Fuels - Required vs. Recommended

Splitting Hairs on Required vs. Recommended

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Given the price difference between regular-grade and premium gasoline, car buyers should always consider the vehicle's fuel requirement, as listed in the owner's manual, as part of the total cost of ownership.

For some models, car makers recommend using premium gas, while others require it. Here is an overview of the difference between specified fuels.

PREMIUM RECOMMENDED The engine is calibrated to perform best using premium-grade gasoline, but the electronic engine management system incorporates a sensor to detect knocking, so it will run on lower-octane gasoline without harm. But drivers may notice a drop in performance and fuel efficiency, said Bill Visnic, a senior editor at Edmunds.com.

PREMIUM REQUIRED Though the engine control computer is programmed to protect the engine from damage, extreme driving conditions may cause problems. A manufacturer might not cover engine repairs under the warranty if any damage is caused by using gasoline that does not meet the octane requirements specified in the owner's manual.

WHAT IS THE OCTANE RATING?
The numbers (87, 89, 91 etc.) refer to the octane *rating*, a

measure of a gasoline's resistance to *detonation* (also known as *knocking* for the sound that it makes). The higher the octane, the more resistant the fuel is to detonation.

We commonly see three types of octane ratings: ·
Research Octane Number (RON) ·
Motor Octane Number (MON) and ·
Anti-Knock Index (AKI)

The most common type of octane rating worldwide is the Research Octane Number (RON). In most countries, including Australia, New Zealand and all of those in Europe the octane rating shown on the pump is the RON Another type of octane rating is the MON. It is calculated in a somewhat different way. The MON of a modern pump gasoline will be lower than the RON, but there is no direct link between RON and MON.

In Canada and the United States, the octane number is the average of the RON and the MON, called the Anti-Knock Index (AKI). We see it written on pumps as (R+M)/2). Because of the 8 to 12 octane number difference between RON and MON, the AKI shown in the United States is 4 to 6 octane numbers lower than elsewhere in the world for the same fuel. So the 91 octane gas we buy in Arizone would be about 95 RON.