

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

## Chapter 55 – Charging System Diagnosis and Service

### Lesson Plan



#### **CHAPTER SUMMARY:**

1. Charging system testing and diagnosis and drive belt inspection and adjustment
  2. AC ripple voltage check, testing AC ripple current, and charging system voltage drop testing
  3. Alternator output test, minimum alternator output, and alternator removal
  4. Alternator disassembly, testing the rectifier, and reassembling the alternator
  5. Remanufactured alternators and alternator installation
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#### **OBJECTIVES:**

1. Discuss the various methods to test the charging system.
  2. Describe how to inspect and adjust the drive belts.
  3. Discuss the alternator output test and minimum required output.
  4. Explain how to remove, disassemble, reassemble, and install an alternator and test its component parts.
  5. Describe remanufactured alternators.
  6. This chapter will help prepare for the ASE Electrical/Electronic Systems (A6) certification test content area "D" (Charging System Diagnosis and repair).
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#### **RESOURCES:** (All resources may be found at <http://www.jameshalderman.com>)

1. **Task Sheet:** Alternator Disassembly
  2. **Task Sheet:** Alternator Rotor Testing
  3. **Task Sheet:** Alternator Stator Testing
  4. **Task Sheet:** Alternator Rectifier Bridge Testing
  5. **Task Sheet ASE (A6-D-1) P-1:** Charging System Output Test
  6. **Task Sheet:** Charging System Diagnosis
  7. **Task Sheet ASE (A6-D-3) P-1:** Alternator Drive Belt
  8. **Task Sheet ASE(A6-D-3) P-1, (A6-D-4) P-1:** Remove and Install Alternator
  9. **Task Sheet ASE (A6-D-2) P-2: (A6-D-2) P-2:** Charging Circuit Voltage Drop
  10. Chapter PowerPoint
  11. Chapter Crossword Puzzle and Word Search
  12. Animations: Charging Circuit Volt Drop Ground and Charging Circuit Volt Drop Power Side
  13. Animations: Measure AC Ripple and Ohmmeter Test - Alternator Rotor
  14. Animations: Ohmmeter Test - Alternator Stator and Remove and Replace Drive Belt
  15. Videos: See list at the end of the lesson plan.
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DEMO

#### ACTIVITIES:

1. **Task Sheet:** Have students complete Alternator Disassembly Task Sheet
  2. **Task Sheet:** Have students complete Alternator Rotor Testing Task Sheet.
  3. **Task Sheet:** Have students complete Alternator Stator Testing Task Sheet.
  4. **Task Sheet:** Have students complete Alternator Rectifier Bridge Testing Task Sheet.
  5. **Task Sheet ASE (A6-D-1) P-1:** Have students complete Charging System Output Test Task Sheet.
  6. **Task Sheet:** Have students complete Charging System Diagnosis Task Sheet.
  7. **Task Sheet ASE (A6-D-3) P-1:** Have students complete Alternator Drive Belt Task Sheet.
  8. **Task Sheet ASE(A6-D-3) P-1, (A6-D-4) P-1:** Have students complete Remove and Install Alternator Task Sheet.
  9. **Task Sheet ASE (A6-D-2) P-2: (A6-D-2) P-2:** Have students complete Charging Circuit Voltage Drop 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:

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

- Battery and alternator testing (time 21:08)
- Electronic load detector (time 3:21)
- Serpentine belt replacement (time 8:05)
- Charging system test (time 4:49)
- Alternator (time 13:52)
- Alternator replacement (time 3:20)
- How to test a voltage regulator (time 2:19)
- Alternator replacement (time 9:40)
- Alternator replacement (time 7:37)
- Wiring diagram for an alternator (time 4:03)
- Alternator Voltage Drop (time 7:48)
- How to Replace an Alternator (time 11:52)