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Author & Automotive Expert James D. Halderman

What's new with Jim?

Everything is organized for you!

As we start a new year, I am pleased to announce that my [website](#) has been enhanced and expanded to include:

1. Online testing with automatic grading with ASE-correlated questions. Click on "Student Assessment" on the home page for details.
2. Now animations and videos and are posted by ASE content area under "downloads" as well as under each textbook chapters.

Where's Jim?

No trips planned for this month.

Keep up with me at:

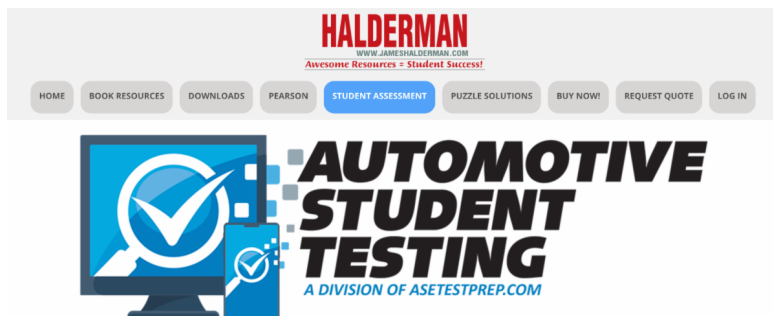
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Puzzle of the month

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



Jim recommends that all of his customers use **Automotive Student Testing** for all of their student assessment needs. **Automotive Student Testing** provides online Tests and Quizzes covering everything you will be teaching your students. Students can use classroom computers or their own smartphones to access the assessment tests.

Downloads

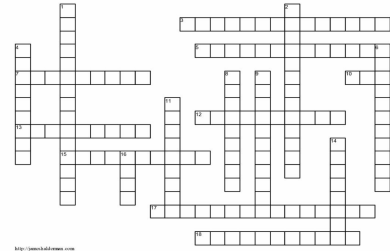
Animations by ASE area

Custom animations developed to illustrate various automotive related functions.

Videos by ASE area

Video links cultivated to teach various automotive functions, diagnosis and repair.

Front Suspension And Service Chapter 8



- ACROSS**
- A _____ suspension uses two control arms as well as a structural strut assembly.
 - Defective shock absorbers can cause _____.
 - To control longitudinal support, a _____ is attached to each beam and is anchored to the frame of the truck using roller bearings.
 - The two main links in a _____ suspension are the upper control arm and the lower control arm.
 - Locating the _____ on the lower control arm is the most common SLA-type suspension configuration.
 - A _____ front suspension was used for over 30 years on Ford pickup trucks and vans.
 - Many GM front-wheel-drive vehicles use a MacPherson strut with a large diameter spring seat area. This is called a _____.
 - A _____ can be of several types, including a MacPherson _____.
 - A _____ can also be used to help locate worn or defective suspension components.
- DOWN**
- Early versions of the beam beam systems used kingpins, while later models used ball joints to support the _____ and axle.
 - Many manufacturing ball joints have wear indicators with a raised area around the grease fitting, called _____ joints.
 - Some replacement control arm bushings have a higher _____ rating than the original.
 - Another name for a strut rod is _____.
 - A _____ front suspension is very strong and is still being used in the manufacture of medium and heavy trucks.
 - Short-long arm suspensions use longitudinal _____, especially in trucks.
 - Some ball joint studs have a slot or groove where a _____ is used to hold the ball joint to the steering knuckle.
 - At the end of many solid beam or tube axles are _____ that allow the front wheels to rotate for steering.
 - Another name for an SLA suspension is the _____ suspension.



Auto Trivia

- The vehicle pictured is a _____
- 1958 Borgward P100
 - 1957 Pontiac Safari wagon
 - 1959 Oldsmobile wagon
 - 1960 DeSoto wagon



*Answer at the bottom

FAQ

What Do Different Grease Colors Mean?

Nothing. According to grease manufacturers, grease is colored for identification, marketing, and for consistency of color reasons.

- **Identification.** The color is often used to distinguish one type of grease from another within the same company. The blue grease from one company may be totally different from the blue grease produced or marketed by another company.
 - **Marketing.** According to grease manufacturers, customers tend to be attracted to a particular color of grease and associate that color with quality.
 - **Consistency of color.** All greases are produced in batches, and the color of the finished product often varies from one batch to another. By adding color to the grease, the color can be made consistent.
- Always use the grease recommended for the service being performed.



