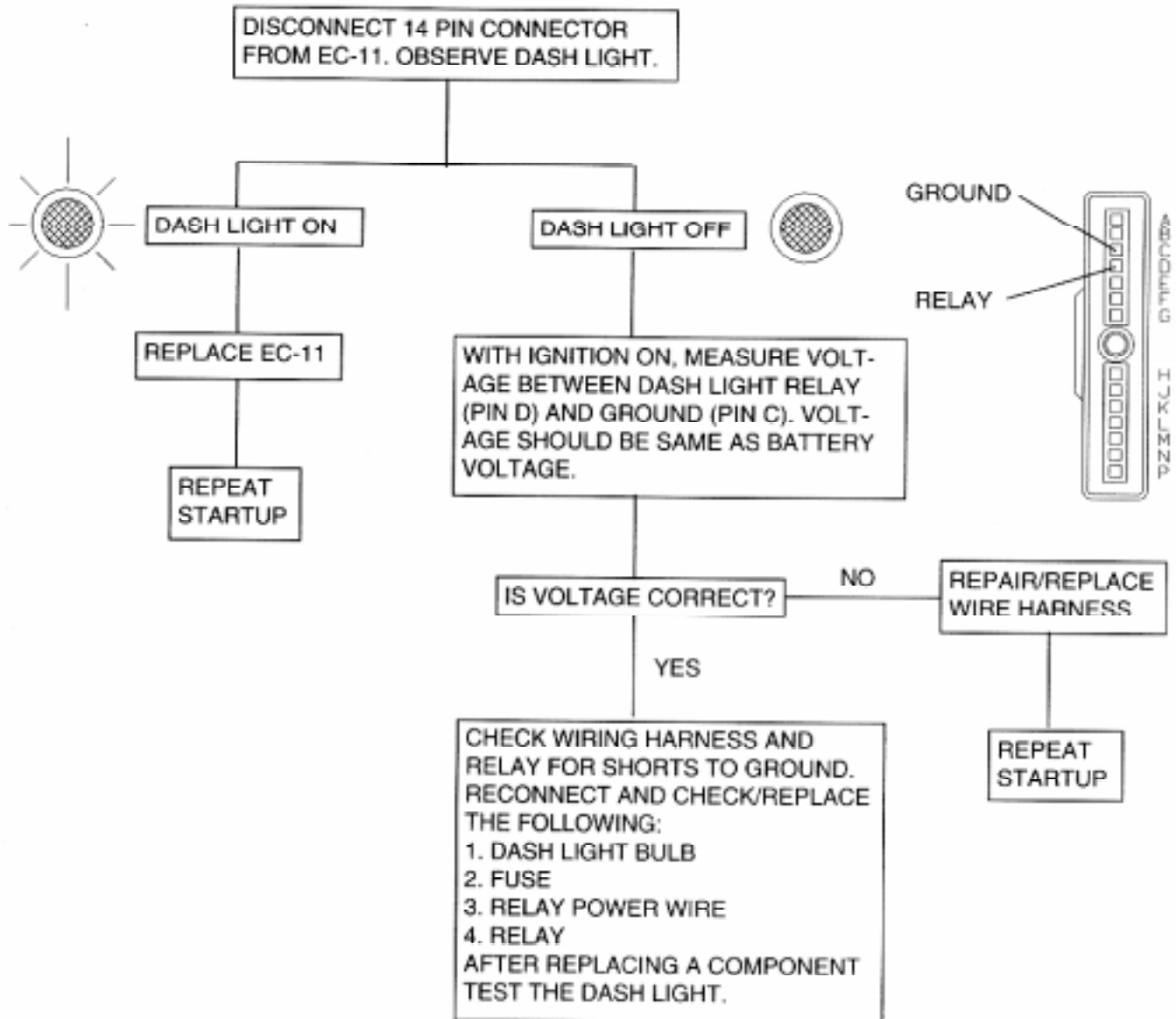
TROUBLESHOOTING

INITIAL START-UP PROCEDURE



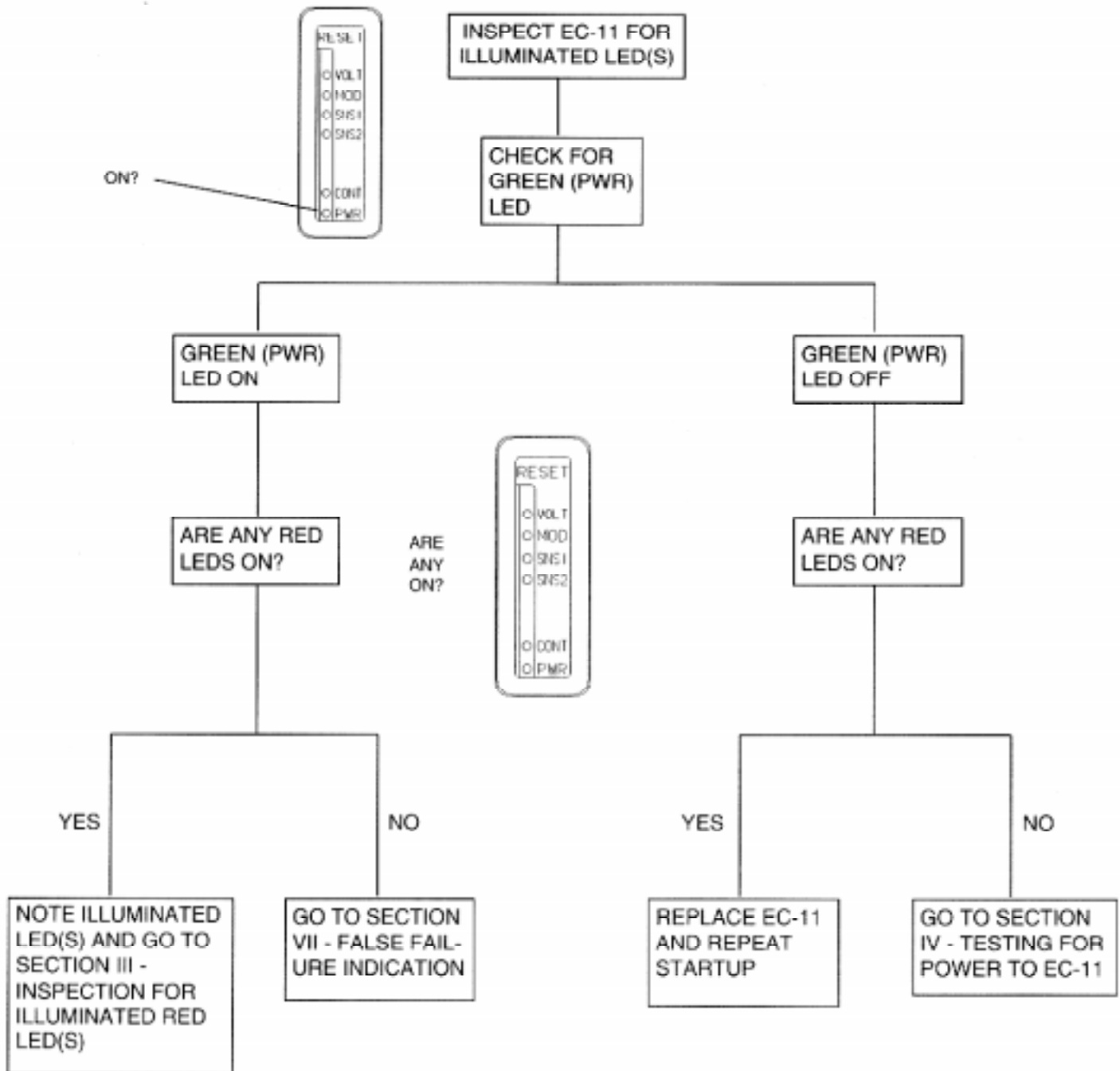
TROUBLESHOOTING

SECTION I - DASH LIGHT TESTING



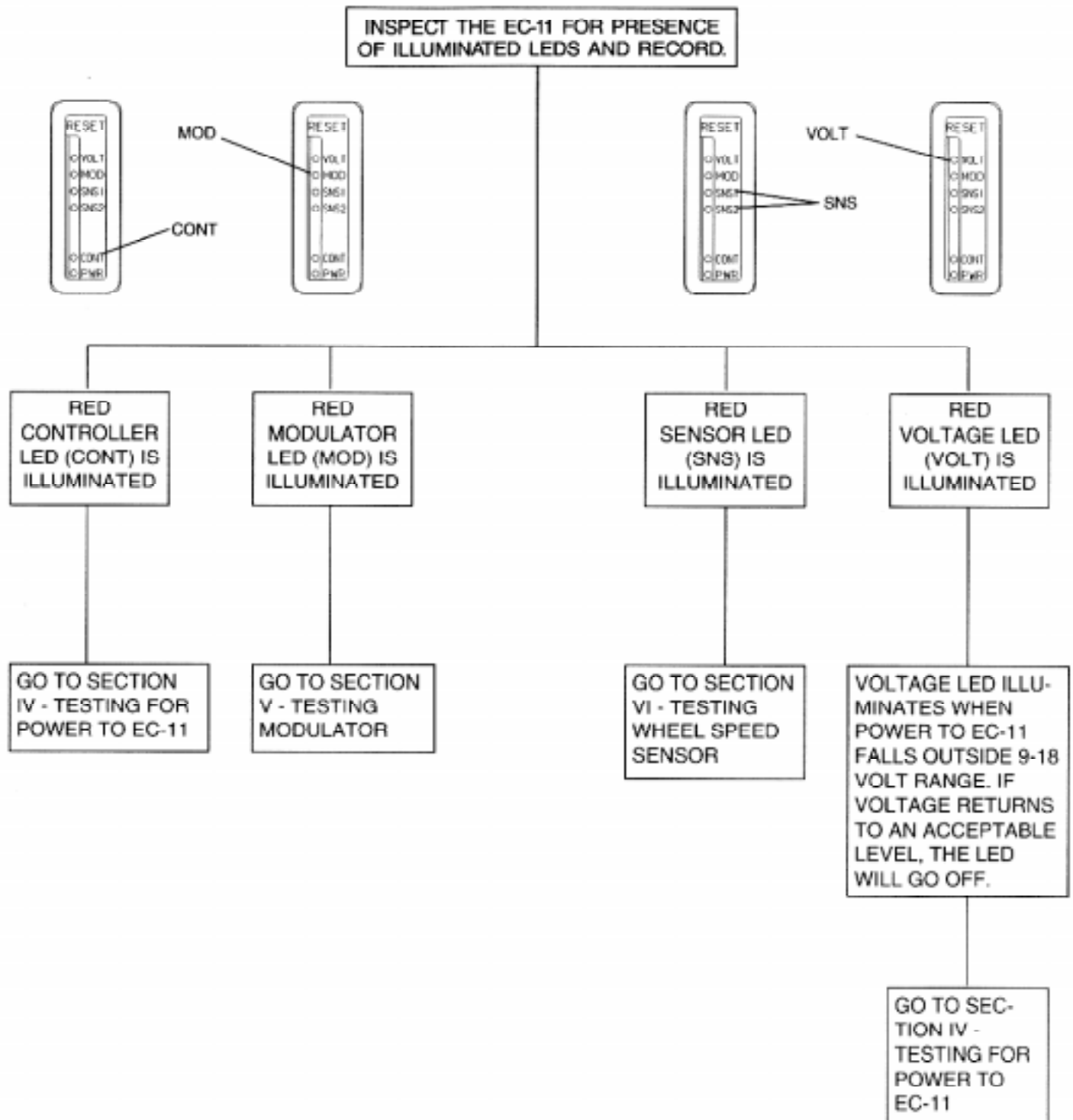
TROUBLESHOOTING

SECTION II - INSPECTION FOR ILLUMINATED LEDS



