Wheels: A recent e-mail asks, "We purchased a 2004 Grand Cherokee Overland which has the high output (HO) engine. When I purchased it, I asked the salesman if it is OK to just use regular gas and he said that regular was fine. After purchasing it, I received an owner's manual. The owner's manual indicated that regular gas was recommended in all of the Jeep Cherokees with the exception of the H.O. engine in which a higher octane than 87 was being recommended. This left me with the impression that while regular gas could be used in a pinch, there may be some long-term effects of continued use of regular gas with this particular engine. We have 4,000 miles on the vehicle and it runs great. The down side is like any SUV, the gas mileage is poor. I get 18 MPG on the highway. Would premium gas increase my mileage and what would the long-term effects on this engine be if I continue to use regular?"

Halderman: This answer is from the Mike Taylor, Professor and Coordinator of the DaimlerChrysler College Automotive Program (CAP) at Sinclair Community College. **"**There is no computer reprogramming listed for the 4.7 L H.O. to change timing, etc. for a lower grade octane gasoline. I would strongly recommend that the owner use the designated fuel, which is probably listed as 91 octane or higher. Maybe the salesman was not up-to-date on the H.O. or he wanted to make a sale and told the potential owner that regular gas (87 octane) is okay. Also, Jeep usually places the words "Premium Fuel Only" on the fuel filler door and on the fuel gauge in the instrument cluster. The standard 4.7 L has 235 H.P. and 295 lb-ft of torque with a compression ratio of 9.0:1. The H.O. version of the 47 L has 270 H.P. and 330 lb-ft of torque with a 9.7:1 compression ratio. I am sure the higher compression ratio is the reason for the owner's manual to list a higher octane for the H.O.
The 4.7 L H.O. has two knock sensors located under the intake manifold (one for each bank). The PCM will retard spark anytime the engine is above idle. This is not a selective cylinder retard system and all 8 cylinders will receive retarded timing if a knock occurs. The knock sensor system also has a short-term and long-term memory; therefore, if the engine is operating on a low octane fuel and spark knock occurs, the PCM will constantly retard the timing. The retarded timing will reduce engine performance and fuel economy. The vehicle should get better fuel economy with higher octane fuel." Thanks Mike for your detailed explanation.