

# Which gasoline is best for mileage, your car's engine and your wallet?

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PHOENIX - National gasoline brands differ widely in their levels of crucial engine-cleaning detergent additives, and some automakers and fuel experts contend the Environmental Protection Agency's minimum standard is outdated.

The Scripps Howard News Service, an ABC15 partner, commissioned a test of five national brands to check levels.

Buying the cheapest gasoline will keep a few extra cents in your pocket now, but it may cost you down the road.

That's because national gasoline brands differ widely in their levels of crucial engine-cleaning detergent additives, the Scripps Howard News Service has found. The additives remove carbon deposits that can impair engine efficiency, reduce gas mileage and increase harmful emissions -- sometimes enough for a car to fail emissions testing.

Complicating the issue: The federal Environmental Protection Agency's minimum requirement for the additives is woefully low and outdated, some automakers and fuel experts contend.

Since 1995, the EPA has required retailers to sell gas with at least a few drops of detergent in each gallon of gasoline -- enough to keep deposit buildup on a test car to less than 100 milligrams per intake valve over 10,000 miles of driving.

"The sensitivity of modern engines is much higher than it was 10 or 15 years ago," said Keith Corkwell, a manager for Lubrizol Corp., an Ohio-based chemicals company. He said the science behind the EPA rule dates to the 1980s: "We don't make engines that look like that any more. The technologies have changed."

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Officials at the EPA's Washington headquarters did not respond to numerous interview requests made since February.

To gauge the differences in fuels, Scripps commissioned a test of gasoline from five national brands:

- BP
- CITGO
- Exxon
- Pilot (sold at travel centers in 43 states)
- Shell



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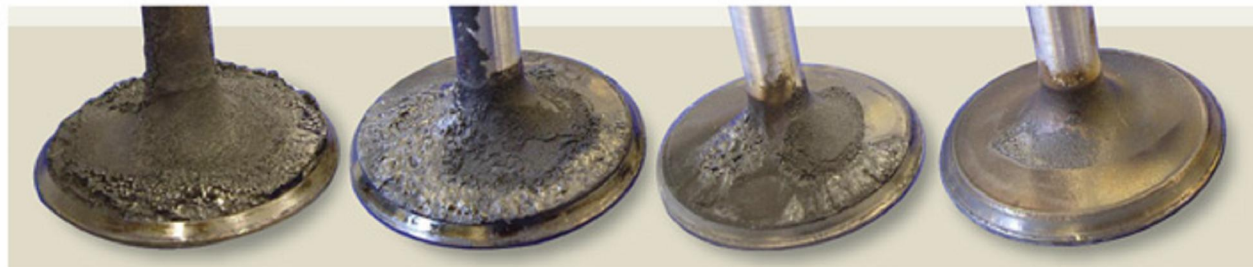
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One-gallon samples of both regular unleaded and premium fuel were collected in metropolitan Detroit on March 10 and analyzed by Paragon Laboratories, an independent, certified testing facility in Livonia, Mich.

Paragon tested each of the 10 samples, measuring the residue left when gas is boiled away. This “unwashed gum” serves as evidence of detergent. Theoretically, the more gum residue, the more detergent -- and the better the gasoline.

## THE DIRT ON GAS DETERGENT ADDITIVES



### REMOVING CARBON BUILDUP

Gasoline detergent additives remove harmful carbon deposits that collect on engine parts, including intake valves. Those shown above, from left, are from engines running on gasoline with no detergent, with 1.1 times the lowest allowable concentration, 1.7 LAC and 2.7 LAC.

The National Institute for Automotive Service Excellence says carbon buildup can:

- Reduce fuel efficiency
- Disrupt combustion, causing engine hesitation
- Create engine “knock”
- Increase hydrocarbon emissions

SHNS photo illustration by John Bruce / images courtesy of BASF

### THE GAS RESULTS:

-- Among samples of regular unleaded gasoline (those with an octane rating of 87), Exxon had the highest level of additives (20.0 milligrams per 100 milliliters), closely followed by BP (17.2 mg) and Shell (16.2 mg). Trailing substantially were CITGO (6.0 mg) and Pilot (5.8mg).

-- Among premium fuels (92 or 93 octane), Shell took the top spot (31.0 mg), followed by BP (26.4 mg) and Exxon (21.2 mg). CITGO (9.4 mg) and Pilot 92 (8.8 mg) lagged behind the other three brands -- including the trio's regular gasoline samples.

The Scripps test shows that “the major brands like Exxon, Shell and BP all had good amounts of detergent,” said Sal Rand, one of several fuels experts who reviewed the results. Rand retired from the Texaco Research Center.

Another was Corkwell of Lubrizol, a leading supplier of detergent additives, and Bob Furey, a consultant who used to work for General Motors Corp.

Detergent amounts in the regular Exxon, BP and Shell samples likely would help keep engines clean, Furey said.

Gasoline with more detergent cleans engines better, said Tony Molla, vice president of the National Institute for Automotive Service Excellence, which certifies mechanics.

Some automakers and fuel experts say the EPA's minimum standard is too low, and they've raised that concern with EPA representatives. Officials at the agency's Washington headquarters declined repeated interview requests.

The residue test can't determine conclusively whether samples meet the federal minimum detergent requirement, which is based in part on detergent quality, not just quantity, Furey said. The Scripps test did not measure detergent quality.

