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Author & Automotive Expert James D. Halderman

What's new with Jim?

Everything is organized for you!

With classes starting, I am pleased to announce that my team has been working hard all summer to help make things go easier for every automotive instructor whether or not they are using a Pearson textbook. Shame on you if you aren't so, please compare the book being used with a Pearson book. Thanks.

My [website](#) has been greatly expanded and improved including:

1. The site is huge (over 10 GB) and to help make everything work faster, it now is located on its own server so it does not share resources with other websites.
2. There are now over 1,000 videos and all are up-to-date and high-quality and all educational. They are also rated "good, better and best" to help instructors select the best ones to share with their students.
3. Over 900 original animations to help students visualize how things work.
4. Resources are placed under the "Downloads" button and are sorted by ASE content area as well as under "Book Resources" where they are all sorted by textbook and chapter.

FREE SAMPLE:

Where's Jim?

After all events being canceled, I am pleased to be able to attend an outstanding event this month in Cary, NC. I will be attending the ASTE event on September 24-25, 2021.

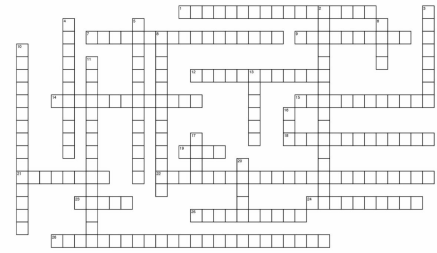


Keep up with me at:
www.jameshalderman.com
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Puzzle of the month

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

Send your name and contact information to the website manager for a free two-day trial. Send your request to Glen at glen@jameshalderman.com



ACROSS

- 1 Used in older diesel engines, fuel is injected into a small pre-chamber, which is connected to the cylinder by a narrow opening. This design is called an indirect injection (IDI) diesel engine.
- 7 A power chamber where the chemical energy of the diesel fuel is converted into heat.
- 8 Design: A term used to describe an overhead valve or pushrod design valve train.
- 12 The valve that opens to allow exhaust gases to escape the combustion chamber.
- 14 An engine where the camshaft is in the block and the valves are located in the cylinder head.
- 15 _____ is the cubic inch (cu. in.) or cubic centimeter (cc) volume displaced, or how much air is moved by all of the pistons.
- 16 A cast or forged rod that connects the piston pin to the crankshaft and transfers engine torque to the crankshaft.
- 18 When only one overhead camshaft is used, the design is called a single overhead.

- 21 A hole in an engine block where a piston is inserted.
- 22 An engine that burns fuel outside of the engine block, such as a steam engine.
- 23 A term used to express the repeating movement of the piston through a series of steps one cycle.
- 24 A process where chemical energy in fuel is converted to heat energy by the burning of the fuel at a controlled rate.
- 25 A cast or forged shaft that converts the reciprocal motion of the piston to rotary motion.
- 26 An engine where engine combustion occurs above the piston.

DOWN

- 4 A valve used to allow air into the combustion chamber in a diesel engine.
- 5 Engines with the camshaft in the block use pushrods to transfer the motion of the camshaft lobes to the valves, using pushrods and rocker arms.
- 6 When two overhead camshafts are used, the design is called a double overhead camshaft (DOHC) design with one cam operating the intake valve and the other operating the exhaust valves.
- 8 The position of the piston at the very top of either the compression or exhaust stroke.
- 10 In a diesel engine where fuel is injected directly into the cylinder.
- 11 The four strokes of the four-stroke cycle are intake, compression, power, and exhaust.
- 13 The stroke of an engine is the distance the piston travels from top dead center (TDC) to bottom dead center (BDC).
- 14 The piston position where it is at the bottom of the stroke.
- 17 The diameter of a cylinder is called the bore and is measured in inches or millimeters (mm). The larger the bore, the greater the piston head area on which the gases have to work.
- 20 All automotive and truck engines are constructed using a solid frame, called an engine block. A block is constructed of cast iron or aluminum and provides the foundation for most of the engine components and systems. The block is cast and then machined to very close tolerances to allow other parts to be installed.

Auto Trivia

This headlight is from which vehicle?

- a. 1999 Mercedes S-class
- b. 1989 Porsche 911 Speedster
- c. 1999 BMW 321i
- d. 2003 Toyota Sequoia



**Answer at the bottom*

FAQ

What Are Diesel Fuel Additives?

There are several types and many brands of additives that are designed to be added to diesel fuel. These types of additives include:

1. **Winter Conditioners**—Winter conditioners are designed to reduce the Cold Filter Plugging Point (CFPP). CFPP is the lowest temperature at which a specified volume of diesel type of fuel can pass through a standardized filtration device in a specified time when cooled under certain conditions.
2. **Multi-functional Conditioners**—Many multifunctional additives increase the cetane rating of the fuel and help keep injectors clean. By raising the cetane rating of the diesel fuel, engine power and fuel economy is improved. This type of additive is designed to be used year-round.
3. **Microbicide**—Microbes can grow in diesel fuel at the junction between the water and the diesel. The microbes live in the water and eat the diesel fuel. Water is heavier than the diesel fuel and is near the bottom of the tank. Water in the fuel can



be caused by condensation of moist air in the tank and during transport and storage. A microbicide is designed to kill microorganisms including bacteria and fungi. Always follow the vehicle manufacturer's recommended service procedures and for best results always use additives from a known brand and use according to the instructions on the product label.

Sample ASE certification-type question

A light diesel engine equipped with a variable ratio/geometry turbocharger (VGT) lacks power. The owner also complains that the exhaust brake does not work. What is the most likely cause?

- a. Restricted exhaust system
- b. Clogged air filter
- c. Stuck turbocharger vanes
- d. Stuck open cooling system thermostat

Answer/Explanation

The correct answer is c. The most likely cause of a lack of power concern is a stuck variable ratio/geometry turbocharger vanes. The exhaust brake uses the vanes of the turbocharger to restrict the flow of the exhaust to act as an exhaust break so this is why this is the most likely cause. Answer a is not correct because while a restricted exhaust could result in reduced power from the engine, it would be unlikely be the cause of the exhaust brake not functioning too. Answer b is not correct because while a restricted air filter could result in reduced power from the engine, it would be unlikely be the cause of the exhaust brake not functioning too. Answer d is not correct because while a stuck open thermostat could result in reduced power from the engine, it would be unlikely be the cause of the exhaust brake not functioning too.

Tech Tip

Quick and Easy Test for Diesel Fuel in the Oil

Some technicians have learned that using a clean paper towel is a quick and easy way to check for diesel fuel in the engine oil. Remove the dipstick and place the end of it above a clean white paper towel. The engine oil dripped from the end of the dipstick will cause a dark spot in the center. If there is diesel fuel in the oil, this will spread out causing a lighter area around the oil spot.

Case Study

The Case of the Tuner Program Gone Bad

The owner of a two-year-old Duramax complained to the dealer service department that the engine was not running smoothly and had a check engine light on. A check of the diagnostic trouble codes indicated a

stored P0300 (random misfire code) DTC. The service technician verified that the engine had a noticeable misfire, plus noticed some engine noise. When one of the valve covers was removed to check for possible valve train-related issues, several bent pushrods were discovered. Because the engine was still under the factory warranty, the factory service rep was called in for help. The district rep discovered the following:

1. The PCM had been reflashed 5 times, yet the factory program was currently installed.
2. The engine had been operated up to 5,500 RPM, which is much higher than the factory programming allowed.

Based on these findings, the warranty was canceled on the engine. The customer was notified that while a hand-held tuner can be used to recalibrate the PCM to increase engine power, it does so by “taking the emissions out of compliance” and can often cause engine damage as in this case. The owner decided to have the engine repaired and left the programming of the PCM the same as when it left the factory.

Summary

- **Complaint** – The owner complained of a rough running engine and the check engine light was on.
- **Cause** – The engine had been operated at a speed that was higher than it was designed to operate, which caused several pushrods to be bent.
- **Correction** – The bent pushrods were replaced, at the customer’s expense, which corrected the rough running engine concern.



Straight Talk

Reader Ask About Oil Change Intervals

From the August 28 Wheels Section of the Dayton Daily News

Wheels:

Bruce B. asks by email:

“Due to the pandemic, I have not driven nearly as much as I normally do. My question is when should I change the oil in my two vehicles? I am now working from home and instead of driving 12,000-15,000 miles per year, I am now filling my gas tank only once a month or so instead of every week. The oil life monitor in my vehicle simply lets me know to change the oil every 10,000 miles and it has been over a year since I changed the oil. What do you recommend? Thanks.”

Halderman:



Thanks for writing and for being concerned about your vehicles. Many vehicles keep track of time and engine use and notify the driver when an oil change is recommended based on the cold starts, idle times and temperatures. With this type of oil life monitor (OLM), your vehicle should have already displayed a message to change the oil based on vehicle, usage or time. Almost all vehicle manufacturers recommend that the engine oil be replaced at least every year. What do I suggest? I recommend to always follow the vehicle manufacturers recommendations and change the oil when the oil life monitor indicates that the oil life is less than 10-15% or at least every year.

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



**Answer To This Month's Trivia:
B. 1989 Porsche 911 Speedster**

Contact Us

