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Halderman newsletter

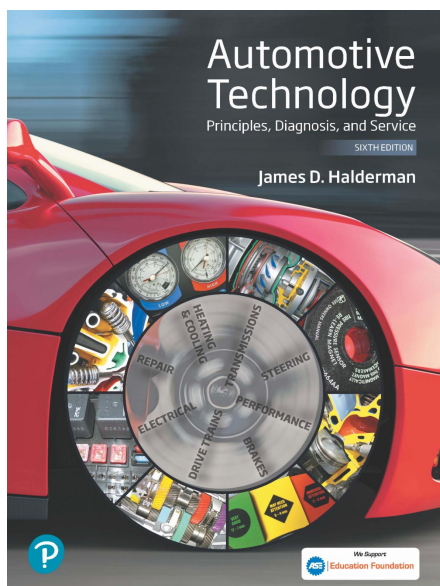
February 2020

What's new with Jim?

I am pleased that my new "big book" is being well received by automotive instructors/ professors. The main reasons, I think are due to the following:

1. Up to date technical content.
2. Hundreds of full color photos
3. Many case studies that include the three Cs (Complaint, Cause and Correction)
4. 136 short chapters (1761 pages) making teaching and learning easier

Examples of the new content includes:



- VIN decoder-page 136
- Diesel Exhaust Fluid (DEF)- pages 155 and 183
- SAE 0W-16 engine oil- page 213
- Variable intake manifolds- page 240
- Cylinder contribution test- page 261
- Variable valve timing- page 356
- Three legged fuses- page 506
- DLC breakout box (BOB) - page 572
- Flooded lead acid (FLA), enhanced flooded batteries (EFB) and absorbed glass matt (AGM) batteries- page 582
- Stop-Start system operation- page 606
- Dash warning symbols (122 of them) - pages 669-670
- Remote start system- page 706
- Advanced driver assists systems (ADAS)- pages 728-736
- Top tier gasoline- page 816
- Wide-band oxygen sensors- pages 911-918
- HV battery pack service photo sequence -pages 1064-1065
- Electric vehicles (EVs)- pages 1069-1072
- Brake pad Leaf Mark- page 1114
- Rim gauge usage- page 1381

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Where's Jim?

February 6-7 - Attending press preview days at the Chicago Auto Show

February 20-22 - Attending the MACS expo in Nashville, TN

Keep up with me at:

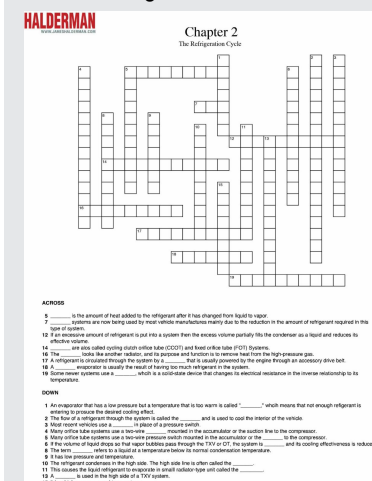
www.jameshalderman.com

Email Jim

Facebook

Puzzle of the month

Find this month's puzzle of the month at this [link](#) and test your students knowledge on air conditioning.



- Power steering systems now two separate chapters. Hydraulic Power Steering (chapter 122) and Electric Power Steering (chapter 123).
- Vibration and Noise Diagnosis now in a separate chapter (chapter 132)
- Adaptive learning added to automatic transmission content --page 1705

Auto Trivia



The car shown is a ____

- 1956 Nash Metropolitan
- 1957 Pontiac
- 1949 Packard
- 1956 Lincoln Mark II

Answer at the bottom of this page!

FAQ

Why is an ATC system slow to get airflow?

Some vehicle owners, new to automatic temperature control systems, complain that it seems to take a long time before the fan starts to move air. There are several reasons that this is done and it is to be considered normal operation: the fan speed is controlled by pulse-width modulating the voltage to the blower motor and it starts slowly, and then ramps up so very little airflow is noticed for the first few seconds. The control doors are often set to blow first to the floor vents before moving the doors to dash the vents. This is done to purge any stale air that may be in the ducts to the floor so that the driver and passengers do not notice the stale air. As a result, most automatic temperature control systems do normally have a delay between the time the engine is started and when airflow is felt. This is perfectly normal operation and no repair or service to the system is needed.

Case Study

If 50% Is Good, 100% Must Be Better

A vehicle owner said that the cooling system of his vehicle would never freeze or rust. He said that he used 100% antifreeze (ethylene glycol) instead of a 50/50 mixture with water. However, after the temperature dropped to -20°F (-29°C), the radiator froze and cracked. (Pure antifreeze freezes at about 0°F [-18°C].) After thawing, the radiator had to be replaced. The owner was lucky that the engine block did not also crack. For best freeze protection with good heat transfer, use a 50/50 mixture of antifreeze and water. As the percentage of antifreeze increases, the boiling temperature increases, and freezing protection increases (up to 70% antifreeze), but the heat transfer performance of the mixture decreases.

