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Author & Automotive Expert James D. Halderman

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Where's Jim?

Due to the Coronavirus, all events have been canceled and I have no travel plans planned for the rest of the year.

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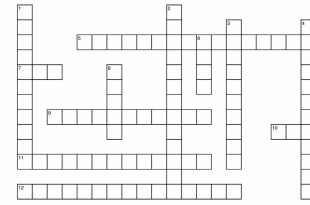
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Puzzle of the month

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



ACROSS

- 5 Another area of concern is a layer of gases that is causing it _____.
- 7 CFCs do the most damage and have an _____.
- 9 In 1990, president Bush (senior) signed the _____, which phased out the production of CFCs in the United States by the year 2000.
- 10 _____ compares the ability of different gases to trap heat, and this is based on the heat-absorbing ability of each gas.
- 11 _____ is a colorless and odorless gas which is naturally occurring chemical compound.
- 12 CFC and hydrocarbon (HC) gases such as butane and propane are considered _____.

DOWN

- 1 PAG or ester oil is very _____, which means that it can absorb moisture directly from the air up to about 2% to 6%.
- 2 This gas layer traps heat at the Earth's surface and lower atmosphere, and it is increasing the temperature of our living area. This is called _____.
- 3 _____ is a portion of the Clean Air Act that places certain requirements on the mobile vehicle air conditioning (MVAC) service field.
- 4 The upper layer of the atmosphere is called the _____, and it begins about 7 miles to 10 miles (11 km to 16 km) up and extends to the outer limits.
- 6 Section 612 of the 1990 Clean Air Act established the _____ program to determine acceptable replacement for Class I and Class II chemicals.
- 8 A layer of _____ extends around the Earth in the stratosphere.

Auto Trivia

This 1951 Henry J was manufactured by what company?

- a. Kaiser
- b. Crosley
- c. Studebaker
- d. Chevrolet



**Answer at the bottom*

FAQ

What Coolant Is Used in a Motor/Electronics Cooling System?

Most hybrid electric vehicle manufacturers specify that the same coolant used in the vehicle's ICE (engine) be used for cooling the motors and electronics. For instance, Toyota specifies that its Super Long Life Coolant be used in the second generation Prius ICE cooling system as well as the inverter cooling system.

Sample ASE certification-type question

Both high-side pressures and low-side pressures are low with the engine running and the selector set to the air conditioning position. Technician A says that the system is undercharged. Technician B says the cooling fan could be inoperative. Which technician is correct?

- a. Technician A only
- b. Technician B only
- c. Both Technicians A and B
- d. Neither Technician A nor B

Answer/Explanation

The correct answer is a. Technician A only is correct because a system that is undercharged (low on refrigerant) will keep the compressor from creating pressure. As a result of the low amount of refrigerant, the cooling ability is reduced. Technician B is not correct because an inoperative cooling fan will cause the discharge pressure to increase rather than decrease because the air will not be forced through the condenser, thereby not allowing the heat to be transferred from the refrigerant to the outside air. Answers c and d are not correct because Technician A only is correct.

Tech Tip

Look at Scan Tool Data on Hybrid or Electric Vehicles

When diagnosing the air conditioning system on a hybrid electric vehicle (HEV) or electric vehicle (EV) that use an electric compressor, look at the scan tool data instead of the pressure gauges. Because the compressor is pulse-width modulated (PWM), the pressures may not be proper because the compressor is driven just enough to provide the necessary cooling.



Air Condition Data - Room Temperature Sensor (°F)	
Room Temperature Sensor (°F)	77.45
Ambient Temp Sensor (°F)	77.00
Adjusted Ambient Temp (°F)	75.05
Evaporator Temp Sensor (°F)	36.50
Evaporator Fin Thermistor (°F)	36.50
Evaporator Target Temp (°F)	36.73
Solar Sensor (D Side)	0

These include but are not limited to the following:

- Toyota/Lexus hybrids
- Chevrolet Volt
- Nissan hybrids
- Ford hybrids

All electric vehicles (EVs) use electrically-driven A/C compressors, including but not limited to:

- Tesla vehicles
- Chevrolet Bolt
- Ford Focus EV
- Nissan Leaf

Case Study

The Case of The Hot Mustang

The owner of a seven-year-old Mustang GT convertible complained that the driver's side A/C vent seemed to be have warmer air coming from it than the passenger side. The owner ignored this situation in the fall but the next spring, the A/C did not seem to cool as quickly as before. When started, the driver felt a burst of cool air from the driver's side vent, then it started sending warmer air. The shop checked the

charge level because having a warmer driver's side vent temperature is a classic example of a system that has a low refrigerant charge. The shop recovered about 7 oz. of R134a and recharged the system with the correct amount of R134a (20 oz.). The shop did not find any leaks, but added some dye to help find a leak if the customer returns later.

Summary:

- **Complaint-** The customer complained of a lack of cooling, especially from the driver's side vent.
- **Cause-** The A/C system was found to have a low refrigerant charge.
- **Correction-** The system was evaluated and recharged with the specified amount of the specified refrigerant with dye to help find a possible leak in the future.

Straight Talk

Reader Has Question About Oil Filters

From the June 26 Wheels Section of the Dayton Daily News

Wheels:

Bob D. writes by email:

"I have a question about oil filters. What is the difference between oil filters? If the circumference is same size, why can't I use any filter as long as it fits? Thank you,"

Halderman:

Thanks for writing. Each vehicle has its own specifications such as:

- pressure relief - The bypass valve allows the engine to be lubricated with dirty oil,
- rather than having no lubrication, if the filter becomes plugged. The oil also goes through the bypass when the oil is cold and thick.
- oil drain back valve specifications
- burst strength

The filter is made from either closely packed cloth fibers or a porous paper. Large particles are trapped by the filter. Microscopic particles will flow through the filter pores. These particles are so small that they can flow through the bearing oil film and not touch the surfaces, so they do no damage. Oil filters should be crushed and/or drained of oil before discarding. After the oil has been drained, the filter can usually be disposed of as regular scrap metal. Always check and follow local, state, or regional oil filter disposal rules, regulations, and procedures. My suggestion is to use the recommended oil filter.



Have an automotive question? Get a straight answer by writing to Jim at jim@jameshalderman.com

Contact Us