Rand, who worked extensively with CITGO, said he expected the Venezuelan company to use more additives: "I am surprised to see their detergency levels are a little bit lower than the majors."

CITGO ensures quality through random checks, said Alan Flagg, a marketing manager.

A vice president of Pilot's parent company, Pilot Flying J of Knoxville, Tenn., said its gas blends meet EPA requirements: "That is the standard we use," Alan Wright said. "We don't put in extra."

BP spokesman Scott Dean said his brand uses far more detergent than the federal rule requires.

Representatives of Exxon, part of ExxonMobil Corp., and Shell Oil Co. did not respond to interview requests.

*\*We know many drivers in the Valley fill up at QT stations, and while their gas was not included in this test, ABC15 talked to a spokesperson who said they put three times the national requirement for detergent in their gasoline.*

The Scripps test provides a one-day snapshot of relatively few samples in a single market. It replicated the approach the auto industry takes on a much broader scale, quietly conducting hundreds of spot-checks nationwide each year. But the industry doesn't disclose these findings to the public.

### **TIPS FOR BETTER MILEAGE:**

Want to get better gas mileage? Use these tips to squeeze more distance out of a tank of gas:

-- Drive as if there's an egg under your foot, gradually accelerating from stops. Darting forward from stops, slamming on the brakes and other sudden speed changes can rob up to a third of your gas mileage.

-- Don't speed. Fuel consumption declines by 7 percent for every 5 mph over 60 mph. Each car has a different speed for maximum fuel economy, but it generally declines above 60 miles mph.

-- Keep your foot off the brake while accelerating. You'll reduce your gas consumption by as much as 35 percent.

-- Inflate tires as recommended by owner's manual. Under-inflated tires can reduce fuel efficiency by nearly 3 percent.

-- Replace air filters as recommended by manufacturer. A dirty one can cut gas mileage by up to 10 percent.

--Tune up. This can improve mileage by up to 4 percent.

--Check your gas cap to make sure it's secure and tightly sealed. Almost a fifth of cars -- 17 percent -- have missing or broken gas caps. Fixing this will improve efficiency by about 1 percent -- and will protect the environment from harmful fumes or spills.

--Consolidate trips. Before you head out to the dry cleaners, check the fridge to see if you need more milk.

-- Get junk out of the trunk. Reducing excess weight.

-- Don't automatically turn on the air conditioner in warm weather. When driving at city speeds, keep windows open to save energy. At highway speeds, turn on air conditioning; open windows create drag, reducing efficiency.

*Sources: AAA, American Petroleum Institute, Consumer Federation of America and National Institute for Automotive Service Excellence*

### **GAS TAX BREAKDOWN**

Where do your gas dollars go? **Here's a breakdown** of the four components that go into every gallon of gas purchase.

Even as gasoline prices flirt with the \$4.11 per gallon record set in July 2008, a handful of cash-strapped states are

taking a look at raising gas taxes. The choice: potholed roads or pricier petroleum.

Especially in states that have not raised gasoline taxes in years, these revenues --- typically spent on transportation -- have dwindled. At the same time, inflation has cut into their purchasing power.

So, even as gasoline prices flirt with the \$4.11 per gallon record set in July 2008, a handful of cash-strapped states are taking a look at raising gas taxes.

This year Connecticut, Hawaii, Maryland and Nebraska introduced legislation hiking their gas taxes, and Arkansas might boost its diesel fuel tax, according to data compiled by the National Conference of State Legislatures and the Tax Foundation. Conversely, Utah, Virginia and Wyoming already have shot down proposed increases this year, NCSL records show.

In July, Minnesota plans to begin testing technology that might enable shifting tax collection from gasoline sales to miles driven, the Minneapolis Star Tribune reported April 19.

The federal government has not raised the 18.4 cents national gas tax since 1993, said Ian Parry, senior fellow at Resources for the Future, a nonprofit, nonpartisan group applying economics to environmental studies.

Because the federal tax hasn't kept up with inflation, the revenue created for federal transportation projects is "being eroded over time," Parry said.

Taxes, the third largest component of gas prices, play a major role in how much consumers pay. They also help explain wide price variances among states.

In California, motorists pay 47.7 cents per gallon in taxes -- the nation's highest rate, according to the American Petroleum Institute, which represents gas companies. Alaska has the lowest tax, charging 8.0 cents a gallon.

Alaska subsidizes its public transportation by taxing oil companies that drill there, said Mark Cooper, research director at the Consumer Federation of America, an advocacy group.

Some state budgets actually benefit from high gas prices. Those that impose a gas sales tax make more money as the price goes up. (The typical gas tax, or "excise" tax, is a flat tax based on the volume of petroleum sold, not the price.) Indiana hits consumers with a 7 percent sales tax on top of the state's 18-cents-a-gallon tax -- and has collected an extra \$202 million over the past year because of higher fuel prices, the Tax Foundation found.

John Felmy, the petroleum institute's chief economist, calls this kind of gas tax a "double whammy" because it hits consumers extra hard when gas prices are already up. On the flip side, states with gas sales taxes lose out on cash when prices fall.

Other states imposing a sales tax on top of a gas tax include California (2.25 percent), Illinois (5 percent) and Michigan (6 percent), the Tax Foundation reports.

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