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What Classic Car Owners Must Know About Ethanol Fuels



It's getting harder to find non-ethanol gas than it ever has before. And that spells trouble for the classic and performance car owner. Many of them are being forced through market choice to use E10 or E15 in their prized vehicles. We understand the angst and dismay that this may bring on.

Classic car owners spend a lot of money. It's a passion for many people. They can spend six or even seven figures to acquire a prized classic car, then there's the upkeep and even the insurance (which can run \$2,000 a year or more for agreed value policies). Jerry Seinfeld, a bigtime classic car aficionado, spend \$1.5 million to build his own car storage facility in Manhattan to house his 50 Porsches. If you don't have the money to build a garage, you can pay a facility \$500 - \$1500 a month for dedicated storage for a classic vehicle.

Then there's the time (and money) spent to keep the cars in working order and even in showroom condition. Classic cars have to be started and operated every so often to keep the clutch from sticking and the brakes from seizing. A serious collector like Jay Leno might even have a staff of employees paid to "exercise" his cars. Maintenance costs for classic cars are a bigger outlay than for normal vehicles. You can spent \$4,000 just for a tuneup on a Ferrari 308.

And what discussion of exotic cars at a show like the Concours D'Elegance would be complete without factoring in the costs to get the car "concourse ready". That bill will run you \$1,000 to \$10,000 for the detailing and engine polishing.

It's pretty clear. Classic car owners spend a lot of money.
So what do they need to know about today's ethanol fuels?

Let's unpack that issue a little bit. We will run through what to expect when using ethanol gasoline blends in older vehicles. What effects, good or bad, do ethanol fuels have? Are there any effective solutions to protect prized classic car investment from any ill-effects of ethanol fuels?

Let's start by doing a brief rundown on the general good and bad with ethanol.



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The good things about ethanol fuels:

- **Ethanol is clean-burning and is a higher-octane fuel than conventional gas.**

Clean-burning means that ethanol contains more oxygen than conventional petroleum. Higher oxygen levels contribute to more complete combustion. It's also well known that pure ethanol has an octane rating of 113. Part of the reason they blend 10% ethanol into gasoline is to enable them to use a lower-octane base gasoline (read: cheaper) and raise its octane to the required amount through the addition of high-octane ethanol.

- **Ethanol is produced from renewable sources.**

This is a big selling point for the farm lobby. US ethanol is produced from corn, obviously something that's a renewable resource.



- **Ethanol-powered vehicles produce lower carbon monoxide and carbon dioxide emissions**, and lower levels of hydrocarbon and nitrogen oxide emissions.

Definitely true. Because ethanol contains more oxygen relative to its weight, it burns more completely. Lower carbon monoxide is direct evidence that this is happening (because complete combustion with adequate oxygen produces carbon dioxide, not carbon monoxide).

- Because ethanol is produced domestically, **it reduces U.S. dependence on foreign oil** and increases the nation's energy independence.
- **Ethanol needs fewer fossil (coal) and petroleum (gas) fuels to produce more BTU** of energy than gasoline (although it does require much more water).

These last two are somewhat debateable, but the evidence does point to there being a modicum of truth in them. Homegrown ethanol is very attractive to people when these points are raised.

The cons of ethanol-gasoline fuel:

- **Ethanol creates 34 percent less energy** than unadulterated gasoline per gallon. This equals a loss in fuel economy of up to 3 miles per gallon for E10 fuels. The fuel economy gets even worse with E85, a loss of 7 to 8 miles per gallon with its higher ethanol content.

Lest anyone dispute these, figures like these have been confirmed through third party testing such as those done by *Consumer Reports* in 2006, which verified a loss in fuel economy of up to 30 percent in a Chevy Tahoe designed to run on flex fuel when it was tested with both unleaded gas and E85. In addition to the lower energy, poor fuel economy can also be attributed to improper fuel system calibration based on computer feedback from oxygen sensors because of the temperatures needed to burn ethanol.



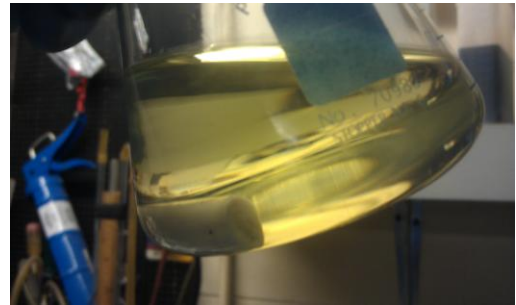
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- **Making ethanol from US corn isn't always a great idea.**

You can make ethanol from a lot of things, and corn happens to be one of the worst grains for making ethanol. But we're stuck with it because we produce so much corn to begin with, that it's the logical choice for large scale ethanol production.

- **Ethanol is hygroscopic**, which means it absorbs water more easily than gasoline.

How much more water? About fifty times more water than regular gasoline does. This leads to water condensation inside fuel tanks, carburetor fuel bowls and fuel lines where air spaces are present. Water content in fuel will also swell up the paper filter media inside fuel filters not specifically designed for flex fuels and can thus restrict fuel flow at the filter.



- **Ethanol erodes fiberglass tanks, rubber hoses and plastic fuel lines.** It contributes to rust in fuel systems by creating condensation in the unfilled portion of gas tanks. It will also dissolve varnish and rust in steel fuel components. Aluminum components are in corrosive danger as the ethanol concentration approaches 25%.

These dissolved ingredients sit in the bottom of gas tanks until they are removed or they will enter the fuel system if the fuel level in the tank gets too low. All of this points to a possible need to detergency treatments for ethanol fuels.

E10 vs E85

The first rule to remember is, if you have to use ethanol gasoline, use E10 and not E85. Only Flex Fuel vehicles can safely run on E85, and classic cars are very far away from flex fuel. Turning a car into a Flex Fuel vehicle involves major modifications to the injectors and computer injection timing system. Nobody's going to do that to a classic car.



Putting Ethanol Into A Classic For The First Time

The immediate effect that ethanol gasoline is going to have is fuel filter plugging because of ethanol's solvency. In this case, we're talking about the cleaning action of ethanol kicking up the decades of dirt inside the engine & fuel system. So you'll probably have to change the filter.



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What should a Classic Car Owner do?

Now we get to the meat of the issue. If you're at the point where you have little choice but to use E10/E15 in your classic car, here are some recommendations on steps you should take to protect your investment while still maximizing your driving enjoyment on ethanol fuel.

- **Ethanol gasoline corrodes metal parts like carburetors, so switch out affected parts.**

That's an immediate concern for classic vehicles. So is the fuel's effects on certain parts made out of leather or plastic. A classic car owner should be very concerned about ethanol's effects on these parts over time. The simple solution here is to do some part exchanges for more modern parts that are ethanol compatible. This is highly recommended to do as a proactive measure for classic car owners.

- **Replace any plastic or rubber fuel lines** with ethanol-resistant hose or nylon tubing.

This will reduce the chance of critical damage to these parts from ethanol solvency.

- **Install a water separator filter** in the fuel line leading to the carburetor. Water collects in the filter and can be removed periodically.
- **Replace any fiberglass tanks with steel or aluminum.**

Ethanol fuels are well known to dissolve and eat through fiberglass. Marinas in the Northeast found this out very early on.

- **Ensure that any O-rings in the fuel system are also ethanol-compatible.**
- **Consider adding a second fuel filter**

Some recommendations are to add a second fuel filter between the tank and the fuel pump to protect it from loose debris that ethanol may have kicked up.

- **Keep your tank as full as possible** to prevent air space where condensation can form.

This is an especially-good idea to combat the fuel's extreme tendencies to attract water from the air around it.

- **Shop around on www.pure-gas.org** to locate a marina or service station that does not pump E10 or E85. None of these stations will be affiliated with a major gasoline producer, but there are still some out there, especially in areas around lakes and rivers where boating is popular.
- **Vent your fuel system** during storage for extended periods

This is recommended because the moisture that your fuel system might absorb from the outside will be less than the moisture created in the air space inside.



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- **Use a fogging solution** in your carburetor during storage to prevent condensation from collecting in fuel bowls.
- **Use a flex fuel-compatible fuel filter** where possible

These filters help prevent the degradation of the paper media in your filter by water in the fuel system.

What About Fuel Treatment For Classic Cars?

Having considered the various problems that ethanol fuels cause with classic cars, it's fair to ask if anything can be done to help on the fuel side? Bell Performance is a great group to discuss classic cars, since they've been around since the earliest classic car days of 1909.

Because so many of these problems listed are directly linked to either properties of the fuel or how the fuel interacts with the components of the engine, the simplest solution to solving these problems lays in treating the fuel with certain chemicals that can offset some of these problems. But this is where the gray area comes in.

There's a big knowledge gap in the consumer market when it comes to fuels and you get a lot of snake oil salesman who prey on this knowledge gap that consumers have with what ethanol does and what can be done about it. Consumers are understandably confused and cautious about treating ethanol. There's so many products out there, all claiming to do the same things or more than the next guy. In other words, a lot of "me-too" stuff on the market. All of them claim to be the most effective thing for what the consumer is looking for. But logically they can't all be the best.



Then you have the fuel additives that try to differentiate themselves in the market by making outrageous claims and guarantees about things that they know the consumer is looking for. You see this most often with fuel additives making mileage claims. Every single consumer we know wants to get better mileage. This spawns a myriad of fuel additives making claims about guaranteeing 20 or 30 or 50% better mileage. Again, having been in the business as long as we have, we know that there are things you can do with ethanol fuels and there are things you cannot do.

Classic car owners aren't the typical consumers, though. They're not so much concerned about gas mileage as they are about performance and protecting their prized vehicles from potential negative fuel issues.

Given that fuel treatment is the simplest and most cost-effective way of addressing many of these problems, the question then becomes - what should you look for in such a fuel treatment?



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How can you know what is going to be an effective solution for them and what is simply going to be a waste of money?

Let's look at some key considerations for protecting your classic car through choosing the right fuel treatment.

What Should It Do?

A quality fuel treatment for ethanol gasoline should be able to do the following things:

Protect the vital parts – With regular cars, you'd list mileage improve first. But that's not what's most important for classic car owners. Because ethanol causes so much damage over time to parts, you want a fuel treatment that interrupts the process and protects both rubber, plastic and metal from softening and corrosion.

Control and remove water without alcohol – Since ethanol fuel and water attraction is such a key element, it stands to reason that a good ethanol treatment will contain surfactants and water absorbers to remove collected water and stave off phase separation. The key thing to look for here is whether it does it without alcohol. A lot of fuel additives will give the impression of solving a water problem by simply adding more alcohol to the fuel – a short term fix at best. Adding more alcohol to solve an alcohol fuel problem isn't going to be a viable long-term solution.

Improve mileage – It's probably going to be hard to find an additive that won't claim to do this. But how does it do it? With fairy dust? There are real combustion improvers that improve the combustion of petroleum; the best ones are organometallic and thus hard to find in on-road fuel additives (power plants use these a lot to improve their heavy fuel oil). Non-metallic combustion improvers tend to dominate on-road/on-shelf fuel treatments, and they can contribute to improving mileage by a certain amount. But watch out for claims that some revolutionary breakthrough will suddenly guarantee that you get 30% better mileage (see below).

What improvement is reasonable to expect? If the fuel additive combines combustion improvers with some of the other types of beneficial ingredients that we'll mention here, you may be able to get 5-12% improvement. But remember that improving mileage depends also on the condition of the vehicle. A new car is going to get less improvement than an old car, because new cars are already functioning about as well mechanically as they're going to get. Anyone who guarantees otherwise is someone you and your wallet will want to avoid.

Clean the engine and fuel system – A quality ethanol fuel treatment will contain multiple detergents that clean and keep clean the injectors, fuel system and combustion chamber. Cleaning these parts is the biggest step to recovering mileage and performance that a fuel additive that contribute. In addition, recalling that ethanol causes damage by dissolving rubber and plastic parts, these detergents should be able to clean and remove these resins that have built up in unwanted places after being dissolved by the fuel.



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Watch Out For Big Claims

Especially where gas mileage is concerned, this is what gets the most consumers and where those consumers have the most hope and the most optimism for fuel additives, especially ethanol fuel additives. Everyone pays attention to gas mileage because it's the most visible indicator from a financial standpoint of how much money they're spending to do what they need to do (i.e. get from Point A to Point B). Drivers are aware of how many miles they typically get on a tank of gas and they're constantly aware of gas prices. When they start getting 320 miles a tank because of ethanol fuel instead of the normal 350 miles (because it's now well known that ethanol gas lowers gas mileage), they feel cheated and they're ready to buy into any hope that adding something to the fuel will put those extra 30 miles back or more.

In fact, one could argue that drivers have a slightly irrational over-emphasis on gas mileage in the larger context of their overall monthly budget. Again, it's because gas mileage is visible and apparent. They get out of their vehicle and spend time pumping the ethanol gas and watching the gallons and dollars rack up. If they have to put an extra 2 gallons of gas per fill-up (\$6-8), they're up in arms about it. But if, political leanings aside, their income taxes go up by a couple thousand dollars a year because of some tax policy decision only seen on C-SPAN, and that increase is just made up by a little more withholding from the paycheck each week, it's not as apparent and the driver doesn't care as much, despite losing more money through taxes than they're spending extra on gas.

So, editorials aside, a good fuel additive or the best fuel additive will never make outrageous claims that are too good to be true. Good fuel additives that actually work are made by people and companies that know what can be done in an engine and what cannot. A fuel additive that "guarantees" **30% better gas mileage** is probably made by people who are trying to make a fast buck or three before enough consumers realize they're not going to get 30% mileage improvement, as much as they hope they will. Of course, once those consumers realize their mistake, their money is long gone and the fuel additive industry gets another black eye.

Much more reasonable gas mileage claims are that you can get 5-12%. It's not going to be the same for everyone because some of it depends on driving habits and the condition of the engine and other factors that vary from person to person. But a marketing claim has to try and hit what's true for the most number of people. A guarantee of 30% improvement is going to be true for.....not many people at all, if any of them.

So pay attention to what's being claimed.

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Bottom Line: Is it worth what you're paying for it?

Classic car owners sure do spend a lot on their vehicles. But that doesn't mean they're not in the business of saving money when they have the opportunity.

The best fuel additive is going to be worth what you pay for it by putting more money back in your pocket than what you paid out to get it. Otherwise, what would be the point in buying it?

A fuel additive can make all the wonderful grand claims for things like gas mileage that it wants. It could claim that it will double your gas mileage. And let's say for the sake of argument that it does. So it's saving you \$50 a tank if you drive an SUV. But if the additive itself costs \$60 per tank to use, then it's still costing you ten bucks instead of saving you money. So why would you buy it?

How much an ethanol fuel treatment saves or costs you is directly related to how much fuel it treats. Concentrated additives like [Ethanol Defense](#) and [Mix-I-Go](#) have much lower treat costs than single-treat additives like....any number of ones you can find on the shelf. Would you rather spend 6-8 cents a gallon to treat your gas or would you rather spend fifty cents a gallon? Many times that's what the cost differential is. A low treat cost means you put more money back in your pocket through savings when you use it. That's really the whole point of using a fuel additive anyway, isn't it?



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We have a lot more where this came from. If you're interested in further information on fuels and engine issues, visit us at www.BellPerformance.com and www.WeFixFuel.com.

Also, if you're a member of a car club, you're our kind of people! Bell Performance would be happy to connect with you to support your next car club meeting. Go to www.WeFixFuel.com/classic-cars for more details.