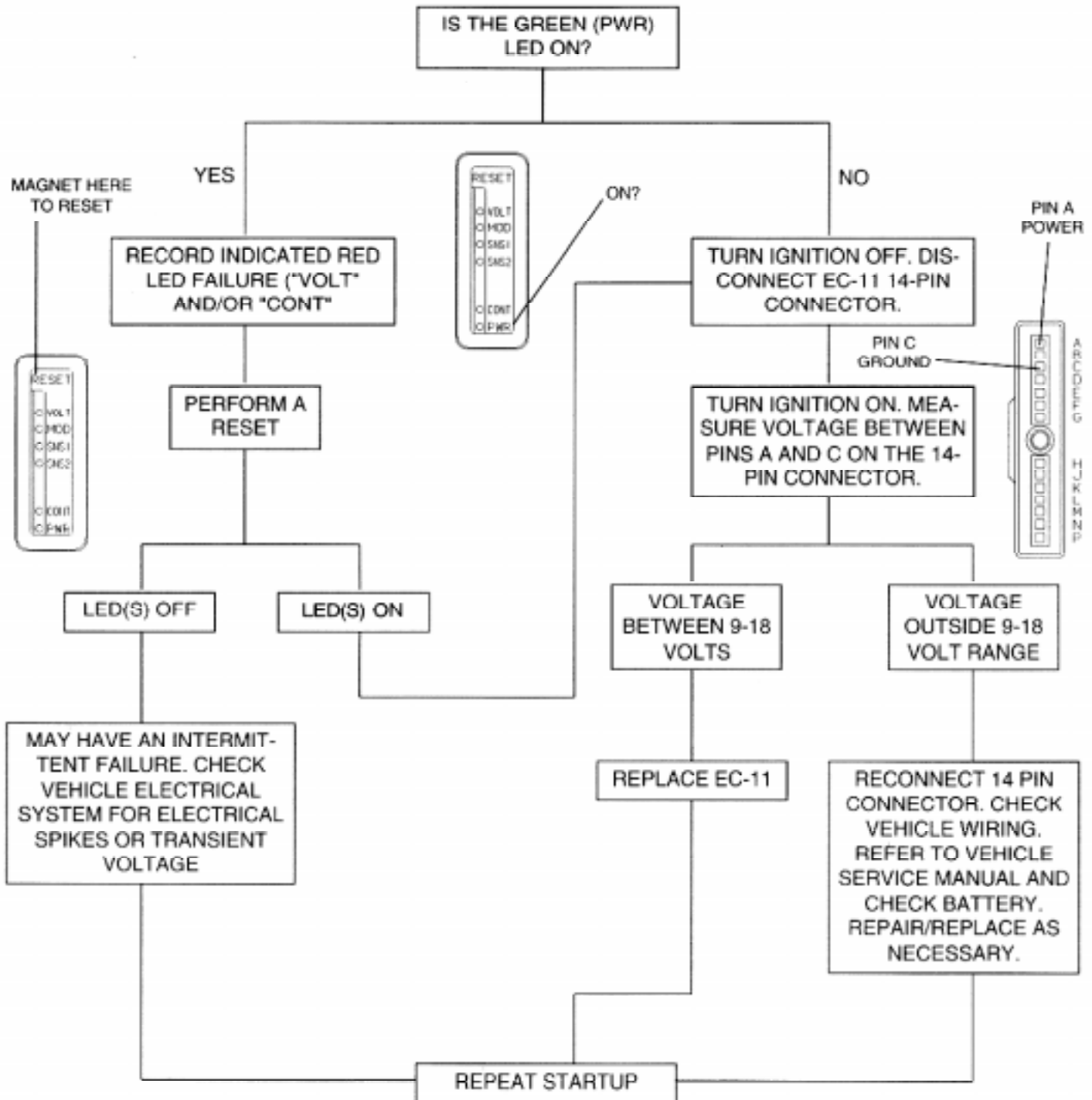
TROUBLESHOOTING

SECTION III - INSPECTION FOR ILLUMINATED RED LEDS



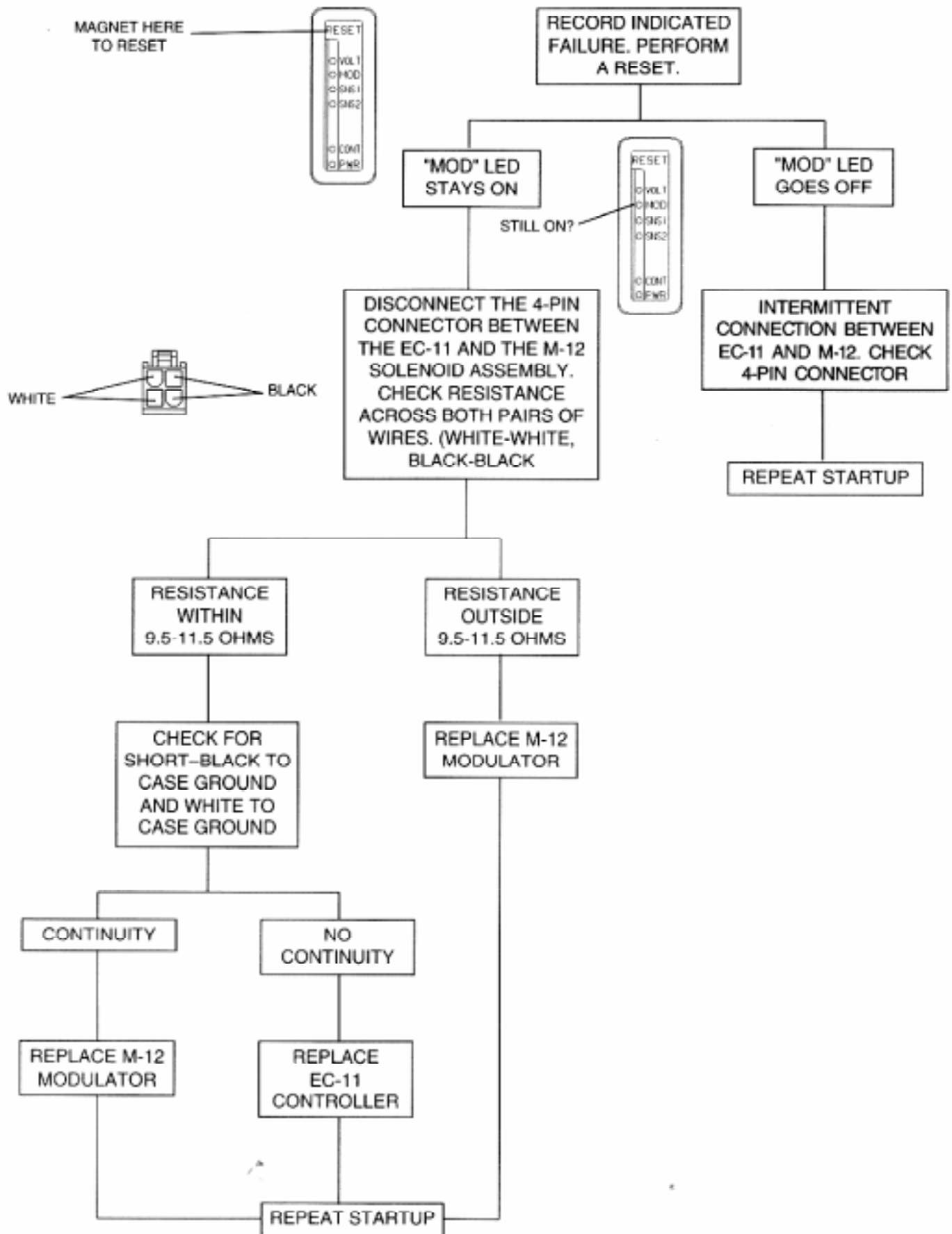
TROUBLESHOOTING

SECTION IV - INSPECTION FOR ILLUMINATED LEDS



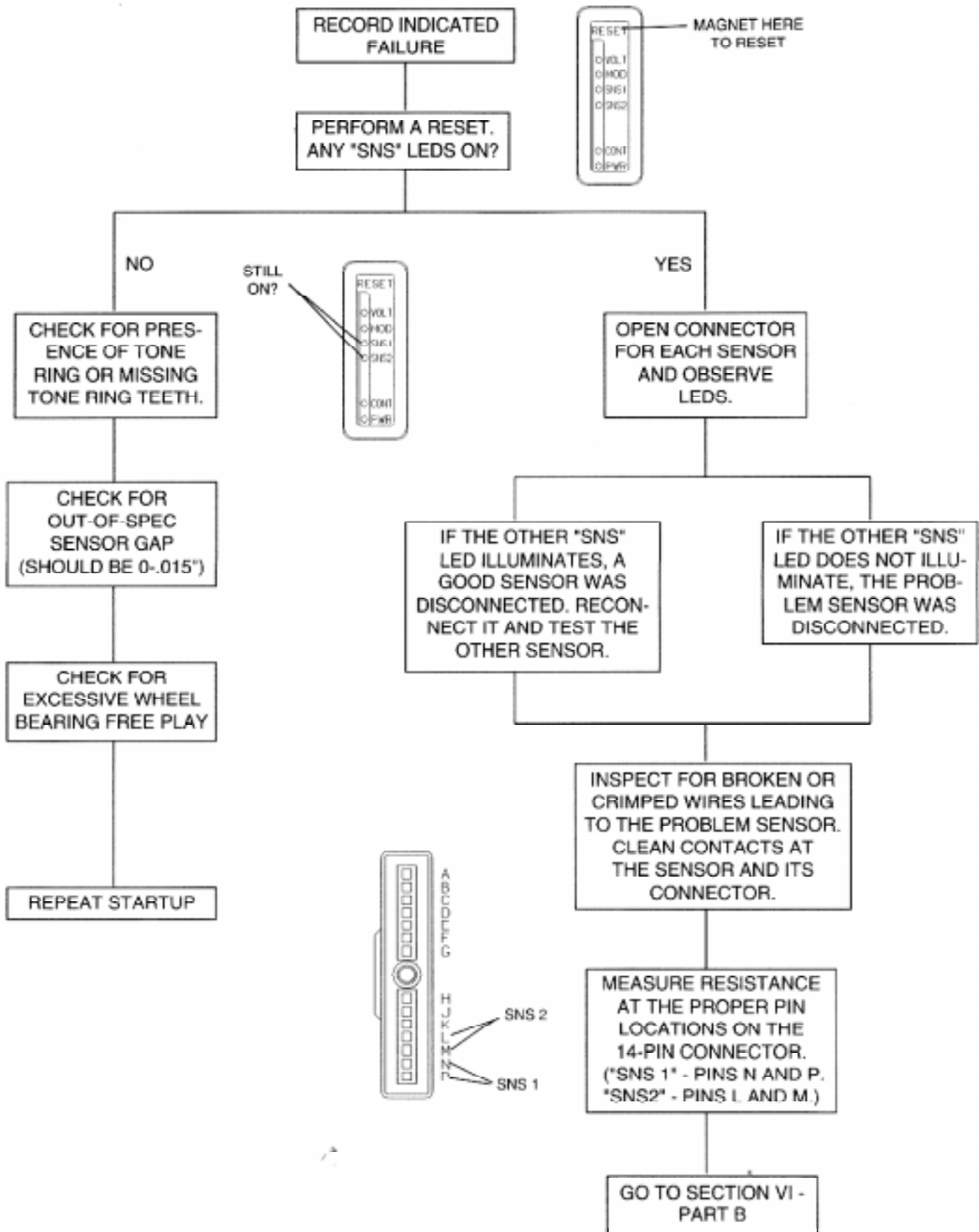
TROUBLESHOOTING

SECTION V - TESTING MODULATOR



