

Save on Gas With Morning Fill-Ups?

Don't Bet on It

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Saturday, August 16, 2008

ConsumerReports.org

Some people say it's better to buy your gasoline first thing in the morning, rather than in the heat of the day. That's because gasoline, like all liquids, expands when heated. So, according to this advice, gasoline will be denser in the cool of early morning, meaning you'll get more energy per gallon than later in the day.

The basic facts are correct, but the advice is not. Gasoline does expand and contract a little depending on its temperature. When gasoline rises from 60 to 75 degrees F, for instance, it increases in volume by 1 percent while the energy content remains the same.

But filling stations typically store their gasoline in underground tanks, where the temperature variation during the day is much less than in the air above. The result is that the temperature of the gasoline coming out of the fuel nozzle varies very little, if at all, during any 24-hour stretch at any particular station.

Craig Eerkes, former chairman of the Petroleum Marketers Association of America, a trade group for filling stations, says that the expansion and contraction of gasoline due to day-long temperature shifts is, for the consumer, "Just so, so minuscule as to be almost nonexistent."

Judy Dugan, Research Director for the California advocacy group Consumer Watchdog, says, "The temperature variation between day and night at an individual gas station is apt to be negligible." She also notes that today's double-welled tanks tend to keep the gasoline at the same temperature at which it's delivered for a while. "If fuel is warm when it's delivered to a station, it'll still be warm when it's sold a few hours later."

What we did. We performed some temperature testing at our auto-test facility in East Haddam, Connecticut, where we have an underground fuel tank similar to a typical filling station's. Over a few summer days we measured the temperature of each gallon leaving our dispenser nozzle both in the early morning (8:30 a.m.) and early afternoon (12:30 to 1:00 p.m.).

Results. While the air temperature between fillings varied by up to 12 degrees, the fuel in our underground tank stayed at a steady 62 degrees F. As a result, we found that after the first few gallons were pumped, the fuel temperature coming out of the nozzle varied very little between morning and afternoon.

At both morning and afternoon fill-ups, however, the first few gallons out of the nozzle were notably warmer than following gallons. The temperature between the first and tenth gallons, for example, dropped by between 8 and 17 degrees. This was a result of the gas sitting in the pump dispenser, which was warmed by the sun. At our underground tank, which stores premium fuel, it's not unusual for the gasoline to sit for hours or even days between fill-ups -- unlike a typical filling station tank, which may be replenished every day or even more often. After pumping a car-tankful of gas, 20 gallons or so, the temperature had declined to that of the underground tank.

For consumers, this indicates that you could be marginally better off getting gas where the fuel hasn't sat in a sun-warmed pump assembly for very long, regardless of the time of day. But that only holds true if the underground tank is keeping the fuel cold. As Dugan points out, that's often not the case. Today's double-walled tanks work just as well at keeping fuel warm as keeping it cool. If fuel is warm when it's delivered to a station, it'll still be warm when it's sold a few hours later, whether that's five in the morning or two in the afternoon.

Bottom line. Even with the temperature swings we saw in the first few gallons pumped at our facility, we didn't see a big penalty for the consumer. A 15-degree difference, for example, would result in a one-percent gain in volume. Or, just a few cents difference on the first gallons pumped -- not enough to change your schedule or routine in chasing costs, especially if it might increase your fuel consumption in the pursuit