

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

## Chapter 53 – Cranking System Diagnosis and Service

### Lesson Plan

#### **CHAPTER SUMMARY:**



1. Starting system troubleshooting procedure and voltage drop testing
  2. Control circuit testing, starter amperage test, starter removal, and starter motor service
  3. Bench testing and starter installation
  4. Starter drive-to-fly wheel clearance
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#### **OBJECTIVES:**



1. explain the procedure to troubleshoot a starting system problem.
  2. Discuss how to perform a voltage drop test on the cranking circuit.
  3. Perform control circuit testing and starter amperage test, and determine necessary action.
  4. Describe the procedure to remove a starter motor.
  5. Explain starter motor service and bench testing.
  6. Describe the procedure to install a starter motor.
  7. Describe how to ensure proper clearance between the starter pinion and the engine flywheel.
  8. This chapter will help prepare for the ASE Electrical/Electronic Systems (A6) certification test content area “C” (Battery and Starting Systems Diagnosis and repair).
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**RESOURCES:** (All resources may be found at <http://www.jameshalderman.com>)



1. **Task Sheet:** Starter Disassembly and Testing
  2. **Task Sheet ASE (A6-C-1) P-1, (A6-C-2) P-1, (A6-C-3) P-2, (A6-C-6) P-2:** Starter Voltage Drop/Current Draw Tests
  3. **Task Sheet ASE (A6-C-5) P-2:** Starter Relays and Solenoids
  4. **Task Sheet ASE(A6-C-4) P-1:** Remove and Install the Starter
  5. Chapter PowerPoint
  6. Chapter Crossword Puzzle and Word Search
  7. Animations: Starter Circuit Voltage Drop Tests and Starter Circuit Voltage Drop Tests 2
  8. Videos: See list at the end of the lesson plan.
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#### **ACTIVITIES:**



1. **Task Sheet:** Have students complete Starter Disassembly and Testing Task Sheet
  2. **Task Sheet ASE (A6-C-1) P-1, (A6-C-2) P-1, (A6-C-3) P-2, (A6-C-6) P-2:** Have students complete Starter Voltage Drop/Current Draw Tests Task Sheet.
  3. **Task Sheet ASE (A6-C-5) P-2:** Have students complete Starter Relays and Solenoids Task Sheet.
  4. **Task Sheet ASE(A6-C-4) P-1:** Have students complete Remove and Install the Starter 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>)

- Charging system test (time 4:49)
- Starter diagnosis (time 15:58)
- Starter replacement (time 3:09)
- Clutch switch (time 2:40)
- Car no start (time 4:20)
- Starter test (time 8:59)
- No crank/no start diagnostics (time 6:20)
- Remote starter switch (time 3:58)
- Starter (time 5:32)
- Solenoid testing (time 2:59)
- Starter diagnosis (time 14:59)
- Starter system voltage drop (time 1:55)
- No start no crank testing (time 4:28)
- 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)
- Ignition lock cylinder (time 2:29)
- Starter (time 9:47)
- Clutch switch (time 5:10)
- Ignition switch replacement (time 4:26)
- How to Change (remove & replace) a Starter (time 11:41)