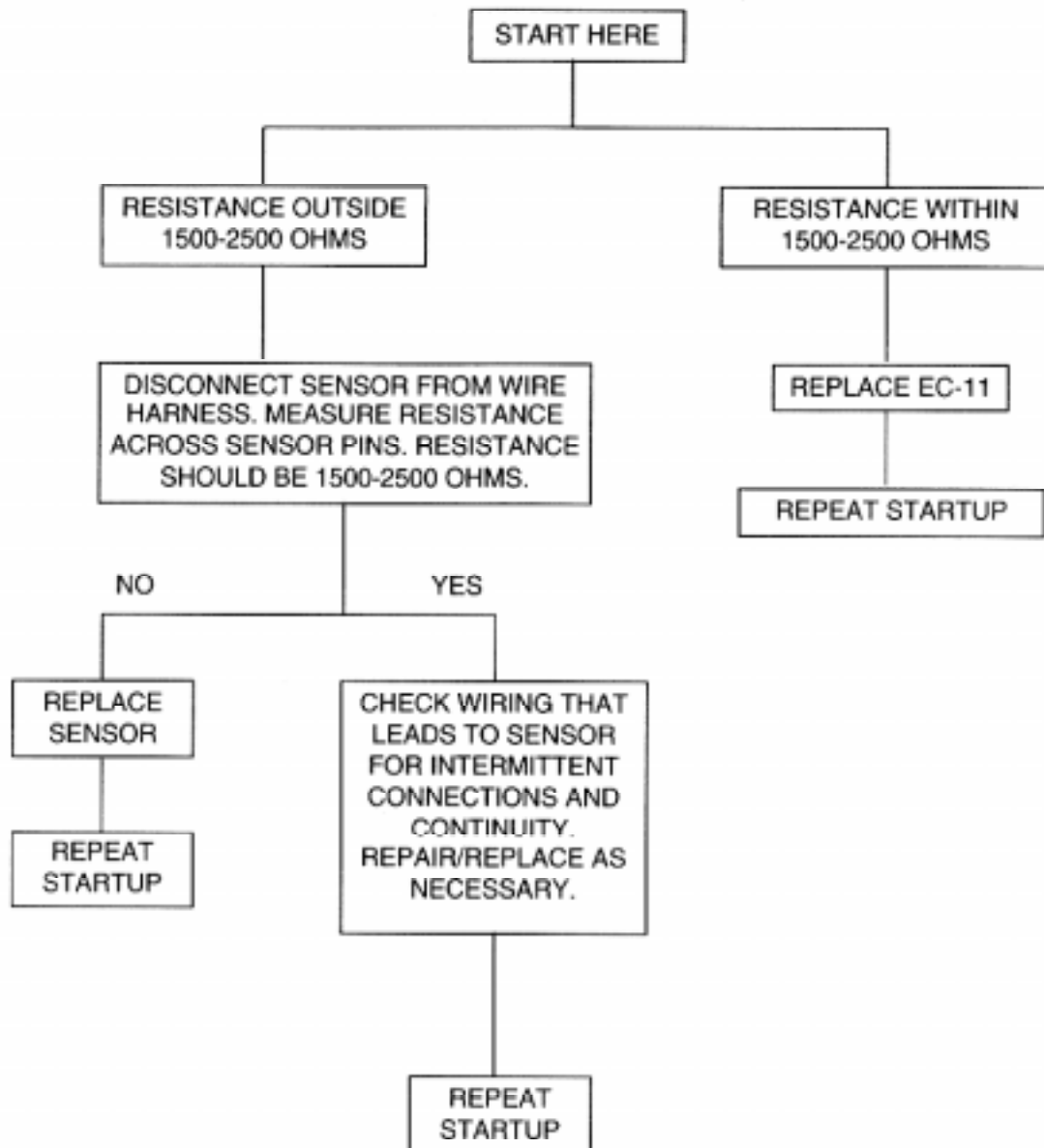
TROUBLESHOOTING

SECTION VI PART A - TESTING WHEEL SPEED SENSOR



TROUBLESHOOTING

SECTION VI PART B - TESTING WHEEL SPEED SENSOR

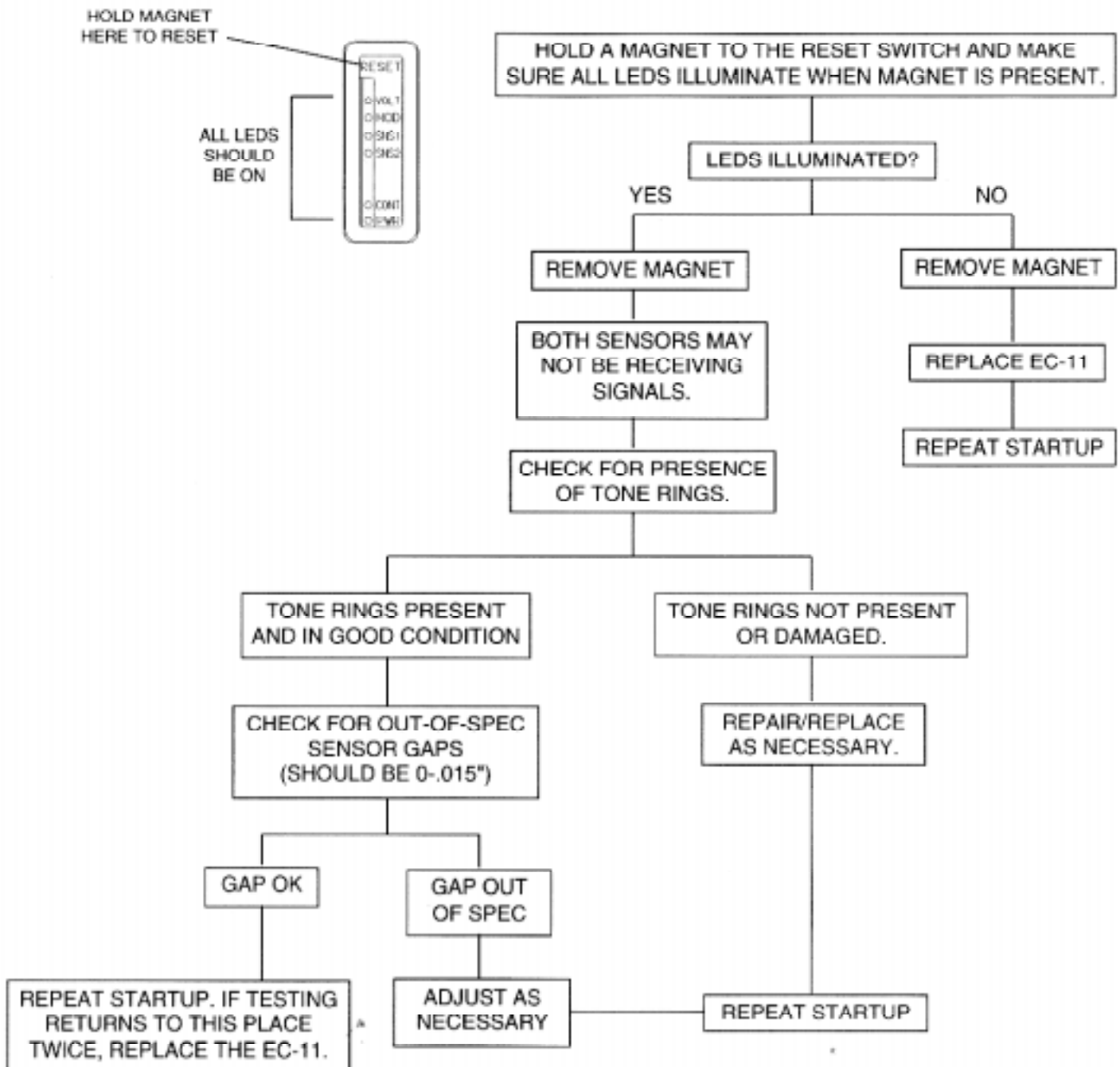


TROUBLESHOOTING

SECTION VII - FALSE FAILURE INDICATION

