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JIM HALDERMAN brings a world of experience, knowledge, and talent to his work. His automotive service experience includes working as a flat-rate technician, a business owner, and a professor of automotive technology at a leading U.S. community college.

He has a bachelor of science degree from Ohio Northern University and a master’s degree from Miami University in Oxford, Ohio. Jim also holds a U.S. patent for an electronic transmission control device. He is an ASE-certified Master Automotive Technician and is also Advanced Engine Performance (L1) ASE certified. Jim is the author of many automotive textbooks, all published by Pearson Education. Jim has presented numerous technical seminars to national audiences, including the California Automotive Teachers (CAT) and the Illinois College Automotive Instructor Association (ICAIA). He is also a member and presenter at the North American Council of Automotive Teachers (NACAT). Jim was also named Regional Teacher of the Year by General Motors Corporation and a member of the advisory committee for the department of technology at Ohio Northern University. Jim and his wife, Michelle, live in Dayton, Ohio. They have two children. You can reach Jim at jim@jameshalderman.com

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—James D. Halderman

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Automotive Electrical and Engine Performance covers content and topics specified for both Electrical/Electronic System (A6) and Engine Performance (A8) by ASE/NATEF, as well as the practical skills that students must master to be successful in the industry. With this textbook, students preparing for the automotive profession get a firm background in the principles and practices of diagnosing and troubleshooting automotive electrical, electronic, and computer systems. The book is written in a clear, concise format at a level of detail that far exceeds most other texts. Well-known author, Jim Halderman, uses his helpful real-world tips and visuals to bring concepts to life and guide students through the procedures they’ll use on the job.

The following changes and updates have been made to the new eighth edition based on requests from instructors and readers from throughout North America.

- Over 75 new full color line drawings and photos have been added to the new edition to help bring the subject to life.
- Updated throughout and correlated to the latest ASE/NATEF tasks.
- The number of chapters has increased from 43 to 46 chapters by splitting up larger chapters and placing the content into shorter more concise chapters.
- A new chapter on Safety, Comfort and Convenience Accessories (Chapter 23) has been added.
- A new chapter called Air Management Systems (Chapter 24) has been added.
- Immobilizer Systems (Chapter 25) has been added to the new edition.
- The ignition system chapter was split into two shorter chapters (Chapters 29 and 30) to make teaching and learning this topic easier.
- The new Tier 3 emission standards have been added (Chapter 41)
LEARNING OBJECTIVES AND KEY TERMS appear at the beginning of each chapter to help students and instructors focus on the most important material in each chapter. The chapter objectives are based on specific ASE tasks.

TECH TIP feature real-world advice and “tricks of the trade” from ASE-certified master technicians.

SAFETY TIP

Shop Cloth Disposal
Always dispose of oily shop cloths in an enclosed container to prevent a fire. SEE FIGURE 1–69.
Whenever oily cloths are thrown together on the floor or workbench, a chemical reaction can occur, which can ignite the cloth even without an open flame. This process of ignition without an open flame is called spontaneous combustion.

SAFETY TIPS alert students to possible hazards on the job and how to avoid them.

CASE STUDY

Shocking Experience
A customer complained that after driving for a while, he got a static shock whenever he grabbed the door handle when exiting the vehicle. The customer thought that there must be an electrical fault and that the shock was coming from the vehicle itself. In a way, the shock was caused by the vehicle, but it was not a fault. The service technician sprayed the cloth seats with an anti-static spray and the problem did not reoccur. Obviously, a static charge was being created by the movement of the driver’s clothing on the seats and discharged when the driver touched the metal door handle. SEE FIGURE 9–39.

Summary:
- **Complaint**—Vehicle owner complained that he got shocked when the door handle was touched.
- **Cause**—Static electricity was found to be the cause and not a fault with the vehicle.
- **Correction**—The seats and carpet were sprayed with an anti-static spray and this corrected the concern.

CASE STUDY present students with actual automotive scenarios and show how these common (and sometimes uncommon) problems were diagnosed and repaired.
How Many Types of Screw Heads Are Used in Automotive Applications?

There are many, including Torx, hex (also called Allen), plus many others used in custom vans and motor homes. **SEE FIGURE 1–9.**

FREQUENTLY ASKED QUESTIONS are based on the author’s own experience and provide answers to many of the most common questions asked by students and beginning service technicians.

NOTE: A parallel circuit drops the voltage from source voltage to zero (ground) across the resistance in each leg of the circuit.

NOTES provide students with additional technical information to give them a greater understanding of a specific task or procedure.

CAUTION: Never use hardware store (nongraded) bolts, studs, or nuts on any vehicle steering, suspension, or brake component. Always use the exact size and grade of hardware that is specified and used by the vehicle manufacturer.

CAUTIONS alert students about potential damage to the vehicle that can occur during a specific task or service procedure.

WARNING

Do not touch any orange wiring or component without following the vehicle manufacturer’s procedures and wearing the specified personal protective equipment.

WARNINGS alert students to potential dangers to themselves during a specific task or service procedure.

---

**FREQUENTLY ASKED QUESTIONS**

1. How many screw heads are used in vehicles?
2. What are the most common types of screw heads?
3. How are screws identified?
4. What is the difference between a metric and an imperial screw?
5. What is the purpose of each screw size?
6. How do you select the correct screw size for a specific job?
7. What are the advantages and disadvantages of using each type of screw head?
8. How can screws be removed from a vehicle without causing damage?
9. What are the most common causes of screw damage in vehicles?
10. How can you prevent screw damage during vehicle maintenance?

---

**STEP-BY-STEP**

Photo sequences show, in detail, the steps involved in performing a specific task or service procedure.

---

**NOTES**

Provide students with additional technical information to give them a greater understanding of a specific task or procedure.

---

**CAUTIONS**

Alert students about potential damage to the vehicle that can occur during a specific task or service procedure.

---

**WARNINGS**

Alert students to potential dangers to themselves during a specific task or service procedure.

---

**THE REVIEW QUESTIONS AND CHAPTER QUIZ**

At the end of each chapter help students review the material presented in the chapter and test themselves to see how much they’ve learned.
# INSTRUCTOR RESOURCES

**RESOURCES IN PRINT AND ONLINE**

*Automotive Technology*

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<tr>
<td>Instructor Resource Manual</td>
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<td>Instructors</td>
<td>NEW! The Ultimate teaching aid: Chapter summaries, key terms, chapter learning objectives, and lecture resources.</td>
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<td>All of the images from the textbook to create customized slides.</td>
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<td>Instructors</td>
<td>Downloadable ASE task sheets for easy customization.</td>
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All online resources can be downloaded from the Instructor’s Resource Center: [www.pearsonhighered.com/automotive](http://www.pearsonhighered.com/automotive) Search for your specific title there and select the Resources.
The following people reviewed the manuscript before production and checked it for technical accuracy and clarity of presentation. Their suggestions and recommendations were included in the final draft of the manuscript. Their input helped make this textbook clear and technically accurate while maintaining the easy-to-read style that has made other books from the same author so popular.

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