

Automotive Engines

Chapter 9 Vehicle Identification & Emission Ratings

Opening Your Class

KEY ELEMENT	EXAMPLES
Introduce Content	This engine systems course or class provides complete coverage of the components, operation, design, and troubleshooting. It correlates material to task lists specified by ASE and NATEF and emphasizes a problem-solving approach. Chapter features include Tech Tips, Frequently Asked Questions, Real World Fixes, Videos, Animations, and NATEF Task Sheet references.
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. 1. Identify a vehicle. 2. Interpret vehicle identification numbers and placard information. 3. Interpret vehicle emissions and emission control information. 4. Read and interpret casting numbers. 5. Locate calibration codes.
Establish the Mood or Climate	Provide a WELCOME , 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.

ICONS	Chapter 9 Vehicle Identification & Emission Rating
         	1. SLIDE 1 TITLE: VEHICLE IDENTIFICATION & EMISSION RATINGS Check for ADDITIONAL VIDEOS & ANIMATIONS @ http://www.jameshalderman.com/ WEB SITE REGULARLY UPDATED 2. SLIDES 2-3 EXPLAIN OBJECTIVES & KEY TERMS 4. SLIDE 4 READ & EXPLAIN Parts of a Vehicle <u>DISCUSSION:</u> HAVE STUDENTS TALK ABOUT WHY, FOR AUTOMOTIVE SERVICING & AND REPAIR PURPOSES, PARTS OF A VEHICLE ARE IDENTIFIED IN TERMS OF LEFT & RIGHT SIDE OR FRONT AND REAR RATHER THAN BY DRIVER OR PASSENGER SIDE. <u>ON-VEHICLE TASK:</u> HAVE STUDENTS USE MASKING TAPE TO LABEL THE LEFT AND RIGHT PARTS OF A CAR OR TRUCK 5. SLIDE 5 READ & EXPLAIN Front-Wheel Drive Versus Rear-Wheel Drive It is common to use acronyms: FWD for Front Wheel Drive, RWD for Rear Wheel Drive, 4WD for Four-Wheel Drive, & AWD for All Wheel Drive. <u>DISCUSSION:</u> ASK STUDENTS TO DISCUSS DIFFERENCES BETWEEN FRONT-WHEEL, REAR-WHEEL, ALL-WHEEL, AND FOUR WHEEL DRIVE SYSTEMS. WHAT ARE ADVANTAGES & DISADVANTAGES OF EACH? STUDENTS WILL PREPARE A CHART SHOWING THE DIFFERENCES IN THE BELOW ON-VEHICLE TASK. <u>ON-VEHICLE TASK:</u> HAVE STUDENTS DO A CHART IN CLASS ON DIFFERENCES BETWEEN DRIVE SYSTEMS

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        	TIME-CHECK: NOTE ON TIME CHECK: DEPENDING ON TIME, YOU MAY WANT TO MOVE TO NEXT HOUR'S TEXT OR CONTINUE ON WITH INSTRUCTION 6. SLIDE 6 READ & EXPLAIN Vehicle Identification 7. SLIDE 7 EXPLAIN FIGURE 9-1 Typical vehicle identification number (VIN) as viewed through the windshield. 8. SLIDE 8 READ & EXPLAIN Chart 9-1 9. SLIDE 9 READ & EXPLAIN Chart 9-2 (The Pattern Repeats Every 30 Years) <u>DEMONSTRATION: SHOW STUDENTS AN EXAMPLE OF A VEHICLE IDENTIFICATION NUMBER (VIN) AND HAVE STUDENTS DECIPHER ITS MEANING BASED ON INFORMATION PROVIDED ON PAGE 126 OF ATE4 CHAPTER 16</u> Before 1980, there was no universally accepted equivalent to a VIN, so OEMs used their own formats. HAVE STUDENTS COMPLETE VIN TASK SHEET. STUDENTS DECIPHER VIN ON A LAB OR PERSONAL VEHICLE <u>HOMEWORK: HAVE STUDENTS RESEARCH THE HISTORY OF VIN. USING COMPETING STANDARDS FOR VEHICLE IDENTIFICATION BEFORE 1980 AND WHY VIN STANDARD BECAME NECESSARY.</u> 10. SLIDE 10 READ & EXPLAIN Vehicle Safety Certification Label (VSCL Label) <u>DEMONSTRATE: EXAMPLE OF VEHICLE SAFETY CERTIFICATION LABEL. ASK THEM TO DECIPHER INFORMATION PROVIDED ON LABEL AND EXPLAIN WHAT IT SIGNIFIES.</u> 11. SLIDE 11 READ & EXPLAIN VECI Label & EXPLAIN FIGURE 9-2 VECI label on a 2008 Ford

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        	<u>DEMONSTRATE: LOCATION OF VEHICLE EMISSIONS CONTROL INFORMATION (VECI) LABEL UNDER HOOD OF VEHICLE</u> <u>ASK STUDENTS TO DISCUSS IMPORTANCE OF INFORMATION PROVIDED ON VECI LABEL</u> <u>HAVE STUDENTS COMPLETE VECI TASK SHEET</u> 12. SLIDES 12-14 READ & EXPLAIN Emission Standards in United States 15. SLIDE 15 EXPLAIN FIGURE 9-3 The underhood decal showing that this Lexus RX-330 meets both national (Tier 2; BIN 5) and California LEV-II (ULEV) regulation standards 16. SLIDE 16 READ & EXPLAIN CHART 9-3 LEV Standard Categories 17. SLIDE 17 READ & EXPLAIN CHART 9-4 California LEV II 120,000-Mile Tailpipe Emissions Limits California Air Resources Board, or CARB, enforces some of world's strictest Air Pollution Standards. Indian Tribes call LA area Valley of Smoke <u>HAVE STUDENTS RESEARCH PROBLEMS OF EMISSIONS IN CALIFORNIA, USING TERMS PHOTOCHEMICAL SMOG AND LOS ANGELOS VALLEY OF SMOKE EMISSIONS</u> <u>HOST DISCUSSION ON WHY CALIFORNIA EMISSION STANDARDS & RESULTS OF INTERNET RESEARCH</u> 18. SLIDE 18 READ & EXPLAIN CHART 9-5 EPA Tier 2—120,000-Mile Tailpipe Emission Limits 19. SLIDE 19 READ & EXPLAIN CHART 9-6 Air Pollution Score 20. SLIDE 20 READ & EXPLAIN Calibration Codes & EXPLAIN FIGURE 9-4 typical computer calibration sticker on case of controller. The information on sticker

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is often needed when ordering parts or a replacement controller.

21. **SLIDE 21 READ & EXPLAIN** Casting Numbers & **EXPLAIN** **FIGURE 9-5** Engine block identification number cast into the block is used for identification

Talk through SUMMARY and questions

HOMEWORK: COMPLETE CH9 CROSSWORD PUZZLE:

[HTTP://WWW.JAMESHALDERMAN.COM/LINKS/BOOK ENGINE THEORY SERV 7/CW/CROSSWORD CH 9.PDF](http://www.jameshalderman.com/links/book_engine_theory_serv_7/cw/crossword_ch_9.pdf)