

# Hybrids & Alternative Fuel Vehicles

## Chapter 20 First Responder Procedures

### Opening Your Class

KEY ELEMENT	EXAMPLES
Introduce Content	This course or class covers operation and service of <a href="#">Hybrid and Alternative Fueled Vehicles</a> . It correlates material to task lists specified by ASE and NATEF.
Motivate Learners	Explain how the knowledge of how something works translates into the ability to use that knowledge to figure why the engine does not work correctly and how this saves diagnosis time, which translates into more money.
State the learning objectives for the chapter or course you are about to cover and explain this is what they should be able to do as a result of attending this session or class.	Explain the chapter learning objectives to the students. <ol style="list-style-type: none"><li>1. Follow first responder standard operating procedures.</li><li>2. Identify a hybrid electric vehicle.</li><li>3. Safely depower a hybrid electric vehicle.</li><li>4. Safely handle spills from a hybrid electric vehicle.</li><li>5. Discuss first responder issues involving alternative-fuel vehicles.</li></ol>
Establish the Mood or Climate	Provide a <i>WELCOME</i> , Avoid put downs and bad jokes.
Complete Essentials	Restrooms, breaks, registration, tests, etc.
Clarify and Establish Knowledge Base	Do a round robin of the class by going around the room and having each student give their backgrounds, years of experience, family, hobbies, career goals, or anything they want to share.

**NOTE: This lesson plan is based on Hybrids 4<sup>th</sup> Edition Chapter Images found on Jim's web site @**

**[www.jameshalderman.com](http://www.jameshalderman.com)**

**LINK CHP 20: [Chapter Images](#)**

ICONS	Ch20 First Responder Procedures
      	<p><b>1. SLIDE 1 FIRST RESPONDER</b></p> <p>Check for <b>ADDITIONAL VIDEOS &amp; ANIMATIONS</b>  @ <a href="http://www.jameshalderman.com/">http://www.jameshalderman.com/</a>  <b>WEB SITE IS CONSTANTLY UPDATED</b></p> <p>At the beginning of this class, you can download the crossword puzzle &amp; Word Search from the links below to familiarize your class with the terms in this chapter &amp; then discuss them</p> <p><a href="#">Crossword Puzzle (Microsoft Word) (PDF)</a>  <a href="#">Word Search Puzzle (Microsoft Word) (PDF)</a></p> <p><b>2. SLIDE 2 EXPLAIN FIGURE 20.1</b> Insulated tools should be used, if possible, when tools are needed to free an occupant or perform removal of battery cables of a hybrid electric vehicle.</p> <p><b>3. SLIDE 3 EXPLAIN FIGURE 20.2</b> Most hybrid electric vehicles (HEVs) can be identified by emblems on the front, side or rear of the vehicle.</p> <p><b>4. SLIDE 4 EXPLAIN FIGURE 20.3</b> hybrid electric vehicle can often be identified by looking for orange-colored cables under hood, as well as other markings on engine cover.</p> <p><b>5. SLIDE 5 EXPLAIN FIGURE 20.4</b> Toyota Highlander hybrid battery pack located under the rear seat.</p>
 	<p><b><u>DEMONSTRATION:</u> SHOW THE INSULATED TOOLS TO THE CLASS</b></p> <p><b>DISCUSS FREQUENTLY ASKED QUESTIONS</b></p>

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	<p>6. <b>SLIDE 6 EXPLAIN FIGURE 20.5</b> Blue cables under hood of a General Motors mild hybrid electric vehicle.</p>
	<p>7. <b>SLIDE 7 EXPLAIN FIGURE 20.6</b> The end of a hot stick has a hook that allows first responders to grab and move high-voltage cables without being shocked because the pole is made from fiberglass, which is an insulator.</p>
	<p><b><u>DEMONSTRATION: LIFT HEV VEHICLE &amp; SHOW LOCATION OF HIGH VOLTAGE CABLES</u></b></p>
	<p><b>DISCUSS WARNING</b></p>
	<p>8. <b>SLIDE 8 FIGURE 20.7</b> Use caution when cutting roof pillars because the curtain airbags could be deployed</p>
	<p><b>DISCUSS WARNING</b></p>
	<p><b>DISCUSS CAUTION</b></p>
	<p><b>DISCUSS FREQUENTLY ASKED QUESTION</b></p>
	<p>9. <b>SLIDE 9 EXPLAIN FIGURE 20.8</b> dotted lines on battery cables indicate where first responders cut 12-volt battery cables, which will de-power high-voltage system</p>
	<p><b><u>DEMONSTRATION: SHOW ACTUAL BATTERY CABLE CUT AREA</u></b></p>

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	<p><b>10. SLIDE 10 EXPLAIN FIGURE 20.9</b> A methanol fuel pump is rarely seen. Methanol is seldom used as a fuel, but it is commonly used as an industrial solvent.</p> <p><b>11. SLIDE 11 EXPLAIN FIGURE 20.10</b> A vehicle designed to use compressed natural gas (CNG) will usually be equipped with a blue CNG label.</p>