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Road Warrior: Ping! The case for premium gasoline

September 25, 2016

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Record Columnist | The Record

Back in the days when we used a crank instead of an electric button to roll up our windows, Mike Buffa and thousands of other motorists would sometimes fill their tanks with premium gas instead of regular to improve performance.

"It was sort of like taking a multivitamin," said the Dumont motorist.

But last week, AAA (aaa.com) kicked that old myth to the curb with a definitive study showing that American drivers wasted more than $2.1 billion last year by "trading up" this way because the higher octane in premium-grade gas offers "no benefit" for cars designed to use a regular fuel grade.

This news is not particularly new. Consumer Reports and other authorities have been offering similar advice for decades. For example, Ray and Tom Magliozzi, the irreverent Click and Clack brothers of "Car Talk" fame on PBS Radio, pulled no punches years ago in words that keep resonating on their Cartalk.com website: "The only things you'll be benefiting [by buying premium gas for cars designed for regular] are the portfolios of oil-company executives."

So, you would think that more expensive premium-gas sales, generally required in luxury vehicles, would be waning.

But no, sales are growing — from a low of 7.8 percent in 2008 to a high of 11.8 percent in September 2015, according to the Energy Information Administration. The reason: Auto manufacturers are gradually retooling engines to meet higher miles-per-gallon ratings under Corporate Average Fuel Economy standards designed to reach 54.5 mpg by 2025. Of course, there are many ways to boost fuel efficiency, such as reducing vehicle weight, improving aerodynamics, using renewable fuels, converting from gas to electric power and converting from a big engine to a smaller, high-compression version.

"Engines with high-compression ratios run best on premium gas," said Sal Risalvato, president of the New Jersey Gasoline Retailers and Convenience Store Association. "So manufacturers will recommend that you use premium gasoline to run your engine at top efficiency."

But recommendations aren't gospel. As Ray and his elder brother Tom kept reminding listeners, there's another option: "Drive judiciously."

Nevertheless, here's what everybody agrees on:

High-compression engines are designed to squeeze more power from smaller engines by using higher-octane gas. High performance comes at a price, however, because premium gasoline costs more. In the past few years, the difference has ranged from about 6 cents to 50 cents a gallon. In theory, though, we'll

be using less fossil fuel once the 54.5-mpg goal is reached, which means we'll save money at the pump, which in turn will lower petroleum consumption and reduce dangerous greenhouse gases.

How much might we save?

American consumers will reap a $1.7 trillion bonanza, the Energy Information Administration estimates. Of course, auto industry executives aren't sure the 54.5-mpg goal can be reached by 2025 unless they get some financial assistance from Washington, which would likely be realized through an increase in the federal motor-fuels tax. Still, each year the industry has been turning out more and more vehicles that run best with higher-octane fuel. In 2010, the Energy Information Administration reported that the percentage of new vehicles optimized for high-octane fuels was 12.5 percent. By 2013, it had reached 14.2 percent.

If the mpg goal is reached by 2025, more than 83.3 percent of the nation's light-vehicle fleet is expected to be dominated by high-compression, turbocharged engines that use high-octane gas.

So, instead of studying drivers with low-octane engines who "trade up" to high octane, as Mike Buffa did in 1975 to pursue better performance, might AAA be called upon in 2025 to study drivers with high-octane engines who "trade down" to low-octane gas in pursuit of lower prices?

Probably not. The reason has little to do with price. Instead, it has much to do with this noise: Ping!

Like the squeal of a baby hungry for milk, pinging or knocking usually is the first symptom noticed in a car hungry for higher-octane volume. It's a sign that gas and air mixing in a car's cylinders aren't combusting evenly.

But it's largely unknown to modern car owners.

One reason is octane, which — to use Mike's analogy — is something like a multivitamin that's added to gasoline mostly to prevent premature ignition. High-octane gas, which requires a higher temperature and pressure to ignite than regular gas, can usually eliminate pinging. But higher octane often needs help from a computerized knock sensor, which, in most cases, acts as a noise suppressant by adjusting the timing of the spark that causes ignition.

Not always, however. If the engine in a modern car still pings, chances are good that the problem lies not with the car, but with an operator who's requiring his vehicle to take on too big a load.

"Load is the amount of work you're asking the car to do … including climbing steep hills, pulling heavy weight, hard acceleration or driving in hot weather. Any combination of these factors affects load."

Over 30 years, the same guys who said that also reminded us to "drive judiciously," read our owner's manual and take all recommendations with a grain of salt.

Boy, does this Road Warrior miss Click and Clack.

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