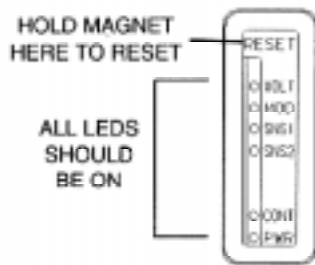
NOTE: IF, DURING STARTUP, THE DASH LIGHT ILLUMINATED WITHOUT BLINKING, GO TO SECTION VII PART B - TESTING FOR FALSE FAILURE CAUSED BY DASH LIGHT RELAY. IF THE DASH LIGHT BLINKED DURING STARTUP BUT ILLUMINATED AFTER THE VEHICLE REACHED 10 MPH, GO TO SECTION VII PART A - TESTING FOR FALSE FAILURE CAUSED BY WHEEL SPEED COMPONENTS.

SECTION VII PART A - TESTING FOR FALSE FAILURE CAUSED BY WHEEL SPEED COMPONENTS



TROUBLESHOOTING

SECTION VII PART B - TESTING FOR FALSE FAILURE CAUSED BY DASH LIGHT RELAY



HOLD A MAGNET TO THE RESET SWITCH AND MAKE SURE ALL LEDS ILLUMINATE WHEN MAGNET IS PRESENT

LEDS ILLUMINATED?

YES

NO

REMOVE MAGNET

REMOVE MAGNET

TURN IGNITION OFF. CHECK FOR CONTINUITY BETWEEN PIN D AND ITS TERMINAL ON THE DASH LIGHT RELAY.

REPLACE EC-11

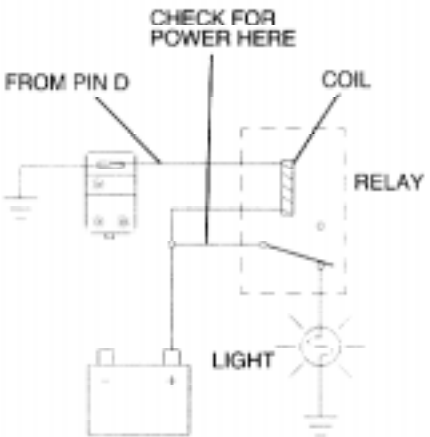
REPEAT STARTUP

NO CONTINUITY

CONTINUITY

