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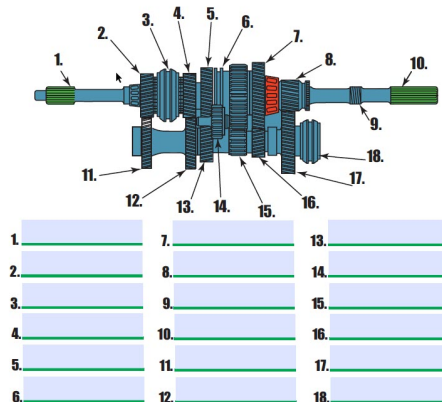
Author & Automotive Expert James D. Halderman

What's new with Jim?

Everything is organized for you!

Many automotive instructors are struggling trying to find resources that can be used for online training. My team has been working hard to create and organize not only teaching material such as animations, but also assessments such as quizzes and parts ID.

A3 Part ID Worksheet
5-Speed Gear Train



For a **FREE two-day trial** so you can view the resources available for yourself, please send your contact information to my assistant, Glen Plants at glen@jameshalderman.com

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.

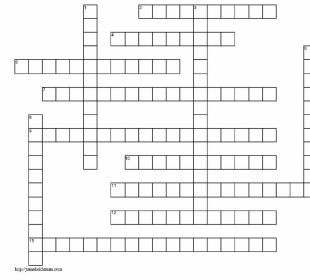
Keep up with me at:
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Puzzle of the month

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

Manual Transaxle Parts and Operation

Chapter 7



ACROSS

2. The driving gears are positioned on the _____ and their score for each forward speed _____.
4. The _____ who includes a gear for each forward speed and three reverse gears.
6. Another name for the main shaft is the _____.
7. The _____ is another name for the main shaft.
9. A _____ is commonly used in rear-wheel-drive vehicles and is often called North-South positioning.
10. The differential _____ and side (bevel) gears in the differential allow for speed differences when the vehicle turns a corner.
11. The _____ is the transmission output and the input for the final drive.
12. All of the gears in a planetary, with the exception of the _____, are in constant mesh, and each of the gear pairs on the input shaft and main shaft represents the power path for a particular gear ratio.
13. The _____ is mounted on the differential case.

DOWN

1. The _____ divides the power flow between the two CV joints coupled to the drive shaft and on to the wheels.
3. A _____ point across the vehicle also called East-West positioning.
5. Unequal-length drive shafts cause the vehicle to pull to one side during acceleration, which is called _____.
8. The input shaft is sometimes called the _____ because it is splined to the clutch disc.

Auto Trivia

What is the vehicle make and model shown?

- a. Lotus Esprit
- b. Toyota Supra
- c. Acura NSX
- d. Ferrari 355



**Answer at the bottom*

FAQ

What are “Chassis Ears”?

Chassis Ears is a brand name for a tool that uses microphones that can be attached to parts under the vehicle and transmit noise to a receiver. The receiver can be tuned so that a technician can listen to one microphone at a time while someone else is driving. This tool makes finding the source of a noise easier.



Sample ASE certification-type question

Drive shaft U-joint working angles can be changed by _____.

- a. Replacing the U-joints
- b. Using shims or wedges under the transmission or rear axle
- c. Rotating the position of the drive shaft on the yoke
- d. Tightening the differential pinion nut

Answer /Explanation

The correct answer is b. Shims under the transmission mount, or a wedge under the leaf springs at the rear of the vehicle, can be used to correct or adjust drive shaft U-joint working angles. Answer a is not correct because the working angle of a U-joint is not changed if the U-joint itself is replaced. Answer c is not correct because

the relationship between the front and the rear U-joints remain the same even if the slip yoke is changed at the output shaft of the transmission. Answer d is not correct because tightening the differential pinion nut will not change the working angles of the U-joints.

Tech Tip

Take the Owner on the Test Drive

Everyone drives differently. By having the vehicle owner along, he or she can better point out when the fault occurs and under what conditions. Sometimes, the owner should drive so the technician can verify the concern.

Case Study

The Case of the Hard Shifting Acura

An Acura Civic (140,000 miles) came in with a hard shifting concern. A road test confirmed that the car shifted hard into every gear. There was no grinding that would indicate a clutch problem. The fluid level was good, and seemed to be SAE 5W-30 engine oil. The technician drained, flushed, and filled the transaxle with Honda manual transmission fluid (MTF), and this fixed the hard shift problem.

Summary:

- **Complaint**—Owner complained of hard shifting.
- **Cause**—Appeared to have had engine oil instead of Honda manual transmission fluid.
- **Correction**—Replaced the transaxle fluid with the specified fluid.



Straight Talk

Reader Asks About Battery Voltage

From the February 27 Wheels Section of the Dayton Daily News

Wheels:

Paul of Bellbrook, OH, writes by email:

“Always enjoy your comments to readers. Here’s a topic I never see discussed that I’ve been pondering for several years. Back in the 1950s, cars transitioned from a 6-volt standard to a 12-volt standard and after 60 + years it’s still that way. Shouldn’t we be at a higher voltage now, say 24, 36, 48 or even higher? Or is 12 the optimum? Or it’s so entrenched that no one dares to suggest an upgrade? Seems to me that a higher voltage would be more efficient. Your thoughts?”



Halderman:

You are correct that the 12-volt standard has been around since the 1950s. You are also correct that a higher voltage would result in less current (amperes) used by the electrical

accessories and components, which in turn would require smaller gauge wires. There was an effort several years ago to have a dual-voltage system using 12 volts and 42 volts, but it never became popular with vehicle manufacturers. Now instead of increasing the voltage, the use of light emitting diodes (LEDs) for lighting has greatly reduced the electrical load which is now handled easily using 12 volts.

Vehicle manufacturers are starting to electrify their vehicles and some are using 48 volts to help propel the vehicle (anything less than 60 volts is considered to not represent a shock hazard). These mild or micro hybrid vehicles are a lower cost version of the more expensive full hybrid vehicles that use higher voltage. These higher voltages of about 300 volts do represent a shock hazard and the wiring is covered with orange conduit to help warn people of the potential

danger. Even though full hybrid and full electric vehicles that are propelled using battery power alone, they also use a 12-volt battery for all of the lighting and accessories. These 12-volt batteries are often in the trunk areas and hidden behind panels.

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



**Answer To This Month's Trivia:
A. Lotus Esprit**

Contact Us

