

# Automotive Engines Theory and Servicing 10<sup>th</sup> Edition

## Chapter 16 – Engine Starting and Charging Systems

### Lesson Plan



#### **CHAPTER SUMMARY:**

1. Battery, Battery Ratings, Battery Service Considerations, and Battery Visual Inspection
2. Battery Voltage Test, Battery Load Testing, Conductance Testing, Jump Starting, and Battery Charging
3. Battery Service, Battery Electrical Drain Test, and Battery Electrical Drain Testing Using an Ammeter
4. Procedure for Battery Electrical Drain Test and Finding the Source of the Drain
5. When a Battery Drain Exist After All Fuses are Disconnected and Cranking Circuit
6. Diagnosing Starter Problems Using Visual Inspection and Starter Testing on the Vehicle
7. Testing a Starter using a Scan Tool, Voltage Drop Test, and Charging Circuit
8. Checking Charging System Voltage and Testing an Alternator Using a Scan Tool
9. AC Ripple Voltage Check, AC Current Check, and Charging System Voltage Drop Test
10. Alternator Output Test and Testing an Alternator Using a Scope

---

#### **OBJECTIVES:**



1. Explain the purpose and function of a battery, and discuss battery ratings.
2. Discuss battery service and battery service safety considerations.
3. Discuss battery voltage test, battery load testing, and conductance testing.
4. Explain how to safely jump start a battery, and discuss battery charging and the charging circuit.
5. Explain the battery electrical drain test.
6. Describe the cranking circuit, and discuss how to diagnose starter problems using visual inspection.
7. Explain starter testing on a vehicle and how to test a starter using a scan tool.
8. Discuss voltage drop testing and how to check charging system voltage.
9. Discuss the need for proper starter drive-to-flywheel clearance.
10. Discuss how to test an alternator using a scan tool and using a scope.
11. Discuss AC ripple voltage check and AC current check.
12. Explain charging system voltage drop testing and alternator output test.

---

#### **RESOURCES:** ([All resources may be found at jameshalderman.com](http://www.jameshalderman.com))



1. Task Sheet: Starting and Charging System Information
2. Chapter PowerPoint
3. [Crossword Puzzle and Word Search \(A6\)](#)
4. [Videos: \(A6\) Electrical/Electronic Systems](#)
5. [Animations: \(A6\) Electrical/Electronic Systems](#)

---

#### **ACTIVITIES:**



1. Task Sheet: Starting and Charging System Information

---

#### **ASSIGNMENTS:**



1. Chapter crossword and word search puzzles from the website.
  2. Complete end of chapter quiz from the textbook.
  3. Complete multiple choice and short answer quizzes downloaded from the website.
-

# Automotive Engines Theory and Servicing 10<sup>th</sup> Edition

## Chapter 16 – Engine Starting and Charging Systems

### Lesson Plan



#### **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.
- 



#### **NOTES AND EVALUATION:**

---