REPAIR/REPLACE WIRE HARNESS. RECONNECT 14 PIN CONNECTOR AND REPEAT STARTUP.

RECONNECT 14 PIN CONNECTOR. TURN IGNITION ON AND CHECK FOR POWER AT THE DASH LIGHT RELAY COIL.

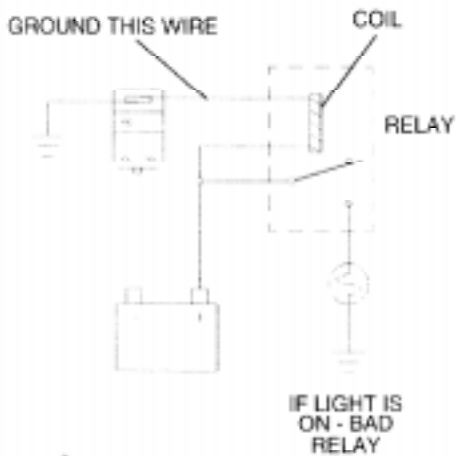


NO POWER

POWER

CHECK DASH WIRING AND CONNECTORS. CONSULT VEHICLE MANUAL FOR FURTHER TROUBLESHOOTING INFORMATION. REPAIR/REPLACE AS NECESSARY AND REPEAT STARTUP.

CONNECT OPPOSITE END OF RELAY COIL TO GROUND AND NOTE REACTION OF DASH LIGHT.



DASH LIGHT OFF

DASH LIGHT ON

REPEAT STARTUP. IF TESTING HAS RETURNED TO THIS PLACE TWICE, REPLACE EC-11.

REPLACE RELAY

REPEAT STARTUP

