

**Wheels:** *J.D. Writes by e-mail: “Can you tell me about rear wheel drive cars? When is it normally used? Is it less fuel efficient than front wheel drive? I'm in a discussion with someone about how with CAFÉ standards, that rear-wheel-drive will go away. And, I guess, I don't understand enough about it. Can you give me a rundown on it so I better understand? Thanks. “*

**Halderman:** Good question. There are many variables involved so I will try to address them one at a time:

1. Rear-wheel-drive is the preferred power train arrangement because it allows the front tires to do the steering only and the rear tires to propel the vehicle only.
2. Rear-wheel-drive is used in most trucks because as a load is placed in the bed of the truck, the weight over the drive wheels an increase which helps with traction. If a front-wheel-drive arrangement is used, the load in the bed of the truck would decrease the weight on the front drive wheels, reducing traction and making the vehicle very unstable.
3. Rear-wheel-drive requires a rear differential which uses a high-friction hypoid gear set to change the direction of applied engine force.
4. In front-wheel-drive vehicles, the direction of the engine torque does not need to be changed 90 degrees, therefore a high-friction hypoid gear set is not needed.
5. Is rear wheel drive less fuel efficient? Yes. This is due to the need for a long driveshaft, plus the added body or frame support to handle the engine torque at the rear of the vehicle and due to the friction inside the rear differential which changes the direction of applied torque. While great advances have been made over the past few years with seven and eight speed transmissions and lightweight materials, the rear-wheel-drive vehicle is still at a disadvantage when it comes to fuel efficiency.

Will rear wheel drive go away? Maybe not any time soon as there will be a need for trucks and other vehicles that need rear-wheel-drive to carry heavy loads and to tow trailers. With increasing need to improve fuel economy due to government mandate, even BMW, who always made rear wheel drive vehicles, is now just starting to introduce front-wheel-drive vehicles to the market.

All-wheel-drive vehicles are popular especially in mountainous regions, but here again they are not as fuel efficient as a front-wheel-drive or a rear-wheel-drive. These inefficiencies result from the added weight and friction of the extra parts and systems used to provide all wheel drive.