Summary:

Complaint-The coolant froze and cracked the radiator.

Cause-Vehicle owner used 100% antifreeze instead of the recommended 50/50 mixture of antifreeze and water.

Correction-The radiator was replaced and the proper mixture of antifreeze/water was used as the coolant.

Guest Expert

EV Heat Pump Systems

A nice, warm passenger compartment has always been easy for vehicles using internal combustion engines; just use some of the engine's waste heat being sent to the cooling system. Electric Vehicles (EVs) have some cooling systems for the batteries, drive motors, and/or electronics which can be used to warm the passenger compartment, but this is not enough heat for very cold areas. Some EVs use resistant heating which is very inefficient, drawing a lot of range from the batteries.

Cooling the passenger compartment is done by air conditioning, using a compressor driven by an electric motor pumping a refrigerant through two heat exchangers. The first is commonly called the condenser that transfers heat out, warming the adjacent area, and the second, commonly called the evaporator, that collects heat, cooling this area.

Many modern EVs convert the AC system into a heat pump by adding a pair of valves that reverse the flow through the two heat exchangers. The condenser now absorbs heat and the evaporator that was gathering heat now discharges heat to the passenger compartment. Power to drive the HVAC system comes from the batteries, and therefore, the HVAC reduces the operating range of the vehicle, limiting travel.

Tom Birch

Retired instructor/Author

Sample ASE certification-type question

Question:

What should the technician do before recovering refrigerant from a vehicle?

- a. Test it using a refrigerant identifier and a sealant identifier
- b. Connect pressure gauges and check the high- and low-side pressures
- c. Tighten the Schrader valves to be sure they are properly sealed
- d. Start the engine and allow the air-conditioning system to work for several minutes

Answer/Explanation

The correct answer is a. Before refrigerant is recovered, a refrigerant identifier and a sealant identifier should be used to avoid the possibility that the system has the wrong refrigerant or a mixture of refrigerants. Answer b is not correct because the wrong refrigerant could be exposed to the pressure gauges and/or equipment used to check high and low pressures. Answer c is not correct because even though the Schrader valves should be checked, it is not the first item that should be done before recovering refrigerant. Answer d is not correct because even though starting the engine and allowing the system to operate for a few minutes will not do any harm, it is not a necessary first step before refrigerant recovery.

Tech Tip



Because It Fits, Does Not Mean It Is Correct

Many air-conditioning systems use orifice tubes that look similar if not identical. They are usually color coded for identification. Always use the recommended orifice tube for the vehicle you are servicing. Some examples of the various colors and sizes available include:

Make, Color, Orifice Size (Inches)

Chrysler- purple, 0.0605

Ford- red, 0.0605

Ford- orange, 0.0560

Ford- brown, 0.0470

Ford-green, 0.0505

GM- yellow, 0.0605

Straight Talk

From the January 25 Wheels section of Dayton Daily News

Reader Asks About His Flex Fuel Car

Wheels:

Brett asks by email:

"I just purchased a new Chevrolet that is labeled a "Flex Fuel" vehicle. I have a few questions:

1. What is the difference in performance between normal cars and flex fuel cars?
 2. Can flex fuel cars use regular gas?
- Thanks."

Halderman:

The difference between a "regular" car and a flex fuel vehicle (FFV) is that the flex fuel vehicle is capable of using E85. E85 is a fuel that is 85 percent ethanol and 15 percent gasoline. Using E85 will result in reduced fuel economy compared to using gasoline. The performance is about the same using E85. The reduction in fuel economy however is what owners often mention and do not like about using E85. The reduction in the fuel economy when using E85 is about 20 percent. If the vehicle is rated at 30 MPG on gasoline, the same vehicle using E85 will likely be rated at 24 MPG. A flex fuel vehicle has a more robust fuel system compared to a regular non-flex fuel vehicle, including stainless steel fuel lines and a fuel pump and fuel injectors that are designed to withstand the corrosive effects of alcohol.

In fact, I often recommend that people purchase a flex fuel vehicle whenever possible, new or used, simply to get the enhanced fuel systems components which will likely have a long service life. The cost of the flex fuel option for most vehicles is often no additional cost or a low-cost option.



The answers to the second question is yes, you can use regular gas. Any flex fuel vehicle can use regular gasoline, but regular vehicles should not use E85.

Have an automotive question? Please write to Jim with your questions at jim@jameshalderman.co

Trivia question answer: b.

Please let me know what you think of the newsletter. I would love to include any of your automotive news, trivia questions or any tech tips you might have. Send me your suggestions!

You can email me [here](#) or visit [my website](#). You can connect with me on Facebook, Twitter and LinkedIn too (links above).

Regards,

Jim Halderman

James D. Halderman writes automotive technology textbooks for [Pearson Education](#). He is an ASE-certified Master Technician with more than 20 years instructional experience.