Sample ASE certification-type question

A “dry park” test to determine the condition of the steering components and joints should be performed with the vehicle _____.

- a. On level ground
- b. On turn plates that allow the front wheels to move
- c. On a frame contact lift with the wheels off the ground
- d. Lifted off the ground about 2 inches (5 cm)

Answer/Explanation

The correct answer is a. The vehicle must be on level ground when conducting a dry park test. With the vehicle weight on the front wheels, resistance is applied to the steering linkage. Answers b, c, and d are not correct because these methods will allow the front wheels to move and not apply a load on the steering linkage.

Tech Tip

Inductive Heating Tool

Fasteners are often rusted and difficult to remove, especially those that are part of the steering system where they are exposed to road moisture, dirt, and debris. A heating tool, such as the Mini-Ductor, uses electrical induction to heat a coil at the tip, and is the tool that many experts recommend to use when heating of a fastener is needed. Using this tool allows a technician to heat a part quickly without the hazard of using an open flame.



Case Study

The Noisy Toyota Highlander

A customer complained that a noise was heard from the rear of a Toyota Highlander SUV. During a test drive, the service technician did notice a slight noise and thought it might be due to a tire. Driving over various types of road surfaces did not change the level or the pitch (frequency) of the noise, indicating that the noise was due to a bearing rather than a tire. As a double check that a tire was not the issue, the technician rotated the tires placing the front tires in the rear and the rear tires on the front. Another test drive resulted in the same results. The technician then recommended that the right rear wheel bearing (bearing hub assembly) be replaced and the customer agreed to the estimate. When the hub bearing was removed and checked for any roughness, the technician did not feel or hear any noise from the old bearing. However, once the new bearing was replaced, the noise was gone during a test drive.

Summary

- **Complaint**—Customer complained of a noise from the right rear of the SUV.
- **Cause**—Defective wheel bearing.

- **Correction**—Replacing the right rear bearing/hub assembly fixed the noise concern.

Straight Talk

Reader Has Questions About Electric Cars

From the December 25 Wheels Section of the Dayton Daily News

Wheels:

Wayne G. writes by email:

"I just had a question and wasn't sure who would have the answer. I think this is something you would know. What is the approximate cost to "fill-up" an electric car? Is it so much per kilowatt or what? I am trying to understand how an electric car saves money or is it just getting away from gas powered cars due to environmental concerns. Would there be any way to incorporate some type of a built-in charging system that would charge the battery off of the physical movement of the vehicle?"



environmental concerns. Would there be any way to incorporate some type of a built-in charging system that would charge the battery off of the physical movement of the vehicle?"

Halderman

I think the key is this. An electric car battery fully charged 100 kWh high-voltage battery has the energy equivalent of three gallons of gas. With that battery, the car can travel about 250 miles depending on the make and model. The key is efficiency. The cost of filling the high-voltage battery is about \$10 worth of electricity, which is a lot less than the cost of gasoline needed to travel 250 miles in a gasoline -powered vehicle. If traveling, the driver can use the car or a smart phone app, such as Plug Share, to locate high speed charging stations. Commercial charging stations charge by the kWh or by time depending on local laws. For example, a typical level 2 charging station at a shopping mall charges \$0.45 pr kWh. Many level 2 charging stations are free to use at some stores and colleges.

I know there are many concerns about electric vehicles regarding total emissions and the effect on climate change. The electrical energy has to be created by the electrical grid that uses coal, natural gas or renewal sources. The emissions from centrally located power stations is easier to control than the emissions from thousands of vehicles. Most owners of electric vehicles charge them at night when electrical use is lower. This is achieved by programming the vehicle or the charging station at home to charge at a preset time interval. The vehicle can also be programmed to heat or cool the interior and prepare the high-voltage battery for use in the morning before leaving for work.

Regarding attaching a generator to charge the battery while driving, this is not practical. It takes power to rotate the generator, and this power comes from the electric drive motor. While it could charge the battery, the net result is less than what it takes to operate the generator.

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



Answer To This Month's Trivia:
b 1957 Pontiac Safari wagon

Contact Us

