

Electric & Hybrid Electric Vehicles 1st Edition

Chapter 4 – Hybrid Engine Systems

Lesson Plan



CHAPTER SUMMARY:

1. Hybrid Internal Combustion Engines (ICE), Engine Fundamentals, and Atkinson Cycle
2. Hybrid Engine Design Features, VVT, and Diagnosing of Variable Valve Timing Systems
3. HEV ICE Cooling System, Cooling System Testing, and Coolant Heat Storage System
4. Hybrid Engine Run Mode and Hybrid Engine Testing

OBJECTIVES:



1. Explain how a four-stroke cycle gasoline engine operates.
2. Explain the Atkinson cycle and how it affects engine efficiency.
3. Describe the importance of using the specified oil in the engine of a hybrid electric vehicle.
4. Describe how the fuel injection and ignition systems work on hybrid gasoline engines.
5. Explain how variable valve timing is able to improve engine power and reduce exhaust emissions.

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



1. Task Sheet: Hybrid Vehicle ICE Service Precautions
2. Task Sheet: Hybrid Engine VVT System Diagnosis
3. Chapter PowerPoint
4. [Crossword Puzzle and Word Search \(L3\)](#)
5. [Videos: \(L3\) Light Duty Hybrid Electric](#)
6. [Animations: \(L3\) Light Duty Hybrid Electric](#)

ACTIVITIES:



1. Task Sheet: Hybrid Vehicle ICE Service Precautions
2. Task Sheet: Hybrid Engine VVT System Diagnosis

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.

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:

