**Automotive Technology 7th Edition**

**Chapter 89 – EV and High-Voltage Batteries**

**Lesson Plan**

**CHAPTER SUMMARY:**

1. Hybrid and Electric Vehicle High-Voltage Batteries, and Nickel-Metal Hybrid Batteries

2. Lithium-Ion High-Voltage Batteries, and Designs of Lithium-Ion Cells

3. Types of Lithium-Ion Batteries, HEV/EV Electronics Cooling, and High-Voltage Battery Cooling and Heating

4. Battery Capacity Vs Vehicle Range, and High-Voltage Battery Control Components

5. Lithium-Ion Battery Repair, and Battery Degradation and Balancing

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**OBJECTIVES:**

1. Discuss hybrid and electric vehicle high-voltage batteries.

2. Describe nickel-metal hydride batteries and designs used in hybrid electric vehicles.

3. Explain the operation of lithium-ion high-voltage batteries.

4. Describe the designs of lithium-ion cells.

5. Describe the types of lithium-ion batteries.

6. Explain HEV/EV electronics cooling.

7. Explain high-voltage battery cooling and heating.

8. Discuss battery capacity versus vehicle range.

9. Discuss the high-voltage battery control components.

10. Discuss the factory authorized lithium-ion battery repair procedure.

11. Describe battery degradation and balancing. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**RESOURCES:** (All resources may be found at jameshalderman.com)

1. Task Sheet: High-Voltage Batteries

2. Task Sheet: High-Voltage Battery Diagnosis

3. Crossword Puzzle and Word Search

4. Chapter PowerPoint

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

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

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**ACTIVITIES:**

1. Task Sheet: High-Voltage Batteries

2. Task Sheet: High-Voltage Battery Diagnosis

3. Crossword Puzzle and Word Search

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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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