

# Automotive Technology 6<sup>th</sup> Edition

## Chapter 45 – Wiring Schematics and Circuit Testing

### Lesson Plan

#### **CHAPTER SUMMARY:**



1. Wiring schematics and symbols
  2. Relay terminal identification, locating an open circuit, and common power or ground
  3. Circuit troubleshooting procedure and locating a short circuit
  4. Electrical troubleshooting guide and step-by-step troubleshooting procedure
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#### **OBJECTIVES:**



1. Interpret wiring schematics and explain the procedure to identify relay terminals.
  2. Locate shorts, grounds, opens, and resistance problems in electrical circuits, and determine necessary action.
  3. Explain the different methods to locate a short circuit, and the procedure to troubleshoot an electrical problem.
  4. This chapter will help you prepare for the ASE electrical/electronic Systems (A6) certification test content area “A” (General Electrical/Electronic System diagnosis).
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**RESOURCES:** (All resources may be found at <http://www.jameshalderman.com>)



1. **Task Sheet ASE (A6-A-4) P-1:** Diagnose Electrical/Electronic Circuits
  2. **Task Sheet ASE (A6-A-4) P-1:** Locate Shorts, Grounds, and Opens
  3. Chapter PowerPoint
  4. Chapter Crossword Puzzle and Word Search
  5. Animations: Bulb Test, Meter, Circuit Test, Amps, Meter, Circuit Test, Meter, and DC Motor
  6. Animations: Fan Motor Checks, Headlight Circuit, Parking Lights, and Headlight Circuit, High Beam
  7. Animations: Headlight Circuit, Low Beam and Map Sensor Ground Check
  8. Animations: Map Sensor Reference Voltage Check
  9. Videos: See list at the end of the lesson plan.
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#### **ACTIVITIES:**



1. **Task Sheet ASE (A6-A-4) P-1:** Have students complete Diagnose Electrical/Electronic Circuits Task Sheet.
  2. **Task Sheet ASE (A6-A-4) P-1:** Have students complete Locate Shorts, Grounds, and Opens Task Sheet.
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#### **ASSIGNMENTS:**



1. Chapter crossword and word search puzzles.
  2. Complete end of chapter 10 question quiz.
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#### **CLASS DISCUSSION:**



1. Review and group discussion chapter Frequently Asked Questions and Tech Tips sections.
  2. Review and group discussion of the five (5) chapter Review Questions.
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#### NOTES AND EVALUATION:



**Videos:** (at <http://www.jameshalderman.com>)

Cruise control and wiring diagram (time 3:33)  
Power locks and wiring diagrams (time 3:47)  
Power windows and wiring diagrams part 1 (time 6:47)  
Power windows and wiring diagrams part 2 (time 6:01)  
Wiring diagram analysis (time 6:25)  
Ohms law and wiring diagrams (time 5:01)  
Negative or positive trigger wiring diagrams (time 1:35)  
Current induction and wiring diagrams (time 4:37)  
Capacitors and wiring diagrams (time 6:09)  
Short circuit detection part 1 (time 5:05)  
Short circuit detection part 2 (time 4:50)  
Open circuit detection part 1 (time 7:07)  
Open circuit detection part 2 (time 7:25)  
Module circuits (time 5:32)  
High resistance detection (time 3:34)  
Electric motors and wiring diagrams (time 6:16)  
Basic sensor and wiring diagrams (time 2:29)  
Power, ground and wiring diagrams (time 4:31)  
Charging system and wiring diagram (time 4:03)  
Voltage drop part 1 (time 2:01)  
Voltage drop part 2 (time 2:25)  
Voltage drop part 3 (time 3:16)  
Voltage drop part 4 (time 2:23)  
Relay diagnosis (time 3:53)  
Solenoid testing (time 6:59)  
Ampere draw (time 1:42)  
Checking circuits for continuity (time 2:1)  
Switches relays and wiring part 1 (time 5:34)  
Switches relays and wiring part 2 (time 5:22)  
Resistors and wiring diagrams (time 7:20)  
Relay current flow (time 11:58)  
Pressure sensor wiring diagram (time 1:46)  
Duty cycle and wiring diagrams (time 3:57)  
Blower motor ampere draw (time 7:16)  
Electric fuel pump testing (time 13:54)  
Finding an electrical short (time 21:29)  
Electrical short (time 8:41)  
Network circuits (time 8:09)  
Alternator voltage drop (time 7:48)  
Solenoid wiring diagrams (time 3:06)  
Starter system voltage drop (time 1:55)  
Voltage drop part 1 (time 3:41)  
Voltage drop part 2 (time 9:29)  
Voltage drop part 3 (time 9:42)  
Voltage drop part 4 (time 9:39)  
Clutch switch (time 5:10)  
Electrical shorts (time 2:44)  
Electrical diagnosis (time 3:37)  
Relays (time 8:13)  
Relays (time 1:32)  
Relays (time 1:27)  
Wiper repair (time 11:34)  
Horns and wiring diagrams (time 3:33)  
Horn troubleshooting (time 3:39)  
Repairing wipers (time 4:03)  
How to test a wiper motor (time 3:04)  
Wiper motor diagnosis (time 9:05)  
Windshield washer pump (time 3:52)  
Wiper motor (time 1:15)  
Horn repair (time 1:17)  
Horn contact repair (time 5:16)  
Horn diagnosis (time 5:13)  
Wiper diagnosis (time 3:04)  
Wiper motor replacement (time 5:30)  
Wiper motor replacement (time 7:38)  
Washer repair (time 1:42)  
Volvo wipers (time 27:34)  
Wiper motor (time 3:21)  
Wiper and washer repair (time 3:42)  
Wiper motor repair (time 2:22)  
Wiper switch (time 1:27)  
Wiper linkage (time 12:11)  
Wiper switch (time 4:41)  
Windshield Wiper Motor Replacement (time 2:35)