



auto

# HIGH-OCTANE INTELLIGENCE

The benefits of premium fuel don't always justify the price

**W**hen it's time to fill up at the gas station, many people assume that "high octane" is always better. However, new research by AAA shows that the benefits of paying more for premium fuel are not necessarily worth the price.

Last year, nearly 1.5 million vehicles sold in the United States recommended premium fuel (as noted on the fuel door, gas cap or in the owner's manual), but did not require it. In an analysis of six of these vehicles, researchers at the Automobile Club of Southern California's Automotive Research Center found that switching from regular unleaded to premium yielded an average improvement of only 2.7 percent in fuel efficiency. The average gain in horsepower was only 1.4 percent.

Since premium fuel (with an octane rating of 91 or higher), on average, costs about 50 cents more per gallon than regular unleaded (87 octane), the researchers concluded the modest benefits do not justify the higher price, with notable exceptions. The engine knocks experienced by an Audi A3 used in testing, for example, suggested that this car would benefit from higher-octane fuel under certain conditions. A Cadillac Escalade and Ford F150 showed the greatest improvements in fuel efficiency (7.1 percent and 5 percent, respectively), leaving researchers to speculate that premium fuel might be most beneficial to relatively small-displacement engines powering heavy loads.

Higher-octane fuels contain additives that allow them to withstand greater compression and prevent knocks and pings, which occur when the gasoline-air mixture in the engine cylinder ignites prematurely. If premium fuel is recommended for your vehicle, but not required, you can usually eliminate knocks and pings by switching from regular unleaded to mid-grade (89-octane) fuel or, if the problem persists, upgrading to premium—and having your vehicle inspected at a quality facility.

Prior research by AAA determined that premium fuel provides no benefits to vehicles designed to run on regular unleaded, but you should always use premium fuel in vehicles that require it. Otherwise, your vehicle could sustain engine damage not covered by the warranty. A separate AAA study determined that the benefits of Top Tier fuel, which contains detergents that reduce engine deposits, are always worth the small price difference. >> [Visit newsroom.aaa.com/auto](http://www.aaa.com/auto) to learn more.



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