**Electric & Hybrid Electric Vehicles 1st Edition**

**Chapter 9 – Low-Voltage Batteries and Stop-Start Micro Hybrids**

**Lesson Plan**

**CHAPTER SUMMARY:**

1. Introduction to the 12-Volt Battery, How a Battery Works, and Valve-Regulated Lead-Acid Batteries

2. 12-Volt Battery Ratings, Battery Service Safety Precautions, and 12-Volt Battery Voltage Test

3. 12-Volt Battery Load Testing and 12-Volt Battery Conductance Testing

4. 12-Volt Battery Charging, The 36-48-Volt Battery and Stop-Start Defined

5. Stop-Start Systems, Micro Hybrids, Battery Diagnosis, and Mild Hybrids,

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**OBJECTIVES:**

1. Describe the purpose of the 12-volt battery.

2. Explain the 12-volt battery rating systems.

3. Describe the 12-volt battery test procedures.

4. Describe the function of the 36-48-volt battery.

5. Explain the 36-48-volt battery test procedure.

6. Describe the main advantages of a stop-start system.

7. Explain the difference between a micro and mild hybrid.

8. Explain how a disable condition prevents the operation of a stop-start system.

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

1. Task Sheet: Hybrid and Electric Vehicle Auxiliary Battery

2. Task Sheet: Stop-Start Scan Tool Diagnosis

3. Chapter PowerPoint

4. [Crossword Puzzle and Word Search (L3)](https://jameshalderman.com/l3_puzzles_lib_page/)

5. [Crossword Puzzle and Word Search (A6)](https://jameshalderman.com/a6_puzzles_lib_page/)

6. [Videos: (L3) Light Duty Hybrid Electric](https://jameshalderman.com/l3_vid_lib_page/)

7. [Videos: (A6) Electrical/Electronic Systems](https://jameshalderman.com/a6_vid_lib_page/)

8. [Animations: (L3) Light Duty Hybrid Electric](https://jameshalderman.com/l3_anim_lib_page/)

9. [Animations: (A6) Electrical/Electronic Systems](https://jameshalderman.com/a6_anim_lib_page/)

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**ACTIVITIES:**

1. Task Sheet: Hybrid and Electric Vehicle Auxiliary Battery

2. Task Sheet: Stop-Start Scan Tool Diagnosis

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**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